



FINAL REPORT: Review of Anadromous Fish Habitat and Hatchery Projects

INDEPENDENT SCIENTIFIC REVIEW PANEL

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Cover design by Eric Schrepel, Technical and Web Data Specialist, Northwest Power and Conservation Council.

Photo of Andrew Dutterer, next page, by Amy Hazel.



In Memoriam

[Andrew Dutterer](#), a leader in river restoration for the Oregon Watershed Enhancement Board, passed away in 2021. We greatly appreciated his high-quality work in this review process for the Willamette Bi-Op Habitat Restoration project. The ISRP recognizes his contributions to the restoration of the rivers of the Pacific Northwest and to the Fish and Wildlife Program. He shared his knowledge and love of rivers with kindness and enthusiasm. His undaunted hope for the future will inspire conservation of the streams and rivers of our region for years to come.

Note on ISRP Membership and Conflicts of Interest

ISRP reviewers do not have direct, current financial conflicts of interest with projects funded by the Bonneville Power Administration. But members do have a variety of relationships with fish and wildlife agencies, researchers, and restoration practitioners who propose projects. For example, relationships include past employment at Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, and NOAA Fisheries. We take steps to avoid introducing the appearance of conflict or bias into reviews, including the recusal of panel members on reviews of specific proposals where appropriate.



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The sequence of projects below is organized geographically by subbasin starting at the estuary moving upriver covering the mainstem tributaries through the upper Columbia (Wenatchee, Entiat, Methow, and Okanogan) and then the Snake River tributaries. ISRP recommendations in *italics* are from the response loop. Click page numbers to jump to reviews.

ID	Title	Proponent	Meets ISRP Criteria?	Page
Basinwide Hatchery and Genetic Research, Monitoring, and Evaluation				
200900900	Basinwide Supplementation Evaluation Project	Columbia River Inter-Tribal Fish Commission	Yes	30
200890700	Genetic Assessment of Columbia River Stocks	Columbia River Inter-Tribal Fish Commission	Yes	35
201003100	IDFG Genetic Monitoring of Snake River Steelhead and Chinook Salmon	Idaho Department of Fish and Game	Yes	40
Estuary and Lower Columbia				
200300700	Columbia River Estuary Ecosystem Monitoring	Lower Columbia Estuary Partnership (LCEP)	<i>Conditional</i>	47
200301100	Columbia River Estuary Habitat Restoration	Lower Columbia Estuary Partnership (LCEP)	<i>Conditional</i>	57
201000400	CREST Estuary Habitat Restoration	Columbia River Estuary Study Taskforce (CREST)	<i>Conditional</i>	65
201007000	Lower Columbia River Estuary Scoping and Implementation	Washington Department of Fish and Wildlife (WDFW)	<i>Conditional</i>	73
201007300	Columbia Land Trust Estuarine Restoration	Columbia Land Trust	Yes	79
201201500	Cowlitz Indian Tribe Habitat Restoration and Conservation Program	Cowlitz Indian Tribe	<i>Conditional</i>	83
199306000	Select Area Fishery Enhancement	Oregon Department of Fish and Wildlife	Conditional	88
Willamette River				
200901200	Willamette Bi-Op Habitat Restoration Project	Oregon Watershed Enhancement Board	Yes	92
Wind River				
199801900	Wind River Watershed	U.S. Forest Service	Conditional	96
Hood River				
199802100	Hood River Fish Habitat	Confederated Tribes of Warm Springs (CTWS)	Conditional	103
198805303	Hood River Production Program	Confederated Tribes of Warm Springs (CTWS)	Yes	108
Klickitat River and Rock Creek				
199705600	Yakama Southern Territories Habitat Project (STHP)	Yakama Nation Fisheries	Yes	117
198812035	Klickitat River Management & Data Project (YKFP)	Yakama Nation Fisheries	Not Applicable	121
199701335	Klickitat River Operations and Maintenance (O&M) for Hatcheries and Acclimation Sites-Yakima/Klickitat Fisheries Project (YKFP)	Yakama Nation Fisheries	Not Applicable	123
199506335	YKFP Klickitat Subbasin Monitoring and Evaluation	Yakama Nation Fisheries	Conditional	125

ID	Title	Proponent	Meets ISRP Criteria?	Page
Deschutes River and Trout Creek				
199404200	Trout Creek Operations and Maintenance (O&M)	ODFW	Conditional	130
199802800	Trout Creek Watershed Restoration	Jefferson County Soil & Water Conservation District (SWCD)	Conditional	135
200830100	Habitat Restoration Planning, Design, and Implementation within the Boundaries of the Confederated Tribes of the Warm Springs Reservation of Oregon, Lower Deschutes River, Oregon Project	Fish Habitat Program, Fisheries Department, Confederated Tribes of the Warm Springs Reservation of Oregon	Conditional	140
200830600	Deschutes River Fall Chinook Research and Monitoring	Confederated Tribes of Warm Springs	No proposal received	145
200831100	Natural Production Management and Monitoring	Confederated Tribes of Warm Springs	No proposal received	145
John Day River				
198402100	John Day Habitat Enhancement	Oregon Department Fish and Wildlife	<i>Conditional</i>	146
199306600	Oregon Fish Screens Project	Oregon Department of Fish & Wildlife	<i>Conditional</i>	156
200739700	John Day Watershed Restoration	Confederated Tribes of the Warm Springs Reservation of Oregon	Yes	164
200001500	Upper John Day Conservation Lands Program	Confederated Tribes of the Warm Springs Reservation of Oregon	Conditional	168
200003100	Enhance Habitat in the North Fork John Day River	Confederated Tribes of the Umatilla Indian Reservation	Yes	172
200102100	Wasco County Riparian Buffers	Wasco County Soil and Water Conservation District	Conditional	175
200203400	Riparian Buffers in Wheeler County	Wheeler Soil & Water Conservation District	Conditional	180
200203500	Riparian Habitat Protection and Enhancement in Gilliam County	Gilliam County Soil and Water Conservation	Conditional	186
199801600	John Day River Salmonid Monitoring to Inform Recovery	ODFW	Yes	192
Umatilla River				
198710001	Umatilla Anadromous Fish Habitat Project	Confederated Tribes of the Umatilla Indian Reservation	Yes	197
199000501	Umatilla Basin Natural Production Monitoring and Evaluation Project (M&E)	Confederated Tribes of the Umatilla Indian Reservation	Yes	198
198902401	Evaluate Umatilla Juvenile Salmonid Outmigration	Oregon Department of Fish & Wildlife	Yes	208
198802200	Umatilla and Walla Walla Fish Passage Operations	Confederated Tribes of the Umatilla Indian Reservation	Conditional	212
198343600	Umatilla Passage Operations and Maintenance (O&M)	Westland Irrigation District	Not Applicable	214
198903500	Umatilla Hatchery Operations and Maintenance (O&M)	Oregon Department of Fish and Wildlife	<i>Conditional</i>	216
198343500	Umatilla Hatchery Satellite Facilities Operations and Maintenance (O&M)	Confederated Tribes of the Umatilla Indian Reservation (CTUIR)	<i>Conditional</i>	223
199000500	Umatilla Hatchery Monitoring and Evaluation (M&E)	Oregon Department of Fish and Wildlife	Yes	230
Walla Walla and Touchet Rivers				
199604601	Walla Walla River Fish Habitat Enhancement	Umatilla Confederated Tribes (CTUIR)	Conditional	236
200739600	Walla Walla Basinwide Tributary Passage and Flow	Walla Walla Basin Watershed Council	Conditional	239

ID	Title	Proponent	Meets ISRP Criteria?	Page
200902600	Umatilla Tribe Ceded Area Juvenile & Adult Fish Passage Improvement	Confederated Tribes of the Umatilla Indian Reservation	Conditional	244
200721700	Walla Walla River Passage Operations and Maintenance (O&M)	Gardena Farms Dist. 13	Not Applicable	249
200003802	Walla Walla Hatchery Operations and Maintenance (O&M)	Confederated Tribes of the Umatilla Indian Reservation (CTUIR)	Conditional	250
200003900	Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project	CTUIR	Yes	254
200003901	Touchet River VSP Monitoring	Washington Department of Fish & Wildlife	Conditional	260
Yakima River				
199200900	Yakima Phase II Fish Screens Operations and Maintenance (O&M)	Washington Department of Fish & Wildlife	Not Applicable	265
200739800	Yakima Tributary Access & Habitat Program	Washington Resource Conservation and Development	Conditional	266
199206200	Lower Yakima Valley Riparian Wetlands Restoration	Yakama Nation Wildlife, Range & Vegetation	Conditional	272
199603501	Yakama Reservation Watersheds Project (YRWP)	Yakama Nation Fisheries	Yes	276
199705100	Yakima Basin Habitat Project	Tribes and Bands of the Yakama Nation	<i>Conditional</i>	281
200900200	Status and Trend Annual Reporting and Information Management	Yakama Nation Fisheries	Not Applicable	290
201003000	Yakima Steelhead VSP Project	Yakama Nation	Yes	294
199506325	Yakima River Monitoring and Evaluation	Yakama Nation Fisheries	Conditional	300
199701325	Yakima River Operations and Maintenance	Yakama Nation Fisheries	Yes	304
198812025	Yakima River Management, Research, and Data	Yakama Nation Fisheries	Not Applicable	305
199506425	Policy, Plan, and Technical Support of Washington Department of Fish and Wildlife (WDFW) – Yakima/Klickitat Fisheries Project (YKFP)	Washington Department of Fish and Wildlife	Not Applicable	307
Upper Columbia Rivers: Wenatchee, Entiat, Methow, and Okanogan				
201000100	Upper Columbia Programmatic Habitat	Upper Columbia Salmon Recovery Board	<i>Conditional</i>	310
200900300	Upper Columbia Habitat Restoration	Confederated Tribes and Bands of the Yakama Nation	<i>Conditional</i>	317
200850300	Studies on Factors Limiting Abundance of Okanogan and Wenatchee Sockeye Salmon	Columbia River Inter-Tribal Fish Commission (CRITFC)	Conditional	326
201003400	Upper Columbia Spring Chinook Salmon and Steelhead Juvenile and Adult Abundance, Productivity, and Spatial Structure Monitoring	Washington Department of Fish & Wildlife	Yes	330
201003300	Reproductive Success of Hatchery and Natural Origin Steelhead in the Methow	Washington Department of Fish and Wildlife	Yes	335
200302200	Okanogan Basin Monitoring & Evaluation Program (OBMEP)	Confederated Tribes of the Colville Reservation	Conditional	339
200303900	Monitor and Evaluate (M&E) Reproductive Success and Survival in Wenatchee River	NOAA/NMFS/NWFSC	Yes	344

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199604200	Restore Salmon Creek for Anadromous Fish	Confederated Tribes of the Colville Reservation (CTCR)	Conditional	347
200810400	Land and Water Acquisition	Confederated Tribes of the Colville Reservation (CTCR)	Yes	352
200722400	Upper Columbia Habitat Implementation Program	Confederated Tribes of the Colville Reservation (CTCR)	Conditional	356
200810200	Okanogan Habitat Acquisition and Restoration	Bonneville Power Administration	Conditional	360
200302300	Chief Joseph Hatchery Program	Confederated Tribes of the Colville Reservation (CTCR)	Conditional	364
199604000	Upper Columbia Production Projects	Yakama Nation Fisheries Resource Management	<i>Conditional</i>	368
Lower Snake, Tucannon, and Asotin Rivers				
200740100	Kelt Reconditioning and Reproductive Success Evaluation Research	Columbia River Inter-Tribal Fish Commission	Conditional	379
201007700	Tucannon River Programmatic Habitat Project	Snake River Salmon Recovery Board (SRSRB)	Yes	383
199401806	Tucannon Stream and Riparian Restoration	Columbia Conservation District	Conditional	387
200820200	CTUIR Tucannon Basin Fish Habitat Enhancement Project	Confederated Tribes of Umatilla Indian Reservation (CTUIR)	Conditional	392
201005000	Tucannon River Steelhead Supplementation M&E	Washington Dept of Fish and Wildlife	Yes	396
199401805	Asotin County Enhancement and Restoration Project	Asotin County Conservation District	Yes	401
200205300	Lower Snake River Steelhead VSP Monitoring	Washington Department of Fish and Wildlife	Yes	407
Grande Ronde and Imnaha Rivers				
198402500	Grande Ronde and Umatilla Fish Habitat Improvement	Oregon Department of Fish and Wildlife (ODFW)	Yes	414
199202601	Grande Ronde Model Watershed	Grande Ronde Model Watershed Foundation	<i>Conditional</i>	417
200739300	Protect & Restore NE OR & SE WA Watershed Habitat	Nez Perce Tribe	Not Applicable	427
199701501	Imnaha River Steelhead Status and Smolt Monitoring	Nez Perce Tribe	Yes	429
199800702	Grande Ronde Supplementation: Lostine River Operation and Maintenance and Monitoring and Evaluation	Nez Perce Tribe	Conditional	438
199608300	CTUIR Grande Ronde Watershed Restoration	Confederated Tribes of the Umatilla Indian Reservation	Conditional	441
200820700	CTUIR Priority Stream Corridor Conservation and Protection (Umatilla Tribe Protection and Capital Acquisition)	Confederated Tribes of the Umatilla Indian Reservation	Conditional	446
200820600	Instream Flow Restoration	Confederated Tribes of the Umatilla Indian Reservation	<i>Conditional</i>	450
200901400	Biomonitoring of Fish Habitat Enhancement	Umatilla Confederated Tribes (CTUIR)	<i>Does not meet</i>	456
200900400	Evaluating salmonid and stream ecosystem response to conservation measures and environmental stressors in the Columbia River basin	Columbia River Inter-Tribal Fish Commission	Yes	469
199202604	Grande Ronde Salmonid Life Cycle Monitoring Project	Oregon Department of Fish and Wildlife	Response requested - pending	472
200708300	Grande Ronde Supplementation Monitoring and Evaluation (M&E) on Catherine Creek/Upper Grande Ronde River	Umatilla Confederated Tribes (CTUIR)	Conditional	478

ID	Title	Proponent	Meets ISRP Criteria?	Page
199800703	Grande Ronde Supplementation O&M on Catherine Creek and upper Grande Ronde River	CTUIR	Yes	481
Lower Snake and Clearwater River				
199005500	Idaho Salmon and Steelhead Monitoring and Evaluation (M&E) Studies	Idaho Department of Fish and Game	Yes	484
199102800	Pit Tagging Wild Chinook	NOAA Fisheries	Yes	489
199608600	Clearwater Focus Program	Idaho Governor's Office of Species Conservation	Not Applicable	493
200860400	Potlatch River Watershed Habitat Improvements	Idaho Governor's Office of Species Conservation	<i>Conditional</i>	497
200206100	Potlatch River Watershed Restoration – Latah SWCD Project Development	Latah Soil and Water Conservation District	<i>Conditional</i>	505
200207000	Restoring Anadromous Fish Habitat in the Lapwai Creek Watershed	Nez Perce Soil and Water Conservation District	Yes	513
199706000	NPT DFRM Focus Watershed Restoration Program	Nez Perce Tribe Department of Fisheries Resources Management – Watershed Division	Not Applicable	519
199607702	Lolo/Selway Watershed Restoration	Nez Perce Tribe DFRM Watershed	Conditional	523
199901700	Protect and Restore Lapwai Creek Watershed	Nez Perce Tribe	Yes	528
200739500	Protect & Restore Lochsa Watershed	Nez Perce Tribe Department of Fisheries Resources Management: Watershed Division	Conditional	533
200207200	Red River & Newsome Creek Watershed Restoration	Nez Perce Tribe	Conditional	537
201000300	Lower South Fork Clearwater/ Slate Creek Watershed Restoration	Nez Perce Tribe	Yes	542
201008600	Protect and Restore Crooked and American River Watersheds	Nez Perce Tribe Department of Fisheries Resources Management Watershed Division	Conditional	546
200206800	Clearwater and Wallowa Parr Distribution and Habitat Assessment	Nez Perce Tribe	<i>Conditional</i>	551
201005700	Snake Basin Anadromous Assessments	Nez Perce Tribe	Yes	562
200206000	Nez Perce Harvest Monitoring on Snake and Clearwater Rivers	Nez Perce Tribe	Yes	567
198335003	Nez Perce Tribal Hatchery – Monitoring and Evaluation (M&E)	Nez Perce Tribe	Yes	571
198335000	Nez Perce Tribal Hatchery Operations and Maintenance (O&M)	Nez Perce Tribe	Conditional	577
Salmon River				
199401500	Idaho Fish Screening Improvement	Idaho Department of Fish and Game	Yes	582
200739900	Upper Salmon Screening Tributary Passage	Idaho Department of Fish and Game	Yes	584
200739400	Upper Salmon Basin Habitat Restoration	Idaho Governor's Office of Species Conservation	Yes	587
200860300	Pahsimeroi River Habitat	Idaho Governor's Office of Species Conservation	Yes	593
201007200	Lemhi River Restoration	Idaho Office of Species Conservation (OSC)	Yes	597
200860800	Idaho MOA/Fish Accord Water Transactions	Idaho Governor's Office of Species Conservation	Yes	601

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200726800	Expense Idaho Watershed Habitat Restoration	Custer Soil and Water Conservation District	Yes	604
200712700	East Fork of South Fork Salmon River Passage Restoration	Nez Perce Tribe	Yes	609
199604300	Johnson Creek Artificial Propagation Enhancement	Nez Perce Tribe	Yes	613
199405000	Salmon River Habitat Enhancement	Shoshone-Bannock Tribes	Conditional	619
200205900	Yankee Fork Salmon River Restoration Project	Shoshone Bannock Tribes	Response requested - pending	624
200890400	Salmon River Basin Nutrient Enhancement	Shoshone-Bannock Tribes	Conditional	630
200890500	Supplementation Projects	Shoshone-Bannock Tribes	Conditional	637
200890600	Crystal Springs Hatchery Planning, Operations, and Maintenance	Shoshone-Bannock Tribes	Not Applicable	642
200740200	Snake River Sockeye Captive Propagation	Idaho Department of Fish and Game	Yes	645

ISRP Final Report: Review of Anadromous Fish Habitat and Hatchery Projects

Introduction

This report provides the Independent Scientific Review Panel's (ISRP¹) final comments and recommendations on [122 proposals](#) submitted for the [Anadromous Fish Habitat and Hatchery Review](#) to implement the Columbia River Basin Fish and Wildlife Program (hereafter "Program").² The ISRP reviewed the proposals to determine if they [1] *are based on sound scientific principles; [2] benefit fish and wildlife; and [3] have a clearly defined objective and outcome with [4] provisions for monitoring and evaluation of results*. The ISRP finds that 48 proposals meet those scientific review criteria and 59 proposals meet criteria with conditions requiring further action, and 1 proposal does not meet criteria. Twelve proposals were not amenable to scientific review and thus received "not applicable" recommendations. Two other projects were given a time extension to complete their responses to our preliminary review. A final review of those projects is anticipated by spring 2022.

This review is limited to projects currently funded under the Program. Although new project proposals were not solicited, proponents of ongoing projects could describe new work elements, phases, or objectives for their projects based on adaptive management or new priorities, within existing budget constraints. Most of the 124 projects in this review have been the subject of numerous past reviews. Consequently, in the [Council's guidance document](#) to project proponents, the Council stated that important functions of this review are to evaluate:

- project results and accomplishments; the degree to which project objectives are being achieved
- how each project has adapted proposed future work based on those results; specifically, the degree to which project objectives, actions, and methods reflect new information gained from those results
- clear delineation of progress towards completion
- how well the project proponents have responded to the scientific and management issues identified in previous Council reviews and recommendations
- the collective progress of particular groups of projects that have a similar focus

¹"ISRP" refers to both ISRP members and Scientific Peer Review Group (PRG) members.

² There are [124 projects](#) identified for this review, but reviews of two proposals are waiting for proposals from the project proponents.

Overall, we are impressed with the proponents' commitment to the objectives of the Program as evident in their many accomplishments, the effort they devoted to the proposals and presentations, and their constructive approach toward scientific review. In addition to recommendations and comments on each project, our report highlights some of the projects' many accomplishments, describes the review process, and provides programmatic comments that apply across projects and are intended to improve Program and project evaluation and performance. Our programmatic comments focus on habitat restoration monitoring and evaluation (M&E) and future project reviews, but we also highlight a few programmatic issues from past reports and some that were raised as part of this review that would benefit from continued and increased attention. These issues include:

- implications of flat funding on projects being able to implement their proposed actions as scientifically reviewed
- recognition of traditional ecological knowledge and multiple ways of knowing in scientific review
- dire conditions of some salmon and steelhead stock
- climate change
- long-term fitness effects of hatchery supplementation and straying on natural populations
- habitat assessment and prioritization methods
- density dependence – relationship of habitat capacity, restoration, and hatchery releases and harvest

We did not have time to fully examine these other programmatic issues as part of this review, but we look forward to exploring these more fully in the future, perhaps as part of a 25-year ISRP retrospective report.

Project Accomplishments

The ISRP is impressed with the substantial accomplishments of the full suite of anadromous fish habitat and hatchery projects implemented under the Council's Fish and Wildlife Program. The accomplishments, new knowledge, and information generated both by individual projects and multiple project programs in this review have contributed extensively to the Program's goals and numerous tribal, state, and federal recovery and management plans in all geographic areas from the estuary upriver to the headwaters of the Upper Columbia and Snake river tributaries and in management and mitigation efforts generally.

The ISRP reviewed projects in three major and often overlapping programmatic categories:

- artificial propagation and associated M&E (34 projects)
- habitat protection and restoration (69 projects), and
- monitoring and evaluation to inform habitat actions, habitat and population status and trends analyses, and other Program needs (21 projects).

The depth and breadth of achievements for all 124 projects combined are extensive and not easily captured in a simple summary. However, there are numerous exemplary projects with impressive accomplishments and sound future plans that illustrate important contributions to management and recovery of anadromous fishes in the Columbia River Basin.

Below, we highlight a few of the many excellent projects from each of the three categories to illustrate the diversity of outstanding projects both geographically and based on overall purpose.

Artificial Propagation

Artificial propagation is used as a management tool throughout the Columbia Basin to accomplish various management objectives (see the [Council's Hatchery Story Map web tool](#)). Within the Council's Program, hatcheries are operated to restore tribal, recreational, and commercial fisheries, supplement natural population production, re-establish natural production through reintroductions, and conserve genetic resources.

The steelhead kelt reconditioning and reproductive success evaluation project ([200740100](#)) has been underway since 2000, at which time little was known about reconditioning kelts (i.e., repeat spawners). Over the past decade this Columbia River Inter-Tribal Fish Commission (CRITFC) project has developed a successful strategy for kelt reconditioning by identifying how to collect kelts; successfully rear them to maturation; and assess maturity status, release location criteria, benefits to target populations, reproductive success, physiology, and homing fidelity. Many critical uncertainties have been resolved and sound production strategies have

been identified. The project has demonstrated that kelt reconditioning and release back to natal areas is a viable option for enhancing spawner abundance. The project has progressed to the point that it is time to shift into production mode with much broader management application, once additional kelt holding facilities are constructed. This project provides an excellent example of developing a relatively uncertain approach into a viable management alternative to enhance spawner abundance in natural steelhead populations. The extensive monitoring and evaluation have been instrumental in the success of the project and its rate of progress.

The Mid-Columbia Coho Reintroduction Project (component of [199604000](#)) has made impressive progress reintroducing coho in the Wenatchee and Methow subbasins, where coho were extirpated decades ago. The proponents have developed productive partnerships with local Public Utility Districts, private landowners, ODFW, WDFW, and the USFWS. Coho are now spawning successfully in both subbasins, and spawner distribution has expanded through time. This project of the Confederated Tribes and Bands of the Yakama Nation has been able to develop broodstock from subbasin specific returns, and a selective breeding program has been developed to produce adults that can reach Tumwater Falls and spawn above the falls. The reintroduction effort in the Methow River has progressed to the natural production supplementation phase, the fourth stage of implementation. The project has demonstrated effective adaptive management and evaluated monitoring results to improve project performance.

The Johnson Creek Artificial Propagation Enhancement ([199604300](#)) is a productive project attempting to prevent extinction of Johnson Creek Chinook salmon and assess the benefits and risks of supplementation in general. Despite efforts to enhance natural production in Johnson Creek, the Chinook salmon population has suffered severe declines in natural origin abundance in recent years and recruit-per-spawner productivity has been well below 1.0 (i.e., replacement) for most recent brood years. The severe downward trends in abundance and productivity, mirrored by most Snake River spring/summer Chinook salmon populations, are of great concern. Monitoring and evaluation are integral to the project's success and provide essential information to assess supplementation benefits and risks for adaptive management. This Nez Perce Tribe (NPT) project has generated a wealth of information and insights that have provided the basis for assessing hatchery performance, productivity, relative reproductive success, life history, survival, genetic variation, and straying. Overall, the results have been highly encouraging, showing numerous benefits and limited negative or unintended outcomes. The project provides multiple benefits, including results that have broad application to other hatchery programs, effective adaptive management based on lessons learned, and sharing of scientific discoveries through publication and professional presentations.

The Chief Joseph Hatchery Program ([200302300](#)) began in the early 2000s. This program of the Confederated Tribes of the Colville Reservation includes hatchery operation and maintenance as well as research, monitoring, and evaluation of four Chinook salmon hatchery programs. These programs represent some of the first to be developed using many of the recommendations from Congress's Hatchery Reform Project, the Hatchery Scientific Review Group, and other independent science reviews. The hatcheries were developed to meet tribal trust obligations and have successfully provided fish for harvest, subsistence, ceremonial purposes, and cultural values. Simultaneously, it serves an important conservation role by augmenting the abundance of summer/fall Chinook salmon and reintroducing spring Chinook salmon back into the Okanogan subbasin. The program has specific desired outcomes for abundance and composition of natural spawners and broodstock. There are well-defined and comprehensive management and production goals with standards for all aspects of in-hatchery and post-release performance. The program's sound adaptive management process clearly identifies response alternatives that guide annual and longer-term decisions.

Habitat Protection and Restoration

Habitat protection and restoration projects are being implemented in the estuary and nearly every subbasin in the Columbia River Basin. Diverse strategies are being implemented to protect and restore critical habitats including floodplain reconnection, wetland and stream restoration, flow enhancement, fish screening, land acquisition, and upslope restoration.

The Columbia Land Trust Estuarine Restoration Project ([201007300](#)) has been underway for just over a decade. The critical location and unique communities of the Lower Columbia River and estuary are vital to viability and recovery of all anadromous fish populations in the Columbia Basin. The Land Trust works on private lands to permanently protect and restore historic floodplains and reestablish native vegetation. Primary objectives for the project include restoring natural processes and access to important habitats and improving shallow water habitats and intertidal wetlands and channels. The project is a critical component of an extensive multi-agency collaborative effort to restore the estuary. The proponents have completed 11 acquisition projects, protecting 7,794 acres and restoring an additional 2,798 acres of estuary habitat. There are plans to acquire an additional 636 acres and implement restoration of 1,380 acres over the next 5 years.

The Wind River Watershed Project ([199801900](#)) has many years of important accomplishments and exemplifies a fully cooperative landscape-scale project for protection and restoration of aquatic habitat. This United States Forest Service led project is a "collaborative restoration and research effort directed toward wild steelhead in the Wind River" based on a whole watershed approach. The project reflects a strong partnership between four primary agencies (U.S. Forest Service, Washington Department of Fish and Wildlife, U.S. Geological Survey's Columbia River

Research Laboratory, and Underwood Conservation District), landowners, and other partners. Restoration and protection actions are coordinated with a comprehensive and robust research monitoring and evaluation program including population-level monitoring of abundance, productivity, spatial structure, and diversity in an intensely monitored watershed program framework. Restoration work on private and Federal land is guided by several strategic habitat restoration and action plans tied to watershed assessments, limiting factors, and condition frameworks. Overall, an impressive range of projects have been completed throughout the watershed, including road decommissioning, invasive weed control, passage improvement, riparian vegetation management, and stream and floodplain restoration. Numerous projects have addressed both adult and juvenile passage limitations. One of the hallmarks of this project is the significant progress they have achieved in restoring riparian and aquatic habitat on private lands. The proponents are commended for continuing efforts to understand how habitat restoration affects steelhead production and viability. The close coordination between restoration practitioners and researchers in this project is more effective than many of the other habitat restoration projects reviewed.

The John Day Watershed Restoration project ([200739700](#)) was initiated about two decades ago. This project of the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) is an essential component of a comprehensive habitat protection and restoration program in the John Day River subbasin. This high-impact project has many partnerships, accomplishments, and a strong record of sharing results. The proponents have developed a diverse, scientifically robust, and collaborative approach to implementing restoration and monitoring in the basin, and they have demonstrated strong commitment to managing information. The highly collaborative nature of the project from sound restoration approaches through monitoring and data management is a core strength. The project focuses on restoring natural processes and promoting ecological integrity and sustainability. Diverse strategies are used to improve floodplain connectivity, instream complexity, upslope conditions, passage, and flow. The protection and restoration accomplishments over the past 20 years are impressive, including 40 miles of stream restored, 700 miles of accessible stream opened up with barrier removal, over 2,600 LWD structures installed, 19,000 acres of juniper thinning, and over 140,000 trees and shrubs planted in riparian areas. The project has an effective outreach and public engagement program. Perhaps most notable is a short film, "[Common Ground – John Day Basin Watershed](#)," that highlights the projects approach and accomplishments with focus on the collaboration between the CTWSRO and ranchers along Fox Creek. The film is professional, inspiring, and has been viewed at multiple film festivals and classrooms in Oregon. The project contributes significantly to achievement of ESA recovery goals for John Day River steelhead.

The Umatilla Anadromous Fish Habitat project ([198710001](#)) is restoring habitat throughout the Umatilla River subbasin for ESA-listed and non-listed salmonids as well as other important focal

species including mussels and lamprey. This project of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) was initiated to protect, enhance, and restore functional floodplain, channel, and watershed processes to provide sustainable and healthy habitat for First Foods species. The ISRP was impressed with the proponent's process-based restoration approach to address root causes of poor river ecosystem function that affects habitat conditions and natural processes for all focal species. The proposal represents an effective integration of traditional ecological knowledge and western science and is well guided by holistic CTUIR River Vision, Upland Vision, and First Foods strategies. The project uses a diverse suite of protecting and restoration approaches and has an impressive list of accomplishments including over 15 miles of floodplain reconnection, restoring access to 187 miles of blocked habitat, protecting 7,089 acres through acquisition and easements, 3.7 miles of levee removal, 6.8 miles of channel reconnections, 3,400 pieces of wood added, 690 acres of vegetation plantings, and 4,100 acres of invasive weed treatments. In addition, 10.6 CFS of instream water rights have been obtained during critical low flow periods. The project has developed an extensive education and outreach program that includes local K-12 and college student field days, use of a story map to display watershed assessments to the public, and numerous other tribal and non-tribal communication endeavors. This project along with the Supplementation Projects ([20089050](#)) of the Shoshone-Bannock Tribes (SBT) were commended for integration of traditional ecological knowledge and western science approaches in development of goals and objectives as well as implementation strategies.

The Idaho Fish Screening Improvement Project ([199401500](#)) is an exemplary project and proposal that should serve as a model for other screening projects in the Pacific Northwest. Water diversions continue to be a major source of mortality and restrict movement of salmonids. The primary role of this Idaho Department of Fish and Game (IDFG) project is to collaborate and develop partnerships with water rights holders and landowners to be granted easements to install and maintain fish screens. The proponents effectively use literature and biological data to illustrate the critical need for the project and to demonstrate effectiveness of actions using metrics that are relevant, meaningful, and relatable. Linking data evaluation with management of a large portfolio of screens and passage projects has provided substantial demonstrated survival benefits for fish. The project has an impressive list of accomplishments. Currently they operate and maintain an inventory of 281 fish screens in five subbasins: 109 Lemhi River, 20 Pahsimeroi River, 29 mainstem Salmon River, 15 North Fork Salmon River, 22 East Fort Salmon River, and 86 in small tributaries. Overall, this has yielded 350 miles of habitat with protected fish passage on mainstem river corridors. A unique aspect of this project is a robust but efficient monitoring strategy using fish data to evaluate the effectiveness of individual screening projects.

Monitoring and Evaluation

The Fish and Wildlife Program supports diverse monitoring and evaluation (M&E) efforts across the Columbia River Basin to assess the benefits and risks of habitat and hatchery projects and assess status and trends of anadromous fish and their habitats. In many cases, monitoring and evaluation efforts for habitat restoration and hatchery projects are implemented by the individual projects. However, in other cases M&E projects address broader scale questions above the individual project level. There have been impressive advancements in the methods and experimental designs applied within the overall monitoring and evaluation effort, especially for viable salmonid performance metrics

The John Day River Salmonid Monitoring to Inform Recovery project ([199801600](#)) is a status and trends study that has received positive reviews from the ISRP since its inception. The John Day River Basin is one of the few basins in the interior Columbia region that has had no recent hatchery releases; however, straying from Snake River populations is a major concern. The project has steadily improved its experimental design, refined its field methods and analyses, and strongly contributes to status and trend monitoring for steelhead and Chinook salmon, life-cycle models, regional actions, and management of the hydrosystem. This Oregon Department of Fish and Wildlife (ODFW) project generates information that is critical for regional management and closely integrated with key management plans and habitat restoration projects. The project continues to refine and strengthen their methods, combining probabilistic sampling for steelhead populations and census sampling for adult Chinook salmon populations. Their data are stored in regional databases and are incorporated into regional planning and evaluation. When BPA budget cuts prevented them from continuing their monitoring for certain population and habitat parameters, they obtained external funding for Chinook salmon escapement assessments and continued to estimate SARs, a critical need for the Fish and Wildlife Program. The project is currently implementing studies to address climate change and conducting experiments to determine whether smallmouth bass predation is additive or compensatory, a complex and important question in the Columbia River Basin. The ISRP appreciates the proponents' leadership, constructive response, and thorough summary of monitoring activities in the John Day River subbasin, for both their project and other collaborating projects. In our preliminary review, we asked the proponents to lead the development of an M&E summary and matrix for the John Day River basin. Their matrix provides an outstanding example of what the ISRP envisioned for M&E matrices, highlighting the cooperation and integration among projects and identification of collaborative monitoring and evaluation in a broad geographic area. This exemplary project is a model for other M&E projects.

The Idaho Genetic Monitoring of Snake River Steelhead and Chinook Salmon Project ([201003100](#)) is innovative and provides valuable information for management of ESA-listed

Snake River Chinook salmon and steelhead. This IDFG project was initiated in 2010 to test and implement genetic monitoring programs for Snake River Basin Chinook salmon and steelhead utilizing two genetic approaches, parental based tagging (PBT) and genetic stock identification (GSI) (in collaboration with CRITFC, project [200890700](#)). PBT involves sampling and genotyping all hatchery origin broodstock, thus allowing all the offspring to be identified genetically. GSI is used to create a reference baseline for all contributing wild stocks so that unknown origin wild fish can be sampled, genotyped, and genetically assigned to a stock of origin represented in the baseline. The ISRP commends the project for its overall achievements and relevance to management. Standardization and application of accurate methods of PBT and GSI are remarkable achievements that have contributed precise and accurate information relevant to numerous management issues. Development of single nucleotide polymorphism (SNP) baselines for Snake River steelhead and Chinook salmon have enabled: 1) cost-effective and routine monitoring of spatial and temporal trends in genetic diversity of natural origin Snake River population groups, 2) estimation of stock composition of harvests in mainstem fisheries and escapement past Lower Granite Dam, and 3) evaluation of proportional natural influence (PNI) for integrated hatchery programs in Idaho. The PBT effort provides the ability to genetically “tag” about 95% of 20 million hatchery reared Chinook salmon and steelhead smolts released annually. PBT is now used to estimate harvest of hatchery Chinook salmon in the Snake River basin. GSI and PBT have been used in combination to estimate stock abundance of wild steelhead, spring/summer Chinook salmon and fall Chinook salmon passing Lower Granite Dam. Abundance, productivity, and diversity measures are provided to NOAA for use in five-year VSP status assessments. Using PBT and GSI has improved accuracy of wild escapement estimates at Lower Granite Dam by identifying untagged hatchery-origin fish that would be classified as wild. Removing untagged hatchery-origin fish from the wild abundance estimates has reduced the overestimation of wild fish abundance significantly (19.6% for Chinook salmon and 8.3 % for steelhead). The project has a strong record of peer-reviewed publications and shares data on numerous publicly available websites. Overall, the project has contributed extensive valuable information for management and assessment of Snake River steelhead and Chinook salmon.

The Evaluating Salmonid and Stream Ecosystem Response to Conservation Measures and Environmental Stressors in the Columbia River Basin Project ([200900400](#)) provides critical research, monitoring, evaluation, and guidance for habitat protection and restoration efforts in the Grande Ronde River Basin. The primary goal of this CRITFC project is to determine the effectiveness of aggregate restoration actions in improving freshwater habitat conditions and viability of ESA-listed salmonid populations in the Upper Grande Ronde River, Catherine Creek, and the Minam River watersheds. The project is integral to and highly supportive of the collaborative adaptive approach of the Grande Ronde Model Watershed and its numerous partners. Project progress is impressive, including extensive physical and biological habitat data

collection, improvement in data collection and analysis techniques, assessment of limiting factors, status and trends of limiting factors at landscape scales, impacts on salmonids using life stage specific fish-habitat models, population life cycle models, and studies of critical uncertainties related to climate change, food webs, and land use. The information and analyses provided by this project are used extensively by the Grande Ronde Model Watershed and numerous habitat restoration projects; by state, tribal, and federal agencies in management and recovery plans; and by the Council's Fish and Wildlife Program. This is an exemplary project that balances rigorous research with monitoring of status and trends of habitat conditions. This is one of the most productive projects in terms of peer-reviewed publications, information sharing through public databases, methods development, and participation in effective adaptive management decision processes. The proponents are valued cooperators and leaders in conservation and management within the Grande Ronde Basin, contributing high-impact analyses that benefit management within both the Grande Ronde Basin at a broader scale throughout the Columbia Basin.

Washington Department of Fish and Wildlife's (WDFW) project Upper Columbia Spring Chinook Salmon and Steelhead Juvenile and Adult Abundance, Productivity and Spatial Structure Monitoring ([201003400](#)) provides data to monitor the trends in abundance, productivity (smolts/redd), spatial structure, and diversity of endangered Spring Chinook salmon and threatened steelhead in the Upper Columbia River subbasins (Wenatchee, Entiat, Methow, and Okanogan rivers). Since 2010, the proponents have completed a steelhead radio telemetry study to independently validate adult steelhead escapement estimates generated from their PIT tag-based model. The data are also used to estimate steelhead population characteristics, evaluate reach-specific juvenile spring Chinook Salmon overwinter habitat utilization in the mainstem Wenatchee River, estimate the precision of redd counts for both steelhead and spring Chinook salmon, and evaluate the precision and accuracy of the smolt monitoring methodology for both steelhead and spring Chinook salmon. Ongoing objectives of the project are to 1) operate and maintain a robust network of instream PIT-tag detection systems (IPTDS) throughout the Upper Columbia River, and 2) operate a rotary screw trap in the lower Entiat River to monitor juvenile spring Chinook salmon and steelhead out-migration. These activities provide key estimates of population demographics to aid resource managers in tracking the recovery of ESA-listed spring Chinook salmon and steelhead within the Entiat River. Beginning in 2020, the proponents began applying a similar PIT-tag based approach to estimate escapement and prespawn survival of spring Chinook salmon in the major spawning areas throughout the Upper Columbia River. The analytical framework of the steelhead escapement model will be used to develop an escapement model for spring Chinook salmon. The proponents have developed an impressive set of field measurements and analytical methods for assessing the accuracy and precision of their estimates, such as a time-stratified mark-recapture approach for estimating abundance of salmonid smolts, and an equally impressive

record of peer-reviewed publications from their work. Overall, these measurements and analyses provide fundamental information critical to the management of the ESA-listed salmonids in the Upper Columbia River Basin.

The ISRP Review Process

Review Criteria

ISRP reviews are based on criteria provided in the 1996 amendment to the Northwest Power Act. The amended Act directs the ISRP to review projects for consistency with the Council's Fish and Wildlife Program and whether they:

1. are based on sound science principles
2. benefit fish and wildlife
3. have clearly defined objectives and outcomes, and
4. contain provisions for monitoring and evaluation of results

Pursuant to the 1996 amendment, the Council must fully consider ISRP recommendations when making its recommendations regarding funding and provide an explanation in writing where its recommendations diverge from those of the ISRP.

For individual projects, as described in the [Council's guidance document](#), the ISRP review focuses on project performance by assessing the following project components:

- the degree to which project objectives are being achieved
- accomplishments and results
- the degree to which project objectives, actions, and methods reflect new information gained from those results and
- a clear delineation of progress towards completion

Review Steps

ISRP reports include written recommendations and comments on each proposal that is amenable to scientific review. These reports reflect the ISRP's consensus. To develop recommendations for this review, the ISRP used a multi-step process:

- 1. ISRP and Council Proposal Workshops (February 11 and 25, 2021).** Several ISRP members participated in two Council hosted webinars in February to guide proponents through the proposal form template, instructions, and submission process. The ISRP and Council's guidance emphasized how to develop quantitative biological objectives and project evaluation and adjustment plans.
- 2. Individual ISRP reviewer evaluations (May 4 – July 22, 2021).** At least three reviewers reviewed each proposal and provided written evaluations. The ISRP assigns review teams based on expertise and whether members reviewed the project in the past or participated in site

visits. Reviewers include Peer Review Group (PRG) members who augment the ISRP's expertise and ensure that the ISRP has the capacity to complete extensive reviews on specific deadlines. Assignments are made to avoid the appearance of bias based on members' past affiliations. Individual reviewer's comments and records of discussions are confidential and not available outside the ISRP review teams.

3. Review meetings (June 14 – July 22, 2021)

- **Project presentations.** Over 5 weeks, 13 review meetings were held, in which the proponents presented their proposals to the ISRP, other project proponents, and Council and BPA staff. Time was reserved for questions and discussions. These discussions aided the ISRP in clarifying specific concerns and understanding the projects. The presentations are available on the Council's [project review webpage](#).
- **ISRP group evaluation meetings.** Individual reviewer comments were compiled prior to the project presentations. Following the presentations, review teams met to discuss individual reviews, develop a consensus recommendation for each proposal, and ensure consistency across reviews. These meetings were attended by ISRP and PRG members only, and the deliberations are confidential.

4. Preliminary report completion (July 23 – September 23, 2021). After the evaluation meetings, a lead reviewer synthesized individual reviewers' comments into a consensus statement on each proposal. The ISRP reviewers evaluated and edited these draft consensus statements to produce a preliminary report ([ISRP 2021-8](#)). In the preliminary review, the ISRP found that 32 proposals met scientific review criteria, 41 proposals met scientific review criteria with conditions, and 12 proposals were not amenable to scientific review and thus received "not applicable" recommendations. The ISRP requested responses on 37 proposals to determine if they fully meet scientific review criteria. Project proponents were provided an opportunity to respond to our concerns by November 22, 2021.

5. Response review and completion of the final report. The ISRP received responses for 35 of the 37 projects for which a response was requested. Two projects were given time extensions, and the ISRP anticipates completing reviews of those projects in the spring of 2022. For the 35 projects that responded, the ISRP again followed steps 2 and 4 above: individual reviewers evaluated the responses, those evaluations were compiled, the ISRP met by online teleconference to discuss the evaluations, and a final draft was circulated to confirm ISRP consensus. Of the 35 projects, the ISRP found that 16 projects met scientific review criteria, 18 projects met criteria with some conditions, and 1 did not meet scientific review criteria.

Next Steps

The ISRP will present its findings at the Council's [February 16, 2022 meeting](#). The public comment period on the report will be open until March 10, 2022. Council staff anticipates presenting draft recommendations to the Fish and Wildlife Committee at the March 2022 meeting. The Committee recommendations are tentatively scheduled to be presented to the Council for a decision at its April 2022 meeting. See the [Council's review webpage](#) for details.

Recommendation Categories

Table of ISRP recommendation categories and use in ISRP preliminary and/or final reports.

Recommendation	Prelim	Final	Short description
Meets Scientific Review Criteria	●	●	Substantially meets the ISRP's criteria
Response Requested	●		Clarification needed before the ISRP can make a final decision
Meets Scientific Review Criteria - Conditional	●	●	Mostly meets criteria but further proposal justification, adjustments, or reporting needed
Does Not Meet Scientific Review Criteria		●	Significant deficiency in one or more of the ISRP's criteria
Not Applicable	●	●	Objectives not amenable to scientific review

The full definitions of the ISRP's recommendation categories are:

1. Meets Scientific Review Criteria is assigned to proposals that substantially meet the ISRP's criteria: "[1] are based on sound scientific principles; [2] benefit fish and wildlife; and [3] have a clearly defined objective and outcome with [4] provisions for monitoring and evaluation of results." Proposals do not have to contain tasks that independently meet each criterion but can be an integral part of a program that provides the necessary elements. For example, a habitat restoration project may use data from a separate monitoring and evaluation project to measure results as long as the proposal clearly demonstrates this integration. Unless otherwise indicated, a "Meets Scientific Review Criteria" recommendation is not an indication of the ISRP's view on the priority of the proposal, nor an endorsement to fund the proposal, but rather reflects its scientific merit and compatibility with Program goals.

2. Response Requested is assigned to a proposal in a preliminary review that requires more information on specific issues before the ISRP can make a final recommendation. This does not

mean that the proposal has failed the review. The ISRP requests responses on many proposals, and, in the past, most proposals provided sufficient information in the response loop to meet the ISRP's scientific review criteria. In terms of requesting responses, the ISRP approached the review with the perspective that all review questions do not warrant the time and expense of a formal response; so, the ISRP focused response requests on those proposals where a response would be critical to whether the proposal meets or does not meet scientific review criteria.

3. Meets Scientific Review Criteria – Conditional³ is assigned in the ISRP's preliminary and final review to a proposal for which additional actions by the proponent are needed to fully justify the entire proposal and substantially meet all the ISRP's criteria. For example, a particular implementation objective or method may need to be modified or removed, a comprehensive results report may be required, or a management plan may be needed. In some cases, the proposal includes some objectives/methods that substantially meet the ISRP's criteria and some that do not. The ISRP specifies which objectives do not meet the review criteria.

The ISRP expects that needed changes to a proposal receiving a "Conditional" recommendation will be determined by the Council and BPA in consultation with the proponent in the final project selection process. Regardless of the Council's or BPA's recommendations, the ISRP expects that, if a proposal is funded, subsequent proposals for continued funding will describe how the ISRP's conditions were addressed by project actions or policy decisions. In some cases, a proposal that receives a Conditional recommendation will be reviewed subsequently by the ISRP outside the standard review process.

3. Does Not Meet Scientific Review Criteria is assigned in the ISRP's final review to a proposal that is significantly deficient in one or more ISRP review criteria. One example is a proposal for an ongoing project that *might* offer benefits to fish and wildlife but does not include provisions for monitoring and evaluation or reporting of past results. Another example is a research proposal that is technically sound but does not offer benefits to fish and wildlife because it substantially duplicates past efforts or is not sufficiently linked to management actions. Some projects receiving this recommendation propose actions that could unintentionally harm non-target, native fish or wildlife. The ISRP notes that proposals in this category may attempt to address needed actions or are an integral part of a coordinated watershed effort, but the proposed methods or approaches are not scientifically sound. In some cases, an alternative approach or project may be warranted to address the needed action.

³ The ISRP previously used "In Part" and "Qualified" recommendations, but "Conditional" is less confusing and better fits our intent and usage.

4. Not Applicable (N/A) is assigned to proposals with objectives that are not amenable to scientific review. Projects receiving “N/A” recommendations in previous reviews were largely administrative, such as regional coordination projects and projects that propose plans to develop plans. The ISRP generally identifies programmatic issues with such projects and provides comments on how the science to inform and evaluate the projects could be incorporated to improve the project.

ISRP Review Comment Sections

[Proposals](#) consist of the following sections:

1. Problem statement and significance to the Program
2. Progress to date
3. Goals and objectives
4. Methods
5. Project evaluation and adjustment process

Supporting sections

6. Potential confounding factors and/or major uncertainties
7. Timeline
8. Relationships to other projects
9. Response to past Council recommendations and ISRP reviews
10. References
11. Key personnel
12. Appendices
13. Proposed budget

The ISRP’s recommendation and comments on each proposal are divided into five fields based on the ISRP’s review criteria covering:

- Overall comment and recommendation
- Q1. Clearly defined objectives and outcomes
- Q2. Methods (based on sound science principles)
- Q3. Provisions for monitoring and evaluation of results and project adjustment process
- Q4. Results: benefits to fish and wildlife

The ISRP considered the following questions to develop comments and recommendations on each proposal, based on the [proposal form](#) guidance, assuring a direct connection between the ISRP’s review criteria, the proposal, and the ISRP’s comments.

Overall Recommendation and Comment

This section describes the ISRP’s recommendation, provides overall impressions, and, if applicable, lists response requests or conditions.

Q1. Clearly defined objectives and outcomes

Did the proposal clearly define its objectives and outcomes? Did the proposal describe and outline—as appropriate to project type—SMART implementation, physical, biological, and/or social objectives? Did the proposal explain why the work is important including problems addressed and anticipated quantitative results, outcomes, and benefits?

Information needed to evaluate this criterion can be found in [proposal form](#) sections *1. Problem statement* and *3. Goals and objectives* and supporting sections (7-13).

Q2. Methods (based on sound science principles)

Does the proposal summarize scientifically valid methods used to achieve its implementation, biological, physical, and/or social objectives? For implementation objectives, does the proposal describe the planning process, specific activities undertaken, best management practices employed, and such? For research and monitoring, is the overall framework of the experimental or sampling design described clearly? For projects with monitoring objectives, the proposal should complement and link to [detailed metadata in MonitoringResources.org](#) including study plans, protocols, and methods.

Information needed to evaluate this criterion can be found in [proposal form](#) section *4. Methods* and supporting sections (5-13).

Q3. Provisions for monitoring and evaluation of results and project adjustment process

Does the proposal describe activities conducted to assess if the project is meeting its implementation, biological, physical, and/or social objectives? Does the proposal describe a project adjustment process to retrospectively evaluate project outcomes and adjust goals, objectives, actions, and monitoring, i.e., link project evaluation to decision-making? If another M&E project tracks physical habitat or biological information related to the project’s actions, does the proposal identify that M&E project and summarize and expand on, as necessary, the results and evaluation conducted under that project? “Project adjustment process” includes what the ISRP and ISAB often describe as “adaptive management” in reviews and reports.

Depending on proposal type, information needed to evaluate this criterion can be found in several [proposal form](#) sections, primarily in *4. Methods* and *5. Project evaluation and adjustment process*, but also in *2. Progress to date*, *3. Goals and objectives*, *8. Relationships to other projects*.

Q4. Results: benefits to fish and wildlife

Does the proposal describe to what extent the project has met its implementation, biological, physical, and/or social objectives, benefiting fish and wildlife? Does it describe the qualitative and quantitative results of the projects actions, what was learned from the results, and how objectives and actions were modified as a result? As relevant, did the proposal describe the broader impacts of the project, including how the project has influenced management, benefited society, informed other projects in the Columbia River Basin, or improved effectiveness and efficiency? Did the results contribute to broader efforts including status and trend monitoring, life-cycle models, regional actions, and mitigation outcomes?

[Proposal form](#) section *2. Progress to date* should contain the information needed to evaluate this criterion. Other proposal sections should provide context as well.

Programmatic Comments

Monitoring and Evaluation (M&E)

The Council's Fish and Wildlife Program strives to mitigate for the effects of the hydropower system and protect and restore habitats and fish and wildlife populations in the Columbia River Basin, one of the largest, most ecologically complex, and culturally diverse river basins in North America. The major regional investments in the Program require rigorous assessment of its actions, risks of unintended outcomes, and benefits for fish and wildlife. Recognizing this importance, the 1996 Amendment to the Northwest Power Act required provisions for monitoring and evaluation of results and benefits to fish and wildlife as fundamental elements of the four ISRP review criteria for all proposed projects.

Based on this responsibility, the ISRP evaluated provisions for monitoring and evaluation in each project in this review, as well as the evidence for benefits and risks to fish and wildlife. We found that most proposals with a primary purpose of artificial production or M&E (e.g., status and trend monitoring projects) contained thorough descriptions of the methods, analyses, and application of M&E for management decisions. However, in our preliminary review, we raised extensive questions about M&E for approximately half of the proposals that have a primary purpose of protecting and restoring habitat. The ISRP frequently could not determine exactly what was being monitored, what monitoring information was being provided by other projects, or how information from those projects was shared and used in project evaluation and management decision making. In most geographic areas, the ISRP often could not determine one or more of the following elements:

1. What types of monitoring are being conducted
2. What is being measured
3. Locations of monitoring efforts
4. What question is being addressed by the monitoring
5. What information is transferred from monitoring projects to implementation projects
6. How the information is used by the project or projects that receive information from other projects
7. How monitoring information is being integrated and synthesized for the subbasin or geographic area
8. How monitoring analyses contribute to adaptive management and decision making

In their proposals and responses, the proponents expressed widely differing and often contrasting perspectives on the types and levels of monitoring (compliance, implementation,

effectiveness, and status and trends) required for the various types of projects. In a few subbasins, collaborations among projects and management agencies have developed integrated research, monitoring, and evaluation programs to evaluate habitat conditions, limiting factors, restoration effectiveness, status and trends of fish populations, and life cycle modeling. Unfortunately, most geographic areas lack an integrated approach for comprehensive assessment of restoration actions and benefits and risks to fish and wildlife.

ISRP Request for M&E Matrices and Summaries

In the Preliminary Review, the ISRP found that it lacked essential information for its assessment of M&E for many proposals and geographic areas. Rather than asking each project to generate this information individually, the ISRP asked the proponents of 10 projects, based on their coordination and monitoring expertise, to lead development of an M&E matrix to summarize the linkages between implementation projects and monitoring projects in their geographic areas. We asked 83 other projects to provide information to support development of the M&E matrices.

A primary goal for the matrix request was to obtain the M&E information that was requested in the proposal template in the Relationship to Other Projects and the Project Evaluation and Adjustment sections. This M&E information is essential for scientific evaluation of individual projects but often is generated by other projects in their subbasins. For example, proponents regularly indicated other projects provide much of their M&E information, but the ISRP was often unable to find the data and/or evidence of the expected monitoring in the referenced projects. To obtain the necessary information for scientific review, we felt a matrix and summary would be more efficient for the proponents to generate and would provide improved understanding of M&E for specific geographic areas than responses from individual projects. In addition to informing this review, the ISRP believed the M&E summaries would provide valuable, spatially explicit descriptions of linkages between implementation and monitoring for the Program. The information also would be valuable for improving efficiencies of monitoring efforts and for facilitating effective sharing of relevant results among similar projects and within geographic regions.

Council and Council Staff Response

Soon after the ISRP Preliminary Report was released, we learned that project proponents, Council members and staff, and BPA staff expressed concerns with our request, which included:

- The ISRP request was beyond the scope of the proposal review and sought information not originally requested or appropriate for the process.
- The response loop period was too brief for developing a matrix, and the ISRP did not provide enough guidance on the specific elements to include in the matrix.

- The matrix request was beyond the scope and function of many projects that the ISRP designated as “lead.”
- It was not appropriate for the ISRP to take the lead in requesting this synthesis. The need to link the M&E activities of projects is a much larger task for the Fish and Wildlife Program.

In the Fish and Wildlife Committee’s October 2021 meeting, Council members and staff expressed support for the general rationale and concept of the matrix but did not feel the response loop was the appropriate process or an efficient forum for collecting this information. The Fish and Wildlife Committee and Council staff welcomed the M&E summaries that projects could develop for subbasins but stated they would not base project recommendations for individual projects on whether or how a matrix was developed.

ISRP Review of Requested Responses and M&E Matrices

For geographic areas that provided M&E matrices and summaries, the ISRP used the information to evaluate the M&E activities for the individual proposals within the subbasin. We found the summaries and matrices substantially improved our review of individual proposals in several geographic areas. In geographic areas for which no additional information was submitted, we reviewed individual projects based on their original proposals and any additional information provided in the response. We did not criticize projects based on the quality of their M&E summaries, their participation in providing information for the summaries, or for not submitting a summary.

Lead and support projects submitted M&E matrices and summaries in 6 of the 10 geographic areas requested by the ISRP. Four major subbasins — Lower Columbia River, John Day River, Grande Ronde, Tucannon — submitted thorough and informative M&E matrices and summaries with supporting tables and maps. Two other subbasins provided much of the information requested and identified processes to complete the summaries. Four projects concluded that they did not have adequate time and funding to coordinate the development of the M&E summaries with other projects. They either did not consider the requested task to be consistent with their project obligations or they asked for an extension.

As the ISRP anticipated, the format and content of the M&E matrices differed among subbasins. All matrices and summaries provided useful information for review of individual projects. Several proponents noted that the summaries and matrices were long overdue and would provide valuable information for the projects in the future. The ISRP is confident that this initial set of M&E matrices and summaries will provide useful examples if the Fish and Wildlife Program decides to develop future summaries of M&E activities and connections in major geographic areas.

ISRP Recommendations for Identifying and Integrating Habitat M&E Actions in the Major Geographic Areas

The ISRP provides the following recommendations for development of an M&E framework for the Program. We recognize that several of the recommended actions may be addressed by the Habitat Research, Monitoring and Evaluation Strategy being developed. Most, if not all, of these recommendations have been identified in previous reports and reviews by the ISRP, ISAB, Council, BPA, and NOAA.

A Framework to Integrate Research, Monitoring and Evaluation (RM&E) Across Different Scales

Rigorous and integrated research, monitoring, and evaluation is a fundamental requirement of the Fish and Wildlife Program. In this Programmatic Comment, we often refer to M&E because all projects are required to include some form of monitoring and evaluation; but at the scale of subbasins and geographic areas, the Program includes research projects as well. The Program must ensure that projects comply with the Program's requirements and that projects are implemented as designed. It must also ensure that actions are effective in achieving the intended outcomes for fish, wildlife, and their habitats; minimize unintended negative outcomes; and successfully mitigate for the effects of the hydrosystem while protecting and restoring fish and wildlife and the ecosystems that support them. The ISRP is keenly aware that it is not possible to collect and analyze data for all sites, watersheds, and populations. Instead, a hierarchical framework is needed to provide information for evaluating the Program's outcomes across local project sites, river reaches, watersheds, subbasins, and the Columbia River Basin.

The ISRP recommends that the Fish and Wildlife Program create a hierarchical monitoring and evaluation framework, identify the major components of its RM&E program, establish the clearly defined RM&E relationships among projects, and ensure the transfer of information among those components.

Summaries and Matrices of Monitoring and Evaluation within Subbasins or Geographic Areas

In this review, the ISRP quickly recognized that it needed comprehensive information on the M&E actions and the sharing of data and information among projects to understand linkages between implementation and monitoring in most subbasins or geographic areas. We requested lead projects to organize the development of an M&E matrix and summary for their geographic area with the support of associated projects. As noted earlier, the Council staff and Fish and

Wildlife Committee support the general rationale and concept of M&E summaries and matrices but did not require projects to complete them as part of the response loop.

The ISRP concludes that summaries of M&E efforts in the major subbasins would greatly strengthen the Fish and Wildlife Program while benefiting individual projects within geographic areas. This comprehensive monitoring summary would include a matrix of project-specific monitoring activities across different projects. The summary also would describe how projects work together to address limiting factors, assess benefits and risks of restoration actions, and identify future actions. The monitoring information would explain whether the biological monitoring is focused on local implementation sites, basin-scale monitoring of status and trends, or smolt-to-adult returns for the subbasin. Collectively, the M&E summaries for the subbasin would inform individual projects about the body of information available for evaluating outcomes related to their goals and objectives and better evaluate their benefits to fish and wildlife in the subbasin. The information would also be valuable for improving efficiencies of monitoring and facilitating sharing results among projects.

Several of the M&E summaries submitted provide useful examples of potential formats and identify important types of information. The ISRP suggests that future summaries should include:

- Geographic area, subbasin, or watershed
- Projects that conduct the monitoring
 - Type of monitoring (implementation, effectiveness, status and trends, research)
 - Site locations
 - Measurements and units of measurements
 - Frequency, timing, and duration of sampling
 - Mapping of monitoring to management questions
- Projects that conduct the analysis and interpretation
 - Spatial scale of evaluation (site, reach, subbasin, basin, geographic area)
 - Temporal scale of evaluation
 - Type of analyses (qualitative, quantitative, or statistical analyses, life cycle models)
- Projects that receive the data and analyses from the monitoring project
- Accessible data repository (online database, non-public database, regional database, Atlas)

The ISRP anticipates that such summaries and matrices will be valuable in future reviews and would be consistent with the Habitat Research, Monitoring and Evaluation Strategy being developed by a regional technical workgroup.

The ISRP recommends that the Fish and Wildlife Program create a process for developing matrices and narrative summaries of M&E actions within major subbasins and geographic areas.

Ultimately, the most critical contribution to the Program will be a comprehensive analyses of the body of information provided by the M&E summaries to identify benefits and risks for fish and wildlife in the subbasins or geographic areas. See the programmatic comment below on Future Review Processes, which recommends the development of syntheses.

Guidance for Individual Projects

The ISRP found that proponents expressed a wide range of perspectives on the types and levels of M&E that should be included in their project. We found little consistent and comprehensive guidance in Program documents that describes the M&E requirements for specific types of projects, other than the [2014 Program's general guidance use of a risk/benefit matrix](#). The 2021 Sponsor Packet and 2021 Anadromous Proposal Template provided little information or links to the types and details of M&E that are required for projects.

The ISRP recommends that the Fish and Wildlife Program develop a specific guidance document on the M&E requirements for individual projects with links to documents that describe the history and current strategy for M&E in the Columbia River Basin.

Representative Subbasins with Fully Integrated Research, Monitoring, and Evaluation

The ISRP recognizes that a fully integrated RM&E program for every subbasin in the Program is not operationally or financially possible. However, several geographic areas have developed many of the components needed to integrate the findings of RM&E efforts and quantitatively evaluate the benefits to fish and wildlife. A scientifically rigorous, integrated RM&E program for a geographic area would include information on habitat conditions at a subbasin or landscape scale, limiting factors, habitat and fish responses to major types of restoration actions, status and trends in fish and wildlife populations, life cycle models that integrate system-wide information throughout the life history of focal species, and explicit identification of benefits to fish and wildlife. Projects in the Lower Columbia River, Upper Columbia River, and Grande Ronde subbasin have created effective collaborative programs with most, if not all, of these RM&E components.

The ISRP recommends that the Fish and Wildlife Program develop integrated RM&E programs for selected representative subbasins. These would build from the existing subbasins that currently have the potential to provide most of the RM&E requirements. The Program could then conduct a gap analysis to determine what portions of the Columbia River Basin or which fish species would not be represented by those integrated RM&E subbasins and target future RM&E integration for those areas or species.

Future Review Processes

This final report marks the end of the ISRP's reviews in this round of Category Reviews of Fish and Wildlife Program projects. The reviews began in 2016 and included 245 projects in four major categories: [2016-2017 Wildlife](#) (29 projects), [2018-2019 Mainstem and Program Support](#) (48 projects), [2019-2020 Resident Fish and Sturgeon](#) (44 projects), and [2021-2022 Anadromous Fish Habitat and Hatchery](#) (124 projects). The ISRP understands that Council staff is beginning to plan for future project reviews and is considering changes to the existing process. We look forward to discussing alternative approaches to increase scientific review efficiency, while maintaining the many purposes of project reviews. Below, we offer some immediate impressions and recommendations.

The current Category Review process includes many effective features. One positive new element is a revised form that focuses proposals on the most essential content for scientific review. Strong features of the current Category review process that we recommend be retained and strengthened when developing future reviews include:

1. review of sets of projects organized by geography and major Program strategies (e.g., hatcheries, sturgeon, wildlife)
2. sequenced and staggered reviews of project sets across years, resulting in multi-year science recommendations
3. documentation of project plans, coordination and connectivity among projects, past performance, and results by proponents through proposal forms/project summaries, annual reports, and project and review information shared in CBfish.org
4. scientific dialogue between the ISRP and project proponents through proposal development workshops, presentations, and response loops

However, the existing review process could be modified to better address issues that have persisted across numerous reviews, especially the need for clearly defined objectives that guide project actions, outcomes, and adaptive management; M&E for habitat restoration projects; summary of collective M&E in subbasins or geographic areas; and synthesis of long-term data and cumulative results. We offer the following suggestions and recommendations, most of which were identified in previous ISRP reviews, to guide the development of future review processes:

- A. focus on discrete sets of projects
- B. foster synthesis reports that summarize integration among and findings of sets of projects
- C. improve communication and learning between the project proponents, ISRP, Council, and BPA, including reinstating site visits

These recommendations are more fully described below. The *Umatilla Initiative Review* ([ISRP 2007-15](#)), the *Lower Snake River Compensation Plan Review* ([ISRP 2014-6](#)), and the ISAB's *Review of Spring Chinook Salmon in the Upper Columbia River* ([ISAB 2018-1](#)) are examples of effective review approaches that reflect many of these review elements.

A. Focus on discrete sets of projects

- **Consider focusing reviews on sets of projects with the greatest need, emerging resource challenges, persistent issues across previous reviews, or that would provide exemplary and innovative approaches to share regionally.** For example, a review could focus on a subbasin that has the potential to show successful integration and collaboration among restoration, hatchery, and monitoring and evaluation actions and practitioners.
- **Address challenges of varying scope and scale of projects in a review category.** As can be expected in reviewing 122 projects, the ISRP found considerable variation in the scope and scale of individual projects. Projects in geographic areas often included hatcheries, habitat, monitoring and evaluation, operations and maintenance, coordination, and administrative work. This wide variation complicated the ISRP's ability to consistently evaluate the scientific merit of projects. A particular challenge was that some areas had: 1) large-scale umbrella habitat restoration projects that played a coordination, funding, and project selection role, with minimal description of site-specific restoration actions, 2) projects with much more limited scope and scale focused on a discrete set of site-specific habitat restoration actions, and 3) operation and maintenance projects. Organizing reviews into smaller, discrete sets of projects within a

specific geographic area, when coupled with increased review time and orientation, could address these issues of scale and review consistency. One key benefit of these strategic sets will be that reviewers will be better able to examine the assessment, prioritization, and coordination features of umbrella projects while evaluating more detailed restoration methods and examples of site-specific actions.

- **Increase the use of alternative review paths for different types of continuing projects.** Continuing projects based on scientific strategies and methods should receive periodic ISRP scientific review for accomplishments, adaptive management progress, and new work planned. Projects that are not amenable to scientific review could receive administrative review not involving the ISRP or programmatic review of common methods. For example, long-term operations and maintenance projects that serve management agencies or oversight projects often have little scientific content to warrant scientific review. Coordination projects that are only responsible for administrative coordination rather than strategic guidance also may not warrant ISRP review.
- **Consider solicitations for new work to address gaps and emerging resource, management, or information challenges and uncertainties.** The ISRP understands that commitments to existing projects and funding constraints have limited solicitations for new projects, but the ISRP believes that solicitation for new projects and competition will improve innovation, development of alternatives, and the application of the best available science.

B. Foster synthesis reports that summarize integration among and findings of sets of projects

In the Resident Fish and Sturgeon Category Review ([ISRP 2020-8](#)), the ISRP strongly recommended that groups of related projects, by geography or topic, develop synthesis documents that integrate multiple projects, analyze collective data, and create conceptual frameworks for future actions. Projects and project review processes could be greatly improved if informed and guided by synthesis reports, for many reasons:

- Past syntheses have been instrumental in guiding adaptive management and identified future actions that evolved directly from the synthesis efforts, for example, the [Ocean Synthesis \(ISRP 2012-3\)](#), the *CSS Ten-Year Retrospective Summary Report* ([ISAB/ISRP](#)

[2007-6](#)), [Lamprey Synthesis Report \(ISRP 2018-2\)](#), and the [Grande Ronde Model Watershed Synthesis](#).

- Numerous projects or groups of projects in the same geographic area or covering the same scientific/management topic have assembled many years of data and results, but further evaluation is needed to identify scientific and management outcomes of their work.
- Past reviews have focused on individual proposals, many of which are implemented at a relatively small scale or are narrowly focused, and integration with other projects in the same subbasin is often unclear (see our comments on the M&E matrices).
- Without an explicit geographic or topical framework, it is difficult and inefficient during a proposal review for the ISRP, rather than the proponents, to assess integration among projects and cumulative results.
- Synthesis reports are expected to benefit other projects across the Basin beyond the ISRP and the reviewed projects, serving as an effective mechanism for disseminating lessons learned and best practices, similar to how Atlas documents have impacted project prioritization and planning throughout the Basin.

Thus, the 2020 recommendations from the Resident Fish and Sturgeon Review remain relevant: *(1) the Council should identify projects or groups of related projects that have developed spatially extensive, long-term data sets that would benefit the Fish and Wildlife Program through collective analysis and synthesis; and (2) synthesis reports should document the broader impacts and accomplishments of the projects by describing how they have influenced management, benefited society, improved action effectiveness and efficiency, or resolved critical uncertainties.*

In addition to project proponents, others (e.g., Council staff, the ISAB, independent contractors, or specific forums) could participate in efforts to develop syntheses evaluating specific areas of the Program. Such analyses and reporting could occur before individual project documents are created (or could replace such documents) and could inform future direction of implementation and monitoring of projects within the Program.

Synthesis efforts take time and money, but the ISRP believes that many projects and project reviews are at a mature enough stage (i.e., 20 years) in which leveraging existing data and examining integration among and cumulative results of sets of projects are justified. Finally, projects that are highly innovative and are producing cutting edge results could also immediately benefit the Program through a synthesis report.

C. Improve communication

- **Reinstate site visits.** Site visits are a highly effective method of building trust among reviewers, project proponents, and their partners and of gaining an understanding of a project's accomplishments, capacity, and challenges. They have been a strong part of the review process in the past. Based on comments made to the ISRP during this review and the Resident Fish and Sturgeon Review, many project leaders support site visits as an integral part of the review process.
- **Expand proposal development, objectives development, and adaptive management workshop opportunities.** The Council and ISRP's guidance on SMART objectives and adaptive management plans in proposals has substantially improved the proposals, reviews, and project quality for many proponents. However, some project proponents have not followed that guidance, resulting in reports, proposals, and responses that lack the information the ISRP needs to evaluate them. The ISRP and Council increased interactions with the proponents during this and the Resident Fish and Sturgeon Review in ways that improved many proposals, but the ISRP believes additional training and workshops are needed.
- **Continue to improve communication between BPA, Council staff, and the ISRP in the review process.** The ISRP continues to see the need to work with the Council, BPA, and Council staff to enhance communication and transparency in the scientific review process. In the Resident Fish and Sturgeon Category Review ([ISRP 2020-8](#)), we included a programmatic comment requesting better communication of how and to what extent BPA implements the Council's and ISRP's project recommendations. BPA's [March 2021 letter](#) responding to the Council's Resident Fish and Sturgeon project review recommendations was a useful step in increasing communication. Another possible improvement that BPA and Council staff supported in response to the ISRP's programmatic comment is greater opportunity for BPA staff to contribute information to the Council and ISRP during the review process, for example, on the Atlas habitat action prioritization tool.

ISRP Recommendations and Comments on Each Proposal

The sequence of ISRP proposal comments below is organized geographically by subbasin starting at the estuary moving upriver covering the mainstem tributaries through the upper Columbia (Wenatchee, Entiat, Methow, and Okanogan) and then covering proposals for actions in Snake River tributaries. Within each subbasin, proposal comments are generally organized with habitat projects coming first followed by monitoring and evaluation (M&E) and then hatchery projects. Within those groupings, comments are further arranged by project proponent, location in the subbasin, and proposal number (oldest first).

Basinwide Hatchery and Genetic Research, Monitoring, and Evaluation

200900900 - Basinwide Supplementation Evaluation Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Inter-Tribal Fish Commission

Province/Subbasin: Basinwide

Recommendation: Meets Scientific Review Criteria

Overall comment:

The Basinwide Supplementation Evaluation (BSE) Project provides state-of-the-art genetic tools (e.g., sophisticated pedigree analyses) to support effectiveness monitoring and evaluation of salmonid supplementation and reintroduction projects on Tribal ceded lands throughout the Columbia River Basin. Most of these individual projects are implemented with funding from the Council and BPA, but they lack technical expertise or financial capacity to perform aspects of needed RM&E. Results from the BSE Project are published and used in adaptive management decision processes that guide future analyses, recovery actions, and management decisions.

The project uses two key metrics for assessing supplementation success, the relative reproductive success (RRS) of hatchery fish compared to natural fish in nature and the demographic boost achieved by hatchery spawned and reared fish relative to natural production. In combination, these two metrics are often used to indicate the success of supplementation programs. However, to clearly assess if hatchery supplementation is working, additional information is needed. Using RRS and demographic boost analyses does not account

for longer-term natural population fitness reductions that may occur because of hatchery intervention. The value of the project would be enhanced if this risk was considered and approaches to assess it were developed.

The project is also investigating methods to reduce the occurrence of precocious maturation in reared Chinook salmon males. A suite of pilot rearing studies tested the effects of various cultural strategies on precocious maturation in males. A production scale experiment using two promising methods and control fish will begin in broodyear 2022 and run through broodyear 2024.

The project addresses many key uncertainties associated with hatchery supplementation and reintroductions identified by the ISRP and ISAB in previous reviews. It has many management applications, and results from the project's effectiveness monitoring and precocious maturation experiments will be of value and interest to many of the Basin's fishery managers.

Q1: Clearly defined objectives and outcomes

All BSE Project studies can be categorized under one of three complementary research objectives: to monitor and evaluate (1) supplemented populations or (2) reintroduced populations of salmon and steelhead; or (3) to conduct experiments to investigate physiological processes and development of salmon and steelhead reared in a hatchery environment.

Flow diagrams are used to illustrate the experimental design or logical sequence of tasks for major studies under each research objective. Each flow diagram possesses multiple boxes that describe a sequence of tasks that will take place to reach an expected quantitative outcome. The outcomes are meant to provide fishery managers with data that can be used to evaluate whether an individual project is meeting its programmatic goals. Or in the case of Research Objective 3, whether altered fish cultural practices can achieve reductions in precocious maturation.

The steps in the flow diagrams essentially fulfill the intent of SMART objectives. They describe specific tasks, they are measurable, attainable, relevant to the problem being examined, and they establish deadlines for project completion. The intent of having SMART objectives is to facilitate adaptive management within a project. Typically, such objectives have quantitative targets. However, the BSE Project includes too many component studies under Research Objectives 1 and 2 to produce such targets for each study. Specific quantitative targets are included when appropriate for the fish culture experiments under Research Objective 3. The series of Gantt charts in section 7 provide commendable clarity and detail about expected timelines.

Q2: Methods

The extensive methods section (20 pages) provides a clear and well-referenced summary of diverse approaches and procedures being used in the proposed studies. The proponents are using state-of-the-art genetic methods to perform pedigree assessments, stock identification, and to calculate reproductive success and relative reproductive success. Some of the methods being employed were developed by the proponents. For example, the genotyping-in-thousands by sequencing approach (GT-seq) was developed by CRITFC personnel and is being used by the project to genotype thousands of individuals at hundreds of SNP markers. Resulting genotype data are then supplied to software programs that identify parent-offspring and sibling relationships. The statistical approaches being used, e.g., the use of ANOVAs to test null hypotheses and generalized linear models (GLMs) to estimate covariate effects, are appropriate. This statistical approach is predominately used to analyze data from the supplementation and reintroduction assessments occurring under Research Objectives 1 and 2.

Relative reproductive success of sockeye reintroduced to Cle Elum Lake has been inferred by comparing GSI assignments to the two donor stocks (Osoyoos and Wenatchee) in samples at successive life stages. The broodstock for the reintroduction was collected at Priest Rapid Dam from 2011-2017 and comprised, on average, 70% Osoyoos and 30% Wenatchee origin fish. In contrast, spawner carcasses collected in Cle Elum Lake in 2013-2016 averaged 72% Wenatchee and 28% Osoyoos, and returning adults sampled at Roza Dam in 2018 were 84% Wenatchee, 7% Osoyoos and 9% hybrids. Accordingly, the proponents estimate a much higher rate of replacement for Wenatchee (0.80) than Osoyoos (0.23).

They also reported a bimodal distribution of spawning time with carcasses assigning to Wenatchee peaking a month earlier than carcasses assigning to Osoyoos, consistent with the typical spawning time of the donor stocks in their respective lake systems. The ISRP notes that spawning time in sockeye and kokanee populations is typically fine-tuned to the expected thermal regime during incubation so that fry emerge at a favorable time in the spring (Brannon 1987; Wood and Foote 1990). We think the late spawning time of Osoyoos sockeye is likely adaptive in the warmer (lake-fed) winter temperature regime of Osoyoos Lake, but mismatched to the colder winter regime at Cle Elum Lake, thus accounting for the lower reproductive success of Osoyoos spawners in Cle Elum Lake. We recommend that the proponents test this explanation by comparing temperature profiles during incubation at the Cle Elum, Osoyoos and Wenatchee spawning sites, and ideally, by confirming similar development rates (i.e., degree-days needed to complete incubation from fertilization to emergence) under standard ("common garden") conditions for both donor stocks.

One of the reintroduction projects being evaluated is comparing the productivity and reproductive success of NOR and HOR spring Chinook spawning in Lookingglass Creek. Data from nine broodyears is currently under analysis. NOR spring Chinook strays may return to the Lookingglass weir and hatchery. It is important that the methods being used to identify these strays are described. The inadvertent incorporation of these fish in the calculation of recruits-per-spawner would create a positive bias in the project's R/S estimates for NOR fish.

Genetic and physiological parameter data are being used to evaluate the effects of different fish rearing strategies on the incidence of precocious maturation. The methods being employed to collect physiological data are well described and appropriate. The proposal indicates that in some rearing experiments specific growth rates (SGR) of fish undergoing different treatments may be assessed. The formula used to calculate SGR contains a typo. The second weight term in the numerator should be weight at time 1 rather than weight at time 2. A recent review of SGR states that SGRs are difficult to interpret because they express additive changes in \log_e weight per unit of time (Crane et al. 2020). Crane et al. algebraically rearrange the standard equation so that proportional increases in weight can be obtained and indicate that multiplying this value by 100 will provide per cent increases in weight per unit of time. The proponents may wish to investigate the use of these new formulas in their Research Objective 3 experiments. The experimental designs and statistical approaches being used in the rearing experiments are well described and are scientifically valid.

References

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- Wood, C.C., and C.J. Foote. 1990. Genetic differences in the early development and growth of sympatric sockeye and kokanee (*Oncorhynchus nerka*) and their hybrids. Can. J. Fish. Aquat. Sci. 47:2250-2260.

Q3: Provisions for M&E

Funding and expertise are often too limited within individual projects to conduct adequate, RM&E. The BSE Project was established to provide tools to support effectiveness monitoring of

tribally managed projects that lack RM&E capacity. Metrics and insights generated by the BSE Project about the biological effects of supplementation and reintroduction programs are being used by tribal partners to evaluate if their projects are meeting their restoration goals. Thus, expected outcomes from the BSE Project become key inputs to adaptive management cycles in the partnered projects. The proponents are in regular contact with their partners, sharing findings, and working to ensure that implementation tasks (e.g., planned genetic sampling) occur as expected.

The proponents also have their own internal evaluation and adjustment process. For Research Objectives 1 and 2, project objectives are shared with tribal managers and any involved co-managers, either informally during meetings with collaborators or formally through presentations. Plans are in place to hold annual virtual meetings with collaborators and biannual genetics workshops within the fish science community. However, the ISRP urges the proponents to develop a formal adaptive management procedure to be followed during such meetings.

Q4: Results – benefits to fish and wildlife

The Progress to Date section of the proposal provides an extensive (34-page) overview of the research questions being addressed; objectives, approaches, and quantitative results for the diverse suite of component studies; plans for future work, and implications of the results so far obtained. These accounts showcase how useful outcomes from the BSE Project are to individual tribally managed projects. The methods used and results obtained also have broad value to fishery managers dealing with similar questions in the Columbia River Basin and beyond.

In our review of research projects in 2018 ([ISRP 2018-8](#)), we noted that NOAA researchers had identified an underappreciated problem of precocious maturation of males in many of the Basin's Chinook hatcheries. In some hatcheries, over 50% of the males may mature as two-year old minijacks. Such fish may distort smolt-to-adult recruit (SAR) values, potentially compete with wild conspecifics for resources, induce numerical predator responses, and cryptically inflate pHOS values in natural spawning populations. Ongoing work and planned experiments by the proponents are examining how fish cultural methods can be implemented to substantially reduce the occurrence of precocious parr in cultured Chinook. Pilot studies performed by the proponents suggest that periods of starvation and photoperiod manipulations can significantly reduce precocious maturation. Future work to refine each of these approaches is scheduled and a production-scale study is planned to evaluate their effectiveness under normal hatchery operations. Results from these studies will be of value across the Basin and elsewhere.

200890700 - Genetic Assessment of Columbia River Stocks

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Inter-Tribal Fish Commission

Province/Subbasin: Basinwide, Mainstem

Recommendation: Meets Scientific Review Criteria

Overall comment:

This project continues to make steady progress in developing state-of-the-art procedures for monitoring genetic diversity and cost-effective applications of Genetic Stock Identification (GSI) and Parental Based Tagging (PBT). It contributes practical advice for fisheries management and addresses a number of critical uncertainties. Application of PBT and GSI has improved the accuracy of stock-specific estimates of harvests throughout the Columbia River Basin and of abundance at multiple dams. Project results are used extensively by the U.S. v. Oregon Technical Advisory Committee for in-season harvest monitoring as well as post-season run reconstruction for multiple species of salmon and steelhead. The record of primary publications and annual reports is excellent.

ISRP suggestions and comments in the sections below should be considered in future proposals.

Q1: Clearly defined objectives and outcomes

Three genetic assessment projects reviewed separately in 2018 have been merged into a single project with six objectives. The first four objectives listed in the Progress to Date section of the proposal correspond to previous research under BPA project 200890700: 1) discover and evaluate SNP markers (for multiple salmonid species and white sturgeon), 2) expand and create genetic baselines (to support PBT and GSI analyses), 3) implement genetic monitoring (PBT/GSI) programs for mainstem Chinook salmon, sockeye salmon and steelhead fisheries, and 4) apply genetic monitoring (PBT/GSI) to Chinook, sockeye and coho salmon and steelhead passing Bonneville Dam. The fifth objective, to characterize adaptive genetic variation associated with environment, landscape, and phenotypic traits, corresponds to research previously undertaken in BPA project 200900500. The sixth objective, to characterize genetic diversity and structure of white sturgeon in the Columbia River Basin, corresponds to research previously undertaken by BPA project 200850400.

Section 3 of the proposal lists additional quantitative objectives, implementation objectives, research questions and predictions under each of the six objective headings. We found these distinctions to be vague, repetitious, and insufficiently quantitative to clearly specify the desired outcomes for the proposal's five-year time period or to evaluate future progress. In short, these objectives do not meet SMART criteria and should be revised in future proposals to clearly document the project's objectives and hypotheses. That said, we understand the challenge of documenting quantitative objectives for this continuing project given its complex mix of exploratory and applied science. One suggestion for meeting the SMART criteria is to create summary plots to show past trends and future projections for quantitative deliverables such as the number of single nucleotide polymorphism (SNP) markers developed and/or selected for application, number of populations incorporated in baselines, number of GSI reporting groups, number of adaptive traits mapped to genotypes identifiable with SNPs, specific fisheries and dams monitored, etc. These summary plots could be based on data provided in various sections of the annual report for 2019.

No specific milestones or timelines are associated with any of the objectives, but it is clear from the proposal and annual report for 2019 that the project is expected to continue for the foreseeable future. PBT requires annual collection and genotyping of tissue samples from hatchery broodstock, and GSI of salmonids harvested in mainstem fisheries or passing Bonneville Dam requires annual collection and analysis of mixture samples. The genomic research programs on adaptive traits and white sturgeon are making steady progress, but they are technically challenging and will likely take many years to deliver their full potential. In any case, it is important to indicate the expected yearly (or perhaps 5-year) quantitative outcomes for each objective that will be used for evaluating progress in the project's internal adaptive management cycle.

Q2: Methods

The proposal provides only a brief overview of the approaches being followed for each objective. Much more detail is provided in the lengthy annual report for 2019 (289 pages with many links and references). It has not been possible for the ISRP to examine these methods in detail during the current review process given the scope and complexity of this aggregate project, which spans many years, objectives, covers multiple species, populations, and fisheries, and employs technically sophisticated laboratory and analytical procedures.

A major strength of this project is the successful development of cost-effective methods (e.g., GT-seq) to screen genotypes at hundreds of SNPs for application to PBT and GSI. Another important innovation of this project is the combined application of PBT and GSI to improve estimates of stock composition of fish passing Bonneville Dam and harvested in mainstem

fisheries. Sampling and analytical protocols are clearly documented in the annual report for 2019. Standard methods are being used for statistical analysis, and confidence intervals or significance test probabilities are provided to support most conclusions. The proponents also use state-of-the-art techniques that were peer-reviewed in their primary publications, and hence, are scientifically appropriate.

The proponents have been diligent and creative in finding ways to minimize bias that can arise in analyzing stock composition of mixtures if weighted stratified random subsamples are improperly weighted. They developed, published, and applied a bias-correction procedure for incorporating new data on PBT detections of hatchery fish that are not adipose-clipped and previously had been assumed to be wild (about 20% of Chinook and 8% of steelhead from 2014-2018, Hargrove et al. 2021), while simultaneously adjusting the overall proportions of hatchery and wild populations based on the GSI results for wild fish. Presumably, a larger proportion (e.g., 0-18% at Bonneville Dam in the fall of 2019) of hatchery fish are “missed” by PBT because of incomplete PBT baseline sampling, but they are not counted as wild fish because adipose clips indicate their hatchery provenance.

White sturgeon present special challenges for genetic analysis because of their polyploid ancestry. Despite this, the proponents are making steady progress in identifying SNPs, demonstrating functional tetraploidy and Mendelian inheritance patterns, and in developing ways to modify analytical procedures when using software programs designed to analyze diploid species.

The proponents have fully addressed previous ISRP requests (2018) to justify the choice of assignment thresholds (they no longer set assignment thresholds), and to compare the relative accuracy of counting individual fish assignments versus estimating mixing proportion parameters without attempting to assign individuals.

Q3: Provisions for M&E

The proponents use section 6 of the proposal (Potential Confounding Factors) to emphasize how this project is uniquely positioned to document widespread influences of climate change on abundance, run-timing, and genetic diversity of salmonids of the Columbia River. As PBT and GSI baselines are updated and expanded, they provide successive “snap shots” of biodiversity within a number of target species. These data could be used to augment High Level Indicators for monitoring the state of biodiversity within the basin. The proponents also plan to routinely sample populations in extreme temperature sites and expect to use SNP markers in combination with genomic and physiological analysis to predict and track the populations’ adaptability to climate and landscape changes.

Section 6, however, is primarily intended to elicit discussion of factors that might hamper progress in meeting objectives. One such factor is the difficulty of getting sufficiently representative samples of various stocks passing Bonneville Dam due to restrictions placed on trap operations there by USACE and NMFS. Sampling opportunities at the Bonneville Dam trap may become increasingly restrictive due to rising temperatures and increasing numbers of shad.

In future proposals, the ISRP would like to see more explanation of the practical limits to GSI resolution with SNP baselines. We understand that GSI resolution will be constrained by the amount and stability of differentiation in allele frequencies among populations (“population structure”) determined by the historical balance of genetic drift and gene flow. What then is the practical limit to GSI resolution that can be reasonably expected despite increasing the number of SNPs or microhaplotypes examined, and regularly updating baselines given observed levels of year-to-year variability associated with random demographic effects (e.g., genetic drift within natural spawning subpopulations and baseline sampling errors)? How are factors that reduce gene flow among populations, and thus maintain differentiation among populations in neutral traits, expected to change in the face widespread hatchery propagation (more straying and transplantation) versus reduced abundance and fragmentation of natural metapopulations, and range contractions due to climate change? Are adaptive traits expected to be more robust to the confounding effects of sampling variation, genetic drift, and gene flow, so that GSI baselines might need be updated less often?

Section 5 (Project Evaluation and Adjustment Process) of the proposal is too brief. In future proposals, the ISRP would like more explanation of the process by which the proponents allocate effort and resources among objectives such as finding new SNPs and updating and expanding baselines. Is there a regularly scheduled decision process to determine, for example, when more SNPs need to be added to panels, which SNPs to include, which stocks to include in baselines, how often to resample them, and how large the samples should be?

Q4: Results – benefits to fish and wildlife

Objectives 1-4: This project has developed the genetic baselines (i.e., SNP) and technical capacity to routinely provide timely estimates of stock composition of mixed stock harvests of hatchery and natural origin Chinook salmon, sockeye salmon and steelhead in the Columbia River, and to estimate the run timing and abundance of genetic stocks passing Bonneville Dam. The practical management application of the project results is impressive. SNP panels are also being developed to identify the origin of coho salmon, white sturgeon, and several lamprey species. The SNP panels have been especially useful for PBT and measuring reproductive success in other pedigree studies.

Sample rates for Chinook salmon, sockeye salmon, and steelhead are often lower than desired due to restrictions imposed by USACE and NMFS on sampling at the Bonneville trapping facility. Another continuing challenge is that GSI reporting groups based on the genetic differentiation of populations, which provide the most accurate estimate of stock composition, are not identical to the management units of most interest to fisheries managers. The proponents are continuing to work with fisheries managers to explore how to best incorporate genetic monitoring results with more traditional monitoring and tagging programs.

In principle, PBT and GSI based on SNP markers are now sufficiently developed that they could replace some (but not all) functions of the coded wire tag (CWT) program for hatchery fish. However, replacing the CWT program would require continued annual genotyping of hatchery broodstock, fish passing Bonneville Dam, and harvested fish.

Objective 5: The project has made steady progress in developing techniques to identify and monitor adaptive divergence among specific environments in a number of species within the Columbia Basin. Recent results indicate that precipitation, elevation, and temperature are among the most important environmental factors driving adaptive divergence in salmonids. Multiple studies are underway to investigate the genetic basis for run-timing, age-at-maturity, disease resistance, and thermal adaptation. Candidate genes for several of these traits have been identified in both steelhead and Chinook. SNP markers from these regions are now being incorporated into standard genotyping panels to cost-effectively scan large numbers of individual fish for genetic variation in adaptive traits. For example, genotypes for temperature tolerance could be screened to identify broodstock for reintroduction efforts. Understanding the genetic mechanisms and potential for adaptation to changes in precipitation, temperature, and other environmental factors will help to guide long-term conservation policies for salmonid populations in the face of climate change.

Objective 6: Genetic analyses of SNP variation in white sturgeon have corroborated earlier surveys of variation in microsatellite markers, with both analyses showing little genetic differentiation among white sturgeon inhabiting different impoundments of the Middle Columbia region. Broodstocks from the Yakama hatchery that are used for supplementation in the Middle Columbia River were genetically similar to the wild populations from which they are derived, which justifies their continued use. The recent increase in SNP markers from 117 to 325 will improve capabilities for resolving population structure and PBT. The new genotyping approach provides an estimate of ploidy level and enables evaluation of the rate of spontaneous autopolyploidy. A large number of samples representing various age classes of white sturgeon from all sections of the Columbia and Snake rivers are currently being genotyped to investigate genetic structure and the frequency of ploidy levels within each section. The project is also making steady progress towards assembling a draft genome for

white sturgeon, as a first step in discovering a genetic marker to non-lethally distinguish males from females at any age.

201003100 - IDFG Genetic Monitoring of Snake River Steelhead and Chinook Salmon

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Department of Fish and Game

Province/Subbasin: Blue Mountain/Grande Ronde, Blue Mountain/Imnaha, Columbia Plateau/Snake Lower, Mountain Snake/Clearwater, Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Final review comment:

This is an exemplary, innovative project. We thank the proponents for submitting a revised proposal as well as a point-by-point response addressing all of the topics identified in our preliminary comments. In our preliminary comments, we requested responses on the following topics:

1. **Compatibility with NOAA status assessment**
2. **MPG and ESU identification**
3. **Alternative approaches**

The proponents added three appendix tables (A1-A3) in response to our request for more detail about how data generated by this project contribute to the abundance, productivity, or diversity measures used by NOAA for hierarchical assessment of ESU viability.

Table A1 highlights the extent to which this project supports assessments in a variety of other projects by genetically distinguishing sex and the hatchery origin of unmarked fish (that would otherwise be assumed to be natural origin). These and other data contributed by the project are clearly important for improving estimates of pHOS, natural spawner abundance, and indices of genetic and life history diversity.

Tables A2 and A3 support the ISRP's preliminary comments that the genetic stock groupings to which fish can be assigned by this project often do not exactly match the TRT populations of steelhead and Chinook salmon, and in some cases even the MPGs of Chinook salmon.

Moreover, the proponents' response does not indicate how estimates of abundance or productivity measured at Lower Granite Dam for genetic stocks comprising mixtures of TRT populations are (or might be) adjusted to provide the spawner-to-spawner data typically required for NOAA's VSP and ESU status assessments. We therefore conclude that the proposal has somewhat overemphasized the utility of this project for the NOAA viability assessments of TRT populations. That said, this project also supports a basinwide effort to implement a variety of approaches for monitoring status and trends at multiple hierarchical levels. To maximize efficiency and effectiveness of that overall effort, it remains important to periodically review and refine the approaches being developed in this and other projects. The ISRP urges the proponents to consider, in future work plans, whether a greater focus on SNPs associated with adaptive traits might improve the capability to resolve TRT populations and MPGs.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

We commend the proponents for a clearly written, well-organized and well-justified proposal. The standardization and application of accurate methods of parentage-based tagging (PBT) and genetic stock identification (GSI) are remarkable achievements by this project (in collaboration with project 200890700). The resulting single nucleotide polymorphism (SNP) baselines for Snake River steelhead and Chinook salmon have enabled (1) cost-effective and routine monitoring of spatial and temporal trends in diversity and genetic structure of natural-origin Snake River populations; (2) estimation of stock composition of harvests in mainstem fisheries and escapements past Lower Granite Dam; and (3) evaluation of proportionate natural influence (PNI) of integrated hatchery programs in Idaho.

The proposal states that the project contributes significantly to NOAA and other investigators by providing data for viability assessments of independent populations defined by the Technical Recovery Teams ("TRT populations"), major population groups (MPG), and evolutionarily significant units (ESU). However, the ISRP was unable to understand how, or the extent to which, this project informs these status assessments.

The ISRP requests the proponents to address the following points in a revised proposal, and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Compatibility with NOAA status assessment.** Clarify how estimates from this project are used in the NOAA status assessments. In many cases, it seems that data generated

by this project could only be used to estimate abundance and productivity of multi-population groupings returning to Lower Granite Dam. It seems that such estimates would not be adequate for viability assessments that typically rely on estimates of spawner abundance and spawner-to-spawner productivity for TRT populations.

2. **MPG and ESU identification.** List the steelhead and Chinook salmon populations by MPG and ESU for which this project provides data that are used by NOAA for viability status assessments.
3. **Alternative approaches.** If the project enables an alternative approach to viability assessment of abundance and productivity, then explain the alternative approach and compare it with the NOAA approach to demonstrate its utility.

Q1: Clearly defined objectives and outcomes

This project addresses management issues and uncertainties that are highly relevant to the Council's 2014 Fish and Wildlife Program, 2017 Research Plan, and High-Level Indicators as well as numerous subbasin plans. However, it is less clear how the project supports and contributes to ESA Recovery Plan objectives.

The current proposal combines objectives from two previous BPA projects to test the feasibility of using PBT and GSI to help manage hatchery and wild Snake River steelhead and Chinook salmon. The eight revised objectives are clearly specified, and most meet SMART criteria. An exception is Objective 2, which is not quantitative. Instead of just saying “discover new SNPs,” we suggest indicating more precisely the number of new SNPs, or the attributes of new SNPs, that need to be discovered for the project to achieve this objective.

In future proposals, it would be advantageous for the proponents to include additional objectives related to adaptive management and reporting, as this would serve to highlight other very successful outcomes from the project.

The project now comprises a well-established annual cycle of activities that is expected to continue for the foreseeable future.

Q2: Methods

The proposal includes a succinct but comprehensive overview of methods, which is organized appropriately by objectives, clearly explains the rationale for various approaches, and provides convenient links to details elsewhere (e.g., monitoringresources.org and references to associated projects and the primary literature). Sampling and analytical protocols are

documented in more detail in the annual report for 2019. Standard methods are being used for statistical analyses, and confidence intervals or significance test probabilities are provided to support most conclusions. The proponents also use state-of-the-art techniques that were peer-reviewed in their primary publications, and hence, are considered scientifically appropriate.

A notable weakness in the methods section is the lack of detail about how data generated by the project contribute to the abundance, productivity, or diversity measures (i.e., viable salmonid population (VSP)) parameters used by NOAA for hierarchical assessment of ESU viability. VSP parameters used to assess the viability of TRT populations are typically based on multi-generational adult spawner-to-spawner data. This proposal does not describe how estimates of abundance or productivity measured at the Lower Granite Dam for stocks comprising mixtures of TRT populations are adjusted to provide the spawner-to-spawner data typically required for NOAA's VSP and ESU status assessments. It seems that in many cases, the scale of the abundance and productivity estimates provided from this project would not align sufficiently with that needed for assessments at the TRT population, MPG, or ESU level. In summary, the methods section should indicate more precisely which data generated by this project are actually used by NOAA for viability assessment and describe more clearly how these data are adjusted to meet (or circumvent) the requirement for spawner-to-spawner abundance and productivity estimates for TRT populations and the specific populations for which data are generated.

Q3: Provisions for M&E

A brief paragraph refers to a history of periodic adjustments to genetic marker panels, genotyping platforms, and statistical tools through regular meetings with genetic collaborators to evaluate results and discuss new proposals. Significant adjustments to improve cost-effectiveness include transitioning to:

- Absorptive chromatography paper that can hold 50–100 samples per sheet and occupies much less space than an equivalent number of ethanol-filled vials;
- 300-400 GTseq SNP genotyping panels for both Chinook and steelhead that provide near zero false-positive and false-negative rates at less cost than the original 96 samples X 96 SNP loci system;
- A 5-year rotating schedule for resampling populations to update GSI baselines;
- Whole-genome sequencing of pools of individuals (Pool-seq) to more cost-effectively estimate allele frequencies across the genome at the population scale; and

- The (proposed) addition of microhaplotypes (multiple, tightly linked SNPs that exhibit contrasting allele frequencies across populations) to the existing GTseq SNP panels in hope of further improving GSI accuracy for steelhead.

The proposal states that project results are regularly evaluated and discussed during meetings with collaborators. Although this project adjustment process appears to be working well, the ISRP would like to see more explanation, in future proposals or the next annual report, of the decision process by which the proponents allocate effort and resources among objectives, such as finding new SNPs and updating and expanding baselines.

The project has excelled at sharing information and providing information to support management decision processes. Monitoring and research results are presented in annual IDFG and BPA reports, at various meetings (e.g., LSRCP, IDFG Anadromous Meeting, Steelhead Workshop, Coastwide Salmonid Genetic Conference), and in the primary scientific literature. Impressively, the proponents have authored or co-authored over 20 papers on work undertaken in this project. The Gantt chart (Fig. 19) clearly indicates the annual cycle of activities, and the table in section 8 (Relationships to other projects) helps to clarify roles and responsibilities in collaborations with six other projects.

Q4: Results – benefits to fish and wildlife

The proponents have worked collaboratively with CRITFC staff (project 200890700) to develop and standardize SNP panels for steelhead and Chinook salmon that cost-effectively integrate application to both PBT and GSI, and identify the genetic sex of each species. The ISRP noted an apparent inconsistency between pages 15 and 27 of the proposal which state the current Columbia-basin-wide panel contains “390 SNPs for steelhead and 299 SNPs for Chinook Salmon” versus “368 SNPs for steelhead and 343 SNPs for Chinook Salmon,” respectively, with Hess et al. (2020) cited in both instances.

On average, 4,900 steelhead and 12,000 Chinook salmon broodstock are sampled each year to create PBT baselines comprising all steelhead and Chinook salmon broodstock used in hatcheries throughout the Snake River basin. This effort allows the Snake River PBT program to genetically “tag” about 95% of 20 million steelhead and Chinook salmon smolts released annually.

Since 2018, the steelhead GSI baseline has represented 23 TRT populations and all 6 MPG. These steelhead collections are pooled to create 45 “GSI populations” for stock composition analysis and 10 “genetic stock” groups for reporting mixture proportions. The Chinook salmon

baseline represents 31 of 41 TRT populations and all 5 MPG. The Chinook salmon collections are pooled to create 30 GSI populations for analysis and 6 genetic stocks for reporting.

PBT has now superseded coded-wire tagging (CWT) to estimate the harvest of hatchery Chinook salmon in the Snake River basin, although CWTs are still used to monitor ocean and downriver harvests, and to assess and compare alternative hatchery rearing and release strategies. Multiple year results have shown that PBT and CWT methods provide similar accuracy, but PBT can provide greater precision because of the larger number of “tags” available.

The proponents have used GSI and PBT in combination (working collaboratively with projects 199005500, 199107300, 198335003, and 201800200) to estimate abundance and stock composition of wild steelhead, spring/summer Chinook salmon, and fall Chinook salmon passing Lower Granite Dam. Abundance, productivity, and measures of genetic diversity are provided to NOAA as part of requirements to review the listing classification of Snake River steelhead and Chinook salmon at least once every five years.

Incorporating PBT with GSI has significantly improved the accuracy of wild escapement estimates at Lower Granite Dam by detecting untagged hatchery-origin fish that would otherwise be mistaken for wild fish, resulting in a significant overestimation of natural abundance. PBT analysis identified that, on average from 2014-2018, 19.6% of Chinook salmon and 8.3% of steelhead adults passing Lower Granite Dam were hatchery-origin, despite having no physical or mechanical marks. Similarly, a comparison of stock-specific abundance estimates for hatchery Chinook salmon returning in 2016 to 2019 revealed that the in-season PIT-tag method accounted for only 65% (averaged across all release groups) of the total detected by PBT.

The project also demonstrated that PBT should be used as part of long-term monitoring of proportionate natural influence (PNI) for integrated hatchery programs in Idaho. Analyses based on physical marks consistently overestimated PNI by overestimating the proportion of natural fish in both the natural spawning and broodstock components of the hatchery program compared to analyses based on PBT.

The proponents have fully addressed previous ISRP recommendations:

- Genetic data from PBT and GSI projects in the Columbia River basin (and throughout the Pacific Coast of North America) are now stored in FishGen (McCane et al. 2018) and available to any lab running PBT projects;

- PBT data for PIT-tagged fish are now being linked to life history data from scale sampling at Lower Granite Dam (i.e., age at maturity) and migration behavior from PIT-tag detections at in-stream arrays (IPTDS). This step allows VSP metrics to be assessed at the scale of some TRT populations. However, because in-stream array coverage is not complete across the landscape, the method cannot be applied to all TRT populations.

Estuary and Lower Columbia

200300700 - Columbia River Estuary Ecosystem Monitoring

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Lower Columbia Estuary Partnership (LCEP)

Province/Subbasin: Columbia River Estuary/Columbia Estuary, Lower Columbia/Columbia Lower

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP found this a difficult project to review without a site visit, given the collaborations with multiple partners. Nevertheless, the ISRP recommends that this project Meets Scientific Review Criteria with three conditions, all of which should be addressed in the next annual report and work plan:

1. **SMART objectives.** Establish SMART objectives for the Ecosystem Monitoring Program (EMP) objectives, as much as possible, including succinct empirical statements of expected outcomes (with timelines).
2. **Benefits to fish and wildlife.** Develop a strategy for collecting, analyzing, and reporting information to quantitatively demonstrate benefits to fish and wildlife from restoration and protection actions.
3. **Budget.** Remove the proposed carbon sequestration study (Objective 7) from the budget and the budget justification.

The ISRP also has a recommendation for the proponents, but it is not a condition. The monitoring data do not appear to be used to in a model that could predict responses or conditions at other estuarine sites within this geographic area. If this is correct, then we encourage the proponents to develop a strategy for constructing such a model, which could be an important tool for understanding the effectiveness of estuarine restoration efforts.

In our preliminary review, we requested responses on the following nine topics. Our final comments follow each item:

1. **SMART Objectives.** While the proponents made the goals and objectives for the two monitoring programs somewhat clearer, they did not establish SMART objectives for the

EMP, which remains unnecessarily vague. Even though the EMP requires multiple partners to complete the monitoring protocol, this should not preclude establishing SMART objectives for their collective actions and requiring partners to develop SMART objectives for subprojects. The ISRP expects the lead project to be responsible for seeing that all partners submit analyses in a timely manner. The ISRP has requested other large, coordination projects to provide similar SMART objectives and assist partners in developing SMART objectives (e.g., Grande Ronde Model Watershed, Upper Columbia Programmatic Habitat).

An attempt should be made to put the objectives into a SMART format as much as possible. For instance, EMP Objective 1 could be revised as follows: *“Monitor status and trends in ZZ characteristics of the ~~of~~ biogeochemistry of mainstem surface waters of the lower Columbia River estuary at XX sites at YY times annually, as well as at XX sites and YY times above the confluence with the Willamette River. These data will be used to quantify the impacts of tidal seawater fluxes and environmental change on habitat capacity for juvenile salmonids.”*

No attempt is made to provide succinct empirical statements of expected outcomes (with timelines). One would expect the proponents to provide reasonable projections of expected changes, especially since the project has been active for more than 20 years.

2. **M&E Matrix – Lead.** In the revised proposal, the proponents provide tables of locations, sampling levels, and metrics for each level of Action Effectiveness Monitoring (AEM), as well as the partners responsible for specific M&E efforts. The project has previously submitted these tables and figures in annual reports to BPA for its regular update of the Columbia Estuary Ecosystem Restoration Program (CEERP) Plan. Notably, the proponents also give this information in a timely manner to their partner projects, including CREST, CLT, WDFW, and CIT. The proposal describes the monitoring methods, analyses, and specific metrics for each overall monitoring objective and provides supporting documentation and links to MonitoringResources.org. The proponents work with their partners to produce a State of the Estuary report to USEPA every five years. The most recent report ([2020](#)) includes a story map with spatially explicit information on land use, ecological conditions, project accomplishments, and monitoring results for water quality and habitat conditions. The 2020 State of the Estuary Report is comprehensive yet concise, and the story map is an exceptional contribution to better understanding the complex nature of the estuary and the monitoring and restoration program.
3. **Project Evaluation and Adjustment.** The proponents’ response generally addresses the ISRP concerns. However, it remains unclear when an AEM protocol can be discontinued.

Table 4 (p. 37) lists the schedule for when AEM activities are to occur but not when they can be discontinued. Perhaps it is not possible to determine when an activity can be terminated (for both AEM and EMP) since no quantitative levels are established to judge if the restoration actions or the environmental conditions are deemed adequate or successful. The proponents should consider how “success” is determined so that specific monitoring activities can be discontinued or transferred to other sites. The program also should consider establishing “thresholds of probable concern” for some environmental characteristics. If measurements consistently fall below a pre-established, ecologically acceptable level (threshold), then resources could be transferred elsewhere for monitoring other important parameters.

4. **Carbon Sequestration and Methane Fluxes.** The proponents removed this activity from the proposal. However, the proposed carbon sequestration study (original Objective 7) still needs to be removed from the budget and the budget justification.
5. **Discussion of Toxic Chemicals.** The ISRP is pleased to see that the Problem Statement section has been revised significantly, including the discussion of toxic chemicals, and that readers are now referred to the habitat restoration proposal (200301100) for more information on limiting factors and threats within the lower Columbia River region.
6. **Accounting for Changes in (Land Use) Development.** The proponents’ response revealed a major information gap for the lower Columbia River. Recent changes in land use in the geographic area have been substantial, especially in close proximity to the river and tributaries. These land-use changes have significant environmental impacts on the Columbia Estuary and associated habitats, even with existing riparian protections. That said, the ISRP is impressed by the information and analyses presented on land use in the 2020 State of the Estuary report using the limited available data. We encourage the proponents, and the states of Oregon and Washington, to seek support for expanding the land-use analyses, which are essential for developing a better understanding of causes for change in the estuary as well as for predicting environmental future changes. The ISRP encourages the Council staff to convey the importance of this informational gap to BPA and other regional agencies with restoration activities in the estuary.
7. **Evaluation of Disturbed Sites.** The proponents provide a reasonable response to the ISRP query about expanding the monitoring program to sites significantly altered by human actions. Because funding for EMP and AEM is capped, we agree that the best

strategy is to remain focused on minimally human-altered habitats as they provide a suite of reference sites for restoration designs and actions.

8. **Benefits to Fish and Habitat.** The response by the proponents is concerning to the ISRP. Despite substantial long-term funding for restoration and protection of juvenile salmonid habitat, the project does not, nor do the other estuary projects (CREST, CLT, WDFW, CIT, LCEP restoration projects), quantify the benefits to fish from the habitat restoration (e.g., total abundance, size at smoltification, or survivorship). The ISRP agrees with the proponents that this is an important, and essential, information gap to fill in order to evaluate the usefulness of many of the restoration and protection actions. A starting point could be to use the recently completed 2020 PNNL and NMFS diagnostic study to document that restoration provides immediate benefits to juvenile salmon and steelhead using the lower Columbia River. The ISRP encourages the proponents to partner with the appropriate agencies and groups in the very near future to see that appropriate monitoring data are collected to demonstrate that habitat restoration and protection are benefiting juvenile salmonids. In other words, the proponents should develop and implement a strategy for collecting the necessary information.

A related concern is that the monitoring data do not appear to be used to populate a model that could predict responses or conditions at other estuarine sites within this geographic area. The proponents note that the data are used to assess habitat capacity within a site (p. 23), but it is unclear how the data are used to accomplish this. Further, the proponents note (p. 24) that data collected under Objective EMP 4 are analyzed in conjunction with data collected under the other objectives to determine relationships between habitat structure, capacity, and juvenile salmonid habitat usage – and the findings are used to assess juvenile salmon habitat usage throughout the lower Columbia River and in comparisons with restoration sites. The ISRP would expect that this would be well known after 18 years of research and monitoring. Yet, there is no mention in the proposal that the data are used to populate a predictive model, one that is powerful enough to be used more widely in the estuary. Is there a model that uses the information to predict the fish capacity of the site, or environmental conditions? If not, then one is needed if only to synthesize the two decades of information already acquired.

Note: The Jeffres et al. (2008) study is impressive but took place under experimental conditions in rice fields of a highly altered California river. The ISRP wonders to what extent this study is applicable to the lower Columbia River.

9. **Process for Determining Number of Monitoring Sites.** The proponents' response to this concern is adequate. Since monitoring funding is capped, a Steering Committee composed of BPA, the USACE, and LCEP guide the prioritization of AEM levels to individual restoration sites. This appears to be a reasonable approach.

Specific Comments:

1. EMP Goal 3 (p. 20) cannot be accomplished without a quantitative analyses of spatial trends in land use associated with the river/estuary. The Goal needs to be re-worded to reflect what is actually being investigated.
2. The use of the term "biogeochemistry" throughout the proposal is vague, and therefore confusing as to what is actually being monitored. It needs to be clearly defined early in the proposal or another, more appropriate, term or terms used.
3. The ISRP agrees that vegetation composition is important for the production of organic matter (released to the river in the form of macrodetritus, p. 32). However, the proponents should consider monitoring microdetritus (< 1 mm diameter) and dissolved organic matter (< 0.5 um). These are the dominant sizes, in terms of mass, of detritus exported to the river. Further, DOM reacts quickly with seawater at low salinities to become biologically available to the foodweb.
4. The abundance of pelagic zooplankton (p. 33) is not a valid method for estimating secondary production. The description of the method should be revised to reflect what is actually measured, zooplankton abundance. If the project needs estimates of secondary production, another method should be used.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The project has been highly productive for many years, providing monitoring for restoration activities conducted throughout the Lower Columbia River. The proponents have received high marks from the ISRP during past reviews for their comprehensive approach. Despite the proponent's strong track record of accomplishments, the proposal's length and inclusion of too much previous work make it difficult for reviewers to differentiate past results from actions being proposed for the next funding cycle, and to evaluate if the activity needs to be continued

or if enough has been learned so that the activity can be deemed successful, and thereby considered complete. It would have helped greatly if the proponents had adhered to the suggested guidelines for proposal preparation. In addition, the proposal did not adequately tie together the monitoring actions with the roles of other estuarine restoration groups. For instance, often it was not clear how specific monitoring activities informed other projects.

The Columbia River estuary is ecologically important and is highly altered by multiple processes, including dams and processes unrelated to dams. Therefore, assessment and monitoring of the numerous restoration actions are surely warranted. The proposal gives the appearance of seeking to measure everything, without specific motivating hypotheses and questions. Some baseline monitoring is understandable, but given the many levels of complexity and variation in the estuary, greater focus would be beneficial. The proposal's two major programs—Ecosystem Monitoring (EM) and Action Effectiveness Monitoring (AEM)—could be better integrated, and the Ecosystem Monitoring could use clearer goals.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **SMART objectives.** Provide succinct objectives in a SMART format (see proposal instructions), as well as succinct empirical statements of expected outcomes (with timelines).
2. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this programmatic project, the ISRP requests the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation projects and monitoring projects in the Lower Columbia geographic area. The summary should provide a table or matrix to

identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist your project in producing this summary.

3. **Project evaluation and adjustment.** Provide a brief narrative of how information generated from this project informs an adaptive management process, both for improving monitoring activities and for modifying specific restoration activities. Explain how the project determines when monitoring has been completed for a specific objective and can be discontinued.
4. **Carbon sequestration and methane fluxes.** While the importance of understanding carbon sequestration is clear, folding Objective 7 into this project seems to represent a major shift in focus. Objective 7 requires different types of monitoring than what is already occurring, and it is not clear whether or not it requires different expertise than what the project currently contains. Would the addition of this objective diminish the ability of the program to address the first six objectives? Unless a clear link can be established showing tangible benefits to fish and wildlife, the proposed new activity, measuring carbon sequestration and methane fluxes, should be removed from this proposal and funding sought from another source.
5. **Discussion of toxic chemicals.** The ISRP agrees that the presence and accumulation of toxic chemicals in the estuary are vitally important to ecosystem and salmonid recovery. However, this topic is not specifically addressed by the monitoring or research program since BPA currently does not fund monitoring for toxins in the estuary. As a result, the ISRP considers a discussion of toxins in the Problem Statement to be tangential. The discussion of toxins should be moved from the Problem Statement to the section on Confounding Factors.
6. **Accounting for changes in development.** The overview states, “Presently, we are not tracking whether our restoration activities are keeping up with urban, industrial, or residential development or the conversion of native habitats to impervious surfaces.” If changes in development are not being accounted for, then it is not clear to the ISRP how the effectiveness of restoration actions can be monitored. This should be clarified since it calls into question the ability to evaluate restoration efforts.

7. **Evaluation of disturbed sites.** The overview states that the focus of the project is on minimally disturbed, tidally influenced emergent wetland sites. While this is important, it is not clear if disturbed sites are also being evaluated for comparison. In the confounding factors section, the proponents note that it may be necessary to broaden sampling efforts to assess “working lands and other less than optimal habitats.” Understanding how monitoring results for minimally disturbed locations compares with disturbed locations seems key to a program intended to evaluate restoration actions. Given this basic need, the proposal should describe how the additional sampling could occur.
8. **Benefits to fish and habitat.** In the section entitled Progress to Date, some broad benefits to salmon and steelhead are described, but it is not always clear if these are tied to quantitative measures of the fish or to habitat actions taken at specific locations. More information on this is warranted.
9. **Process for determining number of monitoring sites.** How are numbers of sites determined each year (see Table 5)? Fewer sites will be sampled in 2022 than in previous years, for example. Factors that determine differences in sample sites each year should be explained. Processes for evaluating and adjusting the project are not fully described and seem to occur informally. It would be helpful to describe the specific meetings in which the focus is in on evaluation versus outreach.

Q1: Clearly defined objectives and outcomes

The Problem Statement had a suggested length of 2 pages or less, but this ran from pages 4-18 including figures. It would be helpful if proponents could more closely adhere to the formatting suggestions and better focus their narrative. As it stands, this section includes many details on methods that would better be presented elsewhere. This excessive length makes it difficult to discern the essential objectives, as well as the fundamental questions and hypotheses driving the work. The importance of estuaries for salmon is well known, as is the degradation of the Columbia River's estuary and the importance of long-term monitoring. Similarly, the statement of Goals and Objectives is too long and includes many details on methods that obscure the goals. The project is so large and complicated that efforts should be made to streamline the proposal and focus on essential information and applications.

The objectives and outcomes are buried in the details. For instance, the information needed, for the most part, to articulate SMART objectives is relegated to the narratives. It should be provided as succinct SMART statements that can be used for future evaluation.

While the authors describe value in integrating climate adaptation and mitigation measures into the project, it would be helpful to understand what (if any) aspects of the current monitoring efforts would be lost if this work was added. Would this change the focus of ongoing efforts by the EMP or the AEM?

An excessive amount of information is included in the problem statement. Presenting a more succinct summary of the need for the program would be helpful as would potentially including information in tables or figures.

In the section on Progress to Date, some broad benefits to salmon and steelhead are described, but it is not always clear if these are tied to quantitative measures of the fish or to actions taken at specific locations. More specific information in the Progress to Date section is warranted.

Q2: Methods

The methods are based largely on established best management practices and are reasonable for the actions being proposed.

While the methods are sound, the questions motivating them are not always clear, contributing to a sense of a program that is very large and growing, with an increasingly broad scope. Many details are presented related to a large number of objectives (biogeochemistry, nutrient cycling, fish sampling, contaminants, temperature, flow).

In terms of details, is there a reason why stable isotope (SI) data are collected at lower trophic levels but not included among the metrics for the fish, or in Table 3? One would think collecting diet, lipid, and SI data from the fish would be standard. Perhaps this is done but not mentioned?

Building on a point in the previous section, the emphasis on sampling undisturbed sites seems to limit the ability to understand if restoration actions are effective.

Q3: Provisions for M&E

The proponents have a strong record of analyses, presenting results at numerous meetings and conferences, as well as conferring with colleagues on related estuarine projects. Nevertheless, it is not clear how the lessons learned are inserted into a formal Adaptive Management process. It also is unclear how the proponents determine that enough has been learned from a specific monitoring activity so that the activity can be considered complete. Are hypotheses being tested or quantitative objectives that are achieved? A discussion focused on determining

when the monitoring has completed a specific objective – and thus can be discontinued – would be helpful.

Given the level of detail in other sections of this proposal, the section on Project Evaluation and Adjustment Process is overly brief. It consists primarily of a list of work groups and conferences but does not indicate feedback loops between data being collected and actions, implementations, adjustments to sampling plan, and so forth. Formal processes for evaluating and adjusting the project should be fully described.

Q4: Results – benefits to fish and wildlife

The importance of estuaries to salmonids, the alterations to the Columbia River estuary, and the needs for assessment and restoration are obvious, though certainly not all species and life history types benefit equally. However, the proposal does not make sufficiently clear how the monitoring results will be used and how benefits to fish and wildlife will be assessed. Perhaps this is regarded as self-evident, but the already broad program is proposed to grow even broader to include methane emissions and carbon sequestration, so it is incumbent on the proponents to justify in more detail how the status quo, as well as the expansion, will benefit fish and wildlife.

The proponents have demonstrated in past reports and analyses the *potential* benefits for fish and wildlife from the restoration activities. While benefits to fish and wildlife are likely, the authors should attempt to support the program's benefits with more quantitative measures of changes occurring over time as a result of the collective restoration actions.

There is a new activity – measuring carbon sequestration and methane fluxes – proposed along with a request for additional financial support. The ISRP feels this is an important research activity that will produce useful scientific information that will be broadly used in climate mitigation. However, it is not apparent how this information will be used to protect or enhance estuarine fish and wildlife. The ISRP feels that the proponents should seek funding elsewhere for these new activities.

The proposal's introduction discusses toxic chemicals, a monitoring component that could generate information helpful to assessing the benefits restoration actions for estuarine salmonids. While vitally important to ecosystem and salmonid recovery, this topic is never addressed by the monitoring or by the research program. The ISRP understands that BPA declines to fund such an activity. The ISRP feels that it should be part of the monitoring

program and encourages the proponents to add it as a specific objective in the proposal (and for BPA to provide interagency support and funding), even if funded from another source.

200301100 - Columbia River Estuary Habitat Restoration

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Lower Columbia Estuary Partnership (LCEP)

Province/Subbasin: Columbia River Estuary/Columbia Estuary, Lower Columbia/Columbia Lower

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP recommends the following conditions be addressed in the next annual report and work plan:

- 1. Working relationships.** Better describe the working relationships and responsibilities among this project, the Estuary Monitoring project (200300700), and the various other projects receiving funds from this project, as well as independently from BPA and other entities.
- 2. Proposed restoration sites (SMART objectives).** Provide site-specific information on each new site proposed for restoration during the 2021 to 2025 project period: a) the ecological attributes of the new sites, b) why they were selected, c) the goals and SMART objectives for each site/project (i.e., a quantitative description of desired future conditions), d) the type(s) of evaluation that will be used for each site to determine if actions have *successfully* met the SMART objectives, e) an objective assessment of *potential* site-specific contributions to the ecological conditions and resources (e.g., juvenile salmonids) in the Columbia Estuary, and f) the strategy and responsibility for long-term maintenance of the sites.

The bulk of the proposal presents the various general justifications and the processes employed for selecting and restoring sites rather than providing information on the proposed activities for specific sites. In reality, the revised proposal remains two projects in one and thus is difficult to fully evaluate. For instance, it is not clear which organization(s) or project(s) has ultimate responsibility for specific projects and/or specific activities. From the ISRP's viewpoint, one part

of this project conducts site-specific restoration while the second part assists partner organizations in various ways to meet their restoration goals/objectives. This proposal would have been much easier to evaluate if the two major activities had been presented separately, with justifications and budgets for each. It is simply not clear in the complex narrative who is responsible for specific activities. Perhaps a comprehensive table or flow chart would clarify the complex activities, roles, and responsibilities. For instance, the Estuary Monitoring project (200300700) conducts some activities, the Estuary Habitat project (this proposal) conducts other actions as well as restoration, and a variety of partners receive funds from this project, as well as from BPA's Columbia River Ecosystem Restoration Program (CEERP) and other entities, to conduct even more activities. These relationships need to be clearly described in terms of responsibilities, site-specific activities and expected outcomes. While the division of labor and responsibilities – and the expected outcomes – appear to be fully understood by the proponents, they are not entirely clear in the proposal.

Further, activities at the sites to be restored and/or protected are not adequately described, nor are the expected outcomes. While we appreciate that the revised proposal describes in great detail the numerous processes involved in selecting sites, conducting restoration, and adaptively managing the processes, these details also mask the actual site-specific activities planned for 2021 - 2025. The site-specific activities are never fully described in the narrative (some general information is provided in Appendix 2 as a Gantt chart and very briefly on p. 31). See Condition 2 above for requested information.

In our preliminary review, we requested additional information and clarifications on several topics. Our final comments are based on the proponents' responses:

1. **Problem Statement.** The ISRP is concerned that the LCEP or another organization is not tracking whether restoration activities are keeping up with urban, industrial, and residential development, nor the conversion of native habitats to impervious surfaces. Tracking development along the river and tributaries should be high priority for future investigations, as well as the integration of climate adaptation measures into the restoration activities.

The Columbia Estuary has entered a unique environmental era, and the proponents identify several vitally important issues (p. 7). These include how to manage sites for “novel” species assemblages as organisms move in response to environmental change and shifts in climate and how workings lands can be enhanced to improve sequestration of carbon, retain soil, and improve nutrient cycling (all components of limiting global change effects). Projecting a clear strategy will be essential for charting a successful

course forward, and the ISRP is pleased to see the proponents are starting those conversations.

2. **SMART Objectives.** In general, the overall SMART objectives are well stated (p. 17). However, SMART objectives are also needed for each new site proposed for restoration in the 2021 to 2025 period. The ISRP notes that the LCEP requires, through the project application: information on quantifiable objectives, a timeline of activities, maps of the activities, and a description of the post-construction monitoring and management activities, including an adaptive management plan, along with other information. The Project Review Committee also ensures these objectives are clear and well-formulated within their evaluation recommendations to project partners. The ISRP expects the LCEP to share information on the SMART objectives for the new projects in their next annual report and work plan.

It is still not clear to the ISRP what the proponents mean by “recover.” The proponents should better explain how the term is used relative to the restoration of specific. Does it mean only the acreage treated or does it include attaining a predetermined objective for fish abundance or other biological characteristics?

3. **M&E Matrix – Support.** The M&E summary and matrix are included in the Estuary Monitoring proposal (200300700). The map and updated tables were also provided to the partners – CREST, CLT, CIT, and WDFW – for inclusion in their responses to the ISRP. As the NPCC Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and resources to help create an effective summary for the lower Columbia River. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. In addition to providing important information for the Fish and Wildlife Program, development of an overall summary of the M&E efforts in the lower Columbia River also would inform and strengthen the restoration efforts of this project.
4. **New Projects.** While the proponents revised the proposal to include more information on the reasons why these projects were selected, they did not fully satisfy the ISRP request. Specific information needed by the ISRP is detailed in the overall comments above and as part of the Conditions.

5. **Benefits to Fish and Wildlife.** As the ISRP indicated in our review of the companion Columbia Estuary Monitoring project (200300700), the response by the proponents raises concerns for the ISRP. Despite substantial long-term funding for restoration and protection of juvenile salmonid habitat, the project does not, nor do the other estuary projects (CREST, CLT, WDFW, CIT, LCEP restoration projects), document the benefits to fish from the habitat restoration (e.g., total abundance, size at smoltification, or survivorship). The ISRP agrees with the proponents that an important information gap must be filled to evaluate the usefulness of many of the restoration and protection actions. A starting point could be to use the recently completed 2020 PNNL and NMFS diagnostic study to document that restoration provides immediate benefits to juvenile salmon and steelhead using the lower Columbia River. The ISRP encourages the proponents to partner with the appropriate agencies and groups in the very near future to see that appropriate monitoring data are collected to demonstrate that habitat restoration and protection are producing positive benefits for juvenile salmonids. In other words, the proponents should develop and implement a strategy for collecting the necessary information.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The ISRP regards the Partnership, as it did during the previous review in 2017, to be an essential project for the Columbia River estuary. It continues to provide a wide variety of services to estuarine partners, as well as actively leveraging funding and other resources to improve environmental conditions for the entire estuarine ecosystem. Specifically, the ISRP appreciates the focus in the current proposal on climate change, the incorporation of appropriate scientific concepts into the programmatic strategy, and the efforts to provide cool-water refuges for migrating fish.

However, this proposal is, in reality, two projects combined into one. The first project conducts site-specific restoration while the second acts as an umbrella project to assist partner organizations in meeting their restoration goals. This proposal would have been much easier to evaluate if the two activities had been presented separately, with justifications and budgets for each. It was simply not clear in the complex narrative who is responsible for specific actions.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Problem statement.** Provide a problem statement that justifies the activities and restoration actions specific to this proposal. The proponents provide basically the same Problem Statement as the Columbia River Estuary Ecosystem Monitoring project (2003-007-00), but it is not clear what differentiates them.

Many other regional restoration activities are also focused on the estuary. It is essential that the proponents make a strong case here for the significance of this proposal's activities to fish and wildlife benefits as well as for differentiating this project's activities from those of other estuarine projects.

Define the terms "Recover" and "Restore." These terms are used widely in the proposal and need to be explicitly defined. As well, the proposal should detail the types of "priority" habitats being targeted.

2. **SMART objectives.** Provide SMART objectives (see proposal instructions) for the approaches employed to meet the stated general objectives.

Clarify whether the Partnership's Project Review Committee insists on SMART objectives and a functional adaptive management process for all new activities (p. 27).

3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a matrix to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation and monitoring projects in the Lower Columbia geographic area. We ask this project (200301100) to assist them in creating the summary and provide information about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
4. **New projects.** Provide justifications for the several new projects (e.g., Multnomah Channel Natural Area, cold water pilot project, and others). Since they appear in the budget as one-time costs, it is essential that details be provided of the prioritization process for the five implementation projects, the attributes of the projects, and why they were selected, clear goals and SMART objectives for each project, type of evaluation they will use for each project, and an overall assessment of the cumulative contribution to the ecological resources (e.g., juvenile salmonids) in the Columbia Estuary.

5. **Benefits to fish and wildlife.** Provide *empirical* information showing that the restoration actions are making an ecologically significance difference. Even though juvenile salmonids make use of restored and reconnected wetlands, no data (or references) are provided to demonstrate that vital life history processes have improved (e.g., total abundance, growth, condition, size at smoltification, survivorship). The species present and those likely to benefit should also be identified, as estuary use varies greatly among species and life history types.

Q1: Clearly defined objectives and outcomes

There is every indication that the project is well conceived and has a strong scientific basis for the proposed activities. Overall, it has a strong track record for the restoration and protection of habitats.

The ISRP agrees with the proponents that climate adaptation and mitigation is where the focus of the work should lie. However, the stated objectives are very general (see p. 19): no net loss and recover 30% of priority habitat by 2030. More detail is provided in the associated narrative about methods and ecological principles to be employed to meet these general objectives. The proponents should provide SMART objectives for the approaches employed during the upcoming funding period.

It is not clear if the climate adaptation and mitigation activities will occur at the expense of working on other objectives. Will staff with different expertise be required? Is additional funding being requested to cover this new focus in work? More information is required to evaluate the shift in project focus.

In the Problem Statement section, the proponents mention creating a guidebook describing climate adaptation techniques and standards, but funding for this effort is not clearly noted. This product would likely benefit others working throughout the Columbia and in other basins as well. Having dedicated funding to develop this guidebook will be essential.

Most importantly, no justifications or other details are provided for several “new” projects (e.g., Multnomah Channel Natural Area, cold water pilot project, and others), yet they appear in the budget as one-time costs. If these are important activities, then adequate detail is needed for the ISRP to evaluate their feasibility and ecological importance.

The proponents should provide the missing details of the prioritization process for the five implementation projects. These should include the attributes of the projects, why they were selected, clear goals and SMART objectives for each project, type of evaluation that will be used

for each project, and an overall assessment of the cumulative contribution to the ecological resources (e.g., juvenile salmonids) in the Columbia Estuary.

In the Problem Statement section, the proponents provide striking evidence for challenges related to water quality issues in the LCRE, including describing specific toxics and documented effects on fishes. However, efforts to address water quality are not described in the proposal. The ISRP assumes that water quality is not addressed because BPA does not support research or monitoring of toxins. Nevertheless, the issue of water quality needs to be addressed, and more information on how that will be done would be helpful, including if it will be a focus in the future, even if supported by other sources or conducted by other projects.

In the Progress to Date section, the proponents describe two broad types of achievements: 1) restoration and protection actions and 2) programmatic accomplishments. The programmatic outreach accomplishments are critical to the program's success but are not adequately described. Specific descriptions of the effects and impacts of outreach efforts as part of the programmatic accomplishments would be helpful going forward.

Under Goals and Objectives, the proponents highlight four types of ecological attributes used to measure biological integrity (natural habitat diversity, focal species, water quality, and ecosystem processes). Somewhat surprisingly, they indicate that only the first two will be addressed by this project. The lack of discussion on targets for water quality and ecosystem processes is a limitation. At a minimum, could the proponents describe how they might identify benchmarks for water quality and ecosystem processes (i.e., perhaps through future workshops)?

Related to this, while the proponents described objectives for habitat diversity in detail (and this was quite helpful), the discussion on focal species was more limited. Some specific mention of species being targeted would be helpful. Later in the proposal, the proponents mention that they are setting habitat restoration targets based on numbers of native species that would be protected. If that set of organisms (60-80% of native species) is the group of target species, stating that would be helpful.

Q2: Methods

The methods, and the fundamental principles guiding the activities, are well accepted in the scientific and conservation communities, and are appropriate for this activity. Earlier in this review, the ISRP noted that: "This proposal would be much easier to evaluate if the two activities had been presented separately, with separate justifications and budgets for each." If

this change was implemented, organizing the methods according to the two types of activities would also be helpful for evaluation.

Q3: Provisions for M&E

This is an umbrella project where, for the most part, monitoring is conducted by a companion LCEP project. Given the difficulties inherent in estuaries as habitats for research and monitoring, the proponents have gone to considerable lengths to have a scientific study design treating restoration as a series of experiments (e.g., BACI), implementing a structured decision-making process, establishing a solid data collection and analysis process, and conducting several levels of scientific and policy review. While this is clearly a large and complex project, it is closely linked with many other projects and entities and has a strong scientific foundation. The ISRP also feels that the project adjustment process is comprehensive and has functioned at a high level for many years. The proponents appear to have an excellent process in place to address existing and emerging Adaptive Management issues.

Q4: Results – benefits to fish and wildlife

The program as a whole is well conceived and seems to be effective in providing benefits to fish and wildlife. The collection of site-specific projects is having positive ecological outcomes. Restoring 30% of the estuary to a better ecological status is a formidable challenge, and the LCEP is making steady progress. Nevertheless, even though juvenile salmonids are making use of the restored and reconnected wetland, no data are provided to demonstrate that vital life history processes have improved (e.g., total abundance, growth, condition, size at smolting, survivorship). Are the restoration actions making an ecologically significant difference? The “currency” used to gauge success could be out-migrating salmonids, or other fish-specific metrics, in addition to or rather than acres restored.

The ISRP also suggests that it would be helpful to have the metrics, in addition to the number of projects completed or acres restored, reported relative to some eventual, achievable goal. For instance, what fraction of the realistic total number of projects or acres considered for restoration has already been restored or otherwise addressed? It seems likely that initially the “low hanging fruit gets picked first,” and thus the pace of success may be rapid at first but then slow down as more complex projects are tackled, more recalcitrant landowners encountered, and so forth. Even a rough sense of this will be helpful because at some point the costs will exceed the likely gains in fish and wildlife benefits.

201000400 - CREST Estuary Habitat Restoration

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Estuary Study Taskforce (CREST)

Province/Subbasin: Columbia River Estuary/Columbia Estuary

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP recommends the following conditions be addressed in the next annual report and future work plans:

1. **Outcomes of goals and objectives.** Describe the outcome or benefit associated with accomplishing each specific goal and objective, including an explicit emphasis on how addressing the goals and objectives will lead to increases in abundances and productivity of focal fish populations.
2. **Link methods to objectives.** Provide methods for each specific objective included in the proposal. This was done for some objectives in the revised proposal, but all objectives should have methods associated with them.
3. **Use of photopoints.** Describe the ways in which photopoint data are being used and how the data are analyzed and evaluated? The ISRP notes that a massive amount of data may be captured with these methods, and changes in vegetation are just some of the changes that could be detected. For insights that could guide analyses, refer to Chapter 5 in "[Guidance: Monitoring and evaluating nonpoint source watershed projects.](#)"
4. **Water temperature.** Describe the way in which water temperature data are being used to evaluate project design, restoration effectiveness, or environmental conditions in the Lower Columbia River.
5. **Benefits to fish and wildlife.** Use data collected by state and federal programs or analyses conducted by others to provide evidence of project effectiveness for juvenile salmonids. This is an important need for the project going forward.

In our preliminary review, we requested a response on the topics listed below. Our final comments based on the response are provided after each topic:

1. **Goals and Objectives.** In general, the goals and objectives are more effectively organized than in the original version of the proposal. The ISRP appreciates the proponents' efforts to link methods to specific goals and objectives and to reorganize the Project Evaluation and Adjustment Section. Collectively, these edits clarify how projects are identified and evaluated. However, see Conditions 1 and 2 above for improvement.
2. **Progress to Date.** The emphasis on broader impacts added to specific projects in Appendix A is helpful.
3. **SMART objectives.** As mentioned above, the goals and objectives are more effectively organized than in the original proposal. Many of the objectives are now framed in a SMART format, and the ISRP appreciates the proponents' efforts to incorporate quantitative criteria into this section. One aspect of this section that remains somewhat limited is that not all objectives are directly tied to specific outcomes. As one example, consider Goal 2, Objective 3: *"Throughout the year share knowledge about project results, innovative restoration approaches, and lessons learned with the CEERP and other estuary sponsors."* What would be the outcome (or benefit) of regular engagement with CEERP and other sponsors? The proponents should add such information for all objectives.
4. **M&E matrix – support.** Table 1 is a very helpful addition to this proposal. The ISRP also appreciates the proponents' efforts to contribute to the M&E documentation requested of project 200300700.
5. **Organization of methods.** The inclusion of specific goals and objectives to which specific actions are tied is a strength of the revised proposal. However, it is unclear why all actions cannot be linked to specific goals and objectives. This weakness can be addressed in a future version of the proposal.
6. **Project responsibilities.** The explanation of project responsibilities was helpful.
7. **New projects.** Detail added for FY 2023 and FY 2024 projects is helpful, and the lack of additional detail on project justifications and expected outcomes for work occurring after FY 2024 seems reasonable given the proponents' explanation that these factors have yet to be negotiated for future projects.
8. **Project evaluation and adjustment.** The proponents' response and their edits to the project evaluation and adjustment section are helpful. The large amount of potential data collected with photopoints indicates that evaluating these data may provide new insights into project effectiveness. It would also be helpful to clarify how water temperature data are being used.

9. **Benefits to fish and wildlife.** The proponents cite a study suggesting that “all lines of evidence from the LCRE indicated positive habitat based and salmon-based responses to the restoration performed under the CEERP” (Diefenderfer et al. 2011; 2016a). The proponents also explain that “CREST is not funded to collect fish data at each restoration site as the cost and permitting requirements are prohibitive, therefore empirical evidence for individual project sites cannot be provided.” They go on to explain that “Instead of individual site data collection, data is collected through various research groups and State and Federal agencies. This data is shared with CREST and other estuary practitioners through the CEERP program.” These data could be used to partially address the recommendation of the ISRP to document the benefits to juvenile salmonids. Because all projects are required to show the efficacy of the program and benefits to fish and wildlife, this information should be included in next annual reports.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

The ISRP recognizes great value in the past and proposed work, and the proponents have a good track record of getting projects done. Overall, the estuary projects seem to be well coordinated. Critical aspects of the proposal, however, are unclear, making the success of individual projects difficult to evaluate.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Goals and Objectives.** The proponents state “More broadly, CREST has developed specific programmatic goals and objectives which allows us to identify locations for restoration projects, willing landowners, and project partners that has resulted in a steady pipeline of restoration projects in the Columbia River estuary.” The way in which this occurs is not clear from the stated goals and objectives, and therefore the process for identifying and prioritizing restoration opportunities should be described in more detail.
2. **Progress to Date.** The proponents state that “broader impacts” of projects can include expanded trail access, more opportunities for hunting, fishing, and boating. It would be helpful and instructive for assessing Progress to Date if these broader impacts for completed projects are documented clearly.

3. **SMART objectives.** Provide all objectives in a SMART format (see proposal instructions). Some of the objectives are vague and not clearly presented (e.g., Goal 1, Objectives 5 and 6).
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a matrix to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation and monitoring projects in the Lower Columbia geographic area. We ask this project (201000400) to assist them in creating the summary and to provide information about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
5. **Organization of methods.** The methods should be organized to facilitate understanding the proposed steps, preferably explicitly related to specific Goals and Objectives. The organization of the proposal hinders easy assessment of the methods, as they are presented in different places (e.g., on p. 21, in the Goals and Objectives section, and also the Methods section on p. 27), and in some cases, seem more like summaries of past actions than proposed methods. The described methods are chiefly the process for letting out contracts, rather than the assessment of results.
6. **Project responsibilities.** The ISRP was under the impression that the LCEP was responsible for funding of direct capital to proponents throughout the estuary. This would include the Columbia Land Trust, Cowlitz Indian Tribe, Lower Columbia Estuary Partnership, Washington Department of Fish and Wildlife, watershed councils, and other entities working on floodplain habitat reconnection. On p. 2, the proponents state that this is their responsibility. Or is that statement referring to BPA's Columbia Estuary Ecosystem Restoration Program (CEERP)? Please clarify with whom the responsibility lies.

Similarly, the ISRP was under the impression that collecting pre- and post-construction action effectiveness data (AEMR program), as part of the larger estuary study to evaluate the success and effectiveness of restoration actions for adaptive management, is also the responsibility of the LCEP monitoring project. Please explain where responsibility falls, along with the types of pre- and post- construction action data that are collected, and by whom.

7. **New projects.** Provide a list of new projects, justifications for each, as well as expected outcomes. The ISRP found a list of sites to be treated along with projected costs only on the last page of the proposal, as part of the budget. The proposal provides no justifications or expected outcomes for any of the sites.
8. **Project evaluation and adjustment.** Provide the formal mechanism or process by which knowledge is incorporated into future projects. For instance, in the Progress to Date section the proponents state that each restoration project that CREST completes offers valuable lessons on restoration design, process, and adaptive management, and that this knowledge is incorporated into future projects. As well, in the Project Evaluation and Adjustment Process, the authors indicate that decisions about which restoration projects to advance in the restoration design and construction phase are informed by results of a prioritization exercise based on disturbance theory and applied at site and landscape scales. For both situations, the proposal should provide better description of how knowledge is incorporated into future projects.
9. **Benefits to fish and wildlife.** Provide empirical evidence that the CREST activities are providing benefits to juvenile salmonids. For example, the evidence should be in terms of fish survivorship and condition, and specific restoration actions that are minimizing the effects of predators and competitors on out-migrating populations. The relevant species and life history forms should be indicated, as not all may benefit equally from these actions.

Q1: Clearly defined objectives and outcomes

The proponents have not proposed any new projects to be evaluated by the ISRP. Only on the last page of the proposal, as part of the budget, did we find a list of sites to be treated along with projected costs. No justifications or outcomes are provided for any of the sites.

The specific goals (e.g., p. 21) are difficult to discern because what is presented is primarily the history of the program. The loss of estuarine habitat is not in question, nor is the beneficial nature of estuarine habitats for salmonids, though species and life history variants differ in their reliance on these habitats. The ISRP infers that the goals are the restoration of estuarine ecosystem processes, and the specific objectives are to identify and restore or protect specific habitat units to advance toward greater proportional restoration, relative to historic losses. Specifically, the objectives are no net loss relative to the 2009 baseline (40% loss of historic coverage) and recovery of 30% of historic coverage by 2030 and 40% by 2050 (= restoration of 22,480 acres).

Some CREST objectives, while general, are presented in a SMART format. Others are not in a SMART format and need to be so for future project evaluation.

The ecological outcomes of projects are not clearly described. See comments below relating to fish and wildlife benefits.

The Methods section stated, "For juvenile salmonids specifically, CEERP's restoration strategy is intended to increase direct access to project sites for feeding and refuge and increase export of prey (primarily insects) from the restored wetlands to the mainstem river where the prey are consumed by out-migrating salmonids." This seems like the kind of information that would be better in the statement of goals, objectives, and outcomes.

Specific description of outreach efforts and target for numbers of meetings is useful (Goal 1, Objective 3), as is the inclusion of a goal intended to build relationships with partners and stakeholders (Goal 3).

Q2: Methods

The floodplain reconnection methods are appropriate and allow fish to move between the river and adjacent (restored) floodplains. The methods should be organized to clearly relate restoration actions to specific Goals and Objectives. Methods are described in multiple sections of the proposal without clear linkages.

Q3: Provisions for M&E

There are ample opportunities for sharing information and for making project adjustments, when required.

The monitoring and evaluation seem to be conducted by the Ecosystem Monitoring Program, which separately collects status and trends data on salmonid occurrence, diet, and condition; habitat structure; food web characteristics; and biogeochemistry.

The proposal states, "LCEP's process for adaptive management is to treat restoration actions as experiments, identify hypotheses or performance targets for each action; collect data and analyze the data against these performance targets to see if actions are performing as intended; report to partners the results in a back-and-forth exchange of information; provide an annual presentation to our Science Work Group to exchange information and support learning, improvements in restoration or monitoring techniques; provide presentations to local and regional conferences and workshops; and provide an annual report to BPA." It is not clear

how the monitoring process, which is characterized as being designed for long-term data collection, is testing hypotheses and providing the knowledge for adaptive learning and project adjustment. If restoration actions are treated as experiments, what hypotheses are being tested?

The section on Project Evaluation and Adjustment Process primarily provides information on the kinds of data being collected rather than the specific feedbacks and data analyses needed to inform decisions about how to change course. A more complete narrative is needed for the ISRP to understand what is actually being done.

Q4: Results – benefits to fish and wildlife

The role of estuaries in salmonid ecology has been the subject of many studies and reviews, and the benefits are many but often complicated by ecological interactions with other members of the biotic community and by abiotic factors. The proposal does not clearly describe how the benefits of the restoration actions are actually being assessed. The metrics are primarily in areas protected and restored, representing progress toward goals set relative to pre-development condition and subsequent alteration. While this is sensible, it is uncertain what the benefits to the fish and wildlife might be. A common (but erroneous) assumption in lieu of information may be that the biological responses are proportional to the acreage protected or restored. The monitoring section also does not make this clear, even for biotic processes directly related to fish such as their diet, much less to processes such as carbon sequestration. Further, no evidence is provided to demonstrate that the restoration actions have not significantly improved habitat for predators and competitors of juvenile salmonids. The ISRP notes that evidence, if it exists, may be in the synthesis reports submitted to the USACE and the BPA (e.g., Johnson et al. 2018 cited in the proposal). A summary of the evidence should appear in this proposal as part of the justification for any proposed future activities.

The proponents assert (p. 5) that “More access points, availability of food resources, and quieter resting areas directly off the main river, are all believed to lead to improved survivability odds.” The proposal should include data and a narrative to support the statement, especially as it relates to improved survivorship.

The proponents provide a list of the most salient regional programs that assert the need for an ecosystem-based restoration of habitats in the lower Columbia River. While this is a useful list of projects, actions, and goals, it reveals little about what has been accomplished for juvenile salmonids. Please identify which projects have quantified improvements in the survivorship or condition of juvenile salmon during out-migration.

Please provide the data or publications to support the statement that “An evidence-based evaluation of the CEERP concluded that ‘all lines of evidence’ from the (lower Columbia River) indicated positive habitat-based and salmon-based responses to the restoration performed under the CEERP... Accordingly, the...strategy for restoration continues to emphasize large- size, full hydrologic reconnection projects at sites near the mainstem river.”

The proposal indicates that a list of CREST Projects Completed 2013-2020 was attached as Appendix A (p. 37), but the list was not in Appendix A. However, a list was found in a Johnson et al. (2018) report to the USACE. The report contained information on sites, year, and miles or acres restored. Please provide this kind of information in the future.

Climate change is certainly an important confounding factor for the success of restoration actions. Nevertheless, the ISRP wonders why other factors that may have substantial impacts on project activities are not mentioned. For instance, curtailment of the sediment supply by dams in combination with estuarine subsidence seems like an important issue. As well, the trapping and recirculation of toxic chemicals and their effects on juvenile salmonids and other aquatic organisms would seem to be a paramount concern. How are these and other emerging environmental issues being factored into the project?

The section on Potential Confounding Factors correctly notes the effects of sea level rise and elevated temperatures from climate change. However, the most obvious and pressing confounding factor at the broad habitat level would seem to be human population growth and redistribution, and the associated effects on shorelines, wetlands, and other parts of the estuarine ecosystem. In addition, from the standpoint of salmonids, the most obvious confounding factor would seem to be the growth of predator populations, especially birds. These factors should be clearly integrated into the proposal.

201007000 - Lower Columbia River Estuary Scoping and Implementation

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish and Wildlife (WDFW)

Province/Subbasin: Columbia River Estuary/Columbia Estuary

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP recommends that the following conditions be addressed in future work plans and annual reports:

1. **SMART Objectives.** Present all objectives in a SMART format. Comments are provided to aid in this step for three objectives below. Additionally, the basis for addressing each specific goal and objective should be described, including an explicit emphasis on how addressing goals and objectives will lead to increases in survival, abundance, and condition of fish.
2. **Ecological benefits of proposed projects.** Include expected ecological benefits for each proposed project. These outcomes should ultimately be linked with SMART objectives. This will be especially important given the fact that the budget will increase substantially over the next 5 years.
3. **Benefits of completed projects.** Use biological data collected by other WDFW programs and Federal agencies or analyses conducted by others to provide evidence of the effectiveness of this project based on benefits to fish and wildlife.

In our preliminary review, we requested a response on the eight topics listed below. Our final comments based on the response are provided after each topic:

1. **SMART Objectives.** The ISRP appreciates the effort by the proponents to reframe the project goal and objectives. The revised goal emphasizes the protection of habitat for “listed salmonids,” while the biological emphasis in the previous goal was on “aquatic organisms.” Additionally, the objectives are more clearly organized and are closer to being framed in a SMART format than the objectives presented in the original proposal. A few questions remain, however, on several specific objectives.

Objective 1: Protect and maintain 1,000 acres of public estuary habitat to support no net loss of native habitats in the Lower Columbia River estuary.

What is the time frame for this objective? How does it relate to the emphasis that, “WDFW protects the existing functional estuarine habitat owned by the agency within the Lower Columbia River estuary”? What is the specific ecological benefit of achieving this objective? This objective would be more effective if the proponents could do more than simply maintain the habitats they acquire. Can actions be taken to improve the habitats? For example, could invasive plant species be removed for conservation purposes?

Objective 2: Restore ecological function to 773 acres of tidal wetland habitat by 2027 to restore access to, and increase capacity of, estuarine habitats used by juvenile salmonids and other species.

The emphasis on the relationship to CEERP objectives is helpful, but a specific statement on benefits should be included in the proposal. Additionally, projects that will contribute to Objective 2 should be listed, and proponents should indicate when they will be initiated.

Objective 3. Engage with 500 Washingtonians regarding the potential tidal reconnection of 687 acres of public tidal wetland habitat by 2027.

The emphasis on outreach is an important part of this project. While engaging 500 individuals will be useful, how will that lead to more trust? This objective could be strengthened by providing context on the mechanisms by which these individuals will be engaged, as well as the organizations they represent.

As one additional comment to consider, the proponents emphasize that other programs monitor fish presence at restored and reference sites. Those data should be evaluated so that biological outcomes can be clearly identified in the objectives. Data and analyses of benefits for fish and wildlife and available summaries from other programs should be provided in the next annual report.

- M&E matrix – support.** The ISRP appreciates that the proponents contributed information for the M&E Matrix. The Council and Council staff have indicated that developing summaries and matrices of the types and locations of monitoring efforts across projects in major geographic areas would provide important information. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. The Fish and Wildlife Program may identify the specific elements and formats for these RM&E summaries and matrices in the near future. The information and expertise of this project would strengthen future coordinated M&E summaries for geographic areas.

3. **List of projects.** The addition of the number and acres restored along with the start and end date for each project provides good context, but it would be more useful to state the expected ecological benefits of each project listed as well.
4. **Scoring and evaluation processes.** The ISRP appreciates the thorough description of the scoring and evaluation process and references for key documents. The explanation of the changes in the scoring and evaluation process in 2020 clarified the process for the ISRP and strengthened the revised proposal.
5. **Project selection.** The information provided on how projects are selected is helpful.
6. **Project evaluation and adjustment.** Again, this is good context. Are other projects on properties owned by WDFW in the Lower Columbia River incorporated in the project's adaptive management? If so, this should be added to Table 1 for more clarity.
7. **Confounding factors.** The additions made to provide information on efforts to mitigate confounding factors are helpful.
8. **Benefits to fish and wildlife.** The proponents emphasize that data on growth, survivorship, condition, and other metrics for juvenile salmon are not collected at project sites, but this information is collected by other WDFW programs and Federal agencies and disseminated through CEERP. Those data should be used to partially address the recommendation of the ISRP to document the benefits to juvenile salmonids. Additionally, data may be available on other focal species (i.e., birds) that could be used in a similar manner. Incorporating such biological information in future reports and proposals will be needed to document the efficacy of the program.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The ISRP recognizes the value of the work and the fact that the activities appear to be well coordinated with other estuarine projects. Aspects of the proposal, however, are unclear making it difficult for the ISRP to adequately evaluate the proposed project.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **SMART Objectives.** Provide project objectives in a SMART format (see proposal instructions), with an emphasis on describing the expected physical and biological outcomes. This proposal (as well as most other estuary projects) frames objectives in terms of acreage but not fish, and this is a limitation for effectively evaluating the activities.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a matrix to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation and monitoring projects in the Lower Columbia geographic area. We ask this project (201007000) to assist them in creating the summary and provide information about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
3. **List of projects.** Provide a complete list of projects for this proposal in an appendix or table. The ISRP noted that each annual report provides a table with details for each project, including what stage the project is in, when it began, and anticipated completion date. These annual reports could be used to generate the project list being requested here. A summary of what is being monitored could also be provided in this table, along with expected outcomes.
4. **Scoring and evaluation processes.** For Survival Benefit Unit (SBU) and the Project Benefit Unit (PBU) scores, describe what these “units” mean ecologically and how they are determined. A citation and a short summary of how the new Expert Regional Technical Group (ERTG) scoring criteria differs from the SBU evaluation would explain the scoring process more clearly.
5. **Project selection.** There are detailed methods presented about how projects are evaluated once selected, but little information on how projects are initially selected. The selection process should be described in more detail.
6. **Project evaluation and adjustment.** Explain the provisions for any overlap with the LCEP AEM monitoring project. While the proponents state that there is a project adjustment process, no specific examples are provided as to where and how it has been used. In fact, the proponents list only one project (Chinook Estuary) subject to an adaptive management process.

7. **Confounding factors.** Provide details on what the project is doing to mitigate for the confounding factors as well as the forward-looking actions that are being implemented as part of the on-the-ground activities. As the proponents note, there are serious confounding factors relevant to ecosystem restoration in the LCRE, all of which have roots in landscape-scale effects: 1) climate change, 2) land conversion, and 3) invasive species.
8. **Benefits to fish and wildlife.** Provide empirical information on how the project is restoring capacity, opportunity, and function. Are restoration actions working as intended? Clarify whether or not actions are improving growth, survivorship, condition, or other fish-related factors for juvenile salmon in the restored areas. Also, if possible, provide evidence that actions are not simply creating sites for predators and competitors of juvenile salmon.

Q1: Clearly defined objectives and outcomes

The project is part of CEERP and is working with four other projects to meet the CEERP goal of restoring 4500 acres by 2035 or an average of 300 acres per year. There are general objectives given for this project in that they are going to scope 5-10 projects over a five-year period, design and plan two projects, and build at least one by 2027. Unless this one restoration action was 1500 acres, they would not attain their goal. The ISRP asks the project to provide some insight and perspective on how this goal can be attained.

This proposal, like the others from the Columbia Estuary, is difficult to evaluate because the projects have substantial overlap. The proponents tout the objectives of others while present their objectives in the internal narrative. This project provided objectives in a somewhat SMART format but never proposed specific restoration actions that could be evaluated for potential ecological benefits. In fact, the objectives are based on acreage rather than ecological outcomes. While physical outcomes are useful, the ISRP recommends that the proponents also articulate ecological outcomes for their projects.

An issue in this proposal also common to the other Columbia Estuary proposals is that, while fish performance is a stated criterion, no one seems to be measuring growth, survivorship, condition, or other fish-related factors that would indicate if the actions are benefiting fish. One would expect this to be necessary for a truly functioning adaptive management process.

How does the information in the bulleted list described as “outcomes of the Lower Columbia River Estuary Scoping and Implementation Project” relate to the projects listed in Table 1?

Q2: Methods

The proponents are implementing restoration actions (reconnecting shallow water habitats to the river) using standard engineering approaches. A description of how principles of landscape ecology influence the work being proposed would strengthen the proposal.

The social techniques are never explained in detail, perhaps because each restoration action is unique and requires a tailored approach. The proposal should include a description of the activities to expand public access such as trail bridges, hunting and fishing access, and boating, which should be documented for existing projects.

The methods to evaluate projects are well described once a project begins. The methods for evaluating cost, however, are unclear. What is the decision-making process for assessing cost? Does this affect how and what projects are accomplished?

It would be helpful if information in the Methods was tied to specific project objectives. As presented, it is very difficult to track. The proposal should include specific restoration activities that can be evaluated for their potential ecological outcomes.

In the section on Key Lessons Learned, the authors indicate the importance of conducting outreach with landowners, local governments, user groups, and the general public, as well as the need to formulate a strategy to do this. Is this being done, and if so, what is the plan/approach that will be taken to do this?

Q3: Provisions for M&E

Monitoring projects in the estuary occurs in three tiers, with level 3 occurring for all projects and levels 1 and 2 being applied more selectively. It is not clear when and how the Action Agencies decide to apply each level of monitoring. A better explanation of this would be helpful.

The adaptive management process seems to be more focused on evaluating how projects make it on the list, and this seems to occur continuously. How does geographic location affect how a project is selected and evaluated? While it is clear that substantial monitoring occurs under the AMER, it is not clear how the information and analyses feed back into project selection and evaluation. The only project where adaptive management seems to be occurring specifically within this project is the Chinook Estuary Restoration, but it is not clear what is being done with this information.

In the Project Evaluation and Adjustment Process section, the proponents state that decisions about what projects to advance are informed by results of a prioritization exercise based on disturbance theory applied at site and landscape scales. The proposal should explain the specific application of disturbance theory in the project prioritization process.

Q4: Results – benefits to fish and wildlife

The proponents describe anticipated benefits and objectives from the other regional plans (p. 5) but do not articulate how their proposed project directly relates to them.

At one level, it is understandable that specificity around future projects can frequently damage project potential, as landowners and land managers rarely like to see restoration projects and actions on their properties proposed for the future without their knowledge and consent (p. 29). However, the level of detail in the proposal is insufficient, and more information is needed within the constraints of uncertainty about the exact restoration actions in the future. This is especially perplexing when the proponents are requesting approximately \$45,000,000 over 5 years to implement a few restoration actions. The ISRP requires additional details to evaluate if the request is reasonable in terms of the potential ecological outcomes.

201007300 - Columbia Land Trust Estuarine Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia Land Trust

Province/Subbasin: Columbia River Estuary/Columbia Estuary, Columbia River Estuary/Elochoman, Columbia River Estuary/Grays, Lower Columbia/Columbia Lower, Lower Columbia/Kalama, Lower Columbia/Sandy, Lower Columbia/Willamette

Recommendation: Meets Scientific Review Criteria

Overall comment:

This strong proposal is part of a set of estuary restoration projects. The ISRP does not have Conditions and is not asking for a response to any issue on this proposal. Some recommendations for improving the project are provided in the following sections.

The overall purpose of this program is clearly expressed in the Problem Statement, "In order to effectively address the issues facing the ecological integrity and recovery of listed salmonid

species, Columbia Land Trust is focused on conserving and restoring key [lower river and estuary] floodplain habitats that provide the most significant opportunity to provide ecological lift and address as many of the limiting factors identified above as feasible." Later, in the Goals and Objectives section, there is a clear statement of the overall goal, "Protect and restore the Columbia River Estuary ecosystem, focusing on habitat opportunity, capacity and realized function for aquatic organisms." This is followed by a series of specific, quantitative, measurable objectives.

The proponents are well organized and have been doing this type of work in the region for a number of years. The budget appears reasonable for what they propose. Comments responding to past ISRP reviews are generally of high quality. The timeline and narrative indicate that they propose to work on various portions of six projects from 2023 to 2027; this timeline and text discussion are useful in providing details on specific activities.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a matrix to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation and monitoring projects in the Lower Columbia geographic area. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The objectives are provided in a SMART format and the outcomes in terms of acreage by project are listed. However, as for other land acquisition projects, the proponents describe the other regional plans but do not articulate how their proposed project directly relates to those plans (p. 5). The ISRP would like to learn more about the coordination.

The ISRP recommends that the proponents describe how landscape connectivity is considered in project selection and evaluation. This issue (e.g., distance from the main channel) can have a significant effect on project performance. A project outside the main channel will benefit fewer juvenile salmon than one next to the main channel. How is the distribution of projects in different reaches determined in project selection? Is there an effort to spread projects out throughout the eight reaches? Projects in Reach A will have different potential benefits than ones in Reach E, for example. Projects undertaken at upriver sites will have a different mix of

stocks than projects farther downstream. These differences do not necessarily make the sites good or bad choices, but they relate to the mix of projects and overall benefits estuary-wide. Restoration actions should be distributed throughout the estuary and, if possible, benefit multiple species, populations, and life history forms.

Q2: Methods

The approaches are standard for this type of activity. The ISRP is pleased to see a list of proposed sites and acreage to be restored (p. 18). Given the extensive history of floodplain restoration in the Columbia Estuary, it would be informative to also estimate the outcomes in terms of juvenile salmonid carrying capacity and performance (e.g., improvements in growth, residence time, survivorship, and so forth).

Habitat condition for this project is determined based on the current status of habitat condition as compared to the Desired Future Condition (DFC; p. 24). Why not use desired “achievable” condition instead? It would be more realistic.

This section (p. 29) does not really address “relationships,” which is concerning since there are significant overlaps with other projects acquiring and restoring floodplains. Please describe any significant competition and conflicts between this and other projects, if they exist, and how they are resolved.

The proponents note six components to the project’s work and describe and discuss each one. However, a better explanation of how a project is initially identified or selected to proceed through the process would be helpful. For instance, where does the list of projects picked from originate? Perhaps this comes from Land Trust Conservation Planning, but that was not clear.

There were several methods (e.g., EIA) that need to be defined when first introduced.

Q3: Provisions for M&E

There are clear paths for Action Effectiveness Monitoring (AEM), evaluation of results, and the adaptive management process. The proponents state that the projects completed during the reporting period have not been included as AEM Level 1 monitoring sites (p. 12). While true, this does not constitute an excuse for not collecting quantitative information on species-specific benefits.

As with all estuary projects, AEMR monitoring is largely controlled by the Action Agencies as part of the CEERP process. The structure of the monitoring is not very satisfying when

attempting to evaluate progress since the Action Agencies seem to decide what monitoring is conducted and where.

Q4: Results – benefits to fish and wildlife

It is implied that the restoration actions and areas protected generally benefit fish and wildlife, and that is undeniably true. The proponents state (p. 27) that “The cumulative evidence from AEMR projects in the LCRE demonstrates that restoration actions are improving ecological processes in the estuary, although spatial and temporal variability influence site-scale responses. Based on analyses, ecosystem restoration is improving habitat conditions for juvenile salmon in the estuary. These improvements are reflected in both direct (onsite) and indirect (offsite) benefits to salmon (Johnson et al. 2018).” Nevertheless, the ISRP is not fully convinced of supporting evidence and therefore the validity of the last sentence. As far as we are aware, no project reviewed so far has provided empirical evidence to support this statement. Is this project able to provide that evidence?

The ISRP recognizes that estuaries are important for salmonid ecology, though to different extents for different species (and stocks), and many other forms of wildlife and fishes benefit from quality estuarine habitats. The nature of the project does not entail specific quantification of benefits in terms of survival or abundance. However, the project relies on and is closely linked to other entities conducting estuary planning and assessments. It is thus understandable that this project is focused on land acquisition. Given this, extensive benefits to fish and wildlife are a reasonable inference, though more information on which species and forms may benefit would be helpful.

The ISRP is surprised that expanding rural development, and its associated land use, are not considered confounding issues. Are they not issues, as they are in other nearby areas?

201201500 - Cowlitz Indian Tribe Habitat Restoration and Conservation Program

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Cowlitz Indian Tribe

Province/Subbasin: Columbia River Estuary/Cowlitz

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP appreciates the proponent's response, including Appendix E, which provides considerable new information but raises some additional concerns and questions. Because the project is applying for permits in 2022 (page 11, Preliminary Design Report), the ISRP recommends the following conditions be addressed by the proponents in the form of a response letter to the ISRP by June 1, 2022:

1. **Clarify the proposed restoration actions.** The ISRP is unclear about how the multiple actions collectively will accomplish the objectives. We remain concerned that some actions might conflict with or reduce benefits of other actions. See Topic 1 below.
2. **Expected benefits.** Clarify the expected outcomes or benefits of the project in terms of species, sizes, and populations of fish that would access this site during the critical periods identified in the proposal. See Topic 2 below.
3. **Construction monitoring plan.** Provide a plan for how the project construction will be monitored and describe expected issues that may arise and how these will be addressed. The ISRP believes improvement to the project evaluation and adjustment process is essential for success. See Topic 4 below.

Details on the conditions are provided below.

In our preliminary review, we requested a response on the topics listed below in the form of a revised proposal and detailed responses. Our comments based on the proponents' responses are provided after each topic:

1. **Restoration actions (Condition 1).** Despite additional details provided in Appendix E, the ISRP is still unclear about some elements of this project. Some design elements appear to conflict with others. Overall, we strongly urge that the proponents refocus the expected benefits of this project on access by juvenile salmon. If this is successful, the proponents could enhance adult salmon access at a later date. We note that no adults

have been found in the wetland/creek complex, but the complex is used by juveniles. The ISRP requests that the proponents provide clarification on the issues listed below.

- a. We are unclear how the project can lower the entrance to provide increased access but then also raise the crest by two feet to hold water. These two actions seem to conflict.
- b. It was not clear if and how the East Fork, which has considerable potential habitat would be improved by all these actions. It seems to dewater in the late summer and autumn under current conditions and results in stranding fish. How would this project not increase stranding in the East Fork by raising the crest?
- c. We are concerned that anchoring large wood is not consistent with the ecological dynamics of wood over the long term, given the consistent tidal action in this portion of the river. Will the portion of the wood on site that is anchored by cable be able to persist during prolonged inundation without breaking apart because of buoyant forces? In addition, would the anchored wood installed at the mouth to retain spawning gravels potentially accumulate so much other wood such that access by juveniles could be blocked?
- d. We are uncertain if sediment placed in the lower section adjacent to the main Columbia River channel to encourage adult spawning would remain in place. Will this sediment not be scoured away during winter high flows? If sediment exchange currently is inadequate to create spawning substrates, how frequently will the sediment need to be augmented from off-site sources to provide spawning habitat?

2. Expected outcomes (Condition 2). The ISRP is still confused about what outcomes the proponents expect, and the ISRP requests these be clarified.

- a. The overall intent of this project is to provide cold-water refuges for mostly juvenile salmon. As the ISRP understands it, the main goal is to provide fish access to the site rather than provide a cold-water refuge adjacent to the mouth of the creek. Juveniles were found within the site on a number of surveys, but the absence of spawning habitat suggests the juveniles migrate in from the main river as opposed to being spawned in Yeon Creek. We noted that some data on fish (date, species) in the Shire habitats are available and we request that proponents provide this in a table showing date, location in the Shire, species, approximate sizes and estimated numbers.
- b. The focus of the project is to provide cold water refuge for salmon during the August to October timeframe. While there is the potential for both juveniles and adults to

access this site, we are unclear which species and size classes of salmon would potentially access this habitat. We ask that proponents thoroughly describe expected benefits, especially what species and size classes would access the restored habitat during August to October. There are various publications that can be used to develop such predictions (e.g., Fish Passage Center Reports for Bonneville Dam; Teel et al. 2009 TAFS Volume 138; Teel et al. 2014 NAJFM, Volume 34; Johnson et al. 2015 CJFAS, Volume 72; Sather et al., 2016 TAFS, Volume 145; Bottom et al. 2005).

3. **Selection process.** The ISRP understands that this is a project of opportunity where the proponents are familiar with the site and the owner, as opposed to one based on a strategic approach. The ISRP is encouraged that the proponents are trying to shift to a selection approach for future projects based on a clear strategy.
4. **Collaboration and project evaluation (Condition 3).** The proponents provided descriptions of some past funding processes for this project: Lower Columbia Recovery Board, Salmon Recovery Funding Board, WDFW, USCOE, and ERTG. Nonetheless, the ISRP still finds the project evaluation and adjustment process to be inadequate. Given the uncertainty in design elements of this project and expected benefits, the ISRP requests that the proponents provide a plan for how the project construction will be monitored, as well as describe expected issues that may arise and how these will be addressed. We believe a more explicit project evaluation and adjustment process is essential for success.

We note that the proponents are still using what appears to be the LCEP description to characterize monitoring of this project. As we have observed in our responses above, this is not a typical lower river restoration project, given the uncertainties in design, construction, and expected benefits. The proponents are encouraged to seek support for monitoring the construction phase of this project so that any issues that arise can be identified and addressed.

5. **Summary of past projects.** The ISRP appreciates the summary of past projects and the table, Appendix B, that was provided in the response.

M&E matrix – support. The M&E summary and matrix are included in the Estuary Monitoring proposal (200300700). The map and updated tables were also provided to the partners – CREST, CLT, CIT, and WDFW – for inclusion in their responses to the ISRP. As the NPCC Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and

resources to help create an effective summary for the lower Columbia River. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. In addition to providing important information for the Fish and Wildlife Program, development of an overall summary of the M&E efforts in the lower Columbia River also would inform and strengthen the restoration efforts of this project.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Restoration actions.** Provide details about the construction process at The Shire. The ISRP is concerned that the project appears to involve the removal of a bedrock sill. This can have unforeseen consequences in how water moves into and out of the project site. Please clarify exactly what geomorphic changes are proposed.
2. **Expected outcomes.** Provide details about the expected biophysical outcomes of restoration actions at The Shire, including but not limited to the volume of cool water being discharged, the distance it might extend from shore, the months it might be used by the fish, and the potential number of adult and juvenile salmon using the site.
3. **Selection process.** Provide details about how new projects are selected (e.g., what process was used to select The Shire project).
4. **Collaboration and project evaluation.** Provide evidence that the proponents and the other programs are cooperating in meaningful ways, especially for AEM and adaptive management. Also, provide a project evaluation and adjustment process for The Shire project and not for CEERP, which is what is provided in the proposal.
5. **Summary of past projects.** The proponents have completed or contributed to 30 projects. There are details provided on the previous projects and the addition of a summary table for those projects, outcomes, funding source, year completed, and monitoring would be helpful to the ISRP.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a matrix to identify the linkages

between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Columbia River Estuary Ecosystem Monitoring Project (200300700) to summarize the linkages between implementation and monitoring projects in the Lower Columbia geographic area. We ask this project to assist them in creating the summary and provide information about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

This is basically a proposal to complete one project — The Shire on University of Oregon land in Washington. The objective is quantitative with an outcome that appears promising. However, the proponents need to provide more details about the expected outcomes. For instance, the volume of cool water being discharged, the potential number of adult salmon using the site, the months that it will be ecologically useful, and other key aspects should be specified. The ISRP appreciates seeing reasonable implementation objectives and subobjectives. These could be expanded and made more complete, however. For example, some timelines would be helpful for the sub-objectives, and the proposal would benefit from some specific biological and physical objectives.

Q2: Methods

Methods (or details) are not provided about the construction process at The Shire. ISRP appreciates that the proponents address progress from previous projects in the appendices, many of which appear to have been successful in terms of acreage and physical restoration. The proponents also discuss why some projects have not been successful, and this too was helpful, as the reasons provided are legitimate.

The Objectives include a very specific set of activities and timelines, which might better be placed in the Methods. The Methods section largely describes the process of project selection and prioritization, and links to CEERP's overall strategy, rather than stating what will actually be done on the ground. There were no details on what monitoring was expected or what those methods would be.

Q3: Provisions for M&E

The proponents indicate that others (LCEP) will do the monitoring and be responsible for an Adaptive Management process. Overall, ISRP is concerned that the process to ensure that the proponents and the other programs will cooperate in meaningful ways is too vague.

There is a clear description of the adaptive management process. However, a similarly detailed and clear description of how this project (i.e., access to Yeon Spring at The Shire by sill removal, channel opening, installation of habitat-forming structures, wetland plantings, and removal of non-native vegetation) will be assessed and modified (if necessary) would have been helpful. How will the specific activities be adjusted as the project progresses? If something is not working at the ground-level, how will issues be identified and rectified?

While The Shire site seems like a location where there may be benefits for fish, how was it chosen? Are there alternative sites under consideration? What criteria were used for selecting The Shire? Providing more about the selection process would have been informative.

Q4: Results – benefits to fish and wildlife

The primary benefit of this project will be access for adult and juvenile salmon to cool water. If the volume of cool water is adequate, then this project could have significant benefits to fish migrating at times when the main river is warm. This project will help address one type of an ongoing and future climate change issue (water temperature) in the Columbia Estuary.

Few would dispute the delivery of cool water as important, but it would be helpful to have more detail on the proximity of the site to sources of naturally-produced salmonids, species and life history forms that might use the spring, timing patterns, possible use by holding adults, and ways by which fish use might be monitored.

199306000 - Select Area Fishery Enhancement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish and Wildlife

Province/Subbasin: Columbia River Estuary/Columbia Estuary

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

As part of this review, the ISRP also considered the proponents' 2017-2019 Annual Report (Baker et al. 2020) and several earlier ISRP and ISRP/Independent Economic Analysis Board (IEAB) reviews. All earlier reviews were informative and gave the project high marks for providing fishery opportunities in the lower river. The ISRP/IEAB review ([2007-3](#)) was based on

the project compilation covering 1994-2005 (North et al. 2006). The ISRP continues to believe that the SAFE project contributes significantly to lower-river fisheries while monitoring and considering upper river ESA-listed stocks. While we believe that the project meets most scientific criteria, the proposal itself was overly long and repetitious and did not follow the proposal guidance. For example, all the elements of SMART objectives are presented, but they are not clearly or explicitly stated.

In the next annual report and in a future synthesis report, the ISRP requests the proponents to provide information to address the following Conditions:

1. **SMART objectives.** Provide a single, consistently described set of SMART objectives (see proposal instructions) as part of the next annual report.
2. **Methods.** In the next annual report, clearly describe methods that answer the four questions listed below in the Methods section of this review.
3. **Synthesis.** By the end of this funding cycle, provide a synthesis report for ISRP review that evaluates accomplishments since the 2005 report (reviewed by the ISRP and IEAB in 2007) and includes:
 - a cost/benefit analysis
 - a clear description of how success of the project is determined
 - an analysis of impacts to upper- and lower-river fish and fisheries, and
 - a description of how the proponents detect small impacts on ESA-listed stocks, given the large number of fish released.

Q1: Clearly defined objectives and outcomes

The SAFE project receives funds from several state and local agencies as well as BPA to raise and release several salmon species (spring Chinook, tule fall Chinook, select area bright [SAB] fall Chinook, and coho) into off-channel hatchery and net pen sites in the lower Columbia River. Adult returns are intended to enhance non-Tribal commercial and recreational fisheries. The SAFE fisheries are monitored closely in-season to ensure minimal impacts on ESA-listed stocks. The project has been very successful in accomplishing these goals.

When the project was initiated in 1993 with a goal of determining the feasibility of the endeavor, there were nine objectives (see proposal pages 14-15). In 2011, the project objectives changed and are now stated as (proposal page 15):

- adaptively manage Select Area production and fisheries for increased benefit

- monitor impact of Select Area fisheries
- monitor impact of Select Area production
- provide supplemental production for regional fisheries
- provide outlets for basin-wide reprogramming of hatchery production that reduces impacts.

These objectives are clearly stated but are not in the SMART format (see proposal instructions). Beginning on page 19, the proponents restate the objectives and provide extensive data and justification for the program based on the number of smolts released and the number, distribution and value of adults harvested. The proponents restate objectives in the proposal Goals and Objectives section. However, Figure 1 (perhaps 3-1, page 38) states four objectives that differ from earlier stated objectives, but these are approaching SMART objectives and subsequent text describes means of measuring success, how decisions are made (i.e., adaptive management), and the data collected. In the Methods section, the proponents provide numbers (measurable) and months (time-bound) for the various smolt releases. These data are also presented in the Timeline section (Table 7-1). The ISRP believes that all the elements for SMART objectives are presented in the proposal, but they are scattered and are not clearly and explicitly stated. A single, consistently described set of objectives is critical.

Q2: Methods

Most of the methods are based on sound science principles, are well documented in monitoringresources.org, and listed on page 44. The ISRP does, however, have some questions about the methods for the proponents to consider moving forward and when developing the synthesis report:

- How did the proponents determine that coded-wire tags in about 10% of the released fish was adequate? Was a power analysis conducted?
- More detail is required on how visual stock identification (VSI) is conducted.
- In various places in the proposal, the proponents briefly describe meetings with staff and public, but it is not clear how much of those meetings involve “outreach.” More description on how outreach/engagement with the public occurs and its importance to the program would be helpful.
- Given the fact that collecting and managing data seems to be one of the primary objectives of the project, what is the process for identifying questions that should be asked using the data? Is a formal mechanism available to ensure that the data collected are suitable for the questions to be answered?

Although it is not in the Methods section, the proponents want to explore past SARs in relation to as many response variables as can be documented. The description of variables, data and analysis sounds similar to what the Comparative Survival Study (CSS; BPA project 19960200) has been doing for many years to monitor Snake River and upper Columbia River stocks. The ISRP encourages the proponents to connect with that project. Much of the work needed to explore SARs may have already been done by the CSS Project. The proponents also mention hazing cormorants that threaten hatchery production. The proponents are collaborating with NOAA Fisheries to compare predation in the lower river to that of upriver stocks. The ISRP suggests that the collaboration examine whether or not the birds hazed away from SAFE hatcheries and net pens contribute to increased predation on ESA-listed smolts as they emigrate through the lower river.

Q3: Provisions for M&E

The project is well coordinated with the funders and cooperators. A flowchart for decision making is provided on page 48. The proponents provide an extensive listing of lessons learned as part of the Progress to Date section, and they also address potential confounding factors such as climate change and predation. Given the fact that the SARs of these fish do not seem to differ from those of upriver fish, the ISRP wonders why uncertainty in factors that affect ocean survival was not presented as a potential confounding factor to this project. The proponents also state that they have moved out of the project adjustment phase. The ISRP disagrees with the proponents' assertion that project adjustment is a phase because project evaluation and adjustment should go on continuously.

Q4: Results – benefits to fish and wildlife

The project has clear benefits to fish and fisheries, as well as providing economic benefits to the communities in the lower Columbia River. The proponents have documented the costs of the project and the returns on the investment in providing fisheries that are regulated to protect ESA-listed species. However, how will the success of the project be evaluated? For example, is the project's success based on the harvest opportunities provided, or the number and value of fish landed, or some measure of public satisfaction with the project as a whole? Or all of the above?

Willamette River

200901200 - Willamette Bi-Op Habitat Restoration Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Watershed Enhancement Board

Province/Subbasin: Lower Columbia/Willamette

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proponents of the Willamette Bi-Op Habitat Restoration Project (Project) provided a well-written and thoughtful proposal that addresses many concerns presented in previous ISRP reviews. The ISRP believes the proposal meets scientific criteria but can be improved. The following suggestions should be considered as the proponents go forward. The main ongoing concern is that this Umbrella Project does not have an effective means to assess the progress of the project. The draft Willamette Focused Investment Partnership (WFIP) monitoring and effectiveness plan should allay this concern.

Another ISRP concern has been the lack of quantitative, time-bound objectives. Proposals submitted to this Umbrella project are required to include SMART objectives, and these proposals are reviewed by an independent TRT composed of subject-area experts. Given this extensive oversight, the ISRP believes this project is going in the right direction. As an Umbrella Project (i.e., a funding program), the proponents should consider adding SMART objectives to this project. For example, objectives can contain a rough timeline for when projects will be solicited and reviewed, and the target number of projects to be funded.

The proponents discussed adaptive management focused on programmatic and financial considerations via learning and adapting. This narrow implementation of adaptive management in the project should be made clear, as most people think of adaptive management as including improvements to habitat restoration actions based on their in-situ performance (i.e., ecological responses).

In the past, the ISRP has been told that no BPA funds (or limited funds) could be used for monitoring and evaluation for this project. Nonetheless, the proponents should consider looking at general trends. For example, are temperatures going down or at least not rising as quickly where habitat restoration activities have occurred?

Q1: Clearly defined objectives and outcomes

As with previous Willamette Bi-Op Habitat Restoration Project products reviewed by the ISRP, the proponents have produced a well-written proposal. This Umbrella Project requires SMART objectives of proposals submitted for funding. However, as noted in other reviews, this Umbrella Project does not have clearly stated quantifiable, time-bound objectives with which to assess success of the Umbrella Project.

The goal of the Project is to increase and enhance habitats of anadromous Upper Willamette (UWR) spring Chinook salmon and UWR steelhead downstream of federal dams. They also consider benefits to bull trout, Oregon chub and Pacific lamprey.

This Umbrella Project has overseen the distribution of funds from the Oregon Watershed Enhancement Board (OWEB), Meyer Memorial Trust (MMT), as well as from BPA. The name of the group making funding decisions has changed through time depending on the source of funds: Willamette Special Investment Partnership (SIP) – 2008-2015 with funds from BPA, OWEB, MMT; Willamette Anchor Habitat Investments (AHI) – 2016-2020 with funds from BPA, OWEB, MMT; and OWEB Focused Investment Partnership (FIP)—2016-2021. A partnership of numerous restoration practitioners operating in the Willamette basin (Proposal, Appendix D), and whose work is supported by the SIP/AHI funding programs is currently known as the Willamette Anchor Habitat Working Group (WAHWG).

The goal of the AHI is to fund as many high-impact habitat projects as possible in the Willamette River basin. The AHI is called a Funding Partnership and the proposal states “the Funding Partnership does not determine what habitat projects are submitted, or ‘come in the door.’ Therefore, there is a significant element of uncertainty that the funding program must contend with in developing SMART goals.” (Proposal page 10). Table 5 on page 20 and Appendix G of the proposal provide examples of SMART objectives that were part of 2016-2020 funded projects that can be adapted to funding for the 2023-2027 period. The Funding Partnership requires that projects address these three objectives: improved connectivity between the river and its floodplain; increased channel complexity and length; and expanded geographic extent and improved health of floodplain forests. The proposal states: “Although the MMT and OWEB investments will conclude in 2021 and the Funding Partnership will dissolve at that time, we expect that the expanded geographic eligibility described here will persist in future years of the Project.” (Proposal page 22).

The ISRP suggests that the proponents examine their process for evaluating and awarding projects. The ISRP is not suggesting a major overhaul of the process but rather some modifications (tweaks, additional emphasis, incentives) within the same overall process. While

the ISRP understands that the Project cannot completely control which specific projects are proposed, there are ways to ensure that proposed projects address key topics and whose results will be complementary and leverage other ongoing and newly funded projects. The ISRP was concerned that the Project was too quickly backing off from focusing proposals on critical topics and areas. The Project cannot be overly prescriptive, but the ISRP considers that the Project can do more to keep proposed projects focused and cross-referenced to each other to maximize the benefits and reduce costs.

Q2: Methods

The project review and selection process of this Umbrella Project is based on sound science principles provided by an independent technical review team (TRT; see Proposal Appendices K & M). However, as has been noted in previous ISRP reviews, the proponents do not have a quantitative scoring system to rank project proposals. Funding decisions are made by the WAHWG through a multi-step process including review of pre-proposals, site review, and final proposal review. The AHI funding process does not use a quantitative decision process but provides projects selected for funding to BPA's Habitat Technical Team (HTT, Appendix L), which determines if the projects meet their selection criteria. Other funding agencies (i.e., OWEB, MMT) have specific interests as outlined in Appendix H of the proposal.

The data collected as part of the projects funded in 2019-2021 (Proposal pages 25-27) appear to be based on sound science principles, but a description of how the data will be analyzed should be included (see next section re: Monitoring and Evaluation).

Q3: Provisions for M&E

The proponents have developed an adaptive management program and have regular meetings and communication between scientists and the restoration practitioners. The proponents provided an extensive section of lessons learned and how these were incorporated through adaptive management, which is commendable. The examples provided, however, focused on programmatic and financial considerations via learning and adapting. This narrow implementation of adaptive management in the project should be made clear, as most people think of learning for adaptive management as also including improvements to habitat restoration actions based on their in-situ performance (i.e., ecological responses). The ISRP recognizes the value of adapting programmatic and financial aspects but would also suggest the project look for low-effort (time and labor) ways to use existing information (i.e., not monitoring by the project) to also learn and adapt for performance and effectiveness. The ISRP is concerned that prevention of M&E specific to the project is viewed as meaning that learning about effectiveness is therefore impossible.

The Effectiveness Monitoring Program for the Willamette Focused Investment Partnership (Appendix N of the proposal) has limited funding and so *“focuses on evaluating effectiveness of broad categories of restoration actions (for example: enhancement of gravel pits, floodplain forest establishment) rather than detailed evaluation of individual habitat projects.”* The goals of the WFIP program are to relate the restoration actions to patterns of fish communities (Appendix N, pages 2-3). The effectiveness monitoring document is in draft form but will be in place for the 2021 project activities.

The ISRP is concerned that the proponents describe the types of data that are collected as monitoring indicators—such as hydrogeomorphic, floodplain forest and aquatic plant, and water quality responses—but also state: *“Currently there is no funding for statistical analyses or evaluation of monitoring results. We hope to carryout analyses and evaluation of monitoring findings in a future phase (Phase 5) of the monitoring program, but have no plans for funding for this. To date, there is simply funding for limited data collection and two ‘state of the science’ syntheses on specific restoration activities.”* (Proposal page 26). The proponents should consider providing some general approaches for trend analysis given the data collected, which would not require substantial effort or funding. Most databases make it easy to look at some general trends. For example, are temperatures going down or at least not rising as quickly where habitat restoration activities have occurred?

Q4: Results – benefits to fish and wildlife

The proponents assume that the restoration actions of the projects funded under this Umbrella Project will have benefits for the fish species of concern. While each funded project stands alone in terms of whether it generated useful information, it is not clear if the data collected thus far (since 2008) as part of the funded projects under this Umbrella project include direct assessment of changes in native fish populations. However, the draft WFIP monitoring and evaluation plan will add effects on fish communities to the evaluation (Appendix N). Please see section above on Monitoring and Evaluation.

Wind River

199801900 - Wind River Watershed

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: U.S. Forest Service

Province/Subbasin: Columbia Gorge/Wind

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This exemplary proposal is well organized, informative, and includes numerous useful maps and tables. More importantly, it has many years of solid accomplishments and continues to be an excellent example of a fully cooperative, landscape-scale project for protection and restoration of aquatic habitat. It is being implemented in coordination with a sophisticated program for the monitoring and evaluation of abundance and trends of steelhead populations. The proposal reflects a strong partnership between the four primary agencies (U.S. Forest Service, Washington Department of Fish and Wildlife, U.S. Geological Survey's Columbia River Research Laboratory, and Underwood Conservation District) and a range of landowners and other partners. The project selection process is clear and involves one process on public lands and another separate process for private lands. Also, the proponents' continuing efforts to understand effects of habitat work on steelhead are to be complimented; such close coordination between restoration practitioners and researchers is not a typical feature of many other projects that the ISRP has reviewed.

The ISRP also emphasizes the importance and positive contributions of active public outreach in this project (and other projects) as being critical to success. This is a component that warrants specific and continued support into the future.

In future annual reports and work plans, the proponents should address the following Conditions:

1. **SMART objectives.** The proponents should incorporate a more complete set of implementation and outcome objectives that meet SMART criteria (see proposal instructions) for the five-year funding period. These should include biological objectives for the watershed and also Trout Creek, site of the Hemlock Dam removal project.

Objectives for habitat restoration and protection could be developed for one or two example projects and used as a template for other projects.

2. **Project monitoring.** The proponents should describe proposed activities and associated objectives for project scale monitoring and evaluation, project maintenance, and public outreach and coordination.
3. **Specific RME questions.** The list of RME questions/hypotheses should be re-written to focus specifically on the Wind River. Currently, these are presented as a fairly generic list of questions. It was also unclear if the proponents were attempting to answer all questions or only some.
4. **Estimation of habitat capacity.** Smolt habitat capacity is estimated at 24,000 to 35,000 based on spawner-smolt recruit analysis, and smolt abundance estimates have ranged up to 43,000. It may be possible that the watershed is close to capacity. The proponents should indicate how often capacity is estimated and how close it may be to full smolt capacity.
5. **Future stream temperature.** Given that the overall goal of the project is to restore watershed processes and habitats to ensure resiliency into the future, it would be helpful to clarify whether or not habitat improvement projects are being designed and implemented to minimize future increases in stream temperature likely to occur with ongoing climate change. Also, it would be useful to clarify whether or not methods may be changing in response to changing climate.
6. **VSP parameters.** Provide a list or table of the VSP parameters that are being estimated, the monitoring that contributes to them, and the analysis that contributes to them.
7. **Implementation and funding.** Consider improving Appendix A by describing the sequencing of implementation of future actions and specifically describing who will fund each project component. It is not clear which projects require matching funds and if those funds have been secured.
8. **Priority protection and restoration actions.** Although accomplishments to date are impressive, it would be useful to see a discussion of the remaining priority protection and restoration actions in the watershed (besides those projects listed in Appendix A) and a general timeline for completion.
9. **Synthesis report.** Given the long-term nature of this project, the proponents should develop a synthesis report of what has been accomplished to date. This synthesis should be completed within the next five years before the next project review. This report should not only describe progress to date but should answer the question as to how

close the watershed may be to capacity. Also, the report should tackle the question of whether or not there may be an end point to restoration work in this watershed and how far proponents may be in terms of efforts for overall restoration of the watershed. (For example, high priority passage and road work seem to have been mostly accomplished.)

10. **Restoration strategy.** Moving forward, it may also be appropriate to develop a unified Wind River restoration strategy that combines the best elements of the two current strategies, one for privately owned land and the other for public land. This would likely serve to improve consistency in project prioritization and selection and in providing better definition on long-term direction and needs for the program

Q1: Clearly defined objectives and outcomes

This proposal describes a “collaborative restoration and research effort directed toward wild steelhead (*Oncorhynchus mykiss*) in the Wind River.” It presents the major issues affecting steelhead production in the Wind River and describes a process-based, whole watershed approach to protection and restoration of aquatic habitat. It also includes description of a robust RME program, involving the U.S. Geological Survey (USGS) and Washington Department of Fish and Wildlife (WDFW), and it is an intensively Monitored Watershed (IMW). Restoration work for the project is split between the Underwood Conservation District (UCD) to address issues on private lands and the U.S. Forest Service to address issues on National Forest lands. This work is guided by two different plans, the LCFRB Wind River Habitat Restoration Strategy for the UCD and a restoration action plan tied to watershed assessment and watershed condition framework for the Forest Service. It would be useful if these two guiding documents were combined to provide an overarching strategic framework to guide restoration in the entire watershed. At a minimum this could serve to better align activities and priority setting as much as possible.

Various efforts are described ranging from road decommissioning and treatment of invasive weeds to fish passage improvement, riparian thinning, and instream and floodplain restoration work. Planned activities for the 2023-2027 time period are included in Appendix A of the proposal and provide solid detail on the project type and planned accomplishments. Objectives for various protection and restoration activities are very broad and qualitative. They do not include quantitative measures for implementation or effectiveness. A series of metrics are provided for measuring accomplishments but lack associated quantities or methods for measurement. An example is the objective for improving stream habitat complexity with a performance indicator of miles of stream protected or improved. The proposal notes, “Each habitat project involves specific habitat objectives, typically involving the physical habitat

attributes and outcomes that can be measured before and after project implementation. These are built for each project, based on broader habitat objectives outlined in Section 2 on Goals and Objectives.” No examples of project specific objectives are provided.

Given the long history of steelhead monitoring in the Wind River, it appears that there is a major opportunity to establish a range of restoration outcome objectives addressing a number of metrics for steelhead populations. These could include expected increases in adult and smolt abundance, smolt-to-adult survival, smolts per spawner, etc. No objectives for restoration outcomes are found in the proposal.

The RME program is impressive in its scope and use of innovative tools for biological monitoring and assessment. It includes four major goals and a lengthy series of objectives, which are actually a long list of monitoring questions. While the four goals before the hypotheses were useful, the list of hypotheses seems too general and appears to have been taken from another document. For example, the proponents list collecting data for the major population group (MPG). Steelhead in the Wind River are part of the MPG, so the ISRP is not sure what this question pertains to. All these hypotheses could use some editing and should be made explicit to the Wind River.

In the section on Progress History, the proponents explain that one of their former achievements was to assess effects of spawning non-native Chinook salmon from the hatchery on naturally produced fish. While no detrimental effects were detected when the study was conducted, that was more than 10 years ago, and conditions in the system are likely changing with changes in climate. It could be worth revisiting this question going forward.

It would also be helpful to have additional detail on the relationship to the YKFP Southern Territories Project (199705600) as that project is developed. The Yakama Nation project proposes to pursue work in the Wind River in addition to that which is currently being conducted as part of this project.

Q2: Methods

The proposal includes a detailed description of methods for restoration project development and implementation for each of the major implementers (UCD and USFS). Also included are discussions regarding methods for reviewing project performance and effectiveness. However, the proposal does not include activities/methods for project scale monitoring/evaluation. Although no objectives were provided, the proposal does include a detailed discussion of methods used for public outreach and information sharing. Links to some very professional videos explaining restoration activities for the project are also provided.

For the RME component of the proposal, a detailed series of references for methods are provided. There is also information provided regarding methods for coordination and information sharing between RME and restoration components of the project.

Proponents provide a clear presentation on how they picked projects. Approaches differed from private lands (accomplished by UCD) vs. public lands (accomplished by USFS). The UCD completed an assessment of protection and restoration needs/opportunities on private lands to identify what needed to be accomplished. The USFS developed an overall protection and restoration plan based on watershed analyses and other assessments (fish passage, road condition, habitat surveys, etc.).

Proponents also included a rich discussion of methods they are using to do RM&E. These include description of a monitoring set up using PIT tags and surveys of various kinds. They are not just sampling the end points but have PIT tag arrays in mid portions of some of their tributaries to look at what the parr are doing and where they are going.

Given the importance of increasing summer water temperature to steelhead and the strong likelihood for temperature increases linked to climate change, it is not clear if the habitat improvement projects are being designed or evaluated for potential effects to offset future temperature increases. Certainly, effects are implied (i.e., more shading from riparian trees), but it seems fairly important to be able to better document likely benefits for various restoration actions on stream temperature.

In the Methods section, the proponents emphasize the importance of working with landowners to gain trust, yet they identify reduced funding for conducting outreach and education as a confounding factor. Given the importance of this watershed to steelhead and increasing needs for strong public support and involvement, outreach could be even more important going forward. The proponents should be commended for the outreach efforts that they have conducted, including the video on habitat enhancement.

The proponents provide a list of planned habitat projects in Appendix A that is particularly helpful. However, the proponents indicate that funding for the projects will require matching sources, besides anticipated funds from BPA. Because of this, it is not clear how likely it is that any of these projects will occur, particularly those that are more complicated and/or expensive. It would be useful to indicate in the text or the table itself which (if any) projects are fully funded and which will require matching funds. It is also not clear if anything (besides proposed timing of the project work) might indicate higher vs. lower priority projects. That would be good to include, as would an indication of which organizations will be partnering on the efforts.

Q3: Provisions for M&E

Primary monitoring for the restoration program appears to be limited to project implementation. There is no detailed discussion of how this is accomplished. Due to funding limitations, there does not appear to be any consistent effectiveness monitoring/evaluation for restoration projects, though it is stated that project specific habitat objectives are tracked to determine the general effectiveness of the restoration work. If there is a core program for monitoring project outcomes and general effectiveness, it is not apparent. If these activities are occurring, they should be described.

Some information is provided regarding general fish response to the Hemlock Dam removal project. The ISRP notes that data to date suggest that, relative to the rest of the subbasin, smolt and adult populations in Trout Creek may have benefited from the removal of Hemlock Dam. It also is noted, however, that statistically significant conclusions will likely require many more years of monitoring. A good deal of information provided describes ongoing and consistent review and critique of all aspects of the program. This includes a range of partners as well as the personnel from the RME program. Also included in the proposal are a number of specific examples of using lessons learned to make management adjustments to a wide range of activities and procedures.

For the RME program, numerous key monitoring questions are provided and there is some discussion of results. One potential outcome of the program is the ongoing development of a life cycle model.

The ISRP compliments the proponents for trying to link habitat actions with fish responses. They seem to have a robust monitoring program organized around four broad goals — determining VSP, responses to habitat actions, contribution of the parr life history strategy, and life cycle modeling. It is not clear what pieces of the work they describe are supported by this project. Proponents adapt effectively to new funding opportunities and changes in land ownership, and they coordinate their activities well.

Helpful context provided for how methods have been changed over time in response to lessons learned. However, at the beginning of the goals and objectives section, the proponents indicate that the overall goal of the project is “to restore self-sustaining watershed processes and habitats to the extent that this watershed will be a steelhead stronghold into the future, will be resilient to future climate change and other major disturbances, and will anchor recovery and delisting of steelhead in the Gorge province.” This prompts the question of whether or not various new approaches or adjustments to current restoration methods are being changed in

response to changing climate, and if so, how exactly? More information on this issue is needed and would be helpful.

Q4: Results – benefits to fish and wildlife

This is an excellent effort overall. Based on some of the monitoring results, the proponents are getting positive results based on monitoring of fish response. The Wind supports a wild steelhead population, and while it has some habitat issues, much of the watershed is in the southern end of the Gifford Pinchot National Forest (90%) and land use impacts are primarily related to forest practices. Currently management direction for watersheds and associated riparian and aquatic habitat are guided by the Gifford Pinchot NF Forest Plan. An extensive description of a strategy for the protection and restoration of aquatic habitat is provided in the Forest Plan. The VSP monitoring helps to provide a reference point for Lower Columbia River steelhead.

The overall project has completed an impressive range of projects throughout the watershed. An initial priority has been to restore fish passage throughout the Wind River. It is noted that elevated, summer water temperatures occur in much of the mainstem but not in upper tributaries where access to many areas has been blocked, especially for juvenile steelhead, by primarily dams and culverts. Perhaps the most impressive passage project to date is the removal of Hemlock Dam on Trout Creek. This was a very complicated and expensive project that fully removed a large, depression era dam originally intended to provide water to a nearby CCC complex. A very informative video was produced describing the project. Also, monitoring of before and after smolt production is ongoing for the project.

There has also been a good deal of progress in the restoration of riparian and aquatic habitat on private land, involving a variety of landowners and industrial timber companies. This work requires extensive interaction with landowners both before and after completion of project work. Accomplishments to date are impressive. However, it would be useful to see a discussion of the remaining high priority protection and restoration work that remains in the watershed, given that work began in 1998, and funding to support needed work is limited.

RME accomplishments also are impressive with several examples of the development of innovative tools and approaches. There has been excellent coordination between the RME and habitat restoration programs that has been mutually beneficial. Completion of a life cycle model, currently in development, will be a major accomplishment.

Hood River

199802100 - Hood River Fish Habitat

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of Warm Springs (CTWS)

Province/Subbasin: Columbia Gorge/Hood

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This proposal is a key part of the Hood River Production Program (HRPP), which also includes a fish production and monitoring and evaluation project (198805303). The proposal was comprehensive and informative. It clearly described current and emerging issues affecting fish populations and aquatic habitat and a generally strategic effort to accomplish meaningful restoration at the whole watershed scale. Innovative use of Intrinsic Potential Assessment to identify priority areas for future restoration was described. Discussion and analyses of the potential impacts of climate change on stream flow and stream temperature and associated potential responses were very informative. Findings on the effectiveness of past work in achieving desired habitat conditions were also particularly useful. Finally, the table showing increased total steelhead smolt production from 1994 to present demonstrates benefits from the HRPP projects. A positive trend appears to begin around 2000. Unfortunately, there is no formal analysis of these data. Additional statistical analysis of these data and discussion regarding links to the restoration program should be included in the proposal.

In future annual reports and work plans, the proponents need to provide information to address the following Conditions:

1. **Implementation and outcome objectives.** Describe activities and outcomes for the time period 2023-2027. Particular focus should be to provide quantitative and time-bound outcome descriptions for Objective 2 (spawning and rearing habitat) and the four sub-objectives linked to it. Objectives for project maintenance, public outreach/ information sharing, and project-scale monitoring and evaluation should also be provided.
2. **Strategic plan.** Provide a concise description of the strategic plan that guides priority setting and implementation of this program. Include a list or analysis of prioritization of sites and projects proposed based on a quantitative model, EDT, or other technique to guide setting priorities.

3. **Standard Operating Procedures.** Provide a more detailed description of Standard Operating Procedures (SOPs) or a more detailed description of methods associated with the six specific objectives.
4. **Coordination.** Provide additional detail on coordination within the HRPP, particularly with the CTWS monitoring and evaluation project 198805303. More detailed information on findings to date regarding fish responses to restoration work at the watershed/subbasin scale and at project and/or reach scales is needed. Also, opportunities for improved coordination with the habitat restoration project should be addressed.
5. **Trends in steelhead smolt production.** Provide statistical analysis of the changes in steelhead smolt production from 1994 to present and discuss the implications of the trends for the restoration program.

Note: A qualification from the ISRP's 2007-2009 Project Review to “develop and implement monitoring and evaluation of the fish response to habitat related actions” has not yet been adequately addressed. The proponents are aware of this and state that they are waiting for direction from BPA regarding monitoring protocols to more fully assess the effectiveness of habitat restoration projects. Please provide a description of this once an agreement is reached with BPA.

Q1: Clearly defined objectives and outcomes

The proposal provides a detailed discussion of the major factors affecting aquatic habitat and the associated primary limiting factors to steelhead production. Four primary Limiting Factors and 14 Contributing Factors/Threats are listed in Figure 3. From these emerge the proposed activities to address them. The proponents provide a clear history of their work and report a modest level of results and EDT model outputs (found in the subbasin plan) to demonstrate issues, progress, and a logical framework for moving forward. Although steelhead are the target species, the Hood River has one of the most diverse assemblages of anadromous and resident fish in Oregon. The proposal provides very informative maps showing the distribution of species of particular interest.

There has been a recent review of limiting factors in the Hood River basin in state and federal recovery plans and the Subbasin Plan (ODFW 2010, NMFS 2013, USFWS 2015, Coccoli 2004) and their incorporation into the most recent strategic action plan for the watershed (Thieman 2021). This review is supplemented with findings from a number of past assessments and investigations in the basin including a Total Maximum Daily Load (TMDL) study of approaches for reducing stream temperatures, an assessment of riparian vegetation and potential for

introduction of large wood on the 170 miles of stream in the watershed, opportunities to increase summer stream flows, and use of an Intrinsic Potential Assessment to identify specific stream reaches with high potential for benefits from future habitat restoration. Additional plans supporting the work of the Hood River Habitat Project include the Wy-Kan-Ush-Mi-Wa-Kish-Wit: Spirit of the Salmon and the Hood River Subbasin Summary. Unfortunately, it is not clear if there is a primary overarching strategic plan that synthesizes and unifies key elements of the plans to guide the project.

More detail is needed to better describe how the specific sites and activities are tied to a strategic list of projects to elevate the overall habitat improvement for the subbasin. The proposal contains three tables (Table 4 for water conservation actions, and Tables 5 & 6 for some project prioritization) that provide a qualitative linkage to physical objectives, but no quantitative, desired biological responses for proposed restoration treatments. Specifically, providing this information would really take the proposal to a higher level of usefulness.

A single primary biological objective (Objective 1) provides quantitative fish production targets for all species and identifies the long-term, desired outcome for the project. Objective 1 is accompanied by five other physical habitat objectives, most of which generally meet SMART criteria, although their listed time for completion (2042) is well beyond the timeline for this proposal. Objective 2, which addresses spawning and rearing habitat provides four sub-objectives describing type location and amounts of restoration work to be accomplished. Unfortunately, there are no quantitative objectives describing desired outcomes for these spawning and rearing habitat restoration activities. Also, despite stating that the proponents will continue to monitor physical habitat responses to individual restoration projects, using accepted protocols, no objectives for project monitoring and evaluation are provided. Finally, there are no objectives for project maintenance or public outreach and information sharing.

Q2: Methods

General methods for project prioritization are provided and describe a series of information resources and considerations used by the Technical Advisory Committee. These include aerial photography, Intrinsic Potential Assessment (Appendix B), fish use, and knowledge of site conditions and potential. Although there is no single, formal process described for priority setting, there is discussion of how general restoration opportunities have been prioritized using the Atlas model. It is not clear whether a single restoration plan/strategy is used to guide the process.

Q3: Provisions for M&E

A positive feature of the proposal is that Project monitoring has been adequate to demonstrate that desired physical outcomes have been achieved for most projects. There is an ongoing program for project implementation and effectiveness monitoring, but the proposal provides no detail regarding implementation monitoring. For effectiveness monitoring, the proposal states that the proponents will monitor physical habitat responses to restoration projects using accepted protocols to gauge the effectiveness of project activities. There is a list of the methods for various physical parameters and links to the protocols used. This includes the use of photo points and canopy measurements recorded for riparian vegetation for assessing the effectiveness of fencing and planting projects. For example, this monitoring has shown that the large wood placement projects, particularly those implemented in the last five years, have resulted in desired increases in spawning gravel, pool frequency, and pool area. These parameters could be used to describe or make predictions about desired future outcomes for restoration of spawning and rearing habitat (Objective 2).

There is little discussion of links to ongoing biological monitoring being done in the basin by other projects. For example, this challenging and long-standing issue is the first qualification from the ISRP's 2007-2009 Project Review to "Develop and implement monitoring and evaluation of the fish response to habitat related actions." The proponents say they are waiting for direction from BPA regarding monitoring protocols to assess the effectiveness of habitat restoration projects in meeting their FRCPS Biological Opinion obligations. It is noted that this project is one of three HRPP projects and that the focus of project 198805303 is to monitor the natural production of steelhead trout and Chinook salmon in the basin and to use this information in "determining fish distribution, providing context for habitat restoration efforts, and tracking population status and trends of fish in the watershed to potentially document the influence of habitat restoration activities on fish abundance." There is no mention of formal data/ information sharing or coordination activities among the three projects. Additional detail on this coordination is needed, especially given that past reviews have identified it as a condition for the project.

The primary tool for making project adjustments is The Hood River Watershed Group (HRWG), which meets annually. These meetings include staff from the CTWS, USFS, and ODFW to review monitoring data related to habitat program effectiveness and lessons learned from implementing current or past-year projects. If projects have not yielded expected ecological outcomes, they are discussed in detail to develop suggestions for alternative implementation strategies. There is no mention of any other activities such as field visits, project design reviews or general coordination and information sharing meetings, which could broaden the scope of current adaptive management.

Q4: Results – benefits to fish and wildlife

Active protection and restoration of aquatic habitat in the Hood River basin has been ongoing since 1998. The proposal provides details for a range of past accomplishments. This includes accomplishments tied to a diversity of restoration treatment types including fish passage, riparian fencing, instream treatments, road decommissioning, water conservation and stream flow additions, and work with private landowners to reduce the introduction of toxic materials into streams. The removal of Powerdale Dam substantially expanded the range and number of lamprey in the system, and the HRPP has been documenting this recovery. However, more description would be useful of biological responses to other target fish species populations (especially native species) following dam removal.

Information addressing the effectiveness of past restoration work was particularly useful for this review. Project monitoring results have shown positive outcomes for most restoration actions. Examples include findings that large wood placement projects, particularly those implemented in the last five years, have shown desired increases in spawning gravel, pool frequency, and pool area (Eineichner 2020). Also, results from riparian buffer plantings and education on pesticide Best Management Practices (BMP's) appear to be continuing to maintain lower pesticide levels in streams. The proposal states that, "a summary table of project effectiveness results was not possible for this proposal due to HRPP staff transitions." Unfortunately, quantitative descriptions describing desired outcomes for some of the work, especially spawning and rearing habitat improvement, were not provided in the proposal.

An informative table in the section on Responses to Past Reviews illustrates the abundance of wild steelhead smolts (≥ 150 mm FL) by age category to the mainstem rotary screw trap (rm 4.5) from 1994 to the present (courtesy of Phil Simpson). Although no statistical analysis of the data is provided, the data potentially show a positive trend in total smolts from about year 2000 to the present. Additional detail and analysis of biological sampling would be very useful to summarize and include in future annual reports and proposals for this project.

198805303 - Hood River Production Program

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of Warm Springs (CTWS)

Province/Subbasin: Columbia Gorge/Hood

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our preliminary review, we requested a response on the three topics listed below. Our final comments based on the response are provided after each topic.

1. **SMART Objectives.** Objective 2 of Goal 3 was modified as we suggested to include the list of actions required to generate pre-season and in-season forecasts of run size, and the creel survey required to estimate harvest. We are disappointed that the actions subsumed by revised Objective 2 still do not explicitly specify quantitative rules for controlling harvest. However, the proponents' response to Topic #2 adequately explains the process for setting and adjusting harvest regulations. Note that Action 3 is missing the word "survey" after "tribal creel." In future work plans and proposals, we recommend including the PNI target as part of Objective 2 and specifying that Actions 1-3 will be conducted annually.

2. **Methods**

- **Generating and evaluating forecast models and predictor variables**

As requested, the proponents provided a copy of the original unpublished report by West, Inc. (Griswold et al. 2009) as well as their annual progress report for 2020. Together these documents provide a detailed account of (and sufficient justification for) the method being used to generate preseason forecasts of adult returns. Statistical "bootstrap" procedures are used to estimate confidence intervals for the abundance forecast associated with each regression model based on variability in the historic data series. However, decisions about which regression models to include for evaluation each year seem a bit *ad hoc*. The annual report points out (on page 30): "We also continue to investigate a wide range of predictor variables that display correlation to Hood River Chinook returns and may be used to improve our forecasts," and (on page 32): "A lesson we have learned is that prediction models are not static. To maintain a good statistical fit and effective predictive value, we must continue to assess model performance and explore alternative predictor variables." For these reasons, and because 12 years of additional data are available since Griswold et al.'s 2009 report, we urge the proponents

to summarize and compare (in a future report) the retrospective performance of their alternative models and predictor variable sets. We suggest retrospectively fitting each candidate model in each year of the entire time series (for which calculation was possible) to compare how the candidate models would have actually performed had they been used in each case. This method of retrospective analysis provides a robust evaluation of any forecasting procedure (Haeseker, S.L., R.M. Peterman, S. Zhenming, and C.C. Wood. 2011. Retrospective Evaluation of Preseason Forecasting Models for Sockeye and Chum Salmon. *North American Journal of Fisheries Management*, 28:12-29).

- **Setting and adjusting harvest regulations based on run size forecasts.**

The response adequately addresses our concerns by providing a detailed (2-page) description of the decision pathway for setting harvest seasons and fishery regulations for spring Chinook salmon. Relevant parts of that text should be included in future proposals and reports to improve clarity and to complete the documentation of methods used in the project.

3. **Evaluation of productivity and recolonization.** The response acknowledges ISRP concerns about the uncertain future of monitoring in the Hood River and whether information will be available to effectively assess productivity, progress towards recolonization, and relationships among fish stocks. The proponents also explain that after their original proposal had been submitted, ODFW decided to completely defund the monitoring activities previously conducted by the ODFW Hood River M&E project 198805304, some of which had been expected to continue in some capacity under the ODFW Hood River O&M project 198805308.

To address these new and unexpected challenges in monitoring, the proponents worked with a consultant to develop an alternative study plan that relies heavily on genetic analyses. They submitted this new monitoring plan, entitled “Winter Steelhead and Spring Chinook Population Monitoring in Response to Restoration Measures in the Hood River, Oregon” as part of their response to the ISRP. The ISRP considers the new monitoring plan to be well designed, and a significant improvement to that proposed in the original proposal. The statistical analyses for evaluating fish responses to hatchery releases and habitat restoration, and the models for estimating population abundance and productivity parameters are specified with commendable clarity and conciseness, together with supporting references. Even so, there is still considerable uncertainty about the feasibility of implementation. Because this monitoring plan will be very

important to the project's success, monitoring results should be reported and evaluated as soon as possible in future annual reports.

Two issues that warrant further consideration and clarification in subsequent reports or proposals are:

- (1) The plan to evaluate fish responses to restoration activities specifies that some metrics will be recorded pre-restoration as well as two- and five-years post-restoration. Have these data already been collected for restoration activities already underway? To improve clarity and precision, we suggest adding a table of restoration activities and a timeline for recording metrics.

- (2) It is not clear why "habitat carrying capacity" is defined as the 95th percentile of the Poisson distribution for N_i (i.e., specified by the Poisson parameter λ_i in equation 1 on page 6). What relationship is being assumed between abundance, recruitment (i.e., intrinsic productivity), and habitat carrying capacity? We agree that habitat carrying capacity can be estimated from maximum observed abundance, but only when recruitment is not limiting and the system has reached equilibrium. For example, the capacity of a bucket can be estimated from the volume of water it contains when it is being filled to the brim continually by rain. However, that measurement could be misleading during a drought, or before it has had time to fill to its capacity, such as immediately following intervention that increased the capacity of the bucket.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This project is currently undergoing review as part of the Council's Three-Step process. In December 2019, the proponents responded to qualifications in the ISRP's review ([ISRP 2019-3](#)) of the *2019 Addendum to the 2008 Revised Master Plan for the Hood River Production Project* (HRPP). The ISRP then recommended ([ISRP 2020-2](#)) that the spring Chinook salmon component of the HRPP Master Plan program meets scientific review criteria with two qualifications remaining to be addressed in the next phase of the review:

Qualification 1: *Develop quantitative harvest objectives for hatchery origin spring Chinook salmon returning to the Hood River. The response to the first of previous qualifications for the spring Chinook program (i.e., SCP 1) does not adequately explain or justify the harvest targets for the terminal fishery in terms of the average number of hatchery origin returns*

(HOR) to be harvested or the proportion of years in which the terminal fishery will be opened. Quantitative objectives should also specify how the target harvest rate would change with adult abundance (e.g., a “sliding scale” decision rule). Quantitative harvest objectives are needed to provide a basis for evaluating the program and for informing stakeholders about the level of harvests that might be expected from the program.

*Qualification 2: Develop a plan for monitoring and reducing the proportion of hatchery origin adults that spawn naturally (pHOS) **prior to** demonstrating success in re-introducing spring Chinook (see previous qualification SCP 3). The ISRP remains concerned that hatchery supplementation efforts are proceeding and expanding without adequate monitoring to detect and respond adaptively to unexpected outcomes (e.g., HOR exceeding harvest demand, excessive straying, poor spawner distribution, or low natural productivity), and without decision rules to change the scale or objectives of the program. Monitoring density effects on productivity (previous qualification SCP 2) is likely the most expedient way to determine if total spawner abundance is exceeding the capacity of the watershed.*

To help the ISRP evaluate progress in addressing the two remaining qualifications, the proponents are requested to provide a detailed point-by-point response on the following specific issues in the current proposal:

1. **SMART Objectives.** Objectives 2-5 of Goal 2 do not meet SMART criteria (see proposal instructions). We suggest reframing them as a single new “Objective 2,” with sub-objectives as necessary to annually implement quantitative harvest rules (see comments in the “Clearly defined objectives and outcomes” section below).
2. **Methods.** More explanation and quantitative detail are needed on the following procedures related to Qualification 1 from [ISRP 2019-3](#) (see additional comments in the “Methods” section below). Specifically:
 - **Generating and evaluating forecast models and predictor variables.** The ISRP could not easily find the report by Griswold et al. (2009) and would appreciate receiving a copy or a digital link, as well as details of subsequent modifications to the methods used by Griswold et al. A descriptive summary is requested to permit a review of the adequacy of these methods.
 - **Setting and adjusting harvest regulations based on run size forecasts.** Description of the pathway and decision criteria for setting of harvest levels is requested.

3. **Evaluation of productivity and recolonization.** More explanation and details of analyses and results are needed to demonstrate how data from monitoring will be used to evaluate productivity and progress in recolonization (i.e., progress toward achieving Goal 1), and potential impacts on winter steelhead trout. The proponents state “estimating [natural origin] spawner abundance is relatively straightforward because the majority of adult natural-origin spring Chinook transit through the Moving Falls Fish Facility.” Why then are there no estimates available since 2011 (excluding 2016)? Will future monitoring of natural-origin spring Chinook salmon not enumerated at Moving Falls be adequate to justify ignoring them in calculations of HOR, NOR and PNI?

The proponents indicated in their presentation that they would continue to monitor steelhead productivity and growth for negative correlations with Chinook salmon smolt releases. How will steelhead productivity be monitored if this project will no longer enumerate adult steelhead abundance after 2024? What analytical methods will be used to determine if negative correlations are attributable to Chinook smolt releases versus other co-variables?

Q1: Clearly defined objectives and outcomes

The problem statement provides helpful background about the merging and reorganization of this project and previous O&M projects 198805304 and 198805308.

Both objectives associated with Goal 1 meet SMART criteria.

Objectives 2-5 of Goal 2 are not quantitative, but all concern the management of adult returns from hatchery releases to be achieved as Objective 1 (and related to Qualification 1 in ISRP 2020-2). The ISRP suggests reframing Objectives 2-5 as a single new “Objective 2” to annually implement quantitative harvest rules. Actions associated with this new objective should include the activities required to generate pre-season and in-season forecasts of run size, and the creel surveys required to estimate harvest. What is missing (and needed) is to explicitly specify the quantitative rules to control harvest. Each action or task should be linked to a description of the appropriate analytical or operational methods.

Objectives 3 and 4 of Goal 3 are not strictly quantitative, but the terms “estimate” and “assess” imply quantitative elements. Timelines are not always specified (i.e., should be more explicit) but are presumed to be annual and continuing indefinitely when not specified.

Q2: Methods

Section 4 of the proposal provides a succinct overview of methods. Table 5 provides helpful conceptual links to the objectives and other sources of information. Adequate details are provided for most methods in the annual reports, appendices, or in other references. Exceptions include methods for generating and evaluating pre-season and in-season forecasts of run size, and methods for setting or adjusting harvest rates based on information from forecasts and creel surveys.

The most recent annual report (2018) states (page 31) “The final version of the run forecast models produced, and the accompanying report *Forecast Models for Hood River spring Chinook and Steelhead* (Griswold *et al.* 2009), was submitted to the CTWS in May 2009. Since then, the HRPP has been using these multiple regression models to forecast runs and continue to further refine prediction models with alternative predictor variables using the template produced by WEST, Inc.” The ISRP could not easily find this report and asks the proponents to provide a copy or digital link, and to provide more detailed explanation of the subsequent methods for generating and evaluating forecast models and predictor variables. Have analyses been undertaken to compare the retrospective performance of alternative models and predictor variables over the time series (e.g., Haeseker, S.L., R.M. Peterman, S. Zhenming, C.C. Wood. 2011. Retrospective Evaluation of Preseason Forecasting Models for Sockeye and Chum Salmon. *North American Journal of Fisheries Management*, 28:12-29)?

The description for harvest adjustment (page 14 of the proposal) is too vague: “When survival rates are relatively good and run forecasts suggest that there will be an adequate return of hatchery-origin spring Chinook salmon to the Hood River, a subsistence fishery is opened to Warm Springs tribal members.” More quantitative details are needed to explain the procedures for adjusting harvest and how and when this was administered in the past (e.g., at what levels of survival and run size). This explanation should be linked to revisions recommended for Objectives 2-5 of Goal 2.

Q3: Provisions for M&E

The proposal should describe how SARs and other quantitative metrics are used to evaluate performance in achieving objectives. For example, the proponents state on page 14 of the proposal that SARs “provide an important population performance metric for the program” but do not explain how or why. The proponents should describe the application of these metrics to project management in future work plans and annual reports.

The framework for monitoring and managing the selective terminal fishery appears to be well conceived and implemented. However, the ISRP requests more detail on procedures used to forecast run size and to adjust the harvest control rules. Statements in the annual report for 2018 allude to the utility of various monitoring activities without explaining how these data are used or why they are useful. For example:

- Page 11. *“Marking fish with PIT tags has been extremely useful in adaptive management. Detection of Hood River fish at Bonneville Dam allows managers to gauge run strength before the fish arrive to the Hood River. This in turn informs managers whether run forecasts are realistic so as to adjust harvest regulations or other management activities accordingly.”*
- Page 34. *“A lesson we have learned is that prediction models are not static. To maintain a good statistical fit and effective predictive value, we must continue to assess model performance and explore alternative predictor variables.”*
- Page 37. *“Harvest monitoring is of critical importance for fisheries managers. The results from this monitoring are used for determining seasons and regulations annually. In some cases, this data may even be used to make fishery changes mid-season.”*

The ISRP is also concerned about the apparent lack of analysis of biological data to evaluate progress toward achieving Goal 1 (“Re-establish and maintain a naturally self-sustaining spring Chinook Salmon population in the Hood River subbasin”). The following statements in the annual report for 2018 emphasize the utility of certain biological monitoring activities, without demonstrating how these data are being used to evaluate productivity or progress in recolonization:

- Page 45. *“Snorkel surveys have been a useful tool for documenting fish distribution in the Hood River basin. This is especially germane for the spring Chinook population that was reintroduced, and we expect to increase in distribution, if the reintroduction is progressing successfully.”*
- Page 50. *“Following the two years of higher redd counts we observed a substantial increase in Chinook parr estimated during snorkel surveys. Repeating this protocol following a range of spawning and water years could reveal patterns of spawning abundance to juvenile recruitment, and at what point the carrying capacity of Chinook parr in this stream section is reached.”*

The ISRP does not understand how the observation that many fish enter the Moving Falls fish ladder but do not continue upstream is evidence of deterrence by the ladder rather than homing to the acclimation site below the ladder. Presumably smolts are released below the ladder? More explanation is needed than given on pages 54-55: “To a certain extent Chinook

may be staging in the area below the falls due to homing and attraction to the smolt release site at the facility. Thus, they may not be motivated to proceed any further up the West Fork. Even considering this homing behavior that may cause fish to stage below Moving Falls, we believe there is evidence of passage delays or deterrence to enter the trap. [...] We documented numerous instances where tagged fish were detected on these PIT antennas at the upstream end of the ladder, but never documented as passing the site or being captured in the trap; ultimately ending up at a final location below Moving Falls.”

The proponents state “estimating [natural origin] spawner abundance is relatively straightforward because the majority of adult natural-origin spring Chinook transit through the Moving Falls Fish Facility.” If this is true, why are estimates not available since 2011 (excluding 2016)? Will future monitoring of other natural-origin spring Chinook (i.e., those not enumerated at Moving Falls) be adequate to show that their abundance can be safely ignored when calculating overall pHOS (the proportion of natural spawners that are of hatchery origin) and PNI (proportionate natural influence)?

The proponents also point out that the total natural spawning abundance remains lower than the target of 400 so that more hatchery origin spawners are necessary to support the recolonization goal. They argue that it is premature to be concerned about monitoring pHOS and more cost-effective to improve PNI (i.e., reduce genetic risks) by improving pNOB (the proportion of hatchery broodstock that is of natural origin). Should pHOS become a concern, hatchery origin fish could be culled at Moving Falls and the East Fork Diversion ladder, providing additional hatchery fish for tribal food distribution.

The proponents have not yet presented data or analyses to determine if juvenile growth of winter steelhead, or the productivity (i.e., smolts per spawner) of the winter steelhead population are negatively associated with the magnitude of spring Chinook salmon releases. They say they will continue to monitor and report on any association between performance metrics for these species. But how will potential effects of Chinook salmon releases on steelhead productivity be monitored if this project is scheduled to stop enumerating adult steelhead abundance after 2024? What analytical methods will be used to determine if negative correlations are attributable to Chinook smolt releases versus other co-variables?

Q4: Results – benefits to fish and wildlife

The proposal provides a good overview of progress achieved since the HRPP began in 1991. In particular, the timeline of milestones (Figure 1) and the history of production goals (Table 1) provide helpful context for reviewing results.

The program is providing tribal and recreational fishers with increased fishing opportunities and harvests of hatchery fish in a selective terminal fishery. Total adult returns of spring Chinook salmon have generally increased over the course of the program. However, the recent 10-year average return to the mouth of the Hood River is only 1,522 adults, and the goal of 1,700 adults has only been met three times. Hatchery feeding and rearing regimes have been adjusted to ameliorate low rates of smolt-to-adult survival and high rates of precocious maturation (“minijacking”) based on recommendations from the 5-year comparative survival study conducted as part of the HRPP’s 2008 Revised Master plan. In 2019, the program was able to meet its original release target, increasing annual Chinook salmon releases from 150,000 to 250,000 yearling smolts, following completion of Moving Falls Fish Facility (MFFF) in 2013 and expansion of Parkdale Fish Hatchery in 2017. Meanwhile, hatchery propagation of both summer-run and winter-run steelhead has been discontinued (in 2008 and 2021, respectively) for a variety of reasons, including concerns about their adverse effects on productivity of the wild ESA-listed population.

Klickitat River and Rock Creek

199705600 - Yakama Southern Territories Habitat Project (STHP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Gorge/Klickitat

Recommendation: Meets Scientific Review Criteria

Overall comment:

In response to a May 23, 2021 request by Council and BPA's Budget Oversight Group (BOG), the ISRP completed an expedited review of the project. The BOG request was made because the proponent requested an expansion of their restoration work in the Klickitat subbasin and into the Rock, Wind, and White Salmon subbasins. The existing Klickitat Watershed Enhancement project would be renamed the Yakama Southern Territories Habitat Project (STHP). To complete this review, the ISRP considered the original proposal; requested additional information from the proponents on several issues on July 7 via an email message; asked questions during the proponents' presentation on July 21; and considered the proponent's answers to our questions, received on August 26, 2021. The additional information was intended to help us reach a final recommendation on the project as to whether it meets scientific review criteria.

After the review of the initial proposal, the ISRP asked the proponents to address three specific questions:

- 1. Please provide more details about the proposed habitat restoration projects in the Klickitat (11 projects), White Salmon (2 projects), and Wind (1 project) subbasins. Please provide methods, expected outcomes, and monitoring actions for each project.*
- 2. More details on project selection should be provided within the proposal. Are the right projects being done in the right places? How often are projects selected based on opportunity vs. strategy? Are projects being selected based upon future expected conditions due to climate change? What information is used to modify the selection process?*
- 3. Waterflow is clearly a limiting factor in tributaries such as Rock Creek. While actions such as formation of pools can be used to improve conditions, is it possible to modify human land use activities (e.g., irrigation withdrawal) to increase flow during critical seasons?*

Furthermore, the proponents should better explain how the ongoing restoration actions are likely to improve stream habitat, such as stream flow, sedimentation, temperature, etc.

The proponents provided 12 pages of text to address these questions and an additional 14 pages to address deficiencies noted in the sections below. The response to the first question provided the requested details on restoration approach, design, and monitoring. Descriptions of each of the restoration projects were provided. The response to the second question provided the requested detail on project selection and prioritization. The response to the third question helped explain the limitations on potential actions to improve water flow and temperature, and it described a series of passive and active restoration actions that have been taken and planned in the future.

Combined with the information in the original proposal, the responses to our questions help to complete the proposal and make it possible to judge that the proposal now meets scientific review criteria.

Q1: Clearly defined objectives and outcomes

The overall goal of the Southern Territories Habitat Project is to restore watershed health and stream habitat to aid recovery of native salmonids in the tributary subbasins of the Yakama Nation's Southern Territories. The proposal provides a series of biological goals to reach this overall goal along with six quantitative objectives for habitat restoration and monitoring. The restoration objectives are quantitative in that they identified the amount of habitat (by type) to be restored over the next five years. A Gantt timeline chart (design, planning, implementation) is provided for each restoration project plus monitoring and evaluation. Quantitative objectives for natural-origin Chinook salmon and steelhead and hatchery production were developed at the Major Population Group and Population level in collaboration with the Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee and presented in task force's Phase 2 Report, which was released in October 2020.

In the original proposal, the proponents provided a clearly stated goal, and they provided Objectives that were generally well formulated. However, objectives needed to be improved to meet standards of the SMART Objective format so that the project could be readily evaluated for progress. Locations for activities were not declared for OBJs 1-4. It was not clear where the planned actions were to take place. The expected outcomes were not expressed in measurable terms.

Furthermore, the proponents needed to add more information about restoration actions proposed for Rock Creek, including a full series of Implementation Objectives and Monitoring Objectives for each proposed habitat restoration project in Klickitat, White Salmon, and Wind watersheds. Expected outcomes in terms of stream miles treated and effect on stream processes and fish populations needed to be stated. It was not clear from the timeline when

monitoring and evaluation activities (habitat surveys, population estimates, coho salmon redd counts, and steelhead redd counts) would be conducted. It was not clear if these activities were limited to Rock Creek, or if they were to be implemented in other watersheds (Klickitat, White Salmon, and Wind) as well. The specifics and relevancy of the monitoring needed to be described.

With their subsequent response, the proponents addressed these deficiencies in a full and adequate manner.

Q2: Methods

The proponent provided a reasonably detailed summary of methods used to examine fish populations in Rock Creek, including fish density in pools, tagging studies to evaluate survival and travel times, spawner surveys, and water quality monitoring. Insufficient detail was provided for how the actual restoration projects were to be conducted. Implementation and monitoring methods associated with Objectives 1-4 for specific restoration projects planned for FY2023-2028 in Klickitat, White Salmon, and Wind watersheds were not described. The proponent briefly noted that *"On-the-ground habitat actions are implemented using best available science and include the suite of activities outlined in the Columbia River System Biological Opinion, Appendix a – Tributary Habitat Technical Foundation and Analytical Methods. For individual monitoring actions approaches are documented on monitoringmethods.org."* In a separate section of the proposal, the proponents noted that habitat actions were documented with photographs. Stream pool habitat surveys were adequately described. However, the proponents did not describe how they were evaluating the effects of other actions to improve stream processes, such as stream flow, sedimentation, temperature, etc. In addition, there was little information provided on the project selection process.

With their subsequent response, the proponents addressed these deficiencies in an adequate manner.

Q3: Provisions for M&E

By expanding the geographic range covered by this proposal beyond the Klickitat River watershed boundaries to include the White Salmon River, Wind River, and Rock Creek watersheds, the proponents have shown a decisive attempt to enhance efficiency for approach and application of restoration actions. This change appears to be a reasonable and responsible change, but it will need to be revisited in the future to understand if there are realized benefits from this expanded range.

The proposal briefly summarized the adaptive/iterative management process, and it referenced the final EIS. The proposal noted one example of adaptive management involving the survival of

various plant species by planting depth, plant source (cutting vs. containerized), and pruning treatment. Other examples could have been described or at least referenced in the proposal.

While the proponent described the significant amount of monitoring to be done in Rock Creek, it was challenging to determine if the right monitoring was being done in the right places. One suggestion was to include a summary of all relevant monitoring work, regardless of the project doing it.

For the most part, the monitoring was not explicitly linked to questions or hypotheses, so in some cases it was hard to determine what the monitoring was going to yield and how the information would be used. The ISRP was unable to determine whether the monitoring would be sufficient to answer questions.

With their subsequent response, the proponents addressed these deficiencies with an adequate amount of new information and descriptions.

Q4: Benefits to fish and wildlife

The proposal provided a good summary of habitat restoration accomplishments over multiple years, and it provided a good summary of fish monitoring results in Rock Creek. Additionally, a technical report for Rock Creek was completed in 2020, and a report on the Klickitat watershed included the 2018 activities and findings. The project has been doing a lot of good restoration work for quite a few years.

It is noteworthy that the smolt-to-adult return rate for the 3,039 steelhead smolts tagged in Rock Creek in 2009-2012 ranged from 2.2 to 5.5%, which is within the target smolt-to-adult return rate for the Middle Columbia River DPS (2 to 6%), as noted in the proposal. Given the two-winter residence of many steelhead in the ocean, it is not clear why SAR data were not also provided in the proposal for fish tagged during 2016-2017.

With the strong monitoring effort in Rock Creek, the response and benefit to fish (steelhead, coho salmon, and bridgelip sucker) from the habitat restoration efforts in Rock Creek will be assessed as part of the project. The fish monitoring proposed is extensive and has a high likelihood of success for assessment of the fish response. However, in the other watersheds where restoration projects are proposed (Klickitat, White Salmon, and Wind), not enough information was provided by the proponent for the ISRP to understand what the potential benefits of project activities to fish and wildlife might be.

With their subsequent response, the proponents addressed these deficiencies and provided much new information, including four tables and three figures that included data on smolt-to-adult return rates and PIT tagging results for smolt emigration and adult returns.

198812035 - Klickitat River Management & Data Project (YKFP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Gorge/Klickitat

Recommendation: Not Applicable

Overall comment:

The objectives of this project are not amenable to scientific review. However, the ISRP provides the following suggestions for project and proposal improvement.

This non-science project provides administrative, management, and database support. This project is centered in the Klickitat River and is an analog of Project 1988120025, which does the same things as this project, but in the Yakima subbasin.

The proponent states that this project is designed to support policy development and administration. Furthermore, it is stated that this is a management and data project that supports staffing to conduct appropriate and necessary planning and administration of the supplementation, reintroduction of extirpated species, and harvest augmentation actions in the Klickitat Basin that are essential to fulfilling regional conservation goals and to meeting regional mitigation and treaty trust obligations. To improve future proposals and to organize annual reports, the ISRP suggests that the proponent develop SMART objectives to address these functions, complemented by a full suite of methods associated with each objective.

Q1: Clearly defined objectives and outcomes

An overarching goal for YKFP regarding fish production targets is provided, but a goal specific to this proposal was not explicitly stated. The goal statement for this proposal could be something like: *Provide oversight, administrative services, policy guidance, coordination, data management, and planning that help to ensure that the YKFP projects in the Klickitat subbasin are as effective as possible.*

The proponent refers the reader to pages 212-249 of the “Phase 2 Report” to find “quantitative SMART objectives,” but the objectives given in the referenced report are incomplete versions of

SMART objectives, and they do not describe the objectives for the proposal at hand, which has to do with project management, planning, and policy, not fish production targets.

Examples of relevant SMART objectives for this project would be:

- *Provide a data repository and data management services for the YFKP projects in the Klickitat Subbasin on an as-needed basis.*
- *Conduct a monthly forum to address technical and policy issues for the YFKP projects associated with the Klickitat Subbasin.*

Q2: Methods

The methods for management, planning, and policy actions lack detail, and they are not tied to specific SMART objectives (see above). It is assumed that additional methods and specificity of methods will increase once appropriate SMART objectives have been developed.

Q3: Provisions for M&E

It would be helpful to present (1) a full list of publications, reports, and products (e.g., models, databases) that this project has supported as a measure of success and (2) a list of planned contributions for publications, reports, and products that are in the pipeline for the near future.

Q4: Results – benefits to fish and wildlife

It is reasonable to assume that fish and wildlife in the Klickitat watershed are benefiting from the oversight and data services that this project provides to a web of important YKFP projects. Specific examples of successful implementation and outcomes would be good to document.

199701335 - Klickitat River Operations and Maintenance (O&M) for Hatcheries and Acclimation Sites-Yakima/Klickitat Fisheries Project (YKFP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Gorge/Klickitat

Recommendation: Not Applicable

Overall comment:

The Klickitat River Operations and Maintenance (K-O&M) Project serves as the project to fund staff and support O&M of existing and new YKFP infrastructure developed per the Klickitat River Anadromous Fisheries Master Plan (KMP). Facilities include the Castile Falls Enumeration Facility, the Lyle Falls Fishway & Research Facility, and the Klickitat Field Office & Maintenance Shop.

This project primarily involves salary support, facility maintenance, and permitting requirements. There is no science or monitoring of hatchery operations by this specific project, so the ISRP found the project title to be somewhat misleading. The title would be clearer if it included the words "Facility Operations and Maintenance."

Hatchery operations and monitoring are reportedly covered by Mitchell Act funding rather than BPA funding. BPA Project 199506335 (YKFP Klickitat Subbasin M&E) and BPA Project 1997701325 (Yakima River O&M) did not address hatchery operations and monitoring in the Klickitat Basin, so there was no opportunity for the ISRP to review hatchery operations in the Klickitat watershed. However, the ISRP recently reviewed hatchery operations as part of the hatchery Master Plan review ([ISRP 2018-4](#), [ISRP 2018-10](#)). The ISRP anticipates that the YN is addressing issues raised by [ISRP 2018-4](#) and [ISRP 2018-10](#), including:

1. Provide performance standards to enable assessment of in-hatchery performance, fish health, the proportion tagged, tag retention probability, and the proportion of smolts that mature as mini-jacks. Performance standards are a key component of an adaptive management process.
2. Describe how minijack abundance will be estimated in the three hatchery lines (H1, H2, and N1).

3. Expand the description of the adaptive management process to include a longer than annual cycle of review (perhaps at 5-year intervals) through which managers will formally consider making major changes to the program.

Q1: Clearly defined objectives and outcomes

The Klickitat River Operations and Maintenance (K-O&M) Project funds staff and supports O&M of existing and new YKFP infrastructure developed per the Klickitat River Anadromous Fisheries Master Plan (KMP). Facilities include the Castile Falls Enumeration Facility, the Lyle Falls Fishway and Research Facility, and the Klickitat Field Office and Maintenance Shop.

The proposal provides a list of objectives. This project primarily involves support for salaries, facility maintenance, and permitting requirements. There is no science or monitoring.

In future proposals, the ISRP recommends that the proponents recast the project objectives in the requested SMART Objective format: (1) Specific and clearly defined, (2) Measurable (quantifiable), 3) Achievable and testable, (4) Relevant and applicable to the Program with benefits to fish and wildlife, and (5) Time-bound with clear milestones and end dates. As is, the objectives lack measurable expected outcomes (e.g., number of training sessions to be held in the contract period, number of visits to screened intakes) and timelines (e.g., annual frequency of maintenance activities). These are important aspects to describe so the adequacy of methods and project performance can be assessed.

Q2: Methods

To effectively operate and maintain Klickitat subbasin BPA-funded facilities, the Klickitat O&M staff has developed seasonal maintenance schedules to ensure data collection is maintained through the Klickitat M&E Project 199506325. Details regarding methods and effort used to maintain the facilities are not provided.

Q3: Provisions for M&E

Klickitat O&M has reportedly evaluated all existing facilities and has made modifications that have made them more robust, easier to use, and less prone to down time. Klickitat O&M also does outreach in coordination with other YKFP staff to allow groups such as schools and outside fisheries professionals to tour the facilities.

The project uses the evaluation methodology in BPA's (1996) final EIS, as do most projects proposed by the Yakama Nation, but no project-specific examples are described by the proponents to explain how they have used this process in practice.

Q4: Results – benefits to fish and wildlife

The Klickitat Operations and Maintenance Program was developed to operate, maintain, repair all BPA supported facilities in the Klickitat Basin after the capital construction of the Lyle Falls Fishway and the Castile Falls Fish Enumeration Facility was complete. Additionally, Klickitat O&M staff provide logistical and technical support to other BPA-funded programs in the basin. This is intended to maximize time for the facilities to operate, keep the equipment in good working order, and support construction and technical components of other programs.

199506335 - YKFP Klickitat Subbasin Monitoring and Evaluation

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation

Province/Subbasin: Columbia Gorge/Klickitat

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proponents provide a reasonably detailed proposal for monitoring and evaluation in the Klickitat Basin. The proposal is further supported by two technical reports that were completed in 2021. M&E shows that the overall program is not meeting the goals for spring Chinook salmon and steelhead.

The ISRP recommends that the proponents provide information on the following five issues. Several of these recommendations were previously made by ISRP ([2018-10](#)), but responses to the recommendations were not clearly presented in the proposal. In future annual reports and work plans, the proponents need to provide information to address the following Conditions:

1. **Limiting factors.** The proponents should synthesize and further evaluate existing data in an attempt to identify the life stage(s) that are limiting survival and abundance of steelhead and spring Chinook salmon. For example, to the extent possible, estimate smolts per spawner as a means to evaluate changes in productivity associated with habitat restoration activities in the watershed and environmental variables. Also, continue to monitor survival at sea as a means to separate ocean effects on survival

from freshwater effects. Adult returns per spawner should be evaluated as a means to track productivity over the entire life cycle. Importantly, all metrics should be evaluated within a density dependence framework (e.g., smolts per spawner and adults per spawner in relation to spawner density) because high density often leads to reduced growth and survival. These relationships should be used to further evaluate status and trends in relation to habitat actions. For example, to what extent are the low returns in recent years of naturally-produced spring Chinook salmon due to factors in freshwater, the mainstem river, versus the ocean?

2. **Investigation of in-river mortality.** As noted by ISRP ([2018-10](#)), a key unknown is the cause(s) of high mortality of PIT tagged smolts between the Klickitat River and Bonneville Dam. This high mortality is a significant factor constraining population growth, and it should be further investigated as a means to identify and potentially repair factors adversely affecting survival.
3. **Population estimates.** The 95% confidence intervals for the summer steelhead population estimates are sometimes exceptionally large, reaching about 100% of the reported population estimate in some years. The methodology relies upon recaptures by sport fishermen, which could lead to less accurate or biased results. Please discuss this issue, methods used for the steelhead population estimates, and potential to improve these methods in the next annual report.
4. **Effects of hatchery releases.** The proponents should evaluate the potential effects of hatchery coho and fall Chinook salmon releases on natural production of steelhead and spring Chinook salmon. These releases are substantial and could affect the rebuilding of the targeted steelhead and spring Chinook salmon. If this evaluation has been previously conducted, please provide a reference. This potential interaction may or may not be responsible for the poor survival of smolts between the mouth of the Klickitat River and Bonneville Dam noted in #2 above, but it could be if the emigrant smolts and presmolts are not of sufficient condition or size, or if seasonal timing of emigration is altered because of the interaction.
5. **Monitoring.** Habitat conditions were inventoried using a Rapid Aquatic Habitat Assessment Protocol developed by YKFP staff. How often is this habitat survey conducted? It seems repeated surveys every five years or so would be beneficial to track habitat conditions, especially in reaches undergoing restoration.

Some monitoring of salmon production in tributaries was described, such as from electrofishing and PIT tags. Please describe the strategy, approach, and extent to which this M&E project is monitoring salmonid trends and their response to habitat actions in

the tributaries in addition to mainstem habitats.

The ISRP anticipated that this M&E project would provide some monitoring of within-hatchery production and survival, and would further address issues raised in previous ISRP reviews (2018-4, 2018-10). We now understand that within-hatchery monitoring is covered by Mitchell Act funding, and so this BPA project proposal did not address within-hatchery performance issues. These responsibilities should be clarified in future proposals as a means to inform reviewers that hatchery M&E is being conducted by another project. The ISRP emphasizes that it is critical to evaluate whole programs rather than subsets of programs.

Q1: Clearly defined objectives and outcomes

The primary goal of the YKFP Klickitat Monitoring and Evaluation Project is to provide status and trends monitoring information for native anadromous salmonid populations and their habitat, while also collecting data to evaluate effectiveness of hatchery and habitat actions and answer key questions or uncertainties in the Klickitat subbasin. Specific objectives include providing annual abundance estimates of returning adults and outmigrating juveniles (via adult and smolt trapping in the lower Klickitat River); monitoring spatial distribution and relative abundance of spawning adults (via redd surveys) and juvenile rearing (via stream electrofishing and PIT tagging); evaluating genetic diversity and relationships between stocks of different origins, life histories, and run timing; and monitoring physical habitat parameters and ecosystem response to habitat actions.

While the goal statement is clear, the objectives would be much clearer if recast in the requested SMART Objective format: (1) Specific and clearly defined, (2) Measurable (quantifiable), 3) Achievable and testable, (4) Relevant and applicable to the Program with benefits to fish and wildlife, and (5) Time-bound with clear milestones and end dates. As is, the objectives lack measurable expected outcomes (e.g., target confidence interval levels of estimates) and timelines (e.g., annual periodicity of assessments). These are important aspects to declare so that adequacy of methods and sample size can be assessed and then possibly modified as needed to meet targets. Furthermore, metrics should include smolts per spawner in relation to spawner density.

Objectives 2 and 4 are vague as to what species of outmigrating and rearing “juveniles” are to be monitored. In addition to spring Chinook salmon and steelhead, it would be good to see that natural production of coho salmon and fall Chinook salmon are being monitored.

Non-salmonids, whitefish, and lamprey do not appear to be targets for monitoring other than when they are considered to be predators of juvenile salmon and steelhead. The proponents should consider adding an objective to include some or all of these other fish species to better understand the changes in productive capacity of the Klickitat River system, not simply changes in a few species.

Q2: Methods

The proponents adequately summarize some methods used to monitor fish populations and referenced two recent technical reports that provided more detail. Additionally, the methods to examine habitat are referenced. The proposal does not address monitoring within hatchery facilities, which is covered by Mitchell Act funding and not BPA funding. Thus, the ISRP does not evaluate hatchery M&E during this review, including the proponents' response to ISRP comments during the 2018 Master Plan step review.

Methods associated with several objectives are not provided, that is, monitoring methods for spatial distribution and habitat use of rearing juveniles (via stream electrofishing, tagging, and PIT tags), survival and smolt-to-adult return rates of spring Chinook salmon and steelhead (via PIT tagging), and predation patterns in the lower Klickitat subbasin (via predator population surveys and juvenile salmonid survival). Furthermore, the 95% confidence intervals for the summer steelhead population estimates sometimes are exceptionally large. The methodology relies upon recaptures by sport fishermen. Could this approach lead to less accurate or biased results?

Q3: Provisions for M&E

The YKFP Klickitat M&E project reportedly provides monitoring and evaluation data for related projects that are implementing hatchery and habitat actions, and it is involved in the development of actions and strategies as well as evaluating effectiveness and reporting information. Information on run size, preliminary productivity and survival data, and genetic characteristics and stock identification facilitate the Klickitat Master Planning process for anadromous fish production. Data on spatial distribution, relative abundance of spawning adults and rearing juveniles, and habitat conditions have reportedly informed local habitat projects and prioritization of habitat actions.

As noted in previous ISRP reviews (e.g., 2018-4, 2018-10), more information is needed on (1) mini-jack production by the hatchery and methods to reduce mini-jacks, and (2) high mortality of PIT-tagged fish from the Klickitat River to Bonneville Dam. Identification of factors causing this high mortality could lead to solutions to improve survival and abundance.

The ISRP expected that the high confidence intervals for the steelhead population estimates would be directly addressed during the adjustment process for the M&E program, but this issue is not discussed. Also, little is offered by the proponents to understand what level of self-evaluation of quality and quantity is done other than stating that: “The Klickitat M&E project receives routine evaluation via review with YKFP and BPA staff at quarterly meetings and at the annual Columbia Gorge Fisheries and Watershed Science Conference.” No examples of project changes and maturation are given so that the project adjustment process could be understood.

The proponents provide an excellent evaluation as to how climate change could affect their monitoring activities (e.g., effect of increased turbidity on redd surveys; increased variability may necessitate increased frequency and intensity of monitoring).

Q4: Results – benefits to fish and wildlife

The proponents provide an excellent summary of wild and hatchery salmon and steelhead population dynamics in the Klickitat Basin. This summary is supported by two reports completed in 2021. This information is critical for documenting the status and response of the populations to restoration actions. As noted in previous reviews, the survival of smolts from the Klickitat River to Bonneville Dam continues to be low, indicating an opportunity to improve survival if the short-term mortality sources (such as predation) can be identified.

The proponents note that habitat conditions were inventoried using a Rapid Aquatic Habitat Assessment Protocol developed by YKFP staff, and they provide a reference to past reports. In addition, temperature was continuously monitored via thermographs at 36 sites in the subbasin, and links to the findings are provided.

The proposal identifies the exceptionally low returns of naturally-produced spring Chinook during 2017 to 2020. The M&E program should strive to identify contribution of each life stage to the low returns, e.g., spawner to smolts, smolt migration in the mainstem Columbia River, or ocean residence. Unfortunately, the low returns of spring Chinook salmon in recent years has constrained mark/recapture population estimates because most sampled Chinook salmon were taken for the hatchery broodstock.

Deschutes River and Trout Creek

199404200 - Trout Creek Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: ODFW

Province/Subbasin: Columbia Plateau/Deschutes

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This is a long-running project that has made significant accomplishments restoring riparian and aquatic habitat in Trout Creek. It is impressive how a small number of highly experienced personnel have worked together for many years to accomplish a substantial amount of high-quality stream restoration work. It is evident from the proposal that there has been consistent completion of planned work and a strong linkage to local landowners and the general community. There has also been a significant amount of cost sharing in the implementation for a wide suite of restoration projects. Although the project is titled an operations and maintenance effort, it proposes not only to complete annual maintenance activities but also to implement habitat restoration actions and monitor restoration results, smolt out migration, and adult abundance. The title of the project does not adequately explain the purpose and function of this project. A name change is in order.

The current proposal provides a good amount of detail but lacks specifics in some key areas. In future annual reports and proposals, the proponents need to provide information to address the following Conditions:

1. **SMART objectives.** Development of SMART objectives (see proposal instructions) describing desired outcomes is needed to evaluate restoration project/treatment effectiveness. Although there are quantitative measures describing expected accomplishments, there also need to be time frames for expected completion of the activities. Also, although there are some well-written objectives for expected outcomes for some individual restoration activities, there is no consistent process described for their development to cover the full range of restoration treatments. It might be useful to develop template objectives for various activity types and develop specific quantitative measures for individual projects. Examples could include: "Within 10 years of planting achieve ___% canopy cover of riparian vegetation and at least ___% stream

surface shading.” Also, objectives could be developed using the web-based NVDI “greenness index.” It may be useful to develop these for use at the priority watershed scale.

2. **Monitoring summary.** A brief summary of planned monitoring and evaluation activities for the time period covered by the proposal. Also, please provide a description and time frame for the evaluation and reporting of this information.
3. **Synthesis.** A synthesis and summary of key findings from past monitoring and evaluation efforts. This would include a retrospective look on the prioritization and implementation of various restoration treatments, their effectiveness at meeting desired fish and habitat outcomes, key lessons learned, and a summary of resulting future actions to improve program performance. The proponents are encouraged to present the response of the Trout Creek system in terms of habitat forming processes and fish production. For example, how reliant is the Trout Creek system on site-by-site fixes? Are the projects done-to-date large enough and linked enough to promote sustainable habitat in the Trout Creek system? What influence has the project had on carrying capacity of native salmonids and steelhead smolt production?

The synthesis has been requested in various forms for the last two ISRP reviews but has not been provided. There is a long history of monitoring activities but a very limited statistical analysis (e.g., trend analysis) and summary of important findings. Given the long history of this project, the synthesis will directly benefit the project and will be of value to other projects well beyond the immediate project area.

The ISRP suggests that the proponents work with Jefferson County SWCD in addressing these Conditions. This coordination will likely be most efficient given the close working relationship, vast amount of collective knowledge, and insights into its history, accomplishments, and future plans. The ISRP is available for future discussion on the synthesis and would like to be provided the finished report.

Q1: Clearly defined objectives and outcomes

The proposal provides a detailed description of major problems and limiting factors for summer steelhead trout. However, it did not mention any potential issues associated with irrigation diversions and reduced flows or runoff of toxic materials linked to valley bottom agricultural activities, road maintenance, and/or forest management.

The project has a clearly stated over-arching Goal (actually an objective) for 100,000 smolts by 2050 and provides support including information in Appendix A. One aspect in Appendix A that

was useful was the process used to prioritize projects. That information could be included in the main proposal in more detail. The proposal also provides a number of detailed accomplishment objectives for planned work that are quantitative but lack any time frame for expected accomplishment. What is lacking are clearly stated objectives that describe key outcomes expected from planned work activities. A simple example is work done to correct fish passage barriers. The proposal states that two barriers are to be removed but does not state that improved passage will be provided for access to ____ stream miles for ____ species. Another example would be noting that riparian/floodplain ____ acres are to be planted, but there is no description of the expected outcomes such as percent ground cover, percent stream surface shading, etc. A tool that is already being used, the web-based tools to measure the “NVDI greenness index,” appears to be an excellent source for use in developing future objectives that describe desired outcomes.

Recent annual reports do include metrics, measures, and monitoring timing and frequency for much of the work. This information would be extremely useful to summarize in the actual description of planned projects and maintenance activities. Also, it could be very useful to develop outcome objectives at the priority watershed scale for key conditions (stream surface shading and summer/winter stream temperatures, percent of riparian zones in fully functioning condition, percent of historic steelhead habitat that is fully accessible, etc.).

Q2: Methods

The project does a generally complete job of describing a wide range of methods that are included in the three major components of the project: operations and maintenance, monitoring and evaluation, and project planning and implementation. In most cases this information is contained in annual reports and/or appendices for the proposal. While many of the objectives are fairly technical in nature, the Methods section felt limited in terms of specific details used to actually implement projects. Moving some detail into the proposal (from appendices and other reports) would be helpful. Although fish monitoring efforts are described in annual reports, which include adult fish monitoring (trapping in the past, video currently), redd surveys, smolt trapping, PIT tagging, and PIT tag detectors, more detail could be included in the proposal.

Q3: Provisions for M&E

The proposal provides a very limited description of ongoing monitoring and evaluation activities that are planned for various future types of restoration activities. This project has had a very complete set of past monitoring (implementation, effectiveness, and validation) activities. Included is some excellent photo point monitoring of various restoration treatments over

several years, which provide excellent documentation of various treatments and outcomes over time. The proponents should consistently include text to highlight those features that the pictures are intended to illustrate and to document a more formal process for creating and implementing a photo point network for individual projects.

It is noted in the proposal that Appendix C provides information on M&E and the management adjustment process for the full project. Appendix C is actually the "Little Trout Creek Monitoring and Adaptive Management Plan." Unfortunately, there is no discussion of how this Plan for an individual stand-alone project relates to a program of activities for the full project. Appendix C and annual reports emphasize that water temperature data are being collected for these projects. Given the importance of temperature to steelhead and to the fact that it is likely to change with climate, some evaluation of trends in temperature with restoration actions would be informative within this report. In the section on Confounding Factors, the authors pose the question as to whether or not the restoration work and ongoing recovery will be enough to address changes in climate. Beginning to understand the effectiveness of treatments for adaptation to climate change by evaluating temperature data will be an important start in a longer and more comprehensive effort.

With over 25 years of project history, the proponents are encouraged to present the response of the Trout Creek system in terms of habitat forming processes and fish production. Key questions include: How reliant is the Trout Creek system on site-by-site fixes? Are the projects done-to-date large enough and linked enough to promote sustainable habitat in the Trout Creek system? What influence has the project had on carrying capacity of native salmonids and steelhead smolt production?

Given constrained funding in the near future, discussion of a base level trend/effectiveness monitoring program would be a useful addition. It could potentially be applied at the priority watershed scale and use parameters such as stream surface shading, summer/winter stream temperatures, percent of historic fish habitat with full passage, and riparian condition using the index of "greenness" described in the SWCD Trout Creek proposal. Also, it may be helpful to explore opportunities for partnering with other groups working in close proximity to the basin. In particular, working with NRCS on monitoring efforts could benefit this project and similar projects being undertaken through CREP.

Past ISRP Reviews (2014 and 2005) have consistently identified the need to synthesize monitoring and evaluation results and lessons learned from this long running project. Although there is a detailed table on long-term accomplishments, there is no summary of the evaluation of past work (particularly results), actual vs predicted outcomes, and major lessons learned. For such a long running project, this information would be particularly useful for informing future

work and for other similar project activities in the Columbia Plateau. One approach could be to use select sets of photo point sequences to summarize key findings on the efficacy of various treatments. Key results and lessons learned could be included in the captions for these photo sets. More detail is provided in Condition 3 above.

It is apparent that many lessons learned have been used to modify management and treatment practices. It appears that this has been facilitated by a relatively small group of project personnel who have been with the project for long periods of time. The proposal notes, "Retrospective evaluation of past project work occurs constantly." Unfortunately, there is relatively little information presented in the proposal describing any actual process for project evaluation and adjustment. A more complete description of this would be useful, especially as long-term employees retire or leave the project and are replaced by new personnel with limited background on past practices and management.

Q4: Results – benefits to fish and wildlife

The proposal provides a detailed table displaying quantitative measures of past accomplishments (acres of riparian area protected, numbers of fish passage projects completed, miles of stream improved, etc.). How these accomplishments compare with the original implementation objectives is not discussed. Discussion of the ecological results (outcomes) of these actions also are not discussed in detail as part of the proposal. Some excellent photo point sequences are provided in the proposal. Although they were limited to a few projects, they are useful in showing results of various activity types over several years. More detail is found in Annual Reports and Appendices. It would be very beneficial to summarize select, key results and lessons learned as part of the main proposal.

There is a long history of status and trend monitoring for fish. There is little discussion of the data set for this work or major findings from its evaluation in the body of the main proposal. Much more detail is provided in Annual Reports and Appendices. Of particular note is the strong negative correlation between numbers of smolt outmigrants and their condition factor. This is not discussed, particularly as related to attainment of the long-term objective of 100,000 smolts by 2050. Also, some discussion of how non-salmonid fishes and amphibians could be monitored would be useful. Again, in acknowledgement of resource limitations, there may be opportunities to partner to get this information.

199802800 - Trout Creek Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Jefferson County Soil & Water Conservation District (SWCD)

Province/Subbasin: Columbia Plateau/Deschutes

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This is a well-written and organized proposal covering long-term, watershed-scale habitat restoration in Trout Creek. It documents the many activities and accomplishments for this project that began in 1999. The use of photo series to show results of past projects helps to demonstrate the quality and effectiveness of past work. The project reflects a strong commitment to develop many partnerships to contribute expertise and resources needed in the restoration of key areas of this Deschutes River tributary. However, it was not clear how far the past and planned activities go towards the totality of stream restoration needed to meet the goal of increasing fish carrying capacity.

In future annual reports and work plans, the proponents need to provide information to address the following Conditions:

1. **SMART objectives.** The proponents should provide SMART objectives (see proposal instructions) at the project or reach scale. Although there are some well-written objectives for expected outcomes from various individual restoration projects included in annual reports and appendices, the main body of the proposal does not include them. It might be useful to develop template objectives for various activity types and to develop quantitative measures based on individual projects. Examples could include, "Within 10 years of planting achieve ___% canopy cover of riparian vegetation and at least ___% stream surface shading." Also, it may be useful to develop these for use at the priority watershed scale.
2. **Monitoring summary.** The proponents should provide a brief summary of planned monitoring and evaluation activities for the time period covered by the proposal. Given the anticipated reductions in funding, description of a base-level program for effectiveness/trend monitoring would be helpful. Also, provide a time frame for the annual evaluation and reporting of M&E data and information.
3. **A synthesis.** The proponents should develop a synthesis and summary of key findings from past monitoring and evaluation efforts. This would include a retrospective look on

the prioritization and implementation of various restoration treatments, their effectiveness at meeting desired fish and habitat outcomes, key lessons learned, and a summary of resulting future actions to improve program performance. The proponents are encouraged to present the response of the Trout Creek system in terms of habitat forming processes and fish production. For example, how reliant is the Trout Creek system on site-by-site fixes? Are the projects done-to-date large enough and linked enough to promote sustainable habitat in the Trout Creek system? What influence has the project had on carrying capacity of native salmonids and steelhead smolt production?

A synthesis for this has been requested in various forms for the last two ISRP reviews but has not been provided. There is a long history of monitoring activities but a very limited statistical evaluation and summary of important findings. Given the long history of this project, the synthesis will directly benefit this project and will be of value to other projects well beyond the immediate project area. The ISRP is available for future discussion on the synthesis and would like to review the finished report.

It is anticipated that the proponent will work with ODFW in addressing these Conditions. Given the close working relationship with ODFW, the vast amount of collective knowledge and experience for the project and insights into its history, accomplishments and future plans, this coordination will likely be most efficient.

Q1: Clearly defined objectives and outcomes

The justification for the project is very clear. The proposal provides a complete discussion of the primary limiting factors for the watershed and description of the major categories of restoration treatments that will be used to address each. It is notable that all restoration efforts are being done on private lands and that the proponent has an admirable record of attracting matching funds for their efforts. A detailed list of projects and predicted accomplishments (quantitative) is provided for the time period 2021-2033. An additional summary table is provided to show all the primary goals and the total estimated measurable objectives the Jefferson County SWCD plans to accomplish for funded and currently unfunded projects through 2033. Quantitative implementation objectives identifying the expected accomplishments from each project are provided; however, implementation objectives for project monitoring and evaluation and project maintenance activities are not included.

Unfortunately, there are no corresponding objectives that describe desired outcomes and time frames for the planned protection and restoration activities. No monitoring objectives and associated time frames describing desired outcomes (physical or biological responses to

restoration) were provided that would indicate if or how success towards increasing salmonid carrying capacity would be assessed. The need to develop a core set of objectives describing desired outcomes and time frames is discussed in Condition 1.

The project is designed to address whole watersheds, from the uplands to the stream channels. Although the proposal provides a very complete discussion of why protection and restoration are needed, which includes the major categories of work/restoration treatments that will be used to address each, there are two potential areas that were not discussed in the problem description. They include 1) the potential effects of irrigation diversions on stream flow, and 2) the possible effects of toxic runoff associated with agriculture practices in the basin, particularly in the valley bottoms. These should likely be addressed in future proposals.

Q2: Methods

The proposal and appendices provide a thorough discussion of methods that will be used to accomplish planned restoration work. A detailed listing and description for each of the methods/steps required for Stream Channel/Floodplain Connection Restoration are also provided and describe the time and effort invested in planning this type of restoration work. This listing is very useful to better understand the overall design and implementation process. Additionally, the project team's acknowledgement of the time needed to develop trust with landowners is appreciated. The proponent made it clear that extensive planning and pre-project assessment efforts are a part of their process before implementation of proven stream improvement techniques. A detailed timeline was provided that helped to elucidate the flow of the project activities.

The proponent made it clear that extensive planning and pre-project assessment efforts are a part of their process before implementation of proven stream improvement techniques. There is additional discussion about changes to the design and implementation of various treatments that have occurred over the life of the project that are a result of long-term observation and experience.

Q3: Provisions for M&E

Monitoring and evaluation are generally addressed, but there is not a description of planned M&E activities for the projects and associated time frames for completion in the current proposal. The authors do a good job of reporting project accomplishment metrics (i.e., number of stream miles straightened, etc.), but quantitative evidence is not provided to show their effectiveness in achieving goals and objectives. The proposal notes that the proponents coordinate extensively with Project 199404200 (ODFW lead proponent) for project activities

and physical attributes monitoring. For overall project monitoring, the proposal states, “Our process is simple, get in the field and observe. The Jefferson SWCD Project Lead and the ODFW Project Lead spend as much time as possible observing past restoration efforts during different flow levels and times of the year, albeit our time seems to be much more limited these days.” Efforts to evaluate project outcomes are not fully described. It is clear that the consistent use of long-term observations has provided strong insights into the performance of various treatments over time and under a wide range of conditions. As an example, the proponents note, “long-term experience and observation of past habitat improvement project work have allowed the project leaders of both projects to refine the design of stream pattern and profile, develop better construction techniques, and modify project revegetation methods enabling better long-term project results. These lessons have combined to deliver an evolving approach to project design that results in high quality habitat restoration projects at a cost-effective price.” A number of excellent photo point sequences are also provided when describing lessons learned. One suggestion would be to include text more consistently to highlight those features that the pictures are best meant to compare. Also, documentation of a more formal process for establishing and using a network of photo points would be useful. Unfortunately, there is no discussion regarding the periodic evaluation of monitoring data and summarization and reporting of important findings.

The degree of fish monitoring for measuring success towards the goal of increasing carrying capacity for summer steelhead was not presented in the proposal. The proponent noted that they aid ODFW in fish assessment efforts such as redd surveys, video weir, trapping, and PIT tagging summer steelhead smolts, but results of these efforts (e.g., fish density, fish survival) were not provided, nor were these fish monitoring efforts provided in the closely related project proposal 199404200 led by ODFW. The question not addressed is if the stream improvement actions are having a measurable positive influence on the focal fish species of summer steelhead and redband trout. Furthermore, it was not made apparent that the fish monitoring efforts are specific and adequate enough to allow assessment of the fish response.

Providing better quantitative measures of success could have an important role in securing additional funding and in gaining support from landowners in the basin. Additionally, quantitative metrics to evaluate shortcomings in efforts would be helpful in making specific modifications to actions. One example where quantitative metrics could be useful is in reference to Antelope Creek, a formerly intermittent stream now reported as being perennial due to the presence of beaver dams. This is an important achievement, and it would be helpful to see outcomes supported by measured changes in flow and/or some characterization of the number/size of beaver dams providing storage. This type of understanding could benefit not only other projects in this subbasin but could serve as a benchmark for other restoration efforts in many other places.

There is also a description that generally addresses “large-scale” habitat projects and notes, “On our large-scale habitat projects, we do have monitoring frequency, timing, and duration thresholds above and beyond just observation. These activities include surveying stream reaches to determine changes in structure, vegetation composition, and re-taking annual photo points.” A monitoring frequency and duration flow chart is provided for the Little Trout Creek Habitat Improvement Project. It is an informative chart but does not include steps for evaluation of data and reporting of results. Also, there is no discussion of the process for evaluating long-term data sets or in reporting results and findings. A useful addition to the proposal would be the description of a possible "base level" trend/effectiveness monitoring program. This could be as focused as a network of thermographs for measuring summer and winter stream temperatures and use of the index, mentioned in the proposal, to measure "greenness" of riparian vegetation corridors using Landsat data.

Q4: Results – benefits to fish and wildlife

Benefits are generally well described, although use of more quantitative measures of project outcomes could likely yield more insights into the success of work that has been accomplished. A summary table of past accomplishments is provided. It documents quantitative accomplishments of past work activities. Reported accomplishments include items such as Length of Stream Restoration, Added Stream Length (miles), Average Flood Prone Width Increase (% change), Wetland/Pond Habitat Created (acres), Added Pool/Riffle Complexes (number of complexes) and Added Alcove Refugia (number of sites).

Although there is limited reporting of overall outcomes by project type or by priority watershed, there are some good examples of successful project results provided. They include some excellent photo point series showing project site conditions before and for many years after project completion. Many of the results shown are quite impressive. It is noted, “We have also been able to see the progression over time of these types of restoration efforts. Once a stream channel is reconnected to the floodplain and vigorous riparian vegetation gets established, we have observed a massive increase in the beaver population and associated beaver activity in these stream reaches.”

A summary of qualitative and quantitative results/outcomes of past work, by priority watershed, would be extremely useful to fully describe the scope and benefits of this impressive, long-running project.

200830100 - Habitat Restoration Planning, Design, and Implementation within the Boundaries of the Confederated Tribes of the Warm Springs Reservation of Oregon, Lower Deschutes River, Oregon

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Fish Habitat Program, Fisheries Department, Confederated Tribes of the Warm Springs Reservation of Oregon

Province/Subbasin: Columbia Plateau/Deschutes

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This detailed proposal provides a substantial amount of information. The proponents are to be congratulated on the time and effort that went into its development. It is clear that this is a well-organized project and one that has made substantial progress toward the landscape-scale restoration of reservation watersheds. The efforts are guided by an over-arching restoration strategy and prioritization matrix that provides strategic guidance for project development and planning. It is clear that project personnel are strongly committed to the continued effectiveness of their watershed and habitat protection and restoration work and community outreach efforts.

In the next annual report and future work plans, the proponents need to provide information to address the following Conditions:

1. **SMART objectives.** The proponents should provide SMART effectiveness objectives (see proposal instructions) for each of the major treatment types describing expected outcomes from project work, including public outreach. A primary goal of the project is to increase the amount of spawning and rearing habitat. A focus of the objectives needs to address metrics that are useful in gauging the amount and general quality of any of these added habitats. Outcomes for restoration treatments are likely best framed for a treatment reach or for a priority watershed. The effectiveness objectives need to meet SMART criteria (see proposal instructions). Some potential examples of outcomes for restoration work at a project or reach scale could include:
 - *By_20xx__, ensure that stream surface shading is at least 60% and that the average number of days where summer maximum stream temperature exceeds 68 F is less than _____. (Protection of water temperature)*

- *By_20xx__, increase the frequency of large primary pools to at least ____per mile. (Restore habitat complexity)*

And for public outreach:

- *By_20xx__, increase annual participation in community outreach activities to at least ____people reached. (Community outreach)*

Where treatments are designed to create thermal refuge and protect water temperatures, it would be helpful to identify the number of refuges to be established and the approximate river miles estimated to be affected.

The examples above can serve as a template for continued development of project scale, outcome objectives for all major work activities covered under the current proposal.

2. **Linkages between projects.** The proponents should provide a more detailed description of the linkage between this project and the sister projects. These projects are described as providing the *“bulk of the field monitoring and data collection.”* This information should include: A) identification of specific activities and timing for M&E of projects and treatment types, B) incorporation of project-scale outcome/effectiveness objectives, C) development of a general timeline and process for evaluation of data and summary of major findings/lessons learned, and D) incorporation of more detail on the gathering and evaluation of fish response data, including that for bull trout and lamprey, and its use in adjusting restoration treatments and locations.

While the proposal is well crafted and provides the information necessary to judge its scientific merit, the proposal is very long (41 pages without references or appendices), and future proposal could be reduced in length.

Q1: Clearly defined objectives and outcomes

The proposal provides a generally complete description of the range of problems that are to be addressed for whole watershed restoration. A good deal of survey and assessment data are provided, and numerous references are included to support identified problems, their source, and likely impacts on watershed conditions, habitat, and target fish species. From a review perspective, however, it would have been helpful to have the specific issues presented more succinctly (the recommendation is two pages or less). The rich information that the authors do provide, however, could form the basis of a review article, which would then only require a brief reference in the problem statement.

One area that should have additional discussion is the issue of toxic materials entering streams from adjacent roads and highways. Potential inputs from OR Highway-26 should receive additional discussion, especially given the recent research results on the effects of pollutants to fish and other aquatic life.

The proposal provides a good deal of documentation on the criteria that will be used to develop project-level implementation and effectiveness objectives. Although no discrete implementation objectives were provided for project implementation, maintenance, or monitoring/evaluation activities, presumably these are contained in detailed plans for project implementation. This was not made clear in the proposal.

To describe desired outcomes, five major limiting factors are identified, and seven primary "objectives" are identified. Other than the objective for sediment (achieve $\leq 20\%$ sediment ≤ 6.4 mm in diameter in streambed substrate), the other four objectives are qualitative descriptions and have no time frames for expected achievement. For example, these include, "*restore habitat complexity to historic, baseline conditions; Increase of thermal refugia and protection of water temperatures against global climate change; Restoration of watershed hydrologic function, including an increase of floodplain and wetland habitat areas; Protection of critical habitat and Conduct outreach with the Tribal community.*" Where the need to increase thermal refugia and protect water temperatures is described, it would be helpful to identify the number of refuges to be established or perhaps the river miles to be affected as part of specific projects. This would serve as a benchmark against which progress could be measured. Related to this, a metric for measuring the restoration of watershed hydrologic function would be very useful.

The ISRP commends the project for including restoration activities that address upslope factors, particularly vegetation impacting summer stream flows and road conditions resulting in accelerated sediment delivery to streams. Community outreach activities are also included in the primary objectives. Unfortunately, the reviewers could find no examples of effectiveness objectives that met SMART criteria to describe desired outcomes for restoration projects, project maintenance, monitoring evaluation, or community outreach activities. It appears that most of the information and detail are in place to establish a core set of these objectives for the various project components. Examples of objectives for selected project activities are needed, especially those describing desired/expected outcomes and the associated time frames for accomplishment.

Q2: Methods

The proposal does a commendable job of fully describing methods for project planning, implementation and for various categories of monitoring. A good deal of data from a variety of

past assessments are supported by maps and references to describe methods. These methods link directly to qualitative objectives that are not time bound. Linking methods to a core set of implementation and effectiveness objectives that meet SMART criteria will significantly improve the proposal.

The proposal provides a detailed description of a Warm Springs Reservation Restoration Strategy developed by the CTWSRO Fish Habitat Program. This strategy is designed to set the course for watershed scale protection and restoration for the next 20 years. Also use of a “prioritization matrix” is presented. This is used to help prioritize locations for protection and restoration activities.

For the three projects to be completed in the next five-year time period (Log Springs Meadow Restoration Project, Shitike Creek, and Warm Springs River, and Middle Beaver Creek), details of the projects could be included in a table similar to Table 5 and Table 8. This would be a good way to organize limiting factors to be addressed, species that will benefit, and proposed actions to be taken. When the projects are complete, tables could be updated to show progress.

Finally, a quite comprehensive description of three major confounding factors is provided. They include climate change and effects to stream temperatures and natural hydrologic processes; cumulative impacts of past and ongoing timber harvesting operations on Reservation sub-watersheds and streams; and the impact of stormwater runoff from highways and roads into stream channels influencing the survival of adult and juvenile salmonids.

Q3: Provisions for M&E

The proposal provides a good deal of general guidance information for project-level monitoring and evaluation activities. It is stated, *“it is expected that the bulk of the field monitoring and data collection will be carried out by its sister projects,”* and *“The CTWSRO Fish Habitat program employs a range of M&E methods that are tailored to each individual project, depending on its objectives, design features, location, and the limiting factors being addressed.”* There is limited discussion describing the actual linkage between the monitoring of sister projects and this proposal. The proposal provides a good amount of detail regarding approach and criteria for monitoring activities, but it does not provide any examples of an actual monitoring plan for a given project or set of activities. Although details of accomplishments are provided for past projects, discussion could be improved regarding how well the activities met intended outcomes or time frames for restoration response. Extensive use of a strong BACI approach to evaluate habitat and fish response to restoration efforts was described. Also, the proponent provided a good deal of information that addressed weaknesses identified in past ISRP reviews.

Since summer stream temperatures in many reservation streams are a key concern for the project, a general point to keep in mind is that modeled estimates of future water temperatures with changes in climate typically do not account for unique local characteristics or specific management actions intended to lead to reductions in water temperatures. These estimates are useful for guiding project planning, but documenting actual changes in water temperatures occurring with changing climate and effects of restoration actions will be critical for guiding efforts in the future.

The proposal provides a number of examples of lessons learned and describes how they have been used to adjust program activities and management. Additionally, there is some very complete documentation of project activities and accomplishments in annual reports. However, there is no direct description of an actual process that is used to periodically review and evaluate M&E findings, field observations, and work experiences, nor a description of how to link what is learned to adjust goals, activities and management decision making. This should be provided in future reports and proposals.

Q4: Results – benefits to fish and wildlife

The project provides a quite detailed description of both quantitative and qualitative results of past project work. There is a listing of past projects, accomplishments, and general responses for two of the streams with past restoration projects including fish population data from the AEM program. Summary tables are provided for each treatment type listing past project accomplishments. There is also a summary of six lessons learned, mostly focusing on restoration techniques. Additionally, recent annual reports provide additional detail for types of various project accomplishments (riparian protection, sediment reduction, community outreach). This information is provided in separate sections of the report. An overall summary describing major results would be particularly useful. Evidence included in the proposal indicates potential benefits to fish and wildlife, but a more explicit characterization would be helpful. Table 6 shows changes in steelhead, Chinook salmon, and coho salmon for one project in particular (Mill Creek at Potter's Ponds), and that was encouraging, but no specific results were presented for bull trout or lamprey, which were also species of concern.

A major shortcoming is the lack of quantitative, time-bound (SMART) objectives describing desired outcomes for various project treatments and activity types. Although the proposal information makes it clear that a good deal has been accomplished, it is difficult to determine the degree to which the actual results to date match those that were originally planned.

200830600 - Deschutes River Fall Chinook Research and Monitoring

No Proposal | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of Warm Springs

Province/Subbasin: Columbia Plateau/Deschutes

Recommendation: No proposal received

Overall comment:

ISRP review is pending submittal of a proposal.

200831100 - Natural Production Management and Monitoring

No proposal | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of Warm Springs

Province/Subbasin: Columbia Plateau/Deschutes

Recommendation: No proposal received

Overall comment:

ISRP review is pending submittal of a proposal.

John Day River

198402100 - John Day Habitat Enhancement

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department Fish and Wildlife

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The proponents did not explicitly address the six topics in our response request, but instead they responded to our text for the four ISRP comments that followed the response requests. We reviewed the information provided by the proponents and attempted to evaluate the response in terms of the six topics we asked them to address.

The ISRP requests the proponents to provide information on the following three conditions in the next annual report and future workplans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to also revise their proposal to reflect these additions.

1. **SMART objectives.** The proponents should provide SMART objectives with explicit quantitative definitions of the project's expected overall ecological outcomes. They should explain the level of ecological response that they would consider meets the objective.
2. **Project evaluation and adjustment.** The proponents should describe their adaptive management process, including the regular process of project planning, assessment and evaluation, decision making, and the mechanism for determining and recording adaptive actions. They should identify the participants expected to contribute in each step of the adaptive management process.
3. **Synthesis.** By the end of the project funding period, the proponents should provide an update to their previous comprehensive assessment in 2008. This synthesis should quantify the overall contribution of their 37 years of protection and restoration of riparian habitats in the John Day River basin and the contributions to overall watershed conditions. The synthesis should identify the project's benefits to fish and wildlife and

the degree to which the project has improved limiting factors within the John Day subbasin.

In our preliminary review, we requested a response on the topics listed below. Our final comments based on the response are provided after each topic:

1. **SMART objectives.** The proponent emphasizes that they are not contractually obligated to monitor their actions to the level necessary to quantify the degree to which they achieved the objective's targets. They indicate that "objectives and methods that are quantifiable, can be measured, and have been proven to achieve our stated goals referenced by several peer reviewed publications provided."

However, the overall project outcomes provided in the proponents' response are stated as increases or decreases without any quantifiable *target outcomes* (i.e., miles of river with exclosures per year, xx more days of floodplain connectivity, etc.). Without clear measurable objectives that describe expected ecological outcomes, it is unclear what level of increase or decrease would be viewed as successful and the basis for continued implementation.

For example, if restoration of riparian vegetation is one of the primary goals of the overall project, the SMART objective should identify the expected quantitative outcomes and timeframes for their attainment. An example of a SMART objective for the overall outcomes for riparian revegetation might be:

"Increase length of riparian vegetation protected by stream fencing by XX miles from 2022 to 2026, which would restore XX% of the potential riparian protection that has been identified as needed in the subbasin and increase the total miles of riparian vegetation protected by this project since 1984 by XX%."

If the proponents have determined the proportion of the riparian area with either woody riparian vegetation, grasses, or wetland vegetation and has estimated the extent and rate of recovery anticipated, they could develop even more informative SMART objectives based on the intended outcome for the vegetation and the timeframe over which that would be achieved.

The proponent listed the potential projects for 2022 to 2026. For some of the projects, they indicated the planned number of riparian plants, miles of riparian fence, and number of BDAs. This information would serve as a start for developing overall SMART implementation objectives. The objectives could state the amount of habitat restoration planned to be implemented. This information could be related directly to overall assessments of habitat and limiting factors in the basin, such as the Atlas and the FIP

Strategy, and the proponents could express the actions as a proportion of the total identified need for restoration in the subbasin.

We encourage the proponents to contact us if they have additional questions or issues they would like to discuss.

2. **Overall plan.** The proponent provides a list of roughly 25 projects they anticipate will be implemented from 2022-2027 and briefly indicates what will be implemented (e.g., miles of fencing, numbers of trees planted, numbers of BDAs). The response states that the projects for each year are selected by a core group of ODFW staff primarily from the Fish Habitat Program and the District and Assistant Fish Biologists. It does not indicate whether these meetings are ad hoc meetings held whenever the project director feels they are needed or whether they are part of a regular systematic prioritization process. It also does not indicate whether the project coordinates with other cooperators in the John Day River subbasin, such as the John Day FIP.

3. **Implementation monitoring.** The proponents indicate that they plan to evaluate the Murderers Creek Habitat Improvement Project. The response also states that other projects would be monitored by the ODFW monitoring project, but it did not specify which projects. It would be useful to include this information in the next annual report.

The proponents' plan to evaluate all BDA constructed projects based on photopoints and evaluation of fish passage and ecological structure and function. These will be assessed at low and high flow 1 to 2 years after implementation and again in 5, 10, and 15 years. The response does not indicate how fish passage or ecological function will be assessed. This should be described. The revision states that "adaptive management will occur when structure function or fish passage is not acceptable or has failed" but it does not describe what determines acceptability or failure and does not explain the adaptive management process. Addressing these elements will improve the overall quality of monitoring and adaptive management.

4. **M&E matrix – support.** The proponents assisted the John Day River Salmonid Monitoring to Inform Recovery Project (199801600) in developing the RM&E Matrix for the John Day area, which was a strong summary of the monitoring and evaluation strategy and addressed a number of questions for the ISRP. The ISRP appreciates the collective efforts to develop the RM&E Matrix and Summary for the John Day subbasin and finds it very useful for reviewing this project. After establishing targets for this project's objectives, the proponents are encouraged to continue this collaboration with the lead project to ensure its objectives are being achieved.

5. **Project evaluation and adjustment.** The Response does not identify an explicit adaptive management approach that includes a regular process of project planning, assessment and evaluation, decision making, and a process for determining and recording adaptive actions. The response summarizes how the project uses “a core group of ODFW staff, primarily from the Fish Habitat Program and the District and Assistant Fish Biologists” to select projects. It appears that many or all of these projects are identified through the Atlas Scoping and Mapping Process of the John Day basin Partnership and ODFW is one of the partners. This process appears to provide some of the elements of an adaptive management approach, relying on the Atlas planning process and the Fish Research Program to assess benefits. However, the project does not describe a strategic evaluation process to understand when and how the objectives and activities of the overall project need to be revisited and/or modified.
6. **Synthesis.** In our Response Request, we asked the proponent to describe the overall contribution to riparian habitats in the John Day River basin and the degree to which the project has influenced limiting factors within the basin. We also asked for information on any documentation of this in previous publications, technical reports, or annual reports.

In the response, the proponents use information on steelhead habitat and steelhead densities to determine the proportion of the steelhead population that exists within stream reaches that have been fenced by this project in the five major subbasins of the John Day basin. They report that 5 to 17% of the steelhead in the John Day basin potentially benefit from their fencing projects. They also describe habitat benefits that have been documented for fencing projects in Thirtymile Creek. We commend the proponents for bringing in these types of data and analyses to document benefits of the habitat projects and encourage them to build on the analyses of benefits they reported in their 2008 Comprehensive Project Review.

The ISRP requested information on the overall contribution of the project and the degree to which the project has influenced limiting factors. The proponents produced a previous Synthesis Report in 2008 (Comprehensive Project Review [1984-2007], Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project), but this report was not mentioned in the proponents’ response. The ISRP review of the Comprehensive Project Review noted that the project has many strengths, but found that, while the restoration practices were recognized as scientifically justifiable practices, the project did not demonstrate the degree to which the project met objectives of the subbasin plan or provided meaningful benefits to fish and wildlife.

After 37 years of restoration implementation, the proponent should update the 2008 synthesis report and provide the information requested in the previous reviews. The assessment provided in the project's response should be expanded to all relevant species and directly address known limiting factors.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

Over the last 36 years, the John Day Habitat Enhancement project has focused primarily on protecting and restoring riparian and instream habitat through fencing and planting to contribute to the recovery of Mid-Columbia summer steelhead and spring Chinook salmon. The proponents have a long record of working with landowners and partners to protect riparian areas in the five major subbasins of the John Day River basin. This is a long running project with demonstrated success in working with private landowners to protect riparian habitat.

Several key elements of an effective project are not included in the proposal. The ISRP expected the proponents to have target accomplishments for each type of action; for instance, miles of new fencing, miles of fences repaired/maintained, number of off-channel improvements (e.g., beaver analog devices/sites), and these should be reflected in the SMART objectives. More complete detail on the project methods, including prioritization of subbasins, a data-informed process for identifying when passive restoration is acceptable, provisions for monitoring of project metrics that directly reflect the intended benefits (e.g., groundwater storage), and justification or elimination of streambank stabilization for protecting and enhancing anadromous habitat.

Analysis of existing data is needed to evaluate the efforts from the prior project phase have provided benefits or if alternate strategies should be employed. In addition, the proposal needs to describe a strategic monitoring approach that uses data from project partners and efficiently focuses limited monitoring resources on detecting intended benefits. Furthermore, the confounding factors section should explain how the project is addressing the identified factors in planning, monitoring, and evaluation. Finally, the proposal needs to describe how the proponents (1) evaluate individual actions and the project as a whole and (2) make adjustments when it is determined that project objectives are not being achieved.

The ISRP asks the proponents to provide information about the following in a response. The response can directly answer each topic requested or provide a revised proposal with a brief

point-by-point response to the ISRP referencing where, and summarizing how, the issues were addressed in the revised proposal:

1. **SMART objectives.** Provide SMART objectives (see proposal instructions) for riparian habitat, channel conditions, water temperature, or fish populations and indicate how they were identified based on the Atlas Prioritization process.
2. **Overall plan.** The proponents should describe the overall plan for the project for the full length of the next project period. Have specific projects been selected and scheduled for implementation? If so, what is the timeline for those project components?
3. **Implementation monitoring.** What specific aspects of specific projects will be monitored, including implementation monitoring, photopoints, or collaborations with other monitoring projects? Have the methods for monitoring been documented?
4. **M&E matrix - support.** The ISRP is requesting a response from the Escapement and Productivity of Spring Chinook and Steelhead project (199801600) to summarize linkages between implementation and all monitoring projects in the basin. We are asking your project to assist them in creating the summary by providing information to them about what is being monitored for your implementation project, as well as where, when, and by whom the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
5. **Project evaluation and adjustment.** What is the structured and scheduled process used for adaptive management of the project? The description needs to include planning, prioritization, project selections, implementation, assessment, evaluation, decision making, and recording of decisions.
6. **Synthesis.** After 37 years, what has been the overall contribution to riparian habitats in the John Day River basin and to overall watershed conditions (e.g., area or length protected, proportion of unshaded stream miles that have been revegetated)? To what degree has the project influenced limiting factors within the basin? Has this been documented in previous reports or Annual Reports? Note that this response should not require detailed monitoring data or complex landscape models. The Atlas process should provide the necessary context and data for such an analysis. This type of analysis also was recommended in the 2008 and 2014 ISRP reviews.

Q1: Clearly defined objectives and outcomes

The proposal identifies two major goals: restoring riparian zones with livestock exposures and restoring floodplain connectivity through constructed beaver dam analogs (BDA) and large

wood. All objectives for these goals are implementation objectives related to planning, implementation metrics, inspections, and maintenance, and total amounts of fencing or structures installed.

No SMART objectives are developed for habitat conditions or biological responses. The objectives primarily are a list of tasks with limited detail about what is expected to be accomplished, even in terms of implementation. Without quantitative objectives, what are the criteria for evaluation of performance or project success? In addition, clearer justification is needed that the objectives provide the expected outcome of improving ecological function. The 2013 Geographic Review called for the project to develop quantitative objectives with time frames for expected responses, but the project has not responded to the recommendation.

Q2: Methods

The Methods section of the proposal largely describes the general processes used in site selection, design, cooperative agreements, and construction. The project has expanded its methods to include off-channel water developments (such as Beaver Analog Devices and other approaches) to improve local riparian conditions. The proponents also have switched to metal posts for fencing to improve longevity (fire resistant).

The Methods section does not provide detailed descriptions of the methods or citations to references where those details could be obtained. The Methods section presents a task list but does not provide content on how the tasks would be completed.

Several aspects of the methods require additional description in the proposal:

- Photo points are used to document temporal changes, but the photo frequency as well as the metrics quantified from the photos are not identified. No information is provided showing the utility of the photo points toward achieving fish and wildlife goals and objectives.
- The ISRP supports the project's transition to focusing efforts within priority subbasins (page 13 of the proposal), but the proposal does not describe how prioritization occurs or which basins are the highest priority. We assume that it uses the John Day Atlas, but the proposal does not make that clear.
- The proposal identifies that riparian vegetation planting may be necessary for stream reaches that are not recovering passively. How do proponents determine that recovery is not adequate, and planting is needed? Given the lack of appreciable change demonstrated in the LiDAR imagery shown in the Appendix, a data-based

process for evaluating recovery and identifying where more intensive planting is required seems critical.

- The metrics proposed for the LT-PBR sites (page 18 in the proposal) are not likely to document the benefits being sought, especially groundwater storage. Additional monitoring will be needed to demonstrate the benefit, particularly given the wide range of results reported in the literature on the effectiveness of BDAs in storing groundwater and recent publications on hydrologic limitations of wet meadow restoration of streamflow (Nash et al. 2018).
- The proposal mentions (page 18) implementing streambank stabilization projects where needed. This is not included in the goals or objectives, and it is not clear how this serves the priority species. It is not clear what habitat benefits stable streambanks provide. Is it intended to reduce sediment loads to the river? Much clearer justification for the habitat benefits of streambank stabilization, based on data and/or peer-reviewed literature, is needed or else this activity should be eliminated from the scope of work.
- The proposal contains a Gantt chart of general monthly activities for 2023 and 2024. The chart does not include specific projects or types of projects and does not include activities beyond years 2023 and 2024.

Q3: Provisions for M&E

The proponents note that BPA funds for monitoring are limited to 5% of total project cost and, as well, monitoring largely occurs through cooperation with the ODFW fish monitoring project (199801600). The ISRP recognizes that monitoring of effectiveness for an implementation project like this one will come from other projects or monitoring programs. Nevertheless, the types, locations, objectives, and outcomes of monitoring occurring for the John Day Habitat Enhancement project were not described in the proposal. Separately, the ISRP is asking the ODFW fish monitoring project to develop a matrix of monitoring activities and their specific connections to habitat and hatchery implementation projects in the John Day River basin. The ISRP is requesting that this habitat project should assist the lead project in developing this overview of implementation and monitoring in the basin.

The proposal points out that habitat projects such as BDAs also can be evaluated over time and indicated a few metrics for habitat and fish passage that can be used for BDA projects, but it did not indicate if those would actually be measured. While some content was provided regarding when BDAs are considered successful (“when stream flows are extended or become perennial, floodplains remain connected for longer durations, stream beds show evidence of sediment

aggradation, and fish passage is maintained during 5% through 95% exceedance levels.”), there was no indication in the proposal that those things would be monitored, either by this project or cooperating projects. This is especially critical since the literature indicates the BDAs do not always produce the benefits expected by the proponents.

The proposal describes the proponents’ use of the Atlas Scoping and Mapping Process to prioritize projects at a landscape scale. The proposal indicates that ODFW will utilize this to the greatest extent possible. This seems to imply that there are factors that limit the use of the Atlas process, but it does not provide an explanation of what factors would limit its application. Clarification is needed about the prioritization process.

The project indicated in the 2013 Geographic Review that it is developing relationships between freshwater productivity and habitat variables at the watershed scale. This proposal provided no indication that such analysis is occurring. Both of the two previous ISRP reviews (2008 and 2014) raised concerns that habitat results were not adequately reported and that little monitoring and evaluation was occurring. That concern remains. In the past, the proponents have maintained that they are implementing actions recognized to be effective in the region and specific evaluation within the John Day River basin is not necessary. They describe monitoring conducted by others in Bridge Creek and Middle Fork John Day IMW. Independent of detailed monitoring at every project site, the proponents could develop an overall assessment of the potential biological benefits contributed by this project based on known relationships from other studies.

The proponents provide no explanation of a structured, systematic evaluation process, such as an adaptive management plan. The proposal clearly indicates that they collaborate with partners and participate in a number of planning groups, but they do not describe their own sequence of planning, design, implementation, evaluation, and decision-making. The proponents do not describe a scheduled process or regular meeting to evaluate outcomes, make decisions, and record the outcomes and decisions.

The confounding factors identified in the proposal are limited essentially to climate change or its influence on stream temperature. The proponents indicate that efforts to maintain riparian shade and floodplain connectivity would be beneficial in the face a warming trends within the region. The proposal mentions that warming trends exacerbate the effects of invasive smallmouth bass, which is a well-documented problem in the John Day River basin. It does not describe activities to coordinate project implementation with other actions to control nonnative predators, such as smallmouth bass. In the face of climate change and expansion of the distribution of smallmouth bass, it would be strategic for the project to directly consider (e.g., risk analysis) how expanding predation should impact the project prioritization and

selection process. The proposal does not address other potential confounding factors in the John Day River basin, such as upslope conditions, irrigation and water withdrawal, human population growth, environmental contaminants, or other factors that may influence the success of their actions.

Q4: Results – benefits to fish and wildlife

Since it began in 1984, the project has protected 283 miles of streams and 10,154 acres of riparian habitat, installed 450 miles of fencing, completed 175 individual projects, planted over 74,000 riparian plants, and applied 3,745 pounds of native grass seed. Currently, 6,535 riparian acres are actively managed and maintained through the program. Since the last ISRP review, the proponents have constructed 141 miles of fencing with 52 individual landowners, installed 6 off-channel watering sites, constructed 39 instream habitat features, and constructed 23 BDA structures. Figure 2 in the proposal illustrates the number of miles protected by year. The graph indicates that the miles protected have decreased in recent years, but the apparent reduction is not discussed or explained. The proposal also describes changes in their approach to be more effective, which include obtaining longer cooperative riparian area agreements, increasing width of riparian exposures, and including instream habitat improvements.

The proposal describes the overall approach and how it is linked to documented limiting factors. It presents findings of past research on the effectiveness of livestock exclosures in both the John Day River basin and other areas of Northeast Oregon. Monitoring and evaluation by others show that a portion of the riparian fencing sites have provided some benefits, with the exception of temperature, which is not surprising given the limited spatial dimensions of the individual actions. While significant improvements in habitat conditions have been observed for livestock exclosures, most responses of fish populations have not been statistically significant. Reasons suggested to explain this include the limited size of exclosures, overall effects of reach-level and basin conditions water quality and habitat, maintenance of exclosures, and other factors. Additional analysis is needed to demonstrate where and what types of benefits for fish and wildlife are produced by the projects' restoration actions. Given that some of the project's restoration actions are monitored as part of ODFW monitoring Project 199801600, the proposal should provide information on the results of past monitoring to evaluate project benefits.

After 37 years, the project should be able to describe the overall contribution to riparian habitats in the John Day River basin and to overall watershed conditions (e.g., area or length protected, proportion of unshaded stream miles that have been revegetated, potential benefits to fish and wildlife). To what degree has the project influenced limiting factors within the basin? Addressing this concern does not require detailed monitoring data or complex landscape models. It could be based on simple relationships between riparian habitat conditions and

abundance of fish and wildlife obtained from scientific literature. The Atlas process should provide the necessary context and data for such an analysis. It is a mature project in close collaboration with ODFW monitoring and assessment projects and, as such, a comprehensive analysis of the benefits of the project to fish and wildlife is well within the collective capacity of the proponents and their partners. This type of analysis also was recommended in the 2008 and 2014 ISRP reviews.

References

Nash, C.S., J.S. Selker, G.E. Grant, S.L. Lewis, and P. Noël. 2018. A physical framework for evaluating net effects of wet meadow restoration on late-summer streamflow. *Ecohydrology*. 11: e1953-. <https://doi.org/10.1002/eco.1953>.

199306600 - Oregon Fish Screens Project

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish & Wildlife

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

Based on the response, the ISRP finds that the project has adequately addressed concerns #1, #2, #3, and #5, but places conditions on the projects related to #4. In addition, the ISRP again recommends that BPA provide the resources to the proponents to conduct some basic planning and prioritizing for the project to fully develop an implementation strategy beyond the next contract cycle.

The ISRP requests the proponents to provide information on the following two conditions in the next annual report.

1. **Coordination with M&E projects.** Document the strategy for coordinating with projects conducting M&E in the basin.
2. **Project evaluation and adjustment.** Develop an explicit schedule for project evaluation and assessment and document their strategy and systematic evaluation process.

In our preliminary review, we requested a response on the topics listed below. Our final comments based on the response are provided after each topic:

1. **Summary of projects.** In the proponents' responses to items #1 and #4, the information provided gives some clarity on how projects are selected. This process appears to be informal and based on the general priorities and insights of project partners. The proposal also indicates that projects are prioritized in consultation with District fish biologists, applying some combination of habitat conditions, presence or relative salmonid abundance, and water availability.

The table provided in the response is helpful as an indication of the potential projects that may be implemented during the next contract cycle. As noted in the proposal, all projects are not expected to be implemented, as issues can arise with personnel, cultural resource surveys, or other constraints. Site characteristics for some (but not all) of the projects provide some insight into the nature of the projects (e.g., "1.5 miles of habitat to next upstream barrier"), though no information is provided on what the "Cumulative Expert Panel Prioritization Score" is.

It was reported that future projects will be selected by local district fish biologists based on the anticipated benefits of a project. (The proposal also indicates this process is already occurring, hence the ISRP's confusion about how projects for the next contract cycle were selected.) However, it still is not clear whether the selection or ranking process is systematic and consistent from year to year. The spreadsheet does not explain how many potential projects were assessed and how the information of rankings, including Low Prioritization Ranking Scores, is documented and retained for future use. As with all projects, the ISRP expected to learn the details about the expected benefits, how they will be characterized, and how they will be used in prioritizing future projects. Given the large number of potential projects (3,411 identified in the response), prioritization for the greatest benefit seems particularly important. Key questions include, for example: How will benefits be characterized? How important are passage projects, relative to pump or gravity screens?

The response provides some general information for evaluating the science behind the project selection and for understanding the scope of projects for the next contract cycle. However, the current processes lack the structure that ISRP expects for programs managing such a large number of projects and a large budget. Simultaneously, the ISRP also recognizes that an adequate budget is necessary for evaluating potential need and priority of projects, and that the proponents currently rely on partners to investigate and prioritize projects. As a result, the ISRP finds that the project could proceed in the

coming contract cycle, but more information should be provided in the next annual report, including a clearer summary of the project selection process. The ISRP again recommends that BPA provide additional resources to the proponents to do this basic planning activity.

2. **Changing project scope.** The response adequately addresses ISRP concerns. Restoration activities are conducted at sites during fish passage/screening improvements and are funded by partners rather than BPA directly. Based on the response and the external source of funds for habitat restoration, it is unlikely that elimination of collaborative habitat restoration activities during fish passage and screening projects would increase the number of screening and passage projects implemented.
3. **M&E matrix – support.** The ISRP understands that this project does not conduct monitoring, aside from identifying the survival or failure of structures, but encourages the project to consider and clarify ways that data from the Escapement and Productivity project can be used for understanding and improving the screening projects.
4. **Project evaluation and adjustment.** The ISRP is required to assess monitoring and evaluation for every project. The M&E component is valuable for documenting a project's value and for evolving and improving the program over time. Having some strategy for program assessment/evaluation is essential, particularly for projects subject to administrative (i.e., budget declines) and hydrologic changes, as this one faces. While the ISRP understands that the project is not funded for monitoring of specific activities, there are funded M&E projects in the basin, as well as options for qualitative and low-cost processes for identifying what projects produce the most benefits, where/how projects and the program can be improved, and where the overall program may need adjustments to accommodate changes. Based on the content provided in the proponents' response to #5, the work conducted under the Escapement and Productivity project (199801600) seems particularly relevant for evaluating the impact of this program. However, it is not clear how or if this program is using those data to better understand the benefits or limitations of this project. The ISRP finds that this concern has not been adequately addressed and recommends that, in the next annual report, the proponents document their strategy for coordinating with other projects conducting M&E in the basin.

The ISRP appreciates the additional context for how the proponents are considering adjustments to the program, which is organized by key components (i.e., fiscal, prioritization, performance). Like the prioritization approach, the evaluation strategy appears to be informal and opportunistic, with some aspects focusing on individual adjustments and a few reflections aimed at the broader program. The response lists

types of decisions made by the project but does not describe a systematic process for evaluation and decision-making. Even with the need to respond immediately to unscheduled events and information, the project would benefit from a regularly scheduled assessment of the collective outcomes of the project for each current work year and documentation of the overall assessment in the next annual report. Such reports are required by BPA and could be readily linked to an adaptive evaluation and adjustment process based on the strategy for addressing needs for fish passage restoration and screening. The ISRP recommends that, in the next annual report, the proponents develop an explicit schedule for project evaluation and assessment and document their strategy and systematic evaluation and management adjustment process.

5. **Benefits to fish.** The ISRP appreciates the proponents pointing reviewers to the appropriate annual reports and contracts where results of the program are presented. However, as indicated in the directions for proposal preparation, these results are most useful if presented directly in the proposal so that the ISRP can clearly understand the benefits to fish and, thereby, avoid asking for this information in the response loop.

The results presented in the response on results from other studies, and especially data from the Escapement and Productivity project (199801600), provide evidence of the project's benefits and illustrate the power of collaboration with M&E projects. The ISRP encourages the project to continue to provide information and evidence of the benefits to fish in future annual reports and future proposals. In addition, the ISRP encourages the proponents to continue to look for opportunities to lead the region in understanding the benefits of the various screening projects. For example, the Lemhi study examined the efficacy of gravity diversions for Chinook salmon. The Escapement and Productivity project examined the effectiveness of rotary bypass systems for passing juvenile Spring Chinook salmon and steelhead. Some important questions include: Is there information about the pump screen projects? How might these different systems perform as hydrology changes? The proponents may seek to develop assessments of the relative benefits of pump screen projects with interested monitoring projects in the basin.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is an important project in the Columbia Basin Fish and Wildlife Program portfolio that should continue to receive support. Screening diversions and increasing access to habitat are

essential for the recovery of fish in the basin, and this project appears to be effective at implementing these protections for fish. However, the proposal lacks some important details needed for evaluating the project's next phase.

The proponents are requested to address the following in a point-by-point response to the ISRP:

1. **Summary of projects.** A summary of screening projects to be implemented under the new contract, including information used for prioritization and the characteristics of sites selected from the prioritization process.
2. **Changing project scope.** The change of scope to include habitat projects requires further information for scientific review. What actions are being proposed? What strategy is used for selecting and implementing habitat projects? What do "smaller" and "larger" scale projects refer to? Given that there already is not enough budget to adequately support the screening work, the ISRP also seeks to understand how the decision to implement habitat projects was made, and questions if the project title needs to be revised.
3. **M&E matrix - support.** The ISRP is requesting a response from the Escapement and Productivity of Spring Chinook and Steelhead project (199801600) to summarize linkages between implementation and all monitoring projects in the basin. We are asking your project to assist them in creating the summary by providing information to them about what is being monitored for your implementation project, as well as where, when, and by whom the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
4. **Project evaluation and adjustment.** The proponents should provide a summary of the strategy for adapting to project changes, independent of RM&E data, including things like how program priorities and objectives, indicators of project performance, and regular assessment are used in making decisions about program resources.
5. **Benefits to fish.** Given the funding level and availability of relevant data, the project should summarize the potential benefits to fish. The number of fish protected could be estimated simply from estimates of run abundance, passage efficiency, and SARs. At a minimum, a subset of actions need to be followed through time to judge effectiveness.

In addition, we direct the Council's attention again to the same recommendation from the 2013 Geographic Review (ISRP Report 2013-11), resulting in the ISRP "encouraging the Council and BPA to increase funding in order to improve the implementation rate." The project has cut staff and the number of projects implemented to accommodate the flat budget over the past 15

years, and additional resources are needed from BPA to maintain the productivity and benefits of this important project.

In future proposals, the ISRP requests that proponents include a map and summary of basic characteristics of projects implemented under the prior contract, including basin location and priority, species benefited, and other details. In addition, we recommend that the dashboard (<https://projects.nwcouncil.org/ProgramTracker/Modules/Screens/DashboardMap>) be updated to include information on the species benefited for each of the mapped screens.

Q1: Clearly defined objectives and outcomes

This project uses BPA funds to install screens and passage structures, and to implement habitat projects at locations where passage is restored. The proposal provides quantitative objectives for each year, though they are not all measurable (i.e., “improve” 10 miles). In addition, they are written as “up to” the targets (e.g., up to 10 gravity fish screens per year). Is there a minimum number of projects to accomplish each year, rather than a maximum? What happens if the project reaches its maximum objective? A minimum desired target would provide a metric to evaluate the project’s intended performance.

The proposal also provides objectives that represent the cumulative outcomes of the project. By 2040, the project aims to construct screens and headgates on 100 diversions, 50 miles of habitat access via passage projects, and restoration of 10 miles of habitat at passage projects. The ISRP notes that these objectives are similar in scope to what was conducted over the past *eight* years and assumes the reduced scope for the next 20 years is a result of the flat budget that was mentioned throughout the proposal, despite rising costs of labor and materials. Is this correct? This budget issue was raised during the 2013 Geographic Review, and the ISRP reiterates our same finding from that review. We are once again “encouraging the Council and BPA to increase funding in order to improve the implementation rate.”

Q2: Methods

Regarding screen design, the proponents appear to be applying best practice, using standard designs established by appropriate resource agencies (e.g., NOAA) and go through an extensive review process that involves both BPA and ODFW. Prior reviews have commented on the lack of a robust prioritization plan, and the proponents directly addressed this concern in the proposal. They still do not have a landscape level inventory or comprehensive prioritization plan due to lack of funding. Instead, their approach is to prioritize projects, among sites with willing landowners, by considering “species presence and numbers, habitat quality, water availability, statewide priority, focus areas, etc.” It would have been helpful if the proposal had included

summaries of the data used in prioritizing projects. The ISRP recommends that proponents maintain and report data on the prioritization criteria for selected projects under the next phase.

Prioritization is also accomplished through quarterly collaboration with in-basin partners, the use of priority basins from the John Day Atlas, as well as “maps and aerial photography,” though it was not clear how maps and imagery are used. What kinds of maps (e.g., OWRD’s Points of Diversion) are examined, and how is that information used? The narrative suggests that proponents are using data in prioritizing sites, but it is difficult to understand how all of the parts fit together to actually select a project for implementation or to assess if the highest impact projects are selected from among those available. Documentation of this process would also provide some indication of the benefits to fish, as discussed below.

Broadly, given the importance of screening, the ISRP believes that the proponents can be more thorough in structuring and describing their prioritization approach. The summary can include a description of how many screens are currently being considered (rather than a ballpark estimate of how many sites need to be screened), what data are used in prioritization and how, and the characteristics of the sites selected from the prioritization process (e.g., species presence and numbers, habitat quality, and so forth).

Q3: Provisions for M&E

The project has been making operational adjustments over time, most notably with a budget that has not reflected rising wages and material costs. These adjustments include eliminating personnel and reducing the number of projects completed. The proponents have also reclassified a field technician to focus on partnerships, coordination, and prioritization. The proposal also includes a comment that needs further explanation. On page 3, the proposal states that, “After the 2013 categorical review, the Project diversified and has been implementing fish habitat projects on a smaller scale.” It is not clear what smaller scale is referring to, or, after reviewing the 2013 review, what prompted this change. Also, it is unclear how diversification is related to a reduction in spatial scale. More description is needed on what types and scales of restoration are planned, particularly since the project proposes to restore 10 miles of habitat over the next project period and no information is given regarding what habitat projects were completed under the prior contract.

A strength of the proposal is the identification of the project’s primary confounding factor (declining streamflows) and specific strategies for adapting the program to those lower flows.

In summary, the ISRP commends the project for making strategic adjustments as project constraints (e.g., budget, streamflows) change. However, the proposal provides no indication of how these critical decisions are being made and instead indicates the sense that a lack of RM&E makes “it difficult to provide an Adaptive Management strategy.” Adaptive Management can be conducted without quantitative data, but instead be based on a documented strategy, which can include program priorities and objectives, qualitative indicators of project performance (e.g., number of projects completed by type relative to the annual objectives), and regular assessment.

The ISRP also notes that some monitoring is being conducted by partner organizations and it would be helpful to know which partners and to see the results. For instance, some “passage and habitat projects completed with USFS will be monitored by USFS for effectiveness.” Are the projects effective, and what has the USFS found?

Q4: Results – benefits to fish and wildlife

The ISRP notes that no information is provided regarding the projects completed under the prior contract, aside from a summary of the number of types of projects completed. It does not appear that this information is included in the annual report either. The 2020 report was only 2.5 pages long and provided only very general details about screen maintenance activities. Furthermore, the section of the proposal describing Significance to Fish and Wildlife Program and other regional plans is simply a list of relevant pages and documents from the 2014 Program. Thus, the ISRP could not assess the benefits to fish from this program. While the ISRP recognizes that no budget is available for RM&E, some further detail about the projected fish benefits would be helpful in characterizing the impact of the program to fish, rather than just assuming the benefits, particularly given that the benefits are highly variable with screen size and location (Moyle and Israel 2005). Examples of basic information that would not require an RM&E budget could include: a map of the project locations relative to the priority basins for the species of concern, data on the frequency and duration of screen failures and repairs, and/or information that is used in the prioritization process (e.g., species presence and numbers, habitat quality, water availability, statewide priority, focus areas, and so forth). Ultimately, while the project's quantitative objectives can be assessed for success in implementation, the objectives and the proposal do not provide any indication of the benefits for fish. For instance, an expected outcome is clearly an improvement in fish survival. Even a coarse estimate of the annual improvement in survivorship would be enlightening and provide further justification for the program. Based on the estimates of run abundance, passage efficiency, and SARs, the proponents should be able to enumerate a meaningful estimate of the number of fish protected by the screening program.

Reference

Moyle, P. and J. Israel. 2005. Untested assumptions: Effectiveness of screening diversions for conservation of fish populations. Fisheries 30: 20-28.

200739700 - John Day Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Warm Springs Reservation of Oregon

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria

Overall comment:

This is a complex and high-impact project with many partnerships, connections, and reports. The ISRP greatly appreciates the time and attention dedicated to organizing the proposal to effectively communicate the project's results and the details of the plan for moving forward. Some of the proposal and project strengths are:

- The proposal provides a through context for the regional and tribal history, landscape characteristics, ecological focus, limiting factors, monitoring programs, and relevant management plans for the project.
- The proposal provides a high level of detail in the narrative of the text, and then provided direct links to documents where more information could be found.
- Including hot links to annual reports, umbrella, monitoring, and other reports are always appreciated since it saves the ISRP time in locating the documents.
- The proposal uses maps and figures effectively to communicate results and strategy.
- The project proponents have developed a diverse, scientifically robust, and collaborative approach to developing and implementing monitoring in the basin, and they have demonstrated a commitment to managing data produced by those efforts.
- The highly collaborative nature of the project, from monitoring to data management to the common ground restoration approach, is a core strength.
- The 15-year synthesis is of great value and, once complete, will be an important contribution both to the John Day basin and Columbia River restoration more broadly.

The ISRP notes that the prioritization and adaptation processes are not as linear and structured as for other (and often simpler) projects. However, the processes reflect a thoughtful strategy and appear to be serving the project. Thus, a highly structured, formal decision-making framework does not seem essential to continuous learning for this project.

The project meets scientific review criteria, but the ISRP makes the following suggestions for project improvement. Actions toward addressing these suggestions should begin immediately and the results can be described in future work plans, annual reports, and proposals.

1. **SMART Objectives:** The proponents should clearly identify the project goals and objectives for the next project period. The objectives should be written as SMART objectives (see proposal instructions). These goals and objectives can be provided in the next annual report.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Escapement and Productivity of Spring Chinook and Steelhead Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop (September 24 to November 22, 2021), we ask your project to assist them in creating the summary and provide information to them about what is being monitored for your implementation project and where, when, and by whom the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard. In most cases, we are asking a regional coordination project like yours to develop the summary, but during the project presentation discussions, the ODFW project agreed that it would be more efficient for them to lead the effort and rely on your project and others for supporting information and assistance.

Q1: Clearly defined objectives and outcomes

The proposal describes a comprehensive and thoughtful list of goals and objectives to guide the project, but they were not organized in a way that made it easy for the ISRP to understand what exactly is being planned. The goal of the program is to “protect, manage, and restore aquatic habitats” and objectives supporting that goal are provided (pages 2 and 25), but they are not SMART. Each objective does have a “physical benchmark,” which could theoretically be measurable but, as written, they include vaguely-defined benchmarks, such as “functioning appropriately.” Most of the objectives are more like project goals and lack quantitative outcomes with explicit time frames. SMART objectives provide a framework for evaluating the

trajectory of the outcomes and are not intended as contractual guarantees or constraints on future funding. On page 27, the proposal includes one outcome for the project (long-term increasing trend in fish populations), a SMART goal for that outcome, and Table 3, which the ISRP understands is to provide some linkages between actions and measuring the progress toward meeting that goal. Table 3 seems to cover a reasonable set of actions and maps them directly to locations, measures of success, and monitoring strategy. However, the table is not easy to interpret, and the ISRP has difficulty understanding what the measurable outcomes might be.

The ISRP finds it difficult to follow the many different levels of goals, objectives, outcomes, and then objectives again. For example, how does Objective 1A1 (in Table 3) relate to SMART goal 1.1? Are they the same? And how does Outcome 1 relate to the objectives listed in pages 2 and 25? The ISRP called for “quantitative objectives and measures of progress towards those objectives” in the 2017 Umbrella Review, and the need for improvement in this project area remains.

Q2: Methods

This project is responsible for identification, development, implementation, and monitoring of restoration projects. The ISRP review of the project monitoring is discussed in the following section. For identification and development, during the next project period, the JDWR Project will use a combination of the:

- CTWSRO Strategy for metrics like restoration potential benefit, limiting factors, and identified target and focal actions.
- John Day Basin Partnership’s Atlas for prioritizing basins for project implementation.
- Structured Implementation and Monitoring Framework (SIM) for setting the implementation timeline.

Appendix B is a map of planned project locations for FY 2023-27 that, in combination with Tables 2 & 3, gives a general sense of what types of projects will be pursued. Given that the projects were not selected at the time the proposal was submitted, the text lacks some details on what exactly will be performed where. This limits the ISRP to a review of the process rather than the projects. Based on the information available in the proposal and in the linked documents, the framework for selecting projects, which applies the Strategy, Atlas, and SIM, appears to reflect meaningful ecological metrics. As well, the framework appropriately relies on collaboration with basin partners.

Q3: Provisions for M&E

Collectively, the monitoring program aims to address both project-level effectiveness and basin-level fish responses. Given the diverse collection of projects and partners, as well as the need for collaboration due to budget limitations, the proponents rely on different study plans and strategies across subbasins and projects. For example, in Fox Creek, the proponents developed a monitoring plan that is based on the BACI design, one that will be implemented over multiple years. In addition, the project uses their Implementation Effectiveness Monitoring (IEM) to revisit specific types of projects after implementation to identify maintenance needs. They are also participating in the Structured Implementation Monitoring framework (SIM) with ODFW for projects in the Middle Fork John Day, as well as the Intensively Monitored Watershed (IMW) and BPA's Action Effectiveness Monitoring (AEM) program.

While details of the monitoring plans are a bit scarce in the proposal, the proponents provided links to several monitoring plans. These plans include a) SMART monitoring objectives that are measurable, b) hypotheses about what response is expected, c) sampling locations, timelines, and protocols, and d) details on data management. In short, the ISRP is impressed at the robustness and careful design of the monitoring plans and commends the proponents for this comprehensive effort. Furthermore, the ISRP was also impressed by the efforts made in centralizing data management, the development of the web-based project tracker, and the decision to hire a data manager to support that effort.

Regarding project adjustments, the proposal links to the Partnership's Theory of Change approach and also provides some specific examples of how monitoring feeds back into project decision making and design. The details of the Theory of Change framework provide both narrative examples and a complex figure (Figure 2 of Appendix D) to help illustrate justifications for project selection and the anticipated outcomes of actions, but do not provide much insight on project adjustments. However, the proposal's specific examples of how monitoring data have been applied in decision making are very informative. For example, the proposal outlines key findings from the IMW related to the important role of temperature, shading, and tributaries (rather than groundwater) and how those findings have impacted their restoration work and prioritization. In addition, the proposal describes pre-determined checkpoints (e.g., 25% canopy coverage after 5 years) in the IEM plans that trigger project review and potential modifications. Another example describes how monitoring data are used to delay project implementation following a very poor return of spring Chinook. In summary, while the proposal did not include the summary of a structured decision-making framework for adaptive management, the ISRP finds that the proponents are effectively collecting and utilizing data about the project to inform decisions and are satisfied that this process serves the project's needs.

Q4: Results – benefits to fish and wildlife

The proposal includes some informative graphics on results from the past twenty years, including an online map, a table that covers the entire project, and a time series of restoration metrics (miles restored, miles accessed, number of LWD structures, acres of juniper removed, number of riparian plants planted). The results are impressive, though it is not clear to what degree these actions have directly benefited fish. The proponents identify another project that has been responsible for data on recovery of fish populations, though connection of the physical metrics and population data to examine causality is not reported. Given that the data are not designed to be used in that way, it is appropriate that such an analysis is not included. Nevertheless, the ISRP looks forward to what proponents will learn from the targeted monitoring that is planned and underway on how the activities are influencing targeted fish populations.

The proposal also discusses outreach and engagement efforts in multiple places. Perhaps most notable is a short film that highlights project efforts, particularly around collaboration between the Tribes and ranchers along Fox Creek. The film is professional and inspiring, and high impact. Since it was published in Oct. 2019, it has over 1,700 views, has been included in multiple film festivals and will be shown in classrooms throughout Oregon.

200001500 - Upper John Day Conservation Lands Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Warm Springs Reservation of Oregon

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This project appears to be successful in moving the John Day River system towards a system that will ultimately “provide culturally significant fish populations at harvestable levels for Tribal members.” Since 2019, the project has focused its resources on managing the three former ranches and the nursery, all of which are assets to the ecological and human communities. The project has effectively fostered collaborations with scientists and agencies to evaluate the impacts of individual projects. While there were minor points of ambiguity that did not benefit

the proposal, it is generally well written, reflects a project that is serving its goals and community and contributes to new capacity for implementation, collaborative monitoring, and shared data management.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **SMART objectives.** The proponents need to revise all objectives (actions) and Gantt chart so that they are presented in a SMART format (see proposal instructions) for the funding period (2021 – 2025), as well as 2050.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Escapement and Productivity of Spring Chinook and Steelhead Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. We ask your project to assist them in creating the summary and provide information to them about what is being monitored for your implementation project as well as where, when, and by whom the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
3. **Long-term expectation.** One question that the ISRP is interested in understanding better is the long-term expectation for conservation areas. As the proposal states, "Many of the objectives of the Project are long term, ultimately focused on the outcome of the conservation areas protecting and maintaining self-supporting habitats with healthy fish and wildlife populations." Given the 2050 timeline for many of the activities, do the proponents expect that this work will need to continue in perpetuity, or is the expectation that the site will itself be self-supporting at some point? If so, how is the project planning activities to transition areas to that self-sustaining state? The ISRP asks that the proponents describe this long-range vision in the next annual report.

Q1: Clearly defined objectives and outcomes

Objectives of the prior project were not SMART (e.g., Reduce Stream Temperature, Increase Habitat Complexity), so it was not possible to evaluate if the project achieved them. The current proposal addresses that prior weakness with Table 4, which provides a comprehensive list of generally SMART objectives for the next project period that includes implementation,

monitoring, restoration, and outreach objectives. However, some objectives are vague in terms of what will actually be done and when the actions will occur. Greater clarity on two points in particular is needed:

- It is not clear why 2050 is the time frame for many of the activities. What is the significance of 2050? While it is instructive to provide a date for ultimately achieving successful actions (i.e., 2050), it is essential to detail the specific accomplishments (actions) expected for the present funding period.
- The text notes that the management plans need to be updated, but that action is not represented in Table 4. When will that work be conducted, who will lead that effort, and what process will be used?

Q2: Methods

The methods employed are well accepted in conservation restoration programs. Cattle and deer fencing and noxious weed treatments requires constant maintenance and attention. In addition, the new attention to developing forest management plans over the next five years addresses ISRP concerns regarding upland management. Annual grazing programs have been developed in consultation with experts and include metrics and measures (e.g., grazing carrying capacities, wildlife forage residuals, and pasture rotation) that emphasize protection of fish and wildlife, and also help suppress invasive plants. The nursery provides plants to the project and to partners across the basin and appears to be a real asset to the community. They have developed descriptions of monitoring methods jointly with ODFW, which are documented in MonitoringResources.org.

Outreach is a strength of this project, and the proposal identifies several high-impact examples (page 35; hunting, birding, project overlook with signage, local resource fairs). While not essential, keeping track of the number of people engaged or hours would help demonstrate the impact of the outreach program, particularly around the theme of demonstrating compatibility of grazing and conservation. Similarly, information on numbers of visitors at the homestead sites could help document engagement with the public.

Collectively, these activities are likely to support recovery of aquatic and riparian habitat while building trust and cooperation within the local community.

Q3: Provisions for M&E

This project involves a diverse collection of monitoring efforts through a variety of collaborations. While not always a neat and tidy dataset with a universal experimental design,

the results appear to contribute to understanding the system and its responses. These efforts include AEM, research collaborations, groundwater and temperature monitoring, Structured Implementation Monitoring framework (SIM) via a partnership with ODFW, and individual project monitoring (e.g., Oxbow Tailings, Vincent to Caribou).

Starting in 2019, the CTWSRO and ODFW formed a Structured Implementation Monitoring (SIM) program to avoid duplication. The data presented in both project proposals indicate the collaborative approach appears to be accomplishing the desired monitoring and evaluation intent. These projects also use a centralized data management system, and the CTWSRO is hiring a data management contractor through 2026. This coordination and data management will be extremely valuable for long-term data gathering and analysis.

The ISRP appreciates the effort the proponents took to provide hot links and PDFs for monitoring plans and reports, which were reviewed and found to support conclusions reported in the proposal. However, no results of the monitoring efforts were included in this proposal. The proposal indicates that previous ISRP reviews had requested data showing how past restoration actions have affected fish abundance and/or production, but the project relies on the Escapement and Productivity of Spring Chinook and Steelhead Project (199810600) to generate information regarding population-level status and trend. From that proposal, the ISRP found data demonstrating that the abundance and distribution of steelhead redds has increased after restoration of the Oxbow Conservation Area and in the Middle Fork of the John Day.

Beyond the analyses described for monitoring individual projects, it is not clear who is responsible for analyzing the data for project evaluation or how decisions are made for the project. The proposal summarizes some ways in which individual actions (e.g., nursery outputs) have changed/adapted but does not speak to the broader project goals. For example, what process led to the 2019 decision by CTWSRO Fisheries management to focus on conservation actions and drop the restoration activities? The proposal indicates that it was based on focusing limited resources and maximizing project staff under the JDWR project. The ISRP assumes that some process is used to make those critical decisions, ones that drive the project's fundamental direction. Nevertheless, no description of that process is provided. Is the decision-making process based on an evaluation of success (or failure) in achieving project objectives, or something else? No response is required under the current review process, but a discussion on the evaluation and strategy process for the broader project would be appreciated in future proposals and annual reports.

Q4: Results – benefits to fish and wildlife

The project appears to be producing benefits to fish and wildlife, though the reporting of those benefits could be improved to better demonstrate the project's impacts. Benefits are reported based on increases in redd density for spring Chinook, number of plants in the ground, miles of channel enhanced/restored, and pass/fail desired conditions criteria, among others. These are important metrics and appear to be supported by meaningful monitoring data. However, the data/metrics on benefits could have been organized in a way that more effectively describes these benefits, based on the complex and diverse collection of monitoring data.

200003100 - Enhance Habitat in the North Fork John Day River

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria

Overall comment:

The ISRP was pleased that the proponents oriented their project around the First Foods concept, especially as a framework for the objectives and the monitoring activities. The CTUIR not only use the concept for project guidance and governance but also include it in the restoration objectives for the North Fork of the John Day basin in Appendix 3. This is a valuable example of how integration of the Tribe's traditional knowledge with regional scientific knowledge provides strength to both and, at the same time, increases the cultural and social relevance of the overall effort. The ISRP encourages the CTUIR to continue to highlight the benefits of recognizing diverse knowledge sources in order to achieve goals for fish and wildlife in the Columbia River Basin.

The ISRP highlights four suggestions to improve the project and its future evaluation:

1. **SMART objectives.** The SMART objectives should be in the main proposal narrative in Section 3. Incorporating these would greatly improve the ability of reviewers to evaluate the program accurately.

2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Escapement and Productivity of Spring Chinook and Steelhead Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop (September 24 to November 22, 2021), we ask your project to assist them in creating the summary and provide information about what is being monitored for your implementation project and about where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
3. **Examples of restoration outcomes.** In a previous review, the ISRP asked that monitoring results be emphasized to a greater degree. The proposal does a great job of providing links to other reports, but a few examples showing changes in key properties over time would have been helpful.
4. **Benefits to fish and wildlife.** Since project activities are starting to be reflected in benefits to fish and to environmental quality, the ISRP recommends that the project develop plans for a comprehensive analysis and a description of the collective benefits of activities over the last two decades. This synthesis would be timely and useful.

Q1: Clearly defined objectives and outcomes

This is a well-functioning and comprehensive project, one that has greatly matured in its approaches and outcomes over the past decade. The objectives, in a general sense, are on target even though the longer-term ecological outcomes may be difficult to predict at this time.

The proponents have internally developed SMART objectives for the funding period, but the details are buried in Appendix 3. The ISRP emphasizes that the SMART objectives should appear as part of the main proposal narrative in Section 3 (Goals and Objectives). This will facilitate future evaluations of progress toward expected outcomes. Additionally, the project could provide more specific outcomes for some objectives. For instance, one objective is to “increase and reestablish in-stream thermal diversity throughout the year.” What metric will be used to quantify thermal diversity and what level of thermal diversity is the desired outcome?

Q2: Methods

The methods are based largely on established best management practices and are reasonable for the actions being proposed.

Table 2 lists examples of outreach efforts associated with certain project objectives, and it is noted later in the Potential Confounding Factors section that landowner priorities sometimes shift. Given the rich scope of this project, reviewers wonder if more outreach opportunities exist, and if they may not be of growing importance given the environmental challenges facing the basin (i.e., invasive species, changing climate). The ISRP also sees great value in communicating project results with others outside the basin, thereby encouraging even broader engagement/outreach efforts.

Q3: Provisions for M&E

The proponents have developed an effective Adaptive Management process, especially with the sustained involvement of additional collaborators. While it is not always clear who will be doing monitoring for specific project outcomes (there are numerous organizations involved), it is important that the data are appropriate for the activity and that they are readily available, which appears to be the case.

The proposal notes that the status of beaver populations is low, but that no formal census is available. Based on their importance to channel maintenance, is a status evaluation warranted? Two additional alternatives would be for the project to develop a few beaver reintroduction projects in areas where beaver could enhance existing efforts and to adopt a beaver-tolerance policy.

Given the emphasis on climate change in the confounding factors section, it is not clear whether monitoring is evaluating the success of efforts to preserve cooler water temperatures. Are these efforts working? In the Confounding Factors section, modeling water temperatures is mentioned, and while a model is good for broadly assessing vulnerability to changes in climate, such large-scale modeling typically does not account for the type of site-specific management actions occurring throughout the basin. Therefore, it would be helpful for future work to investigate water temperatures above and below restoration locations to evaluate the effectiveness of specific actions.

Q4: Results – benefits to fish and wildlife

Project activities are starting to be reflected in benefits to fish as well as to environmental quality. Considering the longevity of the project, a more thorough evaluation of the benefits would be timely. The ISRP suggests that the project develop plans for a comprehensive analysis and description of the collective benefits of activities that have taken place over the last two decades for fish and wildlife.

200102100 - Wasco County Riparian Buffers

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Wasco County Soil and Water Conservation District

Province/Subbasin: Columbia Gorge/Fifteenmile

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The CREP buffer projects in the Fifteenmile subbasin provide valuable riparian protection and landowner outreach and education through the USDA/NRCS CREP program. The riparian buffers contribute to the overall goals of the John Day River Partnership, the Mid-Columbia Steelhead Recovery Plan, and the NPCC Fish and Wildlife Program.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

- 1. Past progress and benefits.** The proponents should provide information on past progress by the project as well as measures of the benefits to fish and wildlife. What has the project achieved since the last ISRP review? The proposal provides no quantitative or qualitative information on the program's benefits. How many acres and miles of riparian buffers have been established on streams in Wasco County? What is the total length of fish bearing streams in Wasco County and how many miles of streams lack riparian buffers?
- 2. Explanation of Objective 1.** The proponents should provide a more thorough explanation as to why Objective 1 was dropped. When was it first proposed? The ISRP assumes the objective was deleted because the proponents do not feel that the actions of this project are likely to substantially change basinwide abundances of steelhead, and many other factors are likely responsible for the basin trends. The proponents should clarify the reasons for the change in objectives in their Annual Report and indicate what objectives will guide them without this previous objective. For example, the proponents should consider developing more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.
- 3. Documentation of methods.** Are the methods used by the project for planning, prioritizing areas of focus, implementing specific projects, and conducting instream

restoration (BDAs, PALS) documented? Please provide documents, if they have been developed, or appropriate linkages to MonitoringResources.org, if any M&E methods.

4. **SVAP assessment.** Do all contracts incorporate sequential SVAP assessment? The proposal simply states that “all the contracts evaluated showed an increased score, indicating that CREP had improved the habitat conditions.” How many projects were assessed? What was the average change in score? How close did they come to the SVAP objective?
5. **SVAP repeatability.** Has the SVAP ever been evaluated for repeatability among those conducting the surveys? If so, what have been the results and how have SVAP assessments been modified? Other similar projects have demonstrated serious problems with observer-based evaluations. The ISRP recommends an evaluation of the repeatability of the SVAP.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the John Day River Salmonid Monitoring to Inform Recovery Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
7. **Stream temperature.** The ISRP recommends collecting water temperature data. Collecting water temperature measurements to evaluate the effectiveness of the riparian plantings and channel mitigation efforts is a major omission from the monitoring efforts. Given the importance of temperature to steelhead and other native fishes and given the likelihood that it will increase with changing climate, it seems imperative to understand the degree to which the restoration actions may be helping to mitigate warming waters. For instance, the web site for the John Day Basin Partnership indicates that the 7-day daily average maximum temperatures is a metric that can be used to evaluate projects. Regrettably, no projects seem to be collecting such data (as indicated on the web site). If data collected above and below restoration sites indicate reduced rates of warming and cooler habitats, it would provide additional evidence to potential fish benefits and may encourage greater participation.
8. **Pace of restoration.** The ISRP asks the proponents to provide an assessment of the pace of restoration as compared to the overall length of streams needing treatment. This

assessment would be best addressed as a cooperative effort with the John Day Basin Partnership, which has much of the basin-level riparian information.

The ISRP provides the following additional comments to consider in future documentation and proposals, but these are suggestions (not Conditions) for the project.

Additional Comments:

The quantitative biological objective is to protect with fencing and plant 15 miles of stream and 450 acres of habitat through 2027. Is this annually or during the entire project period? From the graphic, it appears to be annually, but the total acreage to be protected does not match the information in the graphic. In the proposal summary, 30 CREP buffer agreements are also mentioned as a target, but that does not appear to be clearly stated in the goal/objective statements.

The quantitative social objective is to increase the adoption of in-stream process-based actions on CREP streams by 20%. Is this annually or during the entire project period? The graphic does not provide the needed information.

Other efforts in the John Day basin include promoting beaver presence in riparian areas where landowners are willing. Are these approaches also used in the Fifteenmile subbasin?

The Methods are generally clear, but a comment from a previous review states: “a summary of NRCS plant assemblage standards (with species of plants typically used) should be included in the project description with a reference to how these assemblages will benefit aquatic habitat.” The proposal includes a link to the NRCS documents describing this, but discussion of the benefits specifically to aquatic habitat would be helpful.

Drone spatial information and potential analyses have promise as a powerful tool going forward. Drone protocols should be documented, and a description of potential analyses should be provided. By using photopoints, specific metrics can be developed to quantitatively evaluate habitat conditions.

Q1: Clearly defined objectives and outcomes

The proponents provide SMART objectives and outcomes in terms of riparian acres to be protected and steelhead productivity. The quantitative biological objective is to protect with fencing and plant 15 miles of stream and 450 acres of habitat through 2027. The quantitative social objective is to increase the adoption of in-stream process-based actions on degraded

CREP streams by 20%. The quantitative implementation objective would be to provide on-site initial process-based technical assistance for 20 expiring CREP contracts by 2027.

The Wasco County Riparian Buffers project implements riparian protection of fish and wildlife with an emphasis on steelhead habitat that addresses limiting factors in the EDT analysis of the Subbasin Plan and the Mid-Columbia Recovery Plan using the Conservation Reserve Enhancement Program (CREP) and process-based restoration technical assistance. They are implementing riparian fencing projects in the Fifteenmile subbasin.

The proposal identifies SMART objectives, including two biological objectives, one social objective, and one implementation objective. The first biological objective—to improve the initial Stream Visual Assessment score by 1.5 points five years after implementation—is appropriate and is socially valuable because it involves landowner assessment of ecological conditions. SVAP, when compared with other indices in the Pacific Northwest and throughout the U.S. (Hughes et al. 2010), was weakly to moderately correlated with biological indicators. As well, collaboration with other monitoring groups, when possible, will strengthen the measures of outcomes. The second biological objective—“to protect with fence and plant 15 miles of stream and 450 acres of habitat through 2027”—basically is an implementation objective with biological relevance. It is not clear whether this is a target for each year, the biennium, or the funding period. The social and implementation objectives are reasonable measures of project success.

The proponents removed biological objectives that specified responses of juvenile and adult steelhead for the entire John Day River basin because their project is directed at riparian area protection. While the ultimate purpose of this protection includes recovery of steelhead populations, the basinwide objectives are part of the Mid-Columbia Steelhead Recovery Plan rather than the specific actions of this project. While their point is valid, the project could develop more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.

Q2: Methods

The methods employed are generally well tested and widely applied to riparian restoration throughout the western USA.

The proposal includes a Gantt chart of the typical annual schedule of activities. The ISRP anticipates that the project will work with BPA to provide plans for specific projects as part of their work plans and Annual Reports.

The proposal identifies climate change as a major confounding factor and the proponents have incorporated regional data on assessments of potential changes in temperature and precipitation for planning. They are using several methods, such as BDAs, plantings of drought-tolerant species, pot-rooted stock, and hardwood cuttings, to increase survival and ability to withstand future climate conditions.

Q3: Provisions for M&E

Monitoring of steelhead productivity may be an issue, but the proponents appear to be working on a plan to secure additional funding. They appear to have adequate resources to follow up on the conditions of previous activities. The evaluation and adjustment process appears to be functioning as expected.

The proponents use SVAP for monitoring the physical and biological outcomes of their CREP enrollments. This is appropriate for the activities being assessed. While the SVAP generally has low to moderate correlations with more detailed biological measurements (Hughes et al. 2010), it has several major strengths. It is rapid, inexpensive, and focused on channel and riparian conditions, which are the primary actions of the program. Even more importantly, it teaches the landowners to use the visual assessment, thereby giving them ownership in the assessment process and educating them about stream geomorphology and riparian structure and function. The project also tracks its implementation, landowner participation, and total acreage protected. These are reasonable assessments for these CREP projects for riparian protection. Additional information is needed about the proportion of contracts that include SVAP assessment, the number of projects assessed, and average change in score across all projects. The project also should conduct comparisons of assessments using different survey personnel or landowners to evaluate the method for repeatability. Other similar projects have demonstrated serious problems with observer-based evaluations. The ISRP recommends an evaluation of the repeatability of the SVAP.

The project's adaptive management uses a structured nine-step planning and evaluation process developed by USDA/NRCS.

Q4: Results – benefits to fish and wildlife

The proponents provide no information on the miles of stream and acres of riparian habitat protected by their development of CREP buffers. What has the project achieved since the last ISRP review? The proposal provides no quantitative or qualitative information on the benefit of the program for fish and wildlife.

The ISRP agrees that without intensive monitoring, it is difficult to tie habitat restoration actions directly to improvements in productivity. Therefore, it is understandable that the proponents modified objectives to acknowledge that the protection and enhancement of riparian and floodplain habitats will address previously identified riparian-related limiting factors to these habitats, which in-turn contribute to steelhead productivity.

Reference

Hughes, R.M., A.T. Herlihy, and P.R. Kaufmann. 2010. An evaluation of qualitative indexes of physical habitat applied to agricultural streams in ten U.S. states. *Journal of the American Water Resources Association* 46: 792-806. <https://doi-org.ezproxy.proxy.library.oregonstate.edu/10.1111/j.1752-1688.2010.00455.x>

200203400 - Riparian Buffers in Wheeler County

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Wheeler Soil & Water Conservation District

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The CREP buffer projects provide valuable riparian protection and landowner outreach and education through the USDA/NRCS CREP program. The riparian buffers contribute to the overall goals of the John Day Basin Partnership, the Mid-Columbia Steelhead Recovery Plan, and the NPCC Fish and Wildlife Program.

The ISRP notes that this project effectively incorporates digital images, a useful methodical approach.

The proponents have adequately responded to previous ISRP suggestions and qualifications. As well, the ISRP is pleased that the project is encouraging beaver presence, using beaver dam analogs and post assisted log structures to improve riparian conditions, and that the proponents are cooperating broadly with other regional projects.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22,

2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **Explanation of Objective 1.** The proponents should provide a more thorough explanation as to why Objective 1 was dropped. When was it first proposed? The ISRP assumes that the objective was deleted because the proponents do not feel that the actions of this project are likely to substantially change basinwide abundances of steelhead, and many other factors are likely responsible for the basin trends. The proponents should make the reasons for the change in objectives clear in their Annual Report and indicate what objectives will guide them without this previous objective. For example, the proponents should consider developing more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.
2. **Documentation of methods.** Are the methods used by the project for planning, prioritizing areas of focus, implementing specific projects, and instream restoration (BDAs, PALS) documented? Provide documents, if they have been developed, or appropriate linkages to MonitoringResources.org, for M&E methods.
3. **SVAP assessment.** Do all contracts incorporate sequential SVAP assessment? The proposal simply states that “all the contracts evaluated showed an increased score, indicating that CREP had improved the habitat conditions.” How many projects were assessed? What was the average change in score? How close did they come to the SVAP objective? Do they show similar improvement to that observed in Gilliam County?
4. **SVAP repeatability.** Has the SVAP ever been evaluated for repeatability among those conducting the surveys? If so, what have been the results and how have SVAP assessments been modified? Other similar projects have demonstrated serious problems with observer-based evaluations. The ISRP recommends an evaluation of the repeatability of the SVAP.
5. **Stream temperature.** The ISRP recommends collecting water temperature data. Collecting water temperature measurements to evaluate the effectiveness of riparian plantings and channel mitigation efforts is a major omission from the monitoring efforts. Given the importance of temperature to steelhead and other native fishes and given the likelihood that it will increase with changing climate, it seems imperative to understand the degree to which the restoration actions may be helping to mitigate warming waters. For instance, the web site for the John Day Basin Partnership indicates that the 7-day daily average maximum temperature is a metric that can be used to evaluate projects. Regrettably, no projects seem to be collecting such data (as indicated on the web site). If data collected above and below restoration sites indicate reduced rates of warming and

cooler habitats, it would provide additional evidence for potential fish benefits and may encourage greater landowner participation.

6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the John Day River Salmonid Monitoring to Inform Recovery Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
7. **Pace of restoration.** The ISRP asks the proponents to provide an assessment of the pace of restoration as compared to the overall length of streams needing treatment. This assessment would be best addressed as a cooperative effort with the John Day Basin Partnership, which has much of the basin-level riparian information.

The ISRP provides the following additional comments to consider in future documentation and proposals, but these are suggestions (not Conditions) for the project and BPA.

Additional Comments:

For Objectives 1 (John Day Summer Steelhead Productivity) and 2 (Riparian Buffer Systems on 50 miles), it would be useful to know when the project started and if the trends are moving in a positive direction.

The quantitative biological objective is to protect with fencing and plant 10 miles of stream and 250 (300 acres?) acres of habitat through 2027. Is this annually or during the entire project period? From the graphic, it appears to be annually, but the total acreage to be protected does not match the information in the graphic.

The quantitative social objective is to increase the adoption of in-stream process-based actions on CREP streams by 20%. Is this annually or during the entire project period? The graphic does not provide the needed information.

In future annual reports and proposals, provide a brief empirical narrative of the results of aerial photos, such as the photos in the proposal's Appendix. The temporal sequence of aerial photos in the Appendix appears to be potentially informative. However, an interpretation of

each pair would have improved understanding. For instance, the biophysical meaning of the various scales is not clear. Also, going forward, photographs should include identification of standard points assessed across multiple time periods (i.e., 5, 10, and 15 years after efforts have been implemented) as opposed to just using pairs of images for two time periods.

The proposal indicates that the John Day Basin Partnership received FIP funding from OWEB in 2019. Is any of that effort being conducted as part of the implementation or monitoring of the Wheeler County CREP buffers? If so, what is the nature of the activities? Does the John Day FIP provide monitoring or assessment for this project?

Under the first pathway to achieve the stated goal, the proposal notes that “site appropriate vegetation” will be planted as part of the restoration action. Later, it states that the vegetation selected in past restoration efforts may not have been as effective as vegetation used more recently due to differences in methods and plant selection. The ISRP encourages the proponents to provide more detail on what specific changes were made and why. In the section on Confounding Factors, the proposal states that it may be effective to plant more drought tolerant species (i.e., common choke cherry), further indicating why it is helpful to clearly describe changes made in the planting strategy.

The macroinvertebrate study from Wasco County provides evidence for the effectiveness of riparian buffers. When was the study conducted? Could such a study be repeated for locations in Wheeler County and the John Day basin? Would such a study be relevant for the John Day Basin FIP project funded by OWEB?

Q1: Clearly defined objectives and outcomes

The Wheeler County Riparian Buffers project implements riparian protection for fish and wildlife with an emphasis on steelhead habitat. The project addresses limiting factors in Mid-Columbia Recovery Plan using the Conservation Reserve Enhancement Program (CREP). They currently are implementing four large process-based restoration projects in Wheeler County.

The proposal identifies SMART objectives, including two biological objectives, one social objective, and one implementation objective. The first biological objective—to improve the initial Stream Visual Assessment score by 1.5 points five years after implementation—is appropriate and is socially valuable because it involves landowner assessment of ecological conditions. SVAP, when compared with other indices in the Pacific Northwest and throughout the U.S. (Hughes et al. 2010), was weakly to moderately correlated with biological indicators. As well, collaboration with other monitoring groups, when possible, will strengthen the measures of outcomes. The second biological objective—to protect with fence and plant 10 miles of

stream and 250 acres of habitat through 2027—basically is an implementation objective with biological relevance. The social and implementation objectives are reasonable measures of project success.

The proponents removed biological objectives that specified responses of juvenile and adult steelhead for the entire John Day River basin because their project is directed at riparian area protection. While the ultimate purpose of this protection includes recovery of steelhead populations, the basinwide objectives are part of the John Day Basin Partnership and the Mid-Columbia Steelhead Recovery Plan rather than the specific actions of this project. While their point is valid, the project could develop more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.

Q2: Methods

The proposal describes the context for the project and the approaches used to enlist landowners to develop CREP buffers. They note that currently 986 miles of steelhead stream in Wheeler County lack riparian fencing, and they use the Atlas dataset to prioritize their efforts to contact and enlist landowners in the program. The approach is a formal process developed by NRCS and is coordinated with other regional planning groups, such as the John Day Basin Partnership. Stream reaches are evaluated for the opportunity for riparian fencing, riparian planting, off-stream water source, and beaver restoration management. Sub-watersheds are prioritized based on geomorphic potential, current habitat condition, and future habitat condition. Outreach is focused on steelhead streams with the highest priority scores. This approach is informed by landscape conditions and fish populations and is appropriate for the project's goals and objectives.

In their process-based restoration approach, the proponents also are using beaver dam analogs (BDAs) and post assisted log structures (PALS) to improve instream and riparian conditions. The project is encouraging beaver presence on sites with adequate food sources and pool habitat to promote natural processes. They have identified sites and worked with landowners and ODFW to encourage beaver activity but also control nuisance beaver damage.

The proposal includes a table indicating a monthly schedule of activities for 2023 to 2025. The ISRP anticipates that the project will work with BPA to provide plans for specific projects as part of their work plans and Annual Reports.

The proposal identifies climate change as a major confounding factor, and the proponents have incorporated regional data on assessments of potential changes in temperature and precipitation for planning. They are using several methods, such as BDAs, plantings of drought-

tolerant species, pot-rooted stock, and hardwood cuttings, to increase survival and ability to withstand future climate conditions.

Q3: Provisions for M&E

Post-implementation evaluations are conducted regularly on a schedule (SVAP protocols). Also, an adaptive management process that is appropriate for the activities is being used.

The proponents use SVAP for monitoring the physical and biological outcomes of their CREP enrollments. While SVAP generally has low to moderate correlations with more detailed biological measurements (Hughes et al. 2010), it has several major strengths. It is rapid, inexpensive, and focused on channel and riparian conditions, which are the primary actions of the program. Even more importantly, it teaches the landowners to use the visual assessment, thereby giving them ownership in the assessment process and educating them about stream geomorphology and riparian structure and function. The project also tracks its implementation, landowner participation, and total acreage protected. These are reasonable assessments for these CREP projects for riparian protection.

The project's adaptive management uses a structured nine-step planning and evaluation process developed by USDA/NRCS.

Q4: Results – benefits to fish and wildlife

The activities are improving riparian conditions along streams receiving restoration. Overall, conditions are improving based on SVAP scores and from looking at aerial and photo-point sequences. Wheeler County established 1,770 acres of riparian buffers on 115 miles of streams from 2013 to 2020. Since 2018, they established process-based restoration projects on 4.1 miles of stream with 260 BDAs and PALS from 2018 to 2020. However, the proponents note that, "There are currently 986 miles of steelhead stream in Wheeler County without riparian fencing." With the project restoring about 5 miles annually, it will take nearly two centuries before full riparian restoration/protection is achieved. Can the activities be accelerated? Is the relatively slow pace of riparian restoration/protection having positive effects at the basin scale?

Reference

Hughes, R.M., A.T. Herlihy, and P.R. Kaufmann. 2010. An evaluation of qualitative indexes of physical habitat applied to agricultural streams in ten U.S. states. *Journal of the American Water Resources Association* 46: 792-806. <https://doi-org.ezproxy.proxy.library.oregonstate.edu/10.1111/j.1752-1688.2010.00455.x>

200203500 - Riparian Habitat Protection and Enhancement in Gilliam County

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Gilliam County Soil and Water Conservation

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The SWCD projects in the John Day River basin provide valuable riparian protection and landowner outreach and education through the USDA/NRCS CREP program. The riparian buffers contribute to the overall goals of the John Day River Partnership, the Mid-Columbia Steelhead Recovery Plan, and the NPCC Fish and Wildlife Program. The ISRP encourages the SWCD to continue to develop working relationships with OWEB and ODFW to expand their efforts and provide critical monitoring information for strengthening the program.

The proponents have adequately responded to previous ISRP suggestions and qualifications. As well, the ISRP is pleased that the project is encouraging beaver presence, using beaver dam analogs and post assisted log structures to improve riparian conditions, and that the proponents are cooperating broadly with other regional projects.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

- 1. Explanation of Objective 1.** The proponents should provide a more thorough explanation as to why Objective 1 was dropped. When was it first proposed? The ISRP assumes that the objective was deleted because the proponents do not feel that the actions of this project are likely to substantially change basinwide abundances of steelhead, and many other factors are likely responsible for the basin trends. The proponents should clarify the reasons for the change in objectives in their Annual Report and indicate what objectives will guide them without this previous objective. For example, the proponents should consider developing more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.
- 2. Success in meeting targets.** The number of buffer agreements established annually seems to be less than the target value of 10. What factors have prevented the proponents from achieving their objective for CREP agreements? Will the proposed

actions in the next funding period overcome the factors that have limited their enrollments? Should the enrollment target be adjusted? If so, explain the basis for the new objective.

3. **Documentation of methods.** Are the methods used by the project for planning, prioritizing areas of focus, implementing specific projects, and instream restoration (BDAs, PALS) documented? Provide documents, if they have been developed, or appropriate linkages to MonitoringResources.org.
4. **SVAP assessment.** Do all contracts incorporate sequential SVAP assessment? The proposal simply states that “all the contracts evaluated showed an increased score, indicating that CREP had improved the habitat conditions.” How many projects were assessed? What was the average change in score? How close did they come to the SVAP objective?
5. **SVAP repeatability.** Has the SVAP ever been evaluated for repeatability among those conducting the surveys? If so, what have been the results and how have SVAP assessments been modified? Other similar projects have demonstrated serious problems with observer-based evaluations. The ISRP recommends an evaluation of the repeatability of the SVAP.
6. **Stream temperature.** The ISRP recommends collecting water temperature data. Collecting water temperature measurements to evaluate the effectiveness of riparian plantings and channel mitigation efforts is a major omission from the monitoring efforts. Given the importance of temperature to steelhead and other native fishes and given the likelihood that it will increase with changing climate, it seems imperative to understand the degree to which the restoration actions may be helping to mitigate warming waters. For instance, the web site for the John Day Basin Partnership indicates that the 7-day daily average maximum temperature is a metric that can be used to evaluate projects. Regrettably, no projects seem to be collecting such data (as indicated on the web site). If data collected above and below restoration sites indicate reduced rates of warming and cooler habitats, it would provide additional evidence for potential fish benefits and may encourage greater landowner participation.
7. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the John Day River Salmonid Monitoring to Inform Recovery Project (199801600) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them

about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

8. **Pace of restoration.** The ISRP asks the proponents to provide an assessment of the pace of restoration as compared to the overall length of streams needing treatment. This assessment would be best addressed as a cooperative effort with the John Day Basin Partnership, which has much of the basin-level riparian information.

The ISRP provides the following additional comments to consider in future documentation and proposals, but these are suggestions (not Conditions) for the project and BPA.

Additional Comments:

For Objectives 1 (John Day Summer Steelhead Productivity) and 2 (Riparian Buffer Systems on 50 miles), it would be useful to know when the project started and if the trends are moving in a positive direction.

The quantitative biological objective is to protect with fencing and plant 10 miles of stream and 250 (300 acres?) acres of habitat through 2027. Is this annually or during the entire project period? From the graphic, it appears to be annually, but the total acreage to be protected does not match the information in the graphic.

The quantitative social objective is to increase the adoption of in-stream process-based actions on CREP streams by 20%. Is this annually or during the entire project period? The graphic does not provide the needed information.

In the section titled Progress to Date, the authors mention that when techniques are found to be successful, they are always shared with others working in similar environments to improve the success of the CREP program. More detail is needed on how this occurs, including if any exchanges occur at specific meetings, for example.

Toward the end of the Problem Statement, the authors indicate that degraded water quality should be improved by riparian shading, suggesting that temperature is the issue. Later in the proposal, however, sediments are also mentioned as a cause of degraded water quality. Clarify what specific parameters are being targeted as improvements

The macroinvertebrate study from Wasco County provides evidence for the effectiveness of riparian buffers. When was the study conducted? Could such a study be repeated for locations

in Gilliam County and the John Day basin? Would such a study be relevant for the John Day Basin FIP project funded by OWEB?

Q1: Clearly defined objectives and outcomes

The primary goal of the Gilliam County Riparian Habitat Protection and Enhancement project is to protect and enhance riparian and floodplain habitat for fish and wildlife with an emphasis on steelhead habitat that will address limiting factors outlined in the Mid-Columbia Recovery Plan using the Conservation Reserve Enhancement Program (CREP) and process-based restoration technical assistance. They intend to implement riparian fencing projects with 10 private landowners in the lower mainstem John Day River. The CREP buffer agreements provide critical riparian protection on private lands in the John Day River basin.

The proposal identifies SMART objectives, including two biological objectives, one social objective, and one implementation objective. The first biological objective—to improve the initial Stream Visual Assessment score by 1.5 points five years after implementation—is appropriate and is socially valuable because it involves landowner assessment of ecological conditions. SVAP, when compared with other indices in the Pacific Northwest and throughout the U.S. (Hughes et al. 2010), was weakly to moderately correlated with biological indicators. As well, collaboration with other monitoring groups, when possible, will strengthen the measures of outcomes. The second biological objective—“to protect with fence and plant 10 miles of stream and 250 acres of habitat per (???) through 2027”—basically is an implementation objective with biological relevance. It is not clear whether this is a target for each year, the biennium, or the funding period. The social and implementation objectives are reasonable measures of project success.

The proponents removed biological objectives that specified responses of juvenile and adult steelhead for the entire John Day River basin because their project is directed at riparian area protection. While the ultimate purpose of this protection includes recovery of steelhead populations, the basinwide objectives are part of the Mid-Columbia Steelhead Recovery Plan rather than the specific actions of this project. While their point is valid, the project could develop more quantitative objectives for steelhead and Chinook based on their collaborative monitoring efforts with ODFW.

Q2: Methods

The proposal describes the context for the project and the approaches used to enlist landowners to develop CREP buffers. They note that currently 135 miles of steelhead stream in Gilliam County lack riparian fencing, and they use the Atlas dataset to prioritize their efforts to

contact and enlist landowners in the program. The approach is a formal process developed by NRCS and is coordinated with other regional planning groups, such as the John Day Partnership. Stream reaches are evaluated for the opportunity for riparian fencing, riparian planting, off-stream water source, and beaver restoration management. Sub-watersheds are prioritized based on geomorphic potential, current habitat condition, and future habitat condition. Outreach is focused on steelhead streams with the highest priority scores. This approach is informed by landscape conditions and fish populations and is appropriate for the project's goals and objectives.

The project encourages beaver presence on sites with adequate food sources and pool habitat to promote natural processes. They have identified sites and worked with landowners and ODFW to encourage beaver activity but also control nuisance beaver damage. They also are using beaver dam analogs (BDAs) to improve instream and riparian conditions.

The proposal includes a Gantt chart of the typical annual schedule of activities. The ISRP anticipates that the project will work with BPA to provide plans for specific projects as part of their work plans and Annual Reports.

The proposal identifies climate change as a major confounding factor, and the proponents have incorporated regional data on assessments of potential changes in temperature and precipitation for planning. They are using several methods, such as BDAs, plantings of drought-tolerant species, pot-rooted stock, and hardwood cuttings, to increase survival and ability to withstand future climate conditions.

Q3: Provisions for M&E

The proponents use SVAP for monitoring the physical and biological outcomes of their CREP enrollments. This is appropriate for the activities being assessed. While the SVAP generally has low to moderate correlations with more detailed biological measurements (Hughes et al. 2010), it has several major strengths. It is rapid, inexpensive, and focused on channel and riparian conditions, which are the primary actions of the program. Even more importantly, it teaches the landowners to use the visual assessment, thereby giving them ownership in the assessment process and educating them about stream geomorphology and riparian structure and function. The project also tracks its implementation, landowner participation, and total acreage protected. These are reasonable assessments for these CREP projects for riparian protection. Additional information is needed about the proportion of contracts that include SVAP assessment, the number of projects assessed, and average change in score across all projects. The project also should conduct comparisons of assessments using different survey personnel or landowners to evaluate the method for repeatability. Other similar projects have

demonstrated serious problems with observer-based evaluations. The ISRP recommends an evaluation of the repeatability of the SVAP.

The proponents also strengthened their program by collaborating with ODFW's fish monitoring project in the John Day basin. This type of integration of implementation projects with monitoring projects has the potential to provide valuable information and use regional funding resources more efficiently.

The project has developed and expanded the use of before-and-after drone imagery and SVAP scores to help evaluate all projects

The project's adaptive management uses a structured nine-step planning and evaluation process by USDA/NRCS.

Q4: Results – benefits to fish and wildlife

The activities are improving riparian conditions along streams receiving restoration. Overall, conditions are improving based on SVAP scores.

Gilliam County established 2,279 acres of riparian buffers on 115 miles of streams from 2002-2013 and 1,146 acres of riparian buffers on 88.5 miles of stream from 2014 to 2020. SVAP scores increased by 0.8 for 18 projects that had been enrolled and implemented between 2005 and 2014. Newer projects increased by 1.25, indicating that their practices may be improving. The proponents also obtained OWEB funding to supplement their existing funds. Previous ISRP reviews recommended increased collaboration with ODFW and OWEB, and the project has been successful in developing greater interaction with these agencies.

Reference

Hughes, R.M., A.T. Herlihy, and P.R. Kaufmann. 2010. An evaluation of qualitative indexes of physical habitat applied to agricultural streams in ten U.S. states. *Journal of the American Water Resources Association* 46: 792-806. <https://doi-org.ezproxy.proxy.library.oregonstate.edu/10.1111/j.1752-1688.2010.00455.x>

199801600 - John Day River Salmonid Monitoring to Inform Recovery

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: ODFW

Province/Subbasin: Columbia Plateau/John Day

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our preliminary review, we asked the proponents to lead the development of an M&E Matrix for the John Day River basin. The ISRP appreciates the proponents' leadership, constructive response, and thorough summary of monitoring activities in the John Day River subbasin, for both their project and other collaborating projects. In many ways, the summary of monitoring and evaluation, matrix of monitoring activities, and maps of monitoring locations provided for the John Day River basin is an excellent example of cooperation among projects and identification of collaborative monitoring and evaluation in a geographic area that the ISRP envisioned in our request for M&E matrices.

In the revised proposal, the proponents provide an initial map and table illustrating the relationships between implementation actions and monitoring. The revised proposal thoroughly describes the project's monitoring activities, includes maps of the locations of all monitoring actions, and provides a matrix of the structured implementation and monitoring plan for three John Day River steelhead populations. The proponents collaboratively developed a table of implementation projects associated with the Oregon Watershed Enhancement Board Focused Investment Partnership (Table 8). For each project, the table identifies the restoration strategy, monitoring tier, type of monitoring (implementation, effectiveness), potential metrics, use of drone monitoring, and project responsible for monitoring. They plan to incorporate the figure and table in ongoing annual reports to BPA. The revised proposal includes a preliminary map of implementation projects and associated monitoring in the John Day River basin. The map distinguishes the type of monitoring as implementation, effectiveness, or fish-in and fish-out for fish population productivity. The proposal also summarizes linkages between implementation projects and monitoring efforts in the North Fork John Day and Middle Fork John Day rivers. Basically, the proponents provided initial information on all aspects of M&E that the ISRP requested in the Response Loop. Their M&E matrix and summary could be used as an example for other geographic areas.

The proponents responded to the ISRP's question about quantifying the effects of both flow and temperature and representing these factors in the model for the Middle Fork spring

Chinook salmon population and indicated they agreed that it would be beneficial to update and extend these analyses. Given the importance of both flow and stream temperature as limiting factors in the John Day River basin, the ISRP encourages the project to continue their efforts to understand and model the effects of flow and temperature on spawner recruitment.

The ISRP repeats from its preliminary review that this is an exemplary project and is a model for other M&E projects.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The John Day River Salmonid Monitoring project is a status and trends study that has received positive reviews from the ISRP since its inception. The John Day River basin is one of the few basins in the interior Columbia region that has had no recent hatchery releases; however, straying from Snake River populations is a major concern. The project steadily has improved its experimental design and refined its field methods and analyses. Its data are critical for regional management, and the project is closely integrated with key management plans and habitat restoration projects. The proposal provides a thorough literature review, with much appreciated hyperlinks to key papers and reports. This is an exemplary project and is a model for other M&E projects.

The ISRP requests a response from this project to provide the following information:

- **M&E matrix - lead.** Provide a summary of linkages between the monitoring conducted and the implementation projects in the John Day River basin. One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

The ISRP is requesting a response from this project to summarize the linkages between implementation and monitoring projects in the basin. The summary should provide a table or matrix that specifically identifies what is being monitored for each implementation project, as well as where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps of locations of monitoring actions would be helpful in this regard. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking all relevant implementation projects to assist your project in producing this summary. In particular, the John Day Partnership recently hired Nick Bouwes to help map and coordinate their M&E efforts, and they will be asked to assist.

Q1: Clearly defined objectives and outcomes

The proposal clearly identifies four major goals for the monitoring and evaluation, and identifies key management questions addressed by the monitoring and analyses. Quantitative implementation objectives are identified for each major goal. There are no SMART objectives for physical or biological outcomes, but these are not directly relevant for an M&E project designed to provide critical data and analyses for the region and for habitat projects therein. The project generates information used by multiple projects in the John Day River basin and the region, and the activities appear to be well coordinated.

Q2: Methods

The ISRP has reviewed the proponents' methods previously and has found them to be scientifically rigorous and excellent examples of Tier 2 statistical monitoring at the subbasin scale. The project continues to refine and strengthen their methods. They combined probabilistic sampling for steelhead populations and census sampling for adult Chinook populations. Their data are stored in regional databases and are incorporated into regional planning and evaluation. When BPA budget cuts prevented them from continuing their monitoring for certain population and habitat parameters, they obtained external funding for some measurements. Most notably, they obtained alternative funding for Chinook escapement assessments, which allowed them to continue to estimate SARs, a critical need for the Fish and Wildlife Program. They have used a spatial model (Falke et al. 2013) to provide quantitative predictions of redd occurrence probability and probability of spawning at a landscape scale. This information provides an important context for planning and prioritizing restoration actions.

The proposal thoroughly describes study designs, field and laboratory methods, and analytical procedures. Methods, data, sampling locations, and metadata are located in NRIMP, MonitoringResources.org, and Annual Reports. The ISRP appreciates the thorough descriptions of the methods.

The proposal includes a Gantt chart to describe the general operations of the project monthly for 2023 through 2025. While this helps reviewers understand general distribution of the project efforts through time, it does not provide information on the subcomponents of the project. This information should be provided in annual reports and work plans.

In the Survival, Age Structure, and Productivity portion of the Methods section, the proponents mention that environmental covariates and restoration metrics can be incorporated into the models with more time series data. Given the changes in temperature and flow occurring throughout the basin and the tremendous effort going into restoration activities throughout the basin, this is especially critical. Quantifying effects of these factors on fish will be key to manage for future conditions and ensure that restoration is effective. Could the authors attempt to run models that include these factors now, even if results are preliminary? If not, when do the authors anticipate that enough data will be available?

Q3: Provisions for M&E

The proposal describes a thorough adaptive management process based on regularly scheduled internal meetings, annual reports, and consultation with BPA. They also describe a formal process of meeting with the John Day Basin Partnership to inform habitat restoration planning and implementation. Their explanation is much more complete than that provided by other related projects in the Partnership.

It is less clear what triggers modifications to the program. How are changes to the project proposed and implemented? For example, the proposal mentions the need for more information on bull trout migration, possible challenges due to increasing numbers of invasive smallmouth bass, and changing climate, including asynchronous hydrology between the Columbia River and the John Day River. What prompts a redirection of the project to better account for these factors? Does each component have a “threshold of probable concern” that would result in changes to the activities? If so, what are they? As well, when is each action deemed successful, and when is it not?

The proposal also describes potential confounding factors related to climate change and expansion of nonnative predators. Rather than simply identifying and discussing the nature of these confounding factors, they present studies they are currently implementing to address

these confounding factors and develop methods to implement and assess future management actions. They also have developed an approach for identifying coldwater refuges that could serve as the basis for habitat protection and restoration in the face of climate change. Equally importantly, they are conducting experiments to determine whether smallmouth bass predation is additive or compensatory, a complex and important question in the Columbia River Basin at this point.

The proponents provide an excellent description of their responses to past Council recommendations and ISRP reviews. They have responded positively and creatively to past suggestions, making improvements that exceed recommendations from the ISRP. This constructive communication between the proponents and the ISRP is an example of how the scientific review process is intended to function.

Q4: Results – benefits to fish and wildlife

The proposal provided 13 pages with informative tables and figures of past progress and outcomes to benefit fish and wildlife from the project since 2000. The proponents identified the importance of this information for management decisions within the Columbia River Basin and groups that are using their information for conservation and restoration actions. They clearly have identified lessons learned from their results and how they are being used for management. The indirect benefits of his project are large as this project strongly contributes to status and trend monitoring for steelhead and Chinook salmon, life-cycle models, regional actions, and management of the hydrosystem.

Umatilla River

198710001 - Umatilla Anadromous Fish Habitat Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria

Overall comment:

The purpose of this project is to restore habitat throughout the Umatilla River basin for listed salmonids and other focal species, including removing fish passage barriers, reconnecting rivers with their floodplains, restoring habitat complexity, reducing water temperatures, and providing suitable sediment sizes. The proponents are using a process restoration approach to work toward a well-integrated set of seven goals and SMART objectives to address the root causes of poor river ecosystem function that affects habitat for the focal species. Their work is guided by a holistic River Vision, Upland Vision, and First Foods approach.

This is an exemplary project. The ISRP was highly impressed with this process-based approach and commend the proponents on preparing a very good proposal. Given the constraints, long restoration time frames, and challenges to monitor responses, this project satisfies our review criteria.

Nevertheless, future proposals, annual reports, and work plans would benefit from addressing several points raised during the review.

- 1. Addressing challenging limiting factors** -- A challenge for the proponents is that the relatively straightforward habitat problems identified early in the project, such as fish passage barriers, have mostly been addressed during the 36-year project duration, leaving problems that require coordinated effort over long time frames and large spatial scales. The two factors most limiting, high water-temperatures and sediment sizes that are too large for spawning, require coordination with other projects (i.e., those for water acquisition to increase stream flows) or large-scale restoration (i.e., enhancing interactions with river floodplains to increase sediment sorting). These are complicated problems, but making this point more clearly will facilitate future proposal and progress reviews.

2. **Summary of key accomplishments** -- The proposal would have benefited from a high-level summary of key accomplishments in one summary figure or table, such as, for example, floodplain area reconnected, miles of habitat gained from fish passage projects, temperature changes in restored reaches, and links to other projects to report the number of fish spawning in reaches. There are some results in appendices (lamprey spawning), but not a clear “dashboard” of relevant physical outcomes, or biological data collected by other projects.
3. **M&E matrix – support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Umatilla Basin Natural Production Monitoring and Evaluation Project (199000501) to summarize the linkages between implementation and monitoring projects in the basin. We ask your project to assist them in creating the summary and provide information to them about what is being monitored for your implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Overall, restoration projects should be able to present a high-level summary of what other collaborating projects have discovered about effects on the ultimate physical or biological responses that determine whether objectives have been met.

199000501 - Umatilla Basin Natural Production Monitoring and Evaluation Project (M&E)

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria

Final review comments:

The proponents are to be commended on a thoughtful and thorough response. The presentation of a point-by-point summary of the requested response issues (Responses 1-4

below) and suggested actions (5-10 below), along with a revised proposal reflecting these responses permitted a straightforward review. We address each of the response requests and suggested actions below.

- 1. Leading the development of a M&E matrix.** The proponents for the Umatilla Basin Natural Production Monitoring and Evaluation Project replied to our response request by presenting a table of the BPA-funded projects in the Umatilla subbasin that identified the lead entities, coordination forums and timing, goals and objectives, and other information. The point-by-point response and the revised proposal also provide a map of locations for the M&E activities in the Umatilla River subbasin. Specifically, Table 1 lays out a matrix for 14 subbasin projects for coordination (with criteria and attributes in columns), such as a coordination forum for each project and the frequency of meetings; goals and objectives for each project; reporting documents and processes; and “consumers” of reports.

The Table and Figures 1-4 help to clarify sources and pathways for CTUIR policy and management directives, as well as adaptive management and coordination processes for projects that contribute to the Umatilla Basin Restoration Program.

The response also indicates that CTUIR’s GIS department is creating a mapping application to assist assigning monitoring locations with associated habitat projects in the CDMS database. Additional attributes will link M&E datasets with habitat projects to identify data sets associated with specific habitat projects. The proponents plan to expand the mapping application to include M&E activities of other cooperators.

In summary, no further response is needed for ISRP review purposes. However, in future workplans, reports, and proposals the ISRP suggests an even greater level of clarity may be achieved by specifying what is being measured for each implementation project. For example, a table column could be added to indicate which data sets or parameters are important to evaluating success or progress for each project’s activities or objectives.

- 2. Response - SMART objectives.** The proponents respond by reframing the objectives in the SMART format by inserting a table of objectives broken down by task to describe the SMART criteria. This response satisfies the ISRP’s request.
- 3. Response - Reach-specific survival of outmigrating smolts.** The proponents respond that this objective has been removed from the revised proposal.

4. **Response - Smolt-per-spawner ratios.** The proponents' response acknowledges the importance of monitoring smolt-per-spawner ratios and points out that these ratios are calculated and reported by another project (Project 198902400). The ISRP agrees that a duplication of effort in the current project is not warranted so long as the ratios are updated and reported regularly. Specifically, the graphic provided from Hanson and Schultz 2011 is approximately 10 years old with the last data point in 2008 and should be updated. The proponents' response satisfies the ISRP's request.

Suggested future actions. In addition to the above response requests from our preliminary review, we identified several issues that could be addressed in the future but did not require a response. The proponents provided responses to each of our suggestions, so our feedback follows:

5. **Reliability of redd counts and smolt escapement relationships.** The proponents address the ISRP's comment by producing an alternate Figure 3b and describing the complementary (rather than duplicative) efforts of CTUIR and ODFW in redd surveys. They also describe conditions that may limit their ability to observe redds. Given this and other limitations, the ISRP has ongoing concerns over whether the surveys provide a scientifically supported and reliable index of abundance or spatial distribution of steelhead. The rationale for continuing with the surveys despite the acknowledged limitations is that "managers have asked us to maintain the index surveys for steelhead primarily for long term legacy trend-data." Ultimately if the relationships are unreliable, their value for informing management actions is minimal. In fact, the redd survey data are likely inadequate to meet the goal of "annual status and trend monitoring of spatial and temporal distribution of natural steelhead and salmon spawning" (p. 23). Therefore, the proponents may consider abandoning the redd counts unless valuable for other demonstrated purposes.
6. **Screw trap data.** The proponents' response to our questions on screw trap data is sufficiently thorough. They describe some substantial issues in estimating annual production from trapping data by using smoothing methods to fill in missing data during periods when the traps cannot be fished. However, other programs in the Columbia River Basin are using smoothing approaches that may have utility here. It may be better to attempt to estimate total annual production using a smoothing procedure – even given the wide confidence intervals – than to estimate production only partially over the period the trap was fished, which varies considerably over years. Despite their reservations, the proponents clearly recognized potential benefits of using a smoothing procedure (e.g., Bonner and Schwarz, 2011) as the revised proposal now includes a

commitment to run this model and compare results to estimates based on current procedures.

- 7. Stock-Recruitment relationships.** The ISRP appreciates the proponents' intent to examine relationships with a Ricker Stock-Recruitment-Covariate model. These analyses will be an important contribution to future annual reports. One of the ISRP's concerns relates to the practical issue pointed out by the proponents of "overhandling" outmigrating steelhead smolts to collect scales, thereby causing undue stress. As a result, the age composition of the smolt run each year is not reliably determined. This in turn means that egg-smolt survival and smolt-per-spawner relationships cannot be reliably estimated. The lack of aging data for smolts is a significant impediment to understanding causes for variation in freshwater production. The screw-trapping program already results in significant handling which includes a) a lengthy period between capture and fish processing (likely many hours), b) anesthetizing, measurement and marking (fin clip or PIT tag), c) release of marked fish upstream of the trap to estimate trap efficiency, and d) a repeat of much of this handling for fish that are recaptured. Removing a few scales from a subsample of all fish handled seems like a modest increase in handling relative to all others. Do any studies indicate that scale removal is more harmful than anesthetizing and tagging? Given the impact of an inadequate age sampling on the ultimate goal of the work, better support of this rationale is needed.
- 8. Adapting management actions.** The proponents indicate that their analyses provide critical information to managers. The process by which the information is then used to change and improve management directions is the essential part of adaptive management (see comments above for Response #1. M&E Matrix above).
- 9. Methods.**

 - 9a. Methods entered into MonitoringResources.org.** The proponents indicate they have submitted methods in MonitoringResources.org. The ISRP recommends explicitly referencing and linking methods described in the proposal with the published method on MonitoringResources.org. This can be included in annual reports and future proposals.
 - 9b. eDNA objective.** The proponents indicate that they have removed this from the 2021 proposal for several practical reasons, including funding limits and utility to managers. The response satisfies the ISRP's concern. The ISRP believes that eDNA can be an excellent tool to detect presence/absence and range of species, especially invasive

nonnative species like smallmouth bass and northern pike. However, we recommend keeping in mind ISRP concerns about use for estimating abundance if such an objective is reinstated.

9c. Sampling for 6PPD Quinone. Proponents indicate they have removed this objective from the 2021 proposal. The response satisfies the ISRP's concern.

9d. Water temperature monitoring. The proponents largely address the ISRP's concerns by pointing to specific text in the original proposal. The response satisfies the ISRP's concern about temperature data logger methods and acknowledges the information was provided in the original proposal. Also, the information provided about the use of backup loggers and continuous data downloads address the ISRP's concern. Please include these points in future reports and proposals to complete the project record.

9e. Stream Discharge Monitoring. The proponents provide an expanded description of the streamflow monitoring network cost-shared with USGS. The ISRP encourages the proponents to evaluate whether the discharge information from these gauges is sufficient for their described purposes. This does not require a major analytical effort, but rather identification of any significant gaps in coverage in future reports and proposals.

9f. Redd Survey Sample Design. See our discussion above on Redd Survey issues (Recommendation #1. Redd surveys).

10. Benefits to fish and wildlife.

10a. Demonstrate benefits. The ISRP suggested that the proponents missed an opportunity to provide more extensive and meaningful interpretation of their results to demonstrate benefits to fish and wildlife. The proponents indicate these will be forthcoming, but no outlet or venue was explicitly specified. Therefore, we recommend including expanded interpretation of results in future annual reports and proposals. The proponents need not copy hundreds of tables and figures from past or future annual reports to provide this interpretation (a concern from the proponents raised in their response). Instead, future proposals could briefly summarize the main findings and perhaps include critical graphs or tables (e.g., spawner-smolt plot with anomalies related to a habitat/flow/temperature condition).

10b. Redd survey question. The proponents clarify how previous ISRP reviews shaped their presentation of CTUIR and ODFW redd survey locations. Therefore, the surveys are

purposefully complementary rather than redundant. We recommend including this point in future reports and proposals. See also our discussion above on Redd Survey issues (Recommendation #1. Redd surveys).

10c. The proponents' suggestion that McKay Creek would be productive if steelhead had access. The ISRP acknowledges its confusion and finds that the objective has merit. Therefore, we recommend including a briefly expanded description of the basis and approach as described in the response. Moreover, the moratorium on juvenile electrofishing should be referenced and explained in future reports and proposals to remind reviewers of these limitations.

10d. Fish passage studies. The proponents indicate that the ongoing passage assessments are necessary for adaptive management in a dynamic system. The information provided in the response is sufficient and should be included in annual reports and future proposals.

10e. Flow criteria needed for fish passage facilities. The proponents respond that the justification is to meet regulatory requirements by NOAA. This justification should be included in the project record by highlighting it in annual reports and future proposals.

10f. Summary of efforts and derived data. The ISRP acknowledges the limitations on space to include the full background as text or appendices. Thus, we appreciate the effort to provide “brief summaries and selected examples of the more interesting and relevant data in the proposal,” and to avoid redundancies with other project reports. Ultimately, the ISRP is better able to review and avoid confusion when projects propose objectives and tasks within the subbasin context and thoroughly report previous findings and benefits to fish and wildlife. We encourage the proponents to provide thorough descriptions of the projects' results and benefits in future reports and proposals.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long-standing project with a strong track record of providing data on the number of spawners, smolt production, smolt survival, harvest of adults, adult fish passage, and stock-recruitment relationships, as well as physical data on water temperature and flow. The project

provides important data from a variety of activities and methods in the watershed, along with analyses of related projects – such as habitat and flow improvements – aimed at enhancing natural production in the subbasin. The data generated by this project are critical for the adaptive management of salmon and steelhead in the subbasin.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor responses to physical habitat or by focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this M&E project, the ISRP is requesting this project, the Umatilla Basin Natural Production Monitoring and Evaluation Project, to summarize the linkages between implementation and monitoring projects in the Umatilla basin. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. Reviewers noted that Figure 1 in the proposal for Project 198903500 and Table 2 in the proposal for Project 198902401 could be incorporated and expanded in the summary. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation projects in the Umatilla basin to assist your project in producing this summary (e.g., projects 198710001, 198902401, 198802200, 199000500), and encourage you to work closely with the implementation and monitoring projects to submit a coordinated response.

2. **SMART objectives.** As presented, the objectives section is largely a list of ongoing or new tasks rather than SMART objectives. The ISRP asks the proponents to develop a

complete set of SMART objectives (see proposal instructions) for this project and incorporate and submit them in a revised proposal, which will provide complete project documentation for future reference when reporting project progress.

3. **Reach-specific survival of outmigrating smolts.** It was unclear to the ISRP 1) what would be learned about survival of naturally spawned fish given that hatchery fish will be used as “surrogates”; 2) how the study will be designed to avoid confounding effects of multiple reaches on survival of groups, given that upstream groups will also be subjected to mortality in downstream segments; and 3) how the effects across years will be analyzed. As the data sets for these analyses are already available, these issues should be addressed in a revised proposal.
4. **Smolt per spawner ratios.** Smolts per spawner is a basic measure of natural productivity for anadromous salmonids, but these data are not highlighted in the proposal. These are basic and important estimates that will inform implementation and management actions in the subbasin. If these are presented in annual reports, the ISRP recommends citing the reports and providing a brief summary in the revised proposal.

In addition to the above requests, we identify several issues that will need to be addressed in the future. We welcome responses/feedback on these items during the response loop but understand that some of the issues may take longer to address than the two months allotted to the response loop. Specifically:

5. **Redd counts and smolt escapement relationships.** The proponents provided Figure 3 which displays escapement versus redd counts. These appear reasonably well correlated for some of the overlapping time series, but there was also a period of years (2005-2013) when this relationship appeared weak. The explanation for this was not obvious, so there is diminished confidence in interpreting a firm relationship. Redd surveys may produce unreliable estimates of adult abundance and spatial distribution due to variability in detection probability owing to changes in river conditions and observers. Information about 1) the reliability of redd surveys as a method for quantifying spawner abundance and distribution, and 2) an explanation for the weak relationship between redd counts and abundance of spawners during 2005-2013 should be included in future annual reports to inform management actions in the subbasin.
6. **Screw trap data.** Table 2 indicates that for several years a large portion of the rotary screw trap (RST) sampling period was not completed due to unsuitable river conditions. The potential for these incomplete sampling years continuing into the future could be a significant problem that may possibly worsen owing to increased climate variability. Thus, smolt trapping may not provide reliable estimates of emigrant run size. Moreover, the “pooling” method used to analyze data is not well justified and may also lead to bias

as well as an underestimate of uncertainty. Finally, the confidence intervals of run size estimates for steelhead presented in Table 2 are unrealistically narrow, especially in years when almost half the trapping period was not sampled.

A more advanced approach (Bonner and Schwarz 2011, <https://github.com/csschwarz-stat-sfu-ca/BTSPAS>) is recommended to avoid arbitrary pooling and provide more realistic estimates of uncertainty. Even then, it may not greatly improve results for years when a large portion of the sampling-year was missed. We recognize that the analytical effort to reanalyze the RST data is beyond the scope and timeline of a typical response to ISRP comments. We encourage the proponents to outline a plan for future analytical efforts to address these issues and perhaps commit to undertaking this effort and presenting them in future annual reports.

7. **Stock-recruitment relationships.** One of the more useful elements of this project is that it supports development of a stock-recruitment relationship between escapement and smolt run size. There is some indication of a relationship alluded to in the confounding factors section of the proposal, but this key relationship is not shown in the proposal. For example, how do we know that the relationships between flow and smolt run size are not misleading (Figs. 1 and 2) and instead reflect an escapement to run-size relationship? A more rigorous quantitative analysis, based on estimating a Ricker stock-recruitment-covariate model, is required (e.g., $\log(\text{smolts}/\text{escapement}) = a + b \cdot \text{escapement} + c \cdot X$, where X is a covariate like the flow metrics used in Fig's 1 and 2). Here too, we recognize the analytical effort may be beyond the timeline for a typical response loop. We encourage the proponents to explore such analyses as the project advances.
8. **Adapting management actions.** The linkage between the ultimate goal of defining stock status, trends, and effectiveness of management actions and the tasks in the lists are implied but would benefit from direct connection. As an M&E project, the description of the adjustment process is described generally, i.e., whereby results of this project are reviewed by the CTUIR and multiple stakeholders via an oversight committee (UMMEOC) that meets monthly and prepares an Annual Operating Plan. The various projects also are guided by the River Vision and the First Foods approaches defined by CTUIR.

However, The ISRP Comment #4 from the FY07-09 review highlighted an important point, it is not fully transparent how the many separate projects for the Umatilla River integrate to produce adaptive management decisions (see also Request 1 above for linking monitoring with implementation projects). The proponents state in each

proposal that the UMMEOC is doing that integration, but the ISRP is not able to review those decisions to determine whether various projects are, indeed, making decisions based on science for the benefit of fish and wildlife in this subbasin and the Columbia River Basin as-a-whole. The results section also does not appear to address the most significant project element - which is the relationship between adult escapement (estimated by another study) and smolt run size (estimated from this study), though potential effects of flow (Figs. 1 and 2) are shown. In either case, the ISRP recommends including these analyses in future work plans and annual reports.

9. **Methods.** In general, methods that are long-established by the proponents would benefit from a linkage to descriptions published in MonitoringResources.org, (e.g., deployment and operation of rotary screw traps for outmigrating smolts to estimate smolt production and survival). However, for new project objectives or innovative methods, additional description is warranted to be included in a revised proposal or in annual work plans and annual reports if they remain under development. Specifically:
- a. Use of eDNA to estimate reach-specific relative abundances and species composition of salmonids. This study will require a careful design to ensure detection power and validation of accurate species identification, based on comparison with estimates by another method. Moreover, the study requires sufficient QA/QC protocols to eliminate false readings. The ISRP recognizes that the proponents may need to consult with experts to develop the design and analytical strategy. We recommend this issue be addressed in work plans and annual reports as the project moves forward.
 - b. Sampling for 6PPD Quinone – This is a new objective, but it is unclear why this toxicant was selected for sampling over others that are also toxic to salmonids. Is it now of concern basinwide? Is the proposed investigation likely to be a range-finding analysis or an ongoing (expansive) monitoring effort depending on results? The ISRP seeks to understand why this is a concern in the Umatilla subbasin. Here too, the ISRP recommends this issue be addressed in work plans and annual reports as the project moves forward.
 - c. For water temperature monitoring – The ISRP recommends including description of the kind of sonde or logger being deployed (is NIST-traceable, ONSTET®) sufficient for reproducibility? Are any critical issues if a logger/sonde is lost?
 - d. For Stream Discharge Monitoring – Is coverage sufficient to account for the major tributaries within the subbasin? Would any additional sites provide needed information to complete a robust hydrological model?
 - e. For monitoring redd locations - What sampling design was used to select the rotating panel of sites for monitoring redds? In previous reviews, the ISRP recommended a GRTS design. Regardless, the selection design or process should

be included in future proposals, work plans, and annual reports.

10. Benefits to fish and wildlife. The proponents have an opportunity to provide interpretation along with their results. For example, the results simply state that redd surveys have been completed and that there is minimal overlap in coverage among the different groups conducting the surveys. It was unclear how redd counts in some tributaries inform the potential for upper Mackay Creek to support steelhead. Juvenile electrofishing surveys might be a more repeatable and direct way of measuring tributary use and production potential. Interpretation of passage results is equally problematic. Results from informative telemetry studies are summarized, and it appears one of the lessons learned is to keep fishways clear to allow passage. Again, it seems hard to justify continuing to conduct telemetry given that this finding does not need further validation, unless there are data collected that are critical to program evaluation. There is no mention of specific tests to better define flow-passage relationships. The ISRP recommends the proponents provide some interpretation of the results in annual reports.

198902401 - Evaluate Umatilla Juvenile Salmonid Outmigration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish & Wildlife

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria

Overall comment:

This is a well-written proposal for a project with a long history of critical data acquisition and adaptive changes to increase information and understanding about steelhead in the Umatilla River. The project provides information on population-level survival, productivity, and life history data that is useful for assessing effects of habitat conditions, and restoration and hatchery programs. Of particular interest to the ISRP are the data which show declining smolts-per-female spawner with increasing female escapement (Fig. 3) and the interpretation of it that freshwater habitat is sufficiently seeded (p. 9). The proponents take the interpretation further, suggesting that supplementing the natural population with hatchery-origin fish may not have

been an appropriate management strategy. This is a great example of interpreting M&E data to the point where it can be used by decision-makers.

However, as the data indicate that spawner numbers are not limiting juvenile production, then there should be a sufficient number of natural origin spawners to supply all the broodstock for the hatchery. Thus, the ISRP found it surprising that the hatchery program was using some hatchery origin returns for broodstock. Clearly, this program is providing lots of useful information for decision-makers, though some of the decisions regarding hatchery production appear to be ignoring some of the findings presented in the proposal.

M&E matrix – support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Umatilla Basin Natural Production Monitoring and Evaluation Project (199000501) to summarize the linkages between implementation and monitoring projects in the basin. As a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The section on goals and objectives was brief and some were not specific enough. Stating objectives using the SMART format would be helpful and should be presented in the next round of proposal reviews and annual reports. For Objective 4 for example, how the diversity of steelhead will be assessed is unclear. Also, for Objective 5, it is not clear how or when this this will be accomplished.

Q2: Methods

The methods are generally sound, but there are four areas for potential improvement.

Smolt run size is estimated by a series of independent closed-abundance estimates for each period (sampling interval). The length of each period was not specified in the proposal (except for TMF where it is one month), and the ISRP is concerned about the assumption that all marked fish pass the trap during the interval and/or that capture probability is constant over the interval. If this is not the case, capture probability and abundance estimates will be biased. To what extent have these assumptions been tested? If the length of the interval has increased to meet the passage assumption, is it likely that capture probability is not constant over the longer period?

A more flexible approach would be to use the Bonner and Schwarz (2011 and 2014, BT SPAS R library) time-stratified estimator. This model can be useful when recaptures for some periods are sparse, or when the trap(s) cannot be operated due to high flows (e.g., Fig. 6 of Hanson et al. 2020), and allows for finer temporal intervals that may lead to more accurate estimates of abundance and run timing. This approach avoids problems with arbitrary pooling of data across periods that is needed if sample sizes are low or trapping is not conducted over some periods.

Given the intense effort to mark fish and trap smolts, this analytical upgrade seems well worth it. The precision of smolt run size estimates at TMFD is very high (CVs 1995-2018 =5.4%) and may be an artifact of the analytical procedure (too much pooling). A better model may be more useful in Birch Creek where there are few strata which cover long periods where capture probability is unlikely to be constant as currently assumed (Table 7 of Hanson et al. 2020). Improved estimates of smolt run size at Birch Creek will lead to improved estimates of survival to TMF, which is highly relevant given concerns about survival rates in low-flow years. See Bonner and Schwartz (2011), Bonner and Schwartz (2014), and Hanson et al. (2020) for possible analytical approaches.

Egg deposition estimates could be improved by using a fork length-fecundity relationship rather than age-specific fecundity average. This would better account for the decreasing size and age-at-return that has been seen in many Chinook populations over the last decade or more (e.g., Lewis et al. 2015).

Would it be possible to develop a corrected SAR value that accounts for losses from fisheries? This would allow for better evaluation of effects of downstream/upstream mainstem passage or marine survival. Currently these effects are confounded with changes in exploitation rate.

Would it be possible to calculate the variance on the hatchery:natural ratio using the same binomial likelihood described for the smolt analysis? This error could be substantial for some tributaries where few spawners are observed or where the presence/absence of an adipose fin is difficult to distinguish.

Q3: Provisions for M&E

The proposal provides very little information on how effects of hatchery supplementation, flow, and habitat improvements on smolt run size or juvenile survival rates will be quantified. We suggest fitting a Ricker model with covariates:

$$\log(R/S) = a + b*S + d*X$$

where R is the number of smolts from brood year t, S is egg deposition or female escapement that produced those smolts, a is the log of productivity (R/S when there is no density dependence because S is 0), b is a density-dependent effect, X is a covariate such as flow or

some measure of habitat restoration, and d is the coefficient for the covariate (the strength of the effect per unit increase in X). Another covariate to assess could be $pHOS$, though it could also be included through adjustment of S via,

$$S = S*(1-pHOS) + S*pHOS*e$$

where the first group of terms on the right side of the equation is the contribution of eggs or females from natural origin spawners, the second group of terms is the contribution from hatchery-origin fish where “ e ” is the estimated effect of hatchery-origin fish on survival from egg-smolt. Essentially S is a weighted average spawner abundance, that accounts for reduced spawning success or lower survival rates of juvenile fish produced from hatchery-origin spawners. It may be challenging to estimate e , depending on the extent of variation in $pHOS$ and survival rates over time.

Survival rates between release locations could be evaluated using

$$\log(\text{Surv}) = b_0 + b_1*X$$

where b_0 and b_1 are estimated and X is the covariate to be evaluated.

Q4: Results – benefits to fish and wildlife

The proposal provides an excellent summary of the many project actions, what was learned from the results, and how the objectives and actions were modified as a result. It also provides information about how these results have influenced management and informed other projects that are closely aligned. The results have contributed to broader efforts in status and trend monitoring, and can be used in future life-cycle modeling.

One key problem in the subbasin is that both habitat restoration and hatchery supplementation affect steelhead abundance and survival in the Umatilla River, and so the effects are confounded. The proponents propose tributary-specific monitoring to allow separating the effects of these actions, and this is a high priority for funding.

References

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Lewis, B., W.S. Grant, R.E. Brenner, and T. Hamazaki. 2015. Changes in size and age of Chinook salmon *Oncorhynchus tshawytscha* returning to Alaska. PLoS ONE 10(6):e0130184.

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198802200 - Umatilla and Walla Walla Fish Passage Operations

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This project operates fish passage facilities for downstream juvenile migrants and upstream adult migrants at five migration barriers (dams and irrigation diversions) on the Umatilla River and four on the Walla Walla River, to increase survival of salmon and steelhead. It also operates fish traps to trap-and-haul adults and collect broodstock for hatcheries, as well as coordinates flow enhancement during critical migration periods.

The ISRP appreciates the critical nature of these fish passage facilities and does not require a response to the proposal. However, the ISRP asks that the proponents carefully address several Conditions in future annual reports and proposals.

1. **SMART objectives.** The proponents should develop SMART objectives (see proposal instructions). Although the three main objectives are clear, they are not written as SMART objectives. An example of how Objective 1 might be written as a SMART objective is:

Objective 1: Fish passage facilities, including juvenile fish screens and bypasses and adult fish ladders, will be operated to meet NMFS (2011) fish passage criteria at five migration barriers on the Umatilla River and four on the Walla Walla River, through 2027.

2. **Fish passage criteria.** Please present a table of the criteria defined in NMFS (2011) that these fish passage facilities must meet and a table of quantitative data showing how

many days each facility was in compliance vs. out-of-compliance for these criteria during migration seasons each year. These data are critical for the ISRP and others to evaluate whether this project is meeting its objectives operationally and biologically.

3. **Measures of effectiveness.** Please explain how the effectiveness of the juvenile bypass systems and adult fish ladders is measured, in terms of proportion of fish that were able to pass without delay and effects on their survival. If these metrics are collected or managed by another project(s), describe these linkages (see Condition 7), present a summary of what has been found to date, and reference reports. How is this information used to inform adaptive management of the project?
4. **Lamprey passage.** The goal of Strategy 5 of the Umatilla Subbasin Plan is to “Improve fish passage conditions at all man-made passage impediments for resident and anadromous upstream and downstream migrants.” This includes upstream passage of Pacific lamprey, a species that is in decline. However, this species is typically unable to pass upstream through fish ladders designed for adult salmonids, and it is not clear whether lamprey can use juvenile bypass facilities when passing downstream. How will the proponents ensure protecting fish passage for lamprey, which are one of the First Foods for Native Americans in this region (Quaempts et al. 2018)? Adult lamprey migration is reported in Table 4, with regard to periods that flows are augmented for fish passage, but no information is given about whether facilities are effective for lamprey passage.
5. **Update to current Fish and Wildlife Program.** The proponents report biological objectives listed in the 2000 Columbia River Basin Fish and Wildlife Program, but the current version is from 2014/2020. As applicable, please update the reference to objectives in the most current plan amendments.
6. **Response to past ISRP request.** The response to Point #1 of the past ISRP review was not adequate, concerning how data or observations of the effectiveness of the facilities in promoting fish passage with high survival are used to make adaptive changes to operations. For example, if it is found that the juvenile bypass systems are not passing a high proportion of juveniles with minimal mortality, what management actions result from that finding? Moreover, is there a threshold or range that defines a “high proportion”?
7. **M&E matrix – support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Umatilla Basin Natural Production Monitoring and Evaluation Project (199000501) to summarize the linkages

between implementation and monitoring projects in the basin. We ask your project to assist them in creating the summary and provide information to them about what is being monitored for your implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

198343600 - Umatilla Passage Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Westland Irrigation District

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Not Applicable

Overall comment:

This proposal is for operations and maintenance (O&M) of fish screens and fish ladders at five dams and diversions in the lower 33 miles of the Umatilla River, which allow juveniles and adults of wild and hatchery Chinook and coho salmon, and ESA listed steelhead trout, as well as a few bull trout to pass these migration barriers. The proponents also provide O&M for five aquaculture facilities to acclimate juvenile salmonids or hold and spawn adults in the Umatilla and Walla Walla rivers.

The ISRP found this proposal to be **Not Applicable** under the review process and does not request response from the proponents.

Nevertheless, the proponents should carefully address several points in their future proposals and annual reports.

1. **SMART objectives.** The goals and objectives appear sound, overall, but need to be framed as SMART objectives (see proposal instructions). For example, suggested wording for the two main objectives could be:

“A. Perform cleaning, repair, and maintenance of mechanical, electrical, and hydraulic systems to maximize passage of adult and juvenile salmonids at five migration barriers in the lower 33 miles of the Umatilla River, through FY 2027.”

B. Provide operations and maintenance services required to mitigate high flow events that cause flooding of facilities, through 2027."

2. **Summary of criteria and functioning of fish passage facilities.** The proponents state that project activities are evaluated primarily by whether the operations and maintenance meet the criteria for fish passage outline by NOAA Fisheries, apparently in a NMFS (2011) document. These criteria are not presented in this proposal but are linked in the proposal for Umatilla and Walla Walla Fish Passage Operations (198802200).

The citation is: NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon.

If the objective is to meet these criteria on a daily basis, then the ISRP asks the proponents to, first, present the criteria in a table. Second, please provide a table showing the dates each fish ladder and screen was inspected and whether fish passage was likely impeded or not based on the inspection. For example, you could color code these entries (red vs. green shading) to provide a quick visual summary of how well the facilities were functioning. These data are critical to evaluate whether these facilities are meeting the objectives laid out in the proposal.

3. **Lamprey passage.** The proposal indicates O&M activities are to be conducted to minimize adverse effects on Pacific lamprey, apparently by minimizing effects on bed materials that provide habitat for their larvae. However, adult lampreys also need to pass upstream over migration barriers to reach their spawning grounds. The proponents should clarify what O&M activities are undertaken to ensure passage of adult lamprey, in addition to that of salmonids.
4. **Update to current program objectives.** The proponents refer to biological objectives listed in the Council's 2000 Fish and Wildlife Program, but the current plan was approved in 2014 with a 2020 addendum (see: <https://www.nwcouncil.org/reports/2014-columbia-river-basin-fish-and-wildlife-program>). Please update these objectives, if needed, using the most recent plan amendments, and reference this plan.
5. **Maintenance costs.** In the proposal and the presentation to the ISRP, the proponents emphasized that funds are lacking to maintain more than 30 drum screens, which will create major problems for fish passage when these eventually fail. The costs for needed maintenance were not specified in the proposal but should be presented to the Fish and Wildlife Program to allow planning for them.

6. **Climate adaptation for future flooding.** The Umatilla River sustained a “500-year” flood in February 2020, which damaged various fish passage and fish holding facilities, and all facilities required substantial maintenance. The ISRP suggests that, given ongoing climate change, severe events like these will increase future O&M costs. Climate adaptation for these facilities will require thinking carefully about infrastructure improvements and increased maintenance.
7. **M&E matrix – support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Umatilla Basin Natural Production Monitoring and Evaluation Project (199000501) to summarize the linkages between implementation and monitoring projects in the basin. We ask your project to assist them in creating the summary and provide information to them about what is being monitored for your implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

198903500 - Umatilla Hatchery Operations and Maintenance (O&M)

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish and Wildlife

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

In the ISRP’s preliminary review, we requested point-by-point responses on the topics listed below. The ISRP also requested a revised proposal. Unfortunately, the responses mostly were vague and of limited utility for assessing scientific merit of the actions proposed. Moreover, the proponents did not provide a revised proposal incorporating the requested information and the original proposal remains incomplete. As a result, the original proposal and the responses to the issues raised by the ISRP’s review do not meet scientific review criteria. However, some of the information requested by the ISRP to make the project a scientifically supported project and documented in a stand-alone proposal may be found in other Umatilla subbasin project descriptions (specifically, 199000500 and 199000501, which received recommendation as

Meets Scientific Review Criteria following their responses). Therefore, the ISRP recommends four conditions that the proponents of this project will need to address more comprehensively in the next annual report and work plan:

1. **Proposed production**
2. **Project evaluation and adjustment**
3. **Density dependence**
4. **Evidence for reduced retention time**

Detailed conditions and comments based on the response are provided after each topic.

1. **Proposed production**

Condition: Please provide a more thorough explanation of the history of production and broodstock changes for each of the species and runs produced, distributed, and released. This explanation should include the rationale and supporting scientific basis for proposed production levels to meet program goals. The proponents should examine other project proposals in the subbasin (specifically 199000500 and 199000501) and confer with those proponents to ensure consistency.

Comment: As a hatchery production (O&M) project for the Umatilla Fish Hatchery, the project's goals and actions are part of a larger framework for producing and returning coho salmon, Chinook salmon, and steelhead to the subbasin at harvestable levels. The ISRP seeks a more specific description of this project's role within this larger framework. For example, the proponents responded, "the Coho program was reduced by half in 2017 and the remaining production has been released on the Lostine River as agreed to by co-managers." A number of questions need to be addressed. First, why was coho salmon production reduced in 2017? Next, why were releases shifted to the Lostine River? Had Umatilla coho populations *measurably* responded to alleviate the need for supplementation? Is there evidence to support the conclusion that Umatilla coho salmon are genetically compatible with Lostine populations, and how is this shift consistent with an appropriate HGMP? Finally, the "agreement by the co-managers" warrants a more expanded explanation, especially if it was part of a formal adaptive management process.

Further, the response states "[t]he fall Chinook programs have been reduced to reduce potential straying and also due to lack of rearing water." A lack of water for fall Chinook salmon is noted in the original proposal, and for spring Chinook salmon as well. However, the concern about straying requires additional explanation with greater detail. Is there evidence for straying from the Umatilla subbasin? If so, to what other subbasins

and at what rate? How does production scale (i.e., size of the program) affect straying rates?

Finally, the response states, “[t]he summer steelhead program remains unchanged.” Yet, the original proposal indicates that the program was altered beginning in 2014 from a Segregated program to an Integrated Harvest program, at least in part due to limits on rearing space needed to maintain segregated groups. Also, the ISRP requested a response regarding a proposed shift to substitute 17 HOR females as brood to achieve production levels. Given the small number of NOR female fish required to fill this need, it is unclear why using HOR females is necessary, especially considering that studies have documented reductions in fitness caused by hatchery broodstock relative to wild brood (e.g., Christie et al. 2014). A future response to this issue and explanation of the project’s decision in an annual report will require coordination with co-managers because it is apparently under discussion.

The ISRP suggests that the proponents could examine the responses provided by projects 199000500 and 199000501 for the level of detail we seek. Those responses provide a sufficient level of detail of the ongoing discussions related to this issue. The ISRP recommends including the history of the changes along with the reasons for the changes in future annual reports.

2. **Project evaluation and adjustment**

Condition: Please provide a more thorough description of the evaluation and adjustment process for this project (i.e., adaptive management). As described above, the Umatilla Fish Hatchery has experienced several changes in husbandry and production throughout its history and especially over the past decade. These past and proposed modifications presumably are based on biological and/or practical operational concerns. These reasons need to be explained in one or two concise paragraphs, along with a table and linked references if warranted. Because the proponents may need to confer with co-managers, this description should be included in annual work plans or reports.

Comment: The proponents’ response does not directly address the ISRP’s request about the adaptive management decision process. ISRP requested, “a coordinated response among the proponents (at the Umatilla Fish Hatchery) and the resource co-managers explaining the decisions to abandon the natural broodstock for Chinook salmon and shift away from restoring natural production. The ISRP requests a description (or map with data) of the out-of-basin sources for brood, eggs, or young.” In the response to 1.

Proposed production, the proponents indicate that local broodstock is used “when available.” The purpose of the response request is to understand the pattern of out-of-subbasin sources when local broodstock are not available.

3. **Density dependence**

Condition: The proponents suggest other projects (e.g., Umatilla Hatchery M&E #199000500, for example) are better suited to address the issue. The ISRP requests this project coordinate with those project proponents and summarize a response in the next annual work plan and annual report.

Comment: This ISRP request and the proponents’ response highlight the rationale for requesting the M&E matrix to allow understanding the overarching framework for work being done in a subbasin. In cases where the proponents of this project suggest that other projects are better suited to address the issues, the ISRP requests that proponents of this proposal consult and coordinate with proponents of the other projects to provide a summary. The ISRP recognizes and has previously recommended that other project proponents were better positioned than the Umatilla Fish Hatchery staff for performing M&E and providing the key inputs for adaptive management (e.g., [ISRP 2007-15](#)). However, the proponents should still be able to provide a summary of details through a consultation with associated projects.

4. **Evidence for reduced retention time**

Condition: The proponents suggest another project (the Umatilla Juvenile Salmonid Outmigration project) is better suited to address the issue. The ISRP requests that proponents of this project coordinate with proponents of the other project to develop a summary response to our information request in the next annual work plan and annual report.

Comment: Similar to Conditions 2 and 3, other projects may provide the information; however, a summary is needed to allow ISRP reviewers to understand this project and its linkages to those other projects.

5. **Funding period.** The proponents are correct. The instructions specify “3-5 years of projections.” The proponent provided 3 years of projections, so they satisfied the proposal request.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This longstanding project is part of a set aimed at hatchery production, rearing, and M&E in the Umatilla Subbasin (Projects 198903500, 198343500, 199000500). The ISRP observed the project's operational objectives, although not entirely fitting the SMART format, were appropriate and clear for an O&M project. The operational methods provided were also sufficiently clear. The figure on page 13 was appreciated, showing the responsibilities of each project and how they fit together. This figure, along with Table 2 in Proposal 198902401, should be included in all proposals for the Umatilla suite of projects.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Proposed production.** The Umatilla Hatchery has experienced several shifts in production number, species produced, and broodstock/egg sources in response to several ongoing or emerging challenges. The pathway or scientific criteria leading to the proposed production should be explained more thoroughly. For example, is the pathway consistent with latest HSRG recommendations along with the most up-to-date HGMP? During the presentation, we were provided with a link to a 2017 revision of the HGMP for steelhead (<https://www.dfw.state.or.us/fish/hgmp/docs/2017/Umatilla%20River%20Summer%20Steelhead%20to%20NOAA%205-2-17%20with%20updates.pdf>). This needs to be appended to the proposal to complete the project record.

The ISRP requests a comprehensive discussion of changes to the program relative to long-term goals. Please provide a crosswalk of production characteristics to relevant hatchery operation guidance documents. For example, the ISRP requests proponents to provide justification for the switch in 2014 to include more HORs in the steelhead broodstock. The shift appears to substitute 17 NOR females with HOR females (to achieve production levels). Given the small number of NOR fish required to fill this need, it is unclear why using HOR females is necessary given what we know about reductions in fitness caused by hatchery broodstock relative to wild brood (e.g., Christie et al. 2014). Moreover, the shift in 2014 and thereafter appears to be a switch from an "integrated" restoration program to a "segregated" harvest production program.

This request reiterates Qualifications from previous reviews (2010 RME/AP). “The management plan for Conservation and Harvest groups should be more fully developed and tested and presented at the next ISRP review. The fate of Spring Chinook Natural Origin Returns (NOR), released upstream or taken upstream, should be described, as well as the fate of NOR Fall Chinook. The use of NOR in the Conservation broodstock might be limited such that it does not inhibit natural development of a self-sustaining population, if this is the goal, by establishing a minimum required escapement. A decision tree on the use of NOR returns for hatchery broodstock and natural spawning is needed in the management plan.”

2. **Project evaluation and adjustment.** Related to the request above, what is the decision process and who makes the decisions about shifts in production (i.e., numbers, brood, or egg source when local sources do not reach target levels, and so on)? For example, project goals include preserving native and/or sustaining natural salmon, but specific objectives to pursue these goals are not included. Do these goals remain, or have goals shifted towards increasing harvest at a possible cost to restoring natural production? The ISRP requests a coordinated response among the proponents (at the Umatilla Fish Hatchery) and the resource co-managers explaining the decisions to abandon the natural broodstock for Chinook and shift away from restoring natural production. The ISRP requests a description (or map with data) of the out-of-basin sources for brood, eggs, or young.
3. **Density dependence.** The ISAB produced a report ([ISAB 2015-1](#)) that addresses how hatchery supplementation affects natural populations of salmon and steelhead through density dependence. The proponents should share information they have on impacts or potential impacts to naturally produced native fish populations given that well over a million salmonid smolts are released annually into the Umatilla River. What information is available and what monitoring is conducted to determine if release of large numbers of smolts conflict with goals to restore natural production and native fish populations? Do any current management plans consider the effects of density dependence at the subbasin or larger scales? Does project 199000500 Umatilla Hatchery M&E gather, evaluate, and share some of this information with this project?
4. **Evidence for reduced retention time.** The proponents report that raising fish to smolt size will reduce the amount of time fish spend in the Umatilla and tributaries during downstream migration. Has this assumption been tested? Please provide a summary of the evidence for this assertion, especially for any testing completed within the subbasin.
5. **Funding period.** Please clarify why the proposal requests 3 years of funding, compared to 5 for other projects. Is this a convention for hatchery O&M projects?

Q1: Clearly defined objectives and outcomes

While not entirely in the SMART format, the proposal provides a lengthy list of operational objectives (n=12) and sub-objectives. Several of these (#'s 1, 2, 3, 5, 6, 11, 12) are effectively “administrative, planning or reporting” objectives, and #10 is a “maintenance” objective. The remainder (#'s 4, 7, 8, 9) are the “production” objectives. These provide sufficient information and description. The production objectives (and associated subobjectives) are directly linked with Project 198343500 Satellite Facilities for acclimation purposes.

However, there are a few places where goals, objectives, and methods are switched. For example, Method 1 (Foster and sustain opportunities for sport, commercial and Tribal anglers, consistent with the conservation of naturally produced native fish) is a goal, rather than a method. It is not presented in the goals section, with associated objectives, but should be. This comment is intended to help in preparing future proposals and reports and does not require a response.

Q2: Methods

Sufficient details are provided for production and health actions, especially given the water and space limitations of the Umatilla Hatchery. The ISRP especially appreciates the intent to adhere to Oregon’s Native Fish Conservation Policy and the Hatchery Genetic and Management Plan elements for maintaining genetic integrity (note that links should be provided in future documents). Especially critical will be how the anticipated shift to include HOR steelhead broodstock meets criteria of the Oregon Native Fish Conservation Policy and the HGMP (see Request 1 above). These are important for not only remnant summer steelhead (part of the Major Population Group for the “threatened” Mid-Columbia ESU), but also for re-establishment of viable spring Chinook in the subbasin.

Q3: Provisions for M&E

M&E for released salmonids falls to other projects within the subbasin (especially 199000500 Umatilla Hatchery M&E and others). The Figure in Section 5 illustrates how M&E fits into the broader framework of the projects within the subbasin (but see Request 3 above).

The ISRP recommends including a basic description of in-facility implementation or operational monitoring that will take place on an ongoing or periodic basis. Please see Project 198343500 for an example of this kind of basic description. The ISRP does not need to see a response on this issue, but recommends it be included in work plan, annual reports, and future proposals.

Q4: Results – benefits to fish and wildlife

The benefits fish and wildlife demonstrate modest (albeit, lower than originally proposed) return rates for artificially produced summer steelhead and fall and spring Chinook. The HORs for each group permit harvests, and it is hoped that this harvest will minimize domestication risks. However, the ISRP is concerned that domestication will not in fact be minimized by including HOR in steelhead brood (i.e., the Araki effect), and abandoning the segregated spring Chinook program will prevent achieving key desired outcomes to fish and wildlife.

Reference

Christie MR, Ford MJ, Blouin MS. 2014. On the reproductive success of early-generation hatchery fish in the wild. *Evolutionary Applications* 7:883–896.

198343500 - Umatilla Hatchery Satellite Facilities Operations and Maintenance (O&M)

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP appreciates the proponents' response to clarify and expand on several issues identified in the initial review. Nevertheless, two points were not addressed completely. The ISRP requests the proponents to provide information on two conditions — **1. Goals and objectives** and **5. Use of information from M&E projects** — in the next annual report and work plan.

In our preliminary review, we requested responses on the following topics. We provide our final comments based on the response under each of the topics:

1. Goals and objectives

Condition 1: To meet scientific criteria, the proponents should explicitly describe in the next work plan or annual report how their policies will meet the goals of either an

integrated or a segregated hatchery and harvest program for each target species or run. If the ISRP's question is answered elsewhere, please provide a specific reference.

Comment: The proponents responded that the overarching goal is two-faceted: harvest and supplementation of natural production. There is a suggestion that the "management of fish disposition" of the returning adults is dependent on the run size. The specifics of the management or decision framework for "fish disposition" under expected run sizes is an important consideration and should be included in future work plans, reports, and proposals.

2. **Evidence for abandoning volitional release.** The ISRP appreciates the explanation and clarification provided by proponents. Please include the details of the response in future work plans and proposals.
3. **Effect of non-clipped hatchery steelhead on PNI estimates.** The response satisfies the ISRP request. We acknowledge the confusion on our part and appreciate the proponents' explanation. The ISRP was concerned about unclipped (adipose fin) steelhead. The proponents responded that there are no unclipped hatchery steelhead. However, the response by proponents of Project 199000500 indicates that some Chinook salmon, rather than steelhead releases are unclipped. They note that 100% of the unclipped fish receive CWT's, therefore identification of hatchery-origin fish is an integral part of the program.
4. **Breeding protocol.** The proponents' response includes the additional information requested and partly satisfies the ISRP's concern, though the basis for some of the explanation warrants more thorough investigation. The ISRP encourages the proponents to describe the protocol and science-based rationale for size-selective breeding more fully in future reports and proposals. Specifically, there is regional evidence to contradict the proponents' response that: "A higher percentage of smaller, younger adults have been observed returning in the Basin for years likely due to the random sampling theory for maximizing genetic diversity which leads to long-term selection for younger age at maturity (e.g., increased jack returns)." Chinook salmon have been returning at younger ages and at smaller size for a given age to rivers in Alaska, BC, and in U.S. Pacific Northwest (e.g., <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4474552/>). While it is possible that hatchery practices have contributed to this trend, they have been observed in wild stocks, and the change has largely been attributed to poorer ocean conditions or changing selection pressure owing to size-selective harvest. The contention that size and age at return trends in the Columbia are solely due to random mating practices in hatcheries is questionable. To our knowledge, this conclusion is not supported by data; and therefore, is not a scientifically supported rationale for justifying

size-selective breeding protocols. The other argument provided by the proponents, that age-at-return is heritable, is well-supported by evidence.

5. Use of information from M&E projects

Condition 2: The proponents should describe the types of M&E information used in project evaluation and adjustment, and the sources of that information be included as part of the next annual report, work plan, and future proposals. Specifically, we seek a description of which specific M&E activities are relevant to this project and how that specific set of information is used to inform future production actions (adaptive management). In short, the ISRP requests additional information needed to understand whether the fish released (either directly or after grow-out at the satellite facilities) are surviving and returning at the expected rates. Metrics – such as PNI, pHOS, pNOS, survival, productivity, and others important to performance of the satellite facilities – are measurable. Those results should be referenced and summarized in the context of the proposed work for this project. This request for information is specific to this project and not related to the ISRP’s request for M&E matrices and summaries.

Comment: The proponents responded that the information the ISRP requested will need to be provided by other M&E projects. We recognize that the information may be available from other projects (or elsewhere). However, we are trying to determine how decisions in this project are made within an adaptive management framework. By specifically describing the M&E that informs implementation of this project, the proponents can connect the effectiveness of hatchery production with the goals and objectives for the subbasin. The proponents did not present additional information that indicates how the proponents use information from other M&E projects for evaluation and adjustment or a narrative about decisions linked to outcomes identified through M&E. The ISRP recommends that the proponents coordinate with the related projects to provide requested information in the next annual report, work plan, and future proposals.

6. **Pacific lamprey restoration.** The proponents’ response satisfies the ISRP’s request for additional information and clarification regarding holding Pacific lamprey vs. steelhead at the Minthorn facility.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long-standing project that has gone through periodic ISRP review. The role of the Satellite Facilities is tied to a broader framework for the Umatilla River subbasin that is found in the subbasin plan and the various vision documents for the Umatilla River. It is also directly linked to Umatilla Hatchery project (198903500), and several others providing passage to juveniles and adults. The proponents indicate that the primary goal is to allow imprinting of artificially produced fish to specific locations within the subbasin, thereby facilitating return to multiple tributaries rather than to the hatchery outflow. Water limitation issues at the Umatilla Fish Hatchery partly necessitates the use of offsite satellite facilities as well.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **Goals and objectives.** The proposal presents contradictory information when comparing overall goals and implementation objectives for each of the target species and run. For example, the proponents refer to the Umatilla River Fish Restoration Program and indicate that the overarching goal is natural sustainability. However, the objectives herein appear to be focused more on ensuring harvest and broodstock availability. How do these policies meet the goals of either an integrated or segregated hatchery and harvest program for each target species or run?

If the overarching goal has shifted, the ISRP requests proponents explain why, and how the new goal aligns with the most current Umatilla/Willow Subbasin Plan (or others if they supersede the UWSP).

Ultimately, the satellite facilities receive juveniles from a variety of sources produced elsewhere (e.g., Umatilla Fish Hatchery, and outlined in Project 198903500 to which the ISRP has requested a response). While the current project does not produce the fish in question, the ISRP highly recommends proponents of this and related projects to coordinate their responses to ensure a unified understanding of subbasin activities.

2. **Evidence for abandoning volitional release.** The proponents indicate that volitional releases were abandoned in 2012 in favor of a single-day forced release for each production lot. During the presentation, the proponents indicated that the facilities were not well designed for volitional releases and a portion of the juveniles did not leave the facility. The ISRP requests the proponents coordinate with the M&E projects in

the subbasin for a summary of data and analysis to illustrate the effect and support for this decision, especially in regard to survival, productivity, and return rate. Furthermore, has a facility design retrofit been explored, if that is primary rationale for abandoning volitional release? Last, how is the schedule of forced release determined and are they set to maximize productivity, return rates, or other criteria?

3. **Effect of non-clipped hatchery steelhead on PNI estimates.** The proposal indicates that a proportion of hatchery produced steelhead are not adipose-clipped to ensure a proportion of these fish will avoid the recreational harvest and return to contribute to natural production. It is unclear to the ISRP how non-clipped fish affect their PNI estimates for hatchery broodstock and for spawners in the wild. Do these unclipped fish receive a coded wire tag or other mark that permits identification as HOR by project staff, even though anglers might not recognize them as HOR? Or is a Constant Marking Fraction approach employed? Additional description of how unclipped steelhead are accounted for in the calculation of PNI in broodstock, and the proportion of hatchery origin fish spawning naturally, is requested.
4. **Breeding protocol.** Production for each species is guided nominally by an HGMP, including a breeding protocol. During the presentation, it was suggested that large males used for brood may be paired with multiple females for spawning. This appears to be inconsistent with maximizing effective number of breeders, an important approach to avoid genetic bottlenecks. Regardless, the ISRP requests information (data and analysis) on how often a departure from a 1:1 breeding scheme occurs and its predicted impact to self-sustainability or harvest.
5. **Use of information from M&E projects.** The proposal indicates that other projects are conducting biological M&E objectives. Here, proponents of this and the M&E projects (199000500, 198902401, and perhaps others as appropriate) should coordinate to lay out specifically which M&E activities are relevant to this project and how that specific set of information is used to inform future production actions (adaptive management). In short, the ISRP requests additional information needed to understand whether the fish released (either directly or after grow-out at the satellite facilities) are surviving and returning at the expected rates.
6. **Pacific lamprey restoration.** During the presentation, the proponents indicated that Minthorn facility has been transferred to the Pacific lamprey restoration effort. None of the projects in the subbasin appear to have objectives related to Pacific lamprey. It may be covered by a separate set of proposals (other than those reviewed in this cycle), but it is worth describing these and their ecosystem relationship to current objectives, such as ecosystem function and cultural values. In the proposal's summary, Minthorn facility

is described as an adult holding facility for summer steelhead. Is this still the case? If not, the summary needs to be revised.

Q1: Clearly defined objectives and outcomes

This project, operated by CTUIR-DNR, is part of the suite of projects for the Umatilla River Subbasin. As an O&M project, it operates and maintains the Satellite Facilities for rearing of hatchery fish produced and bred at ODFW hatchery facilities (198903500 Umatilla Fish Hatchery, along with fish from Oxbow, Cascade, and Bonneville hatcheries). The goal is to allow imprinting of artificially produced fish to specific locations within the subbasin, thereby facilitating return to multiple tributary reaches rather than the hatchery outflow.

As an O&M project, the objectives are appropriate, albeit not presented in a SMART format. However, the elements of the SMART format are found in the Production Goals (Tables 6 & 7). For example, the first objective (OBJ-1) is stated as “Increase adult salmon and steelhead survival and homing to the Umatilla River basin.” This is more of a general goal rather than a Specific and Measurable objective. Reconfiguring the objective (perhaps with subobjectives for each satellite facility) will be reasonably straightforward given the M&E elements in the subbasin (199000500 Umatilla Hatchery M&E and 198902401 Evaluate Umatilla Juvenile Salmonid Outmigration). Similarly, for OBJ-2, some additional specificity is included in Tables 6 and 7. Again, the information is there, it simply can be recast with a minor revision in future annual reports and future proposals.

One issue the ISRP recommends in future proposals, work plans, and annual reports (not specifically requiring a response here) is to cast the rationale for the goals and objectives as an integrated or a segregated hatchery program for each species and location. In the response to a previous ISRP review, when asked whether the goal of self-sustaining populations will be met in the future, the proponents state that this is not their purview, but instead that this is a question for “RM&E.” For ISRP reviewers, the issues to be addressed are often not apparent until key statements are made in proposals like this, distant from the RM&E proposal (199000500). The current proposal should not simply suggest that biological response is measured elsewhere, but rather point to critical finding(s) of that M&E as it applies to the O&M projects. These goals and objectives, in fact, have measurable benchmarks or metrics that can be monitored and reported (e.g., PNI, pHOS, pNOS, survival, productivity, and so on).

Specifically, for Chinook salmon, the proposal refers to production as part of the Umatilla Fish Restoration Program. It appears that co-managers have abandoned attempts to develop self-sustaining populations (of extirpated runs) and aim to produce fish primarily for harvest. As an example, for spring Chinook (see p. 17) broodstock are taken from NOR and a variety of marked

hatchery fish (Adipose only, Adipose + CWT, CWT only), which means that all types of fish are mixed. In contrast, for coho, no NOR are collected for broodstock (see Request 1 above). Given this, how do these policies specifically meet the goals of either an integrated or segregated hatchery program for each species or run?

Q2: Methods

As described, the methods for the Satellite Facilities are well described and are sufficient for an operational program. Any concerns the ISRP has regarding operational methods relates to program rationale and desired outcomes in the basin (described above). The ISRP recognizes that co-managers operate and maintain different facilities within the subbasin. However, projects in the subbasin warrant a unified and coordinated strategy that dictates operations.

Q3: Provisions for M&E

As an O&M project, most of the direct M&E is conducted within the facilities as implementation M&E (rather than effectiveness M&E), which is conducted in other projects (i.e., 199000500 Umatilla Hatchery M&E and others). The schedule for in-facility monitoring is ongoing or at monthly intervals, which is a reasonable practice (BMP).

To clarify this relationship, the ISRP suggests that in future reports and proposals the proponents include and discuss the diagram in the Section 5 of Project 198903500 that illustrates how all of the Umatilla River Subbasin projects relate to each other. Alternatively, Table 2 in Project 199802401 provides a tabular summary of these interrelationships.

Q4: Results – benefits to fish and wildlife

The benefits fish and wildlife demonstrate modest (albeit, lower than originally proposed) return rates for artificially produced summer steelhead, fall, and spring Chinook.

199000500 - Umatilla Hatchery Monitoring and Evaluation (M&E)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish and Wildlife

Province/Subbasin: Columbia Plateau/Umatilla

Recommendation: Meets Scientific Review Criteria

Final review comment:

The proponents responded concisely and thoroughly to the ISRP's request for additional information and clarification. No further response is required by the ISRP.

In our initial review, we requested a response on the issues listed below. Our final comments based on the response are provided after each topic:

- 1. SMART objectives.** The proponents revised 15 objectives in Section 3 in a SMART format. The response satisfies the ISRP's request.
- 2. Expected NORs.** The proponents responded by modifying Table 3.1 to show the history of return objectives for the total number of hatchery-origin and natural-origin adults, along with harvest for fall Chinook salmon, spring Chinook salmon, and steelhead. The table is a clear presentation of changes to the goals through time and the associated legal decisions and planning documents (i.e., US v. Oregon, Umatilla Master Plan, Spirit of the Salmon, Umatilla Subbasin Plan, and recent HGMPs). The information permits the ISRP to directly compare the releases with subbasin goals. The response satisfies the ISRP's request.
- 3. Support to a M&E matrix.** The proponents provided sufficient clarification. The ISRP appreciates the inclusion of Tables 5.1 and 8.1 from the other projects in the basin. This indicates an important level of communication and coordination among the projects' actions and the M&E important for adaptive management. Such information will be useful in future proposals to clarify how monitoring data are being used to inform and adjust the project.
- 4. Rates of strays and jacks.** The additional information on the rates of straying and jacks provides a more complete picture of project operations. The references included for Clarke et al. (2008, 2010, and others) support the description of rates of strays and jacks. The response satisfies the ISRP's request.
- 5. Self-sustaining populations.** The proponents provided additional information and discussion on the issues raised by the ISRP regarding the linkages between goals and

actions. Importantly, the response indicated that issues such as inclusion of the 33% HORs as brood will be the subject of ongoing discussions between co-managers and monitoring programs. These are important discussions to inform decisions about harvest and breeding, especially when returns fall below stated goals in the implementation proposals and the HGMPs. The response satisfies the ISRP's request.

The ISRP encourages the proponents to document the decisions made during these discussions (along with the rationale for them) in future annual reports, work plans, and proposals to more fully describe the adaptive management process.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long-standing project that has gone through periodic ISRP review (e.g., <https://www.nwcouncil.org/reports/umatilla-initiative-review>). The project provides important biological response data and analyses for hatchery production projects (especially Projects 198903500 and 198343500) and is critical for the adaptive management of salmon and steelhead in the subbasin. The proponents report on a thorough set of M&E actions on in-hatchery operations, but the connection to the “larger picture” on sustainable populations and ecological interactions was not clear to the ISRP.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **SMART objectives.** The ISRP requests the proponents reformat the 15 biological objectives in a SMART framework (see proposal instructions) for review in a response. For example, Objective 1 currently states, “Monitor and assess whether broodstock collection and spawning protocols are met.” This could be replaced with “Objective 1. For each species and run, document broodstock collection for a) duration and representation of run; b) size and condition factor for males and females; c) number of jacks included; d) female fecundity; e) sex ratio; and f) other attributes for meeting benchmarks outlined in the Umatilla Hatchery HGMP. Results from this monitoring will be reported in annual reports and evaluated for achieving target levels annually at basin-wide winter coordination meetings during the project period FY23-27.”

2. **Expected NORs.** The ISRP requests a clarification of why the expected NORs listed in Table 3.2 differ from the NORs listed as Goals on pages 19 and 20. Specifically, which is the current proposed target?
 - Spring Chinook 2000 vs 1700
 - Fall Chinook 4000 vs 4200
 - Summer steelhead 4000 vs 3600
3. **M&E matrix – support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Umatilla Basin Natural Production Monitoring and Evaluation Project (199000501) to summarize the linkages between implementation and monitoring projects in the basin. As a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.
4. **Rates of strays and jacks.** The ISRP requests information on straying and “jacking” rates be included in the proposal - both by salmon and steelhead produced in the subbasin, but also strays from other mid-Columbia subbasins (specifically from the Snake River and perhaps John Day subbasins) into the Umatilla subbasin. During the presentation, proponents provided some relevant information on the role of diet and growth rate, but this does not appear in the results section of the proposal. Proponents also addressed information about comparing acclimation v. direct release. Again, these results appear highly relevant and merit summarizing. Co-managers likely have given consideration about straying and jacking decision thresholds (or triggers) that would reduce or eliminate further releases.
5. **Self-sustaining populations.** The ISRP requests clarification on several points on developing self-sustaining populations of spring Chinook and steelhead.
 - a. Managers opted to discontinue the Conservation group of Spring Chinook in 2017, citing inadequate space to rear separate Conservation and Hatchery groups. However, the actual reason appears to be that returns of natural-origin spring Chinook salmon were too low (See Fig. 1.2, only a few hundred fish annually) to provide sufficient numbers of broodstock for the Conservation hatchery program. Proponents currently do not clip adipose fins on 150,000 of 810,000 smolts produced from the hatchery to increase escapement from the fishery and the

- natural spawning for HORs. Would this approach reduce the efficacy of the integrated hatchery program for enhancing natural production since it would lead to an increase in the proportion of hatchery origin fish spawning in the wild?
- b. Similarly, unclipped HOR fish would be indistinguishable from NOR fish during broodstock collection. Would this lead to an overestimate of PNI in the broodstock, and perhaps lead to a reduction in conservation benefits associated with HOR fish contribution to natural production?
 - c. Managers use 33% hatchery-origin summer steelhead for producing smolts, amounting to 34 fish total (see 198903500 Umatilla Hatchery Operations and Maintenance) even though the number of adult natural origin summer steelhead spawners (about 1000 to 4000) are apparently not limiting natural production given the stock-recruitment relationship. Given the loss in fitness caused by including HOR steelhead in the broodstock, the ISRP request clarification on why any HOR are included rather than sacrificing a few more NOR spawners.

Q1: Clearly defined objectives and outcomes

This project provides the M&E for hatchery production in the subbasin, especially those found within Project 198903500 Umatilla Hatchery O&M for artificial production and Project 198343500 Satellite Facilities for acclimation purposes of target species. The ongoing M&E proposed meets actions and objectives found in the Umatilla/Willow Subbasin Plan related to population status and trends, natural production, hatchery production, fisheries, flow, and passage. The proposal also has objectives addressing M&E purposes in the NMFS Biological Opinion, NPCC Fish and Wildlife Program, and the Accords.

The current production (smolt release) numerical targets are listed as 800,000 fall Chinook smolts; 810,000 spring Chinook smolts; and 150,000 summer steelhead.

The targets for adult returns (HORs) from the hatchery artificial production have been reduced from the initial Master Plan to 8,000 fall Chinook, 8,000 spring Chinook, and 5,500 summer steelhead.

The written description in Section 3. Goals and Objectives was a bit difficult to understand, so the ISRP recommends that the proponents provide a summary table that includes smolt releases, smolt-to-adult survival, adult returns, PNI, NOR, and harvest to provide a summary of the proposed program.

Q2: Methods

The methods described are generally sufficient for the kinds of monitoring and evaluation proposed. The ISRP appreciates that the proponents have described and cataloged the methods in MonitoringMethods.org. Data, such as CWT and PIT, are entered into regional databases, which is an important feature. Table 4.1 was very helpful in summarizing where key data sets can be found.

In the proposal, the proponents state the following: "Controls are not required in trend monitoring because cause-and-effect relationships are not sought. We monitor salmon and steelhead trends by making repeated and consistent measurements to quantify change over time." This statement appears to conflict with the objective of assessing hatchery effects using a time series approach. Aren't the proponents trying to evaluate the cause-and-effect relationship between hatchery practices, return rates, and natural production? Perhaps the wording needs revision to something like: "The goal is to establish cause-effect relationship between hatchery practices and returns, but inference about cause-effect relationships from time series data without controls will be weaker." Ultimately, the ISRP recommends clarifying this issue in future proposals, work plans, and annual reports.

Q3: Provisions for M&E

The proponents provide sufficient support for how the M&E activities and actions inform management in a general sense. Two multi-agency forums that meet frequently are the mechanism for sharing information and making adaptive management decisions. Table 5.1 succinctly summarizes a list of examples of how certain performance issues have altered actions taken for the subbasin's production activities.

The Figure in Section 5 of Project 198903500 (along with Table 2 in Proposal 198902401) illustrates how M&E fits into the broader framework of the projects within the subbasin. The ISRP recommends including a similar figure or a Table laying out linkages to projects in the subbasin to ensure transparency. The ISRP does not need to see this as part of a response, but rather for inclusion in the future to provide adequate context.

The proposal states: "The relationship between harvest estimates derived from creel surveys and total returns to the Umatilla River of Fall Chinook Salmon, Coho, Steelhead, and Spring Chinook are shown in Figure 3." There is no Figure 3 in the proposal but there is a Fig. 2.1 which shows creel vs. punch card harvest estimates. Is the conclusion here that there is no loss of information on harvest since punch card data are still reported and correlate well with creel estimates which are no longer done due to funding?

At a more specific on-the-ground level, the ISRP requests that proponents of this and the O&M projects coordinate and provide a unified description of the M&E needs for the operational/implementation objectives and how the M&E provided herein link to these needs (see Request 4 above).

Q4: Results – benefits to fish and wildlife

Robust monitoring and evaluation of hatchery and wild production, return, and harvest are recognized as important elements for determining effectiveness of management projects in the subbasin.

Regarding the benefits to fish and wildlife, the proponents demonstrate modest (albeit, lower than originally proposed) return rates for artificially produced summer steelhead, fall, and spring Chinook. The HORs for each group permit harvests, while attempting to limit domestication risks. The M&E herein has provided important information about optimizing size at release, effectiveness of acclimation sites and other critical program elements.

Water for the USH has not met design specifications in its operational history and presents and ongoing challenge to the hatchery production goals and objectives. The effects of climate change, especially on seasonal temperature profiles and precipitation patterns, will likely be confounding factors in the future.

Walla Walla and Touchet Rivers

199604601 - Walla Walla River Fish Habitat Enhancement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Umatilla Confederated Tribes (CTUIR)

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

Generally, the proponents submitted a good proposal along with a strong record of accomplishments and progress toward program goals. Especially strong is the framing of the objectives and actions under the First Foods and River Vision concepts as these target habitat processes and functions. We note that this framework has broader utility for other regional watersheds in the region as well (i.e., Umatilla, Tucannon, John Day, and perhaps others). Also well-presented was the project history and accomplishments-to-date sections. Presenting these by area and by objectives permitted a clear illustration of the activities and physical improvements, such as to geomorphic processes and riparian conditions. Table 3 was a concise summary of the project's track record for work accomplishments.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **Priority areas.** Describe the "priority areas" (locations) for each of the objectives in a table, map, or appendix to enhance specificity. It is difficult to discern which activities are being implemented at each location.
2. **Methods.** Include short descriptions of specific methods to be employed, as well as references or links to any documents containing these methods, as they likely exist elsewhere. For example, we suggest describing the methods employed for implementation objectives (specific tasks) to be executed in the project's first proposed restoration project (restoration of RM 50.5 – 51.5) in the Walla Walla River.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages

between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project (200003900) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

4. **Basis for how specific projects are selected.** An important piece of doing restoration is ensuring that the right projects are conducted in the right locations. We appreciated the nice description of how the project selection process occurs. The ISRP asks proponents to be clearer on what projects are selected based on strategic priority (identified through the planning process) and what is done based on opportunity – e.g., where a willing landowner suddenly comes forward.
5. **Climate change and restoration actions.** The proponents provided an excellent discussion of how climate change will likely affect the Walla Walla Subbasin and to recovery of imperiled species in this system. What was not clear, however, is how their climate change analysis is used to determine specific project actions. A high priority action under present or past conditions, for instance, might be quite different from those under likely climate change scenarios. The ISRP encourages the proponents to continue to refine their projections and adjust project selection and actions accordingly.

Q1: Clearly defined objectives and outcomes

The proponents provided a thorough description of past efforts and accomplishments (outcomes) as background. The project's progress is impressive despite some pretty significant challenges (especially water availability, obstruction to passage, and land uses within the subbasin). The basis and need for the project's activities appear well grounded in the Walla Walla Subbasin Plan and other plans or documents, e.g., the First Foods and the River Vision documents. The proponents appear to use EDT predicted responses in productivity from habitat enhancement to guide some of their high priority actions.

The proponents describe (in Table 7) two overarching Goals and eight Quantitative Physical and Implementation Objectives, which are tied to functional "Touchstones" presented in the CTUIR River Vision Touchstones. Focusing on function is not a simple or a trivial undertaking but represents a higher level of thinking than focusing solely on composition or structure. The proposal's objectives are essentially presented in a SMART format, generally with specific amount of work and completion date (e.g., "Restore access to 40 acres of floodplain in high

priority areas by 2027”). Other Objectives include restoring ~16 miles of floodplain connectivity by 2043. Another is to correct two high priority fish passage barriers by 2027, although these are not identified. The last general objective is a commitment to participate and contribute to a series of annual coordination meetings with basin partners that focus on habitat restoration. General implementation objectives with quantitative targets and end points are also described, but details on the tasks needed to accomplish those objectives might be enhanced in future presentations (See Condition 1, above).

Q2: Methods

The methods for habitat improvement appear sound and are generally “more” of ongoing activities. The tables and figures were very concise and helpful. Descriptions were sufficient to follow what is proposed. Figure 3 provided a good idea of the 5-step Riverine Ecosystem Planning Approach (Scope, Assess, Monitor, Implement, Report) to the projects, including the logic and path for projects to go from proposal conception to implementation, monitoring, reporting and so on. Also, beneficial is the crosswalk of the Touchstones to Accords Limiting Factors and NOAA’s Ecological Concerns.

The methods appear to represent a high level of thinking; however, specific methods for each of the proposed actions is not included. What is missing, however, are general descriptions of how implementation actions are carried out. What criteria, for example are used when large woody debris is installed, or riparian plantings are to be employed, etc.? A few brief examples or standard practices (i.e., SOPs) currently in use or expected to be used would be informative. References (or links) to any documents used by the proponents to guide how specific restoration actions are expected to occur would help delineate the restoration practices being employed (see Condition 2 above).

Q3: Provisions for M&E

Proponents provide a good level of description to how work will be monitored from an implementation standpoint. In terms of effectiveness, the proponents suggest biological monitoring will be delivered through related projects in the subbasin and regionally., e.g., Project 200003900 by CTUIR (but see Recommendation 3 above). The project has a well-developed adaptive management process where information on action effectiveness is funneled back into the project. Monitoring data provided by: (a) Biomonitoring of Fish Habitat Enhancement (200901400), (b) Walla Walla Basin Monitoring and Evaluation (200003900), (c) WDFW Walla Walla River Basin Monitoring and Evaluation (200003901), and (d) Hyporheic Flow Assessment in Columbia River Tributaries (200725200), are used in this process. When judged

necessary, adjustments based on lesson learned are made to further enhance the effectiveness future restoration actions.

Q4: Results – benefits to fish and wildlife

The proponents provided a crosswalk of the Functional Touchstones to Accords Limiting Factors and NOAA’s Ecological Concerns the majority of which focus on habitat loss (connectivity, condition, connectivity, hydrology, etc.). Thus, habitat improvements are expected to produce biological benefits to aquatic communities, including target fish species. These can be predicted from EDT or analogous kinds of analyses. However, the ISRP recognizes that observing incremental biological or physical responses in a project time frame can be difficult to measure until a critical mass of effects reach a tipping point. Therefore, longer time horizons are often needed to observe effects.

The proponents note that since the project’s inception substantial gains in restoring stream geomorphology (installation of instream structures, pools, and improved stream complexity), connectivity (floodplain reconnections, access to fish habitat, and removal of migration barriers) and streamside vegetation (riparian acres planted, protected, and improved) have been realized due to project efforts. Details on eight projects are included that highlight the project’s recent efforts to restore habitat functions in the subbasin. In summary the project is working successfully with partners to address some of the numerous priority habitat constraints present in the Walla Walla subbasin.

200739600 - Walla Walla Basinwide Tributary Passage and Flow

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Walla Walla Basin Watershed Council

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The ISRP commends the proponents for a sound proposal along with a strong record of accomplishments and progress toward program goals. Past restoration actions performed by the project have helped reduce fish passage barriers, enhanced habitat complexity and availability, and improved water quality. Proposed work is scheduled to occur in the upper

tributaries and forks of the Walla Walla River. Ten new projects are scheduled for the next funding period. As with previous work, these projects are focused on removing migration barriers, restoring watershed functions via fencing, culvert removal, bank sloping, riparian planting, floodplain and side channel reconnections, and pool creation. In one project, Beaver Dam Analogs or BDAs will be used to slow and spread water during periods of moderate to high flows to reconnect floodplains, encourage riparian plant growth, and gradually deliver water to the channels after high flows.

Project site selection is based on numerous criteria. The proponents follow the hierarchical strategy of Roni et al. (2002, 2018, and references therein) and focus on restoration with an appropriate set of techniques at multiple scales. Methodologies and standard practices for implementation objectives were provided from BPA's HIP and screening protocols. The links to implementation monitoring methods published in MonitoringResources.org along with brief descriptions of methods in the text were especially helpful. Finally, the incorporation of concepts of resiliency and incorporation of climate change more explicitly in their work were noteworthy.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **SMART objectives.** Proponents should continue to work toward framing their objectives to align more with the SMART format (see proposal instructions) in future proposals, work plans, and annual reports. The implementation monitoring objectives generally lacked some elements of SMART objectives
2. **Explanation of objectives.** We note there was also some disconnect with the presentation of Progress by Objective. Specifically, in the diagram Objectives are listed as A-G (n=7), while in the Progress section they are listed as 1-10. Given that BPA is no longer funding a couple of previous objectives, ISRP recommends that the proponents provide a crosswalk of the different set of objectives for improved clarity in the final work plan or next annual report.
3. **Links between implementation, outcomes, and monitoring.** The ISRP recommends a couple of refinements to the descriptions of implementation methods and subsequent monitoring to include in the work plan or next annual report. Specifically, the proponents could list each of the projects by objective and then present methods for the restoration activities (e.g., plant X trees in the riparian zone) and then follow-up with the monitoring. Ultimately, each of the monitoring methods poses a similar kind of

question, i.e., can we detect a physical or hydrological change(s) due to restoration activities? While this may appear to be a simple question, there is the issue of separating signal (effect of restoration) from the noise (all the other things going on). There are also issues associated with scale (e.g., local reach v. subbasin-wide) which complicate detecting an effect. If for example stream temperatures do not change, does that suggest there is a problem with the objective or approach? Or is some other explanation likely. While the ISRP recognizes these points are not fatal flaws for the project, it would be useful for the monitoring to have some expectations for effects from the project(s) and over what time scale.

4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project (200003900) to summarize the linkages between implementation and monitoring projects in the basin. In the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
5. **Explanation of aquifer recharge activities.** The ISRP recommends adding some brief text to clarify the aquifer recharge (MAR) activities. The proposal mentions that water conservation efforts have reduced groundwater recharge. The reason for this was not obvious until discussed during the presentation. This should be explained more clearly in future annual reports and proposals. Also during the presentation was a discussion of recharge projects, including last year's effort as the largest to date. These apparently are not funded by BPA and other local funding sources are being sought. These appear highly relevant to the project's passage and flow goals and should be briefly discussed in that context.
6. **Climate change and prioritization.** The proponents provided an excellent discussion of how climate change will likely affect the Walla Walla Subbasin and to recovery of imperiled species in this system. The CTUIR fish habitat project (199604601) also included a strong presentation on climate change, which indicates considerable thinking on this topic and how it will affect the subbasin. What was not clear, however, is how the climate change analysis is used to screen specific project actions. A high priority action under present or past conditions, for example, might be quite different from those under likely climate change scenarios. The ISRP encourages the proponents to

continue to refine their projections, coordinate with other projects, and adjust project activities accordingly.

Q1: Clearly defined objectives and outcomes

The proposal focuses on Walla Walla Basin Watershed Council's set of actions in the upper tributaries of the subbasin (especially North Fork Walla Walla, Couse, Cup Gulch, and Big and Little Meadow Canyon creeks). Proponents frame the problem(s) in the subbasin very well, especially in relationship to current hydrological and geomorphic challenges compared with historical conditions.

An overview of the substantial changes that occurred in the Walla Walla subbasin caused by agriculture, forestry, grazing, and human development was provided. These changes have brought about a suite of deleterious effects, including reductions in stream flow, increases in the occurrence of fish passage barriers, decreases in water quality (e.g., increases in water temperatures, sedimentation, and toxics), isolation of floodplains and side channels, and simplification of stream habitats. In aggregate these alterations from historical conditions have impaired the subbasin's native fish populations. The proponents, along with other groups working in the subbasin, are engaged in efforts to correct and improve conditions in the subbasin for salmonid fishes.

The proponents do a commendable job of linking their proposal to a broader set of 14 plans and documents with a good description of how the proposal fits in (e.g., Walla Walla Subbasin Plan to Council's Fish and Wildlife Program addendum, and others). The project's four overarching goals, to increase fish passage for salmonids; enhance habitat complexity; restore floodplain and riparian functions; and improve water quality are clearly expressed. A hierarchical flow diagram depicting the goals and objectives of the project shows how the project's proposed implementation and monitoring objectives are linked to each of the project's overarching goals.

In the Progress to Date section, the proponents provide a description of outcomes to date. They frame this by laying out their 10 Objectives along with the implementation metrics and benchmarks. This was well presented and framed although the Objectives as presented are stated as broad topical goals, although the SMART framework is interwoven (see Condition 1 above). A couple of previous activities are no longer funded by BPA (e.g., irrigation efficiency and MAR projects in the basin), the rationale for which was not provided.

In the Goals and Objectives Section, the diagram on pages 22-23 that connects four goals with seven objectives is easy to follow and a nice presentation. However, there was also some

disconnect with the presentation of Progress by objective. Specifically, in the diagram Objectives are listed as A-G (n=7), while in the Progress section they are listed as 1-10 (see Condition 2 above).

Q2: Methods

The general approach taken by the project, to address the core causes of habitat loss by restoring watershed processes and functions, is far-sighted and commendable. Implementation methods are appropriately described at a brief and basic level. The proponents provide links to documents for proposed actions (e.g., NRCS 2003, OWEB 1999) that further embellish standard methodology for actions/objectives.

For the implementation monitoring methods, it looks like basin-scale and project-scale monitoring is the focus (see Condition 3).

The proponents also indicate that they regularly deposit and share data with subbasin partners. Interpreted summary data are publicly available on the wwbbc.org website.

Q3: Provisions for M&E

The proponents plan on using an adaptive management process described by Wheaton et al. (2019). A schematic of this method is provided, and it was developed to address adaptive management in projects using process-based habitat restoration. Therefore, it should be suitable for the project. Both annual and periodic (once every 5-year) assessments are planned, and adjustments will be based on the results of their effectiveness monitoring. The WWBWC project committee, landowners, and BPA representatives will participate in the adaptive management process. Federal, state, and Tribal agencies will be invited to evaluate project designs. All adjustments will be made through consensus. Quarterly and annual reports will be used to document the decisions and evaluations made.

The ISRP notes that the specifics of what is being biologically monitored for each objective needs some additional coordination and clarity in the final work plan and next annual report (see Condition 4 above).

Q4: Results – benefits to fish and wildlife

The chief beneficiaries of the proposed actions are ESA-listed summer steelhead, bull trout, and reintroduced spring Chinook. These benefits can be observed by way of subbasin biomonitoring (e.g., Project 200003900 or others). While the project addresses elements of the limiting factors in the subbasin, connecting the actions to these factors would complete the presentation. The

ISRP recommends including linkages to subbasin biomonitoring (e.g., Project 200003900 or others) to how the activities benefit target species.

Previous and recent restoration actions by the project have helped remove passage barriers, improved habitat complexity by reconnecting floodplain and side channels, planted riparian vegetation to create shading to reduce water temperatures, and worked with landowners to increase irrigation efficiency to improve river flows. Many of the proponents' water conservation projects have also been paired with managed aquifer recharge sites or MARs (see Condition 5 above). In past site visits, the ISRP has been impressed with the benefits generated by MARs which capture water in the winter/spring months and through infiltration will recharge groundwater sources. BPA, however, has decided to discontinue funding MARs. Fortunately, the proponents have secured outside funding that can be used to continue to support these sites and their eventual delivery of relatively cool waters to springs and other outlets. The project has also collected and managed hydrologic data that is used by many of its restoration partners.

The ISRP commends the proponents and others in the subbasin that are trying to understand what the effects of future climate change in the basin may be by doing some modeling and forecasting. There are opportunities to extend and coordinate these considerations as the project progresses (see Condition 6 above).

200902600 - Umatilla Tribe Ceded Area Juvenile & Adult Fish Passage Improvement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proponents present a project aimed at removing barriers and providing diversion screens that is generally well organized. The proposal describes the goals, objectives, and means to achieve proposed actions. The proponents (CTUIR) provide an overarching framework for this and other projects in the region tied to First Foods and Functional Touchstones. The ISRP found

this to be an understandable and beneficial framework for this and related projects – we encourage its use more broadly.

The proponents have established productive partnerships with multiple groups and have successfully corrected or eliminated numerous fish passage barriers using agreed-upon approaches among cooperators. Fourteen additional projects are scheduled for the next funding period. These projects will take place in the Walla Walla, Umatilla, John Day, Grande Ronde and Tucannon subbasins. All are designed to improve access and survival of migrating juvenile and adult salmonids and resident bull trout.

In future annual reports and work plans, the proponents need to provide information to address the following Conditions:

1. **Explanation of objectives.** Table 3 summarizes the project’s objectives (listed as actions and measures) along with a general response expected (i.e., “uplift”). The relationship between the actions and measures, however, is not obvious and appear to propose the same thing stated differently. For example, the first (action) objective is to remove 15 barriers while the second (measure) objective is to restore passage to 150 miles. These seem to just state the same thing with differing metrics (barriers v. miles). Further, the timeline lists 6 major projects. Presumably, the 15 barrier removal projects are broken into these 6 projects, but that was not clear. The ISRP recommends clarifying these related forms of the objectives during the work plan, annual report, and contracting stages.
2. **Details on procedures.** Specific details on implementation objectives and methods used to correct fish passage and diversion screening problems are not described. While no formal response is needed, the ISRP recommends attaching a link or an appendix that briefly describes the standard operating procedures, best practices, or formal guidance and methods used for specific kinds of projects (implementation objectives) in the final work plan or next annual report. The proponents indicate that they follow state passage requirements and projects are selected from OR and WA priority lists, but the specific procedures and criteria are not provided.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project (200003900) to summarize the linkages between implementation and monitoring projects in the basin. We ask this project to assist them in creating the summary and provide information to them about what is

being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

4. **Database availability.** The proponents appear to have a useful database, but it was not clear what part was or was not publicly available. The ISRP recommends providing a description of the database and its accessibility in the next annual report.
5. **Climate change and prioritization.** The proponents provided a list of climate change issues likely to affect the Walla Walla Subbasin and to recovery of imperiled species in this system. The CTUIR fish habitat project (199604601) also included a strong presentation on climate change, which indicates considerable thinking on this topic and how it will affect the subbasin. What was not clear, however, is how their climate change analysis is used to select specific project actions. Specifically, a high priority action under present or past conditions might be quite different from those under likely climate change scenarios. The ISRP encourages the proponents to continue to refine their projections, coordinate with other projects, and adjust project activities accordingly.

Q1: Clearly defined objectives and outcomes

The proposal aims to continue a suite of actions directed at providing passage in several subbasins through diversion dam removal or retrofit, screens, ditch consolidation, and culvert removal/improvement. The ISRP notes that the current project has taken a rather circuitous path to its present form (199601100 was combined with 200739600 and then split out again in the current project). The proponents clearly state the major impediments to the projects' outcomes, such as water availability and habitat connectivity.

Historically, the project(s) has completed a good number of actions such as diversion dam removal or fish ladder retrofits, screen installations, ditch consolidations, and culvert removals/improvements.

Regarding the proposed objectives, Table 3 frames actions in terms of Goals, Quantitative Actions, Quantitative Measures, and Biological Function Uplift (i.e., response). The connection between action and measure appears to restate the same thing with differing metrics (see Condition 1 above). The proponents state that 10 passage impediments will be targeted based on OR and WA priority (candidate) lists and species benefiting (Table 4). A public process is described for determining final selection although specifics are not presented (see Condition 2 above).

Like most of the Walla Walla or CTUIR proposals, the overall, large-scale objectives are the primary focus, and they do a commendable job presenting and discussing these. They have a well-stated project goal which they reframe into a useful biological goal, i.e., "restore longitudinal connectivity, fish passage and habitat quantity." Objectives of the project are to remove 15 passage barriers. Projects are systematically identified through plans, basin and subbasin plans and so on. There is a process they go through to do this, but for an outsider it is not clear which projects can be selected or the basis for the selection. In short, it is not clear how much of project selection is driven by opportunity, strategic need, or other criteria. Further details on the project selection process should be provided in a subsequent annual report.

Q2: Methods

Implementation methods are generally described, including specific project selection (see above). These are appropriate at a high level. Based on past implementation success, it appears that the proponents have a firm handle on how to undertake such projects and measure their implementation. While no formal response is needed, the ISRP recommends attaching a link or an appendix that covers some of the standard operating procedures, best practices, or formal guidance and methods used for the specific kinds of projects in the final work plan or next annual report (See Condition 2 above).

Federal (NMFS and USWFS) and state (WDFW and ODFW) partners participate with project staff to design culvert replacements, bridges, and structures that incorporate current NMFS and state (Oregon and Washington) fish passage standards. Recently, design criteria have also included elements that facilitate Pacific lamprey passage. Compliance and periodic monitoring are used to determine if the restoration actions are performing as expected. Methods being applied to improve passage appear to be sound based on the proponent's expertise, collaboration with professionals from outside agencies, and upon the adherence to established fish passage criteria.

Q3: Provisions for M&E

Biological M&E is provided through associated projects. As an implementation project, implementation is provided through contracting and compliance.

At a high level, improving or providing passage (identified as Quantitative Action and Measures Objectives) is expected to lead to benefits to fish and wildlife (identified as Biological Function Uplift). The realization of the "Uplift," however, implies a sound M&E to observe and measure. As such, the M&E for implementation of barrier removal and improved access will be conducted within the activities of this project; however, the potential biological effects

resulting from the project's actions will be measured by a consolidated M&E project (200003900 and perhaps others). The ISRP recommends coordinating with the M&E project proponents to link specific activities in that project to what can be used to measure a response to passage improvements (see Condition 3. above)

Adaptive management is described at a general level – annual coordination and policy meetings provide the platform for decision making. Some recent trends indicate the outcome of adaptive thinking, although little detail on process or rationale is provided. For example, there appears to be a shift of focus into tributary or smaller systems. In future proposals, it would be useful to understand why proponents are shifting to tributary/smaller system work. Are these priority places, or is there less opportunity to work on mainstem/bigger system projects (or other rationale)?

Q4: Results — benefits to fish and wildlife

The primary obstacles this project addresses are access for fish and wildlife to water and habitat connectivity. The expected benefits (Biological Function Uplift) to anadromous species and resident bull trout are outlined in various ESA, Vision, and Accord documents.

From 2008 to the present the project has successfully removed or corrected 48 passage barriers and updated 14 irrigation screens and improved anadromous fish access to an estimated 725 miles of stream habitat all within the Ceded Lands of the CTUIR. Additionally, all the project deliverables mentioned in the 2013 Geographic Review, with one exception, have been completed or are in the planning and design stages.

Ultimately, documenting benefits to fish and wildlife requires sound M&E to evaluate the effectiveness of the implementation objectives at achieving the predicted biological function uplift.

The proponents describe a lengthy list of climate change issues on page 27; however, it is not clear how all the partners in the basin are looking ahead to incorporate climate change into management actions and decisions (see Condition 5 above).

200721700 - Walla Walla River Passage Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Gardena Farms Dist. 13

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Not Applicable

Overall comment:

The proposal did not describe the project adequately for scientific review. Despite being an O&M project, all elements of the proposal template are relevant to assessing the scientific merit of the proposed work. At a minimum, the proposal needed a clearer statement of the proposed work, how work is being coordinated among projects, and some indication of how the proponents reflect on the success in supporting fish passage (and how it can be more effective). In addition to clearing debris from the passage structures and to ensure that the project is protecting fish, some strategy is needed to evaluate whether the passage structures themselves are adequate for supporting fish passage and to identify when the project and individual structures need adaptation.

The ISRP found this proposal to be **Not Applicable** under the review process and does not request response from the proponents. Nevertheless, the proponents should carefully address the following issues in their next annual report and future work plans:

1. **SMART objectives.** The proposal provides a goal related to increasing adult returns and increasing survival of juvenile and adult salmonids. However, this is not a SMART objective, and it is not clear how or if the proponents are assessing their success at meeting that goal. The proponents should develop SMART objectives (see proposal instructions) focused on the O&M activities conducted under this project.
2. **Monitoring and evaluation.** There was no content provided on monitoring evaluation of the project, except the statement that it is not relevant to the project due to its O&M focus. However, despite there being no M&E funded on this project, it is still an important practice to learn lessons from the years of maintaining these facilities. For example, is a log kept of the regular (or irregular) issues faced at different facilities? What are the proponents doing to reduce the frequency or severity of those issues, and their impacts on fish passage? In addition, with no consideration of confounding factors, how do proponents anticipate being proactive and responsive to changing flow conditions from climate change? Will passage structures need to be modified, and if so, how will that work be prioritized and funded? Are there other ways in which the O&M

needs to be evaluated or adjusted to ensure that the objectives of increasing adult returns and increasing survival of migration juveniles and adults can still be met?

- 3. Benefits to fish and wildlife:** Furthermore, the ISRP encourages the proponents to work with project partners to develop simple tools for enumerating the benefits of the project to fish. The 2013 Geographic Review indicated that the proponents were partnering with ODFW for M&E using PIT tag arrays. Is that collaboration still occurring? If so, what do the data indicate regarding how many fish are being protected by this project? If the collaboration has ended, then please explain why and provide an alternate approach for documenting the benefits to fish. Simple calculations for the number of fish protected could be based on run abundance, passage efficiency, and Smolt-Adult Return rates, if those data exist. If not, more details about the number and types of activities performed and population estimates for the river would provide some basic information to support the benefit of the project.

200003802 - Walla Walla Hatchery Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

Beginning in 2000, the proponents (CTUIR) began an effort to reintroduce spring Chinook salmon into the Walla Walla subbasin. Initially, adult spring Chinook were outplanted into the South Fork Walla Walla and into Mill Creek. Starting in 2005, adult releases were supplemented by annual releases of 250,000 yearling spring Chinook smolts into the subbasin. Spring Chinook adult migrants were produced from the program and some natural reproduction occurred. Yet the adult returns produced from these two actions were not sufficient to reach tribal harvest and reintroduction objectives. Additionally, the continued use of out-of-basin fish was recognized as being inconsistent with best hatchery practices. The creation of a spring Chinook salmon hatchery located on the South Fork Walla Walla was initiated as an additional action that could be implemented to meet Tribal harvest expectations and eventually create a population of spring Chinook that were adapting to local conditions of the Walla Walla River. The hatchery is expected to become operational in 2021. The ISRP reviewed the Hatchery

Master Plan in 2013 and also the program’s Monitoring and Evaluation Plan in 2015 and 2018. The 2018 review ([ISRP 2018-9](#)) resulted in a “Meets Scientific Criteria with Qualifications.” The qualifications fell into two categories, assessments of within hatchery performance (2+ qualifications), and evaluations of post-release performance (6 qualifications). These qualifications and other issues (data storage, release site selection, etc.) produce general confusion on how the hatchery will operate and be evaluated to meet its important role in reintroduction of spring Chinook and ultimately harvest.

In future annual reports and work plans, the proponents need to provide information to address the following Conditions:

1. **M&E responsibilities.** The proponents indicate that hatchery staff supported by this project (200003802 Walla Walla Hatchery O&M) will evaluate within-hatchery performance while project 200003900 (Walla Walla River Basin Monitoring and Evaluation (M&E) personnel will assess post-release performance and the ecological/biological effects of the hatchery’s smolt releases. Ultimately, the metrics of these M&E activities should be presented in work plans and annual reports.
2. **Production protocols.** Questions raised by the ISRP regarding broodstock monitoring and holding, spawning procedures, incubation conditions, rearing methods, and fish release protocols in the 2018 review were partially addressed in the proposal. However, from the information that the ISRP has reviewed, it does not appear that key decisions for how the hatchery will be operated have been addressed. For example, gametes from adults captured at the Nursery Bridge trap (Walla Walla River) as well as adults obtained at Three Mile Dam (Umatilla River) will be used to reach the egg take goal of the hatchery. It is unclear what decision rules will be employed to coordinate egg takes at these two different sources. Presumably, to achieve a locally adapted stock, eggs from the Umatilla subbasin would only be imported to the hatchery on an as needed (infrequent) basis, but this is never mentioned. Spawning is expected to occur weekly, and the plan is to use adults throughout the entire run. What steps will be taken to adjust developmental rates in eggs collected at different times and places (NBD and TMD) to ensure that groups of juveniles can be simultaneously ponded and reared at desired densities? Can the hatchery cool incubation waters to adjust developmental rates to create such coordination or will other methods be used?
3. **Production assumptions.** The objectives for the number of adult pairs (175) and jacks (17) needed to reach the hatchery’s green egg take goal are clear but the underlying assumptions about fecundity and expected survival do not lead easily to these numbers. One hundred and sixty-five pairs are expected to produce 925,000 green eggs and 860,000 eyed eggs. Yet, average fecundity is stated to be 3,800 eggs. Given this

fecundity value, these fish would produce 627,000 green eggs not 925,000. At spawning, single pair crosses are planned. No mention is made of how jacks may be incorporated into their proposed breeding scheme. Instead, it is suggested that males > 900 mm will be used repeatedly as sires. No rationale for this decision is presented or how the multiple use of single males may affect adult collection numbers, sex ratios, and ultimately effective number of breeders.

4. **Pathogen monitoring.** Bacterial Kidney Disease is an important pathogen in Chinook salmon, and the proponents propose culling egg lots from females based on ELISA optical density values (OD) to control its presence. Yet, they plan on sampling just 60 females or ~36% of their female broodstock. To be effective, ELISA OD values should be obtained on every spawned female and an agreed upon OD value for culling should be established.
5. **SMART objectives.** The proponents along with the hatchery's manager need to produce an annual hatchery operation plan that describes the tasks and criteria that address the above and related questions. The plan should contain explicit SMART objectives (see proposal instructions) that cover all aspects of hatchery operations along with an accompanying adaptive management process. Much of what is needed is already in the proponent's monitoring and evaluation plan (e.g., Table 14) and their proposal. This plan can be incorporated into the project's next annual report.

Q1: Clearly defined objectives and outcomes

The overall purpose of the Walla Walla spring Chinook hatchery program is clearly presented in the proposal. Although the overall purpose of the new hatchery is well described, specific fish cultural objectives are not presented. Because the hatchery will not begin full operation until 2022, time is still available to develop such criteria. As indicated in the general comments section of this review, the proponents have developed explicit quantitative objectives for many of the hatchery's operations. They will become essential components of the hatchery's adaptive management procedure. These standards should be presented as "SMART" objectives and need to cover all aspects of the hatchery's fish cultural operations. Having an easily identified list of SMART objectives embedded in an annual hatchery operations plan will allow the proponents to readily assess whether desired end points are being reached. As the hatchery continues to operate these standards can be adjusted and initial methods can also be modified as needed.

Q2: Methods

Generally, the methods described to perform fish cultural and routine hatchery operations and broodstock collection are appropriate. There are a few instances, however, where the proponents may wish to consider alternative methods to those described in their proposal and M&E plan. In past reviews, the ISRP has suggested using isobuckets (as done at the Cle Elum Supplementation and Research Facility) to temporarily incubate eggs from single females to prevent BKD transmission and allow the culling of egg lots with high ELISA OD values. Horizontal transmission is prevented by this approach whereas it is still possible when eggs are placed into MariSource incubation trays because of how water moves through stack incubators.

Currently, the proponents are confident that they can identify sex for prospective broodstock visually. This may well be the case. Several other spring Chinook programs in the Columbia Basin, however, are using handheld ultrasound wands to sex prospective broodstock. This has proved to be a highly accurate way to sex fish, particularly early on in a run when sexual dimorphism is not highly developed. During spawning the proponents plan on producing single pair crosses. If this approach is used, we recommend that they include backup males to help ensure high fertilization rates. Having a robust estimate of the number of green eggs spawned is a critical metric since it is used to calculate survival rates at multiple life stages. The proponents plan on using a random sample of females to generate a fecundity estimate and through this relationship estimate green egg take. We suggest that fecundity estimates be made on every spawned female. Gravimetric estimates of fecundity can be rapidly made under typical hatchery operations. Making such estimates will allow the proponents to gather egg weight and quality data, and reproductive effort values. Finally, there appears to be some doubt about the usefulness of assessing precocious maturation in hatchery males. The ISRP considers this to be an important metric because the production of minijacks in spring Chinook hatcheries can be substantial. Without knowing this rate, SAR values can be biased low. Several methods can be used to acquire this type of data, including visual inspections on gonadal development on a random sample of fish just prior to, or at the time of release.

As in our earlier reviews we urge the proponents to talk with other tribal and non-tribal hatchery staff culturing spring Chinook in the Basin. Innovations and lessons learned from these ongoing hatchery programs should help the proponents craft methods and determine expected standards that can be incorporated into their SMART objectives.

Q3: Provisions for M&E

No formal adaptive management process or cycle is presented for assessing within hatchery performance. Establishment of an approach that can be followed during an annual or end of

season review process is needed. Once SMART objectives have been established it should be relatively straightforward to compare observed performance with expected standards.

The proponents indicate that an Annual Operations Plan (AOP) to be co-developed by CTUIR, ODFW, and WDFW personnel will be established once the hatchery becomes fully operational. This plan appears to be largely concerned with where, when, and how hatchery reared fish should be released. If the AOP could be combined with a within hatchery operations adaptive management plan, then the project would have a comprehensive way to adjust to its challenges and opportunities.

Q4: Results – benefits to fish and wildlife

Under present environmental conditions, consistent releases of smolts from the Walla Walla Hatchery likely represent the best approach of establishing sustainable and harvestable populations of spring Chinook in the Walla Walla subbasin. Additionally, if broodstock can reliably be collected from inside the subbasin, the hatchery will also expedite the establishment of spring Chinook locally adapted to the South Fork Walla Walla and perhaps to other release locations (upper Mill Creek) as well. The project's goals fit well within the Council's Fish and Wildlife Program and tribal visions.

200003900 - Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: CTUIR

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our preliminary review, we requested responses on the following topics:

1. **M&E matrix – lead.** In their response, the proponents provided a table of 17 project activities for seven BPA-funded projects in the Walla Walla subbasin with brief descriptions of the sponsors, locations, focal species, types of monitoring, timing of monitoring, and data storage and archiving. The response also included a map of the monitoring locations for 19 types of monitoring in the subbasin (Figure 1). Three

support projects provided information to the lead project. The proponents created a table that briefly identified the connections between implementation and M&E projects and described their current collaborations with other projects to develop a summary or framework for M&E in the Walla Walla subbasin. The response did not fully describe linkages between the implementation and M&E projects. Information on the type of ongoing or past M&E activities, locations, timeframe, and transfer of information between projects would have been useful in the M&E summary. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. We anticipate that the Fish and Wildlife Program will identify the specific elements and formats for these RM&E summaries and matrices in the future. The ISRP anticipates that this project will coordinate with Council staff to provide important information for the coordinated future M&E summaries for this geographic area.

CTUIR's GIS department is addressing an important regional need by creating a web mapping application to assist projects in assigning monitoring locations with associated habitat projects in the CDMS database. Additional attributes will link M&E datasets with habitat projects to identify data sets associated with specific habitat projects. The project is exploring issues that need to be addressed for the final M&E coordination summary. The proponents plan to expand the mapping application to include M&E activities of other cooperators in the future.

- 2. Project evaluation and adjustment.** The proponents provided a satisfactory overview of the Adaptive Management process being used by the project. The project's Monitoring and Evaluation Plan (CTUIR 2018) indicates that reviews of status and trends data, working hypotheses, key assumptions, and decision rules occur annually. Methods used by the project also are reviewed and changed when necessary. Several examples of how methods were changed were given. These included changing the location of the project's rotary screw traps in the upper Walla Walla subbasin, doubling the application of PIT tags on hatchery origin smolts, and the use of two PIT tag detection barges installed close to the mouth of the Walla Walla River. All changes were made to increase the accuracy of smolt survival and abundance estimates. However, changes in methods may not permit sound data comparisons among years as abrupt increases/decreases in trends associated with these methodological changes may reflect a reduction in measurement bias rather than a real response to management actions. Consequently, whenever such substantial methodological changes are made, it is important to note their occurrence in the project's databases. Additionally, when possible, efforts should be made to collect data using both the old and new methods to allow data calibration.

Relationship of WDFW spring Chinook releases to CTUIR release

The proponents also gave a complete and informative response to our questions regarding the planned annual release of 100,000 yearling spring Chinook salmon from the Walla Walla Hatchery into the Touchet River. Currently, these fish will not be released into the Touchet River. Instead, it is anticipated that the 2012 Memorandum of Agreement (MOA) between the co-managers will be modified so these fish can be released into Mill Creek. The proponents supplied a brief, but satisfactory, explanation of how PIT and CWT tags plus PitPro software will be used to estimate the smolt survival, SAR, and SAS values of these fish.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The primary emphasis of the project has been to collect VSP (abundance, productivity, survival rates, and distribution) data on re-introduced spring Chinook and to a lesser extent on ESA-listed summer steelhead in Mill Creek, South Fork Walla Walla, and the mainstem Walla Walla River. Although bull trout are another ESA-listed species in the watershed, observations on these fish have been restricted to video monitoring at the Nursery Bridge Dam (located downstream of the North and South Forks of the Walla Walla River). The project has provided important monitoring and evaluation data to CTUIR, ODFW, and WDFW fishery managers. For example, the abundance and SAR values of summer run steelhead and spring Chinook salmon have been tracked since 2002 and these data are being used to guide future management actions. Data collected on spring Chinook, for instance, indicated that CTUIR objectives for harvest and conservation would not be reached using ongoing adult out-plants and releases of smolts into the subbasin. A spring Chinook salmon hatchery located on the South Fork of the Walla Walla River was recently built and will be used to augment the spring Chinook reintroduction program.

The hatchery will begin fish culture operations in 2021 and a pilot release of ~125,000 yearling smolts is scheduled to occur in 2023. Releases of ~500,000 yearling smolts are expected to begin in 2024 and annually thereafter. In 2013, 2015, and 2018, the ISRP reviewed the Master Plan and the Monitoring and Evaluation Plan for the Walla Walla spring Chinook Hatchery. Our 2018 review (ISRP 2018-9) produced a finding of meets scientific review with eight qualifications. Two of the qualifications asked for more information on within hatchery operations. The remaining six dealt with post-release topics. During the project's presentation it was made clear that hatchery personnel would be responsible for monitoring and reporting of within hatchery performance metrics (200003802). Conversely, post-release performance of

the hatchery's yearling spring Chinook salmon releases will be monitored, assessed, and reported by personnel associated with this project (200003900).

Data from the project are being incorporated into an adaptive management process by fishery managers to adjust the spring Chinook salmon reintroduction program and to track VSP parameters of these fish and of summer steelhead in Mill Creek and the South Fork of the Walla Walla River. The proposal does not explain how the project reviews its own procedures and determines when changes to its methods and objectives may be necessary, however.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this M&E project, the ISRP is requesting the Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project (200003900) to summarize the linkages between implementation and monitoring projects in the geographic area. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist your project in producing this summary.

2. **Project evaluation and adjustment.** The ISRP requests that the proponents explain the adaptive management process used to evaluate their methods and objectives. The ISRP encourages the proponents to highlight examples of project adjustments based on M&E results.
3. **Relationship of WDFW spring Chinook releases to CTUIR release.** 100,000 yearling spring Chinook salmon originating from the South Fork Walla Walla Hatchery were scheduled to be annually released into the Touchet River beginning in 2024. This release was curtailed due to planned releases of 250,000 yearling spring Chinook salmon by WDFW into the Touchet subbasin. A clear description or explanation of the relationship of the WDFW releases to the CTUIR release is warranted. Information on where the 100,000 smolts from three South Fork Walla Walla Hatchery will now be released and how their in-river survival, SAR values, etc. will be evaluated should also be described in the response.

Q1: Clearly defined objectives and outcomes

The proposal narrative clearly states the overall aims and expected outcomes of the project. General biological and implementation goals were presented for natural- (NOR) and hatchery-origin (HOR) spring Chinook and summer run steelhead originating from the South Fork Walla Walla River and Mill Creek. A supplementary general goal of assisting in bull trout spawner surveys and documenting trout movements in the South Fork Walla Walla were also described.

Annual project objectives by fish species are shown in a flow chart and more completely described in the proposal's Method section. Although not presented as SMART objectives, the project's annual workflow and assorted tasks are easily understood. However, to facilitate the project's annual adaptive process, we recommend that the proponents develop SMART objectives and use them in an annual adaptive management cycle. With some slight reconfigurations, such objectives could be produced from the proposal's Methods and Objectives sections. The proposed work directly benefits tribal and non-tribal fishery managers. Data derived from the project's tasks will track the effects of hatchery and habitat improvements on the subbasin's salmonid populations.

Q2: Methods

The description of the methods being employed provides understandable summaries of the steps, procedures, and tools being used. Additional information about specific methods is also provided by links to finalized methods in the MonitoringResources.org web site.

Methods used by fishery biologists conducting “adult in” and “smolts out” evaluations have evolved over time in the Pacific Northwest. The ISRP commends the proponents for using up-to-date methods and for breaking ground on new approaches. The Walla Walla Barge PIT tag array is an example of an innovative approach the project is successfully using to detect and quantify PIT tagged salmonids in a large river and deep-water environment where tag detection is often problematic.

Q3: Provisions for M&E

The proponents indicate that once the South Fork Walla Walla Hatchery has become fully operational (2022) that CTUIR, ODFW, and WDFW will draft an Annual Operations Plan that will be informed by results of monitoring and evaluation activities occurring in the subbasin. No formal annual adaptive management process was, however, described. The ISRP recommends that an annual adaptive management process be developed and implemented by proponents to include measurable benchmarks for viability along with if/then actions responding to measured outcomes. For example, adaptive scenarios will differ if returns are small versus those that are large. With some additional thought, for instance, the project’s described implementation objectives, data analyses, and work products could be folded into an annual adaptive management process. Because the project has been in place for over a decade, the ISRP recognizes that substantial changes in most of the project’s M&E activities are not likely. However, once the hatchery is operational and releases of spring Chinook smolts start to occur new monitoring and evaluation opportunities and challenges may occur.

Q4: Results – benefits to fish and wildlife

One long-term goal of the project is to establish a locally adapted spring Chinook population via a hatchery program. The hatchery will become fully operational in 2022, with smolt releases occurring during the spring of 2024. To promote local adaption, broodstock for the hatchery is expected to originate from HOR and NOR spring Chinook adults returning to the South Fork Walla Walla River. Eggs from spring Chinook trapped at Three Mile Dam on the Umatilla River will be utilized, as necessary, to reach the new hatchery’s production goals. Smolts from the hatchery will be used to help with the spring Chinook reintroduction effort taking place in the Walla Walla subbasin.

Data from the project has demonstrated the feasibility of reintroducing spring Chinook into the subbasin. Releases of out-of-basin smolts have occurred, adults have been produced, and natural reproduction has taken place in the South Fork Walla Walla River and Mill Creek. The project found no difference in the survival of HOR or NOR smolts as they emigrated through the subbasin. However, monitoring data indicated that a survival bottleneck for emigrating smolts

occurs in the Walla Walla Valley. Knowledge of this problem has prompted the proponents to explore alternative release locations to enhance juvenile survival. Additionally, the project's use of new equipment (two Barges with vertical PIT tag detectors) capable of perceiving PIT tagged fish in a large river environment is providing researchers and managers with an important opportunity to evaluate the utility of this approach throughout the Columbia River Basin.

200003901 - Touchet River VSP Monitoring

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish & Wildlife

Province/Subbasin: Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

Obtaining status and trends data on the abundance of summer run steelhead in the Touchet River has been a consistent challenge. Until recently, spawning ground surveys and redd counts were used to gather this information. Environmental conditions in the Touchet subbasin (high flows, turbidity), however, often put constraints on when such surveys could be conducted causing high uncertainty in abundance and productivity assessments. Because of these issues, the proponents have abandoned the use of spawning ground surveys and are now starting to employ a hierarchical Bayesian Model to estimate several key VSP parameters (adult abundance, adult to juvenile productivity, SAR rates, and diversity in migration timing and size at migration). This approach was made possible by improvements in portable adult weir designs and PIT tag detection arrays. Briefly, weirs are placed in tributaries to census adult numbers and a rotary screw trap (RST) is operated in the lower Touchet River to capture out-migrating steelhead smolts. NOR smolts receive PIT tags, and PIT tag detection arrays in the Walla Walla subbasin and mainstem of the Columbia River are used to track migration and survival rates. The proponents are in the process of comparing abundance estimates produced by their model to those previously obtained through the spawning ground surveys and are also using previously gathered project data to refine their Bayesian Model. It is acknowledged that additional PIT tag detection arrays are needed in the Walla Walla and Touchet subbasins and elsewhere in the Columbia Basin (e.g., in the Snake River subbasin) to help determine stray rates and further refine spatial distribution and diversity VSP parameters. At least for the

present, the project seems well poised to produce status and trend information and SAR values on NOR Touchet summer-run steelhead.

The methods being employed by the project to estimate juvenile and adult steelhead abundance and survival are promising, well conceived, and innovative. Not only will they help assess the status of summer steelhead in the Touchet, but they also have the potential to be widely used in other parts of the Columbia River Basin where environmental circumstances make spawning ground surveys problematic.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **Spring Chinook salmon releases in upper Touchet.** We recently learned that WDFW plans to release 250,000 yearling spring Chinook salmon into the upper Touchet on an annual basis into the foreseeable future. A substantial effort is being made in the Walla Walla subbasin to reintroduce spring Chinook salmon. Are these releases part of that effort, or are they being made for harvest augmentation and Orca relief? What will now happen to the 100,000 smolts from the hatchery that were scheduled to be released into the Touchet? Is any effort planned to evaluate the SAR rates, adult abundance, and stray rates of these fish? Precocious parr are likely embedded in these releases. Will their incidence be estimated? Precocious parr may compete with juvenile steelhead for food and territorial locations. How will such potential impacts be assessed? How will potential impacts of Chinook smolts to steelhead (the target species of this project) be identified and assessed?
2. **SMART objectives.** The proposal narrative clearly describes how the project has adapted its methods to meet its monitoring obligations. Yet, the project currently lacks an annual adaptive review cycle. Additionally, specific SMART objectives (see proposal instructions) need to be developed. A description of the project's internal adaptive management process and associated SMART objectives need to be included in the project's next annual report. In combination, the creation of SMART objectives and the use of an annual adaptive management process will allow the project to quickly identify and adapt to any potential problems or obstacles. See below for further comments on this request.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or

geographic areas. The ISRP is requesting a response from the Walla Walla Sub-Basin Salmonid Monitoring and Evaluation Project (200003900) to summarize the linkages between implementation and monitoring projects in the basin. During the response loop, as a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The primary purpose of the project, to assess the population status and trends of summer steelhead in the Touchet subbasin, is clearly articulated. Originally spawning ground surveys and redd counts were used to estimate and track adult abundance. However, environmental conditions often prevented these surveys from taking place leading to uncertainty about the status of steelhead in the subbasin. The project has recently stopped using this procedure. Instead, a mark-recapture method based on PIT tagged fish and their subsequent detections is being used to estimate VSP parameters. The rationale, benefits, and expected outcomes of moving to a mark-recapture approach to estimate demographic trends are well explained.

Tasks listed under the project's six objectives describe the work that needs to be accomplished to use this new methodology. Some of the tasks described will occur on a regular annual basis, others may occur more sporadically. For clarity, the proponents should develop SMART objectives that are identified as either implementation or biological and indicate when work under each objective is expected to be completed (see the 2nd Condition above). SMART objectives are recommended because they can be easily folded into a project's annual adaptive management process.

Q2: Methods

A clear explanation is given for why the project has moved from using data collected during spawning ground surveys and redd counts to a mark-recapture method to obtain demographic data on summer steelhead. Methods for how the project's new approach will be implemented are well described and scientifically sound. The proponents are developing a hierarchical Bayesian model that relies on mark-recapture data to estimate juvenile and adult abundance and survival. This innovative statistical approach will likely be useful in other parts of the Basin. Preliminary results obtained from their model (Touchet Steelhead Abundance Model—TSAM) using existing data were presented in the proposal. The analyses performed helped demonstrate the suitability, benefits, and outcomes of their Bayesian model.

Q3: Provisions for M&E

No formal annual adaptive management process is described in the proposal (See the 1st Condition above). Nevertheless, project personnel have reviewed their operations and made substantial alterations. Foremost among those is the shift from using data from spawning ground surveys to a mark-recapture approach to track the status of summer steelhead. Other changes mentioned in the proposal were alterations in weir design, changes in juvenile and adult trapping locations, up-grading of instream PIT tag detection (IPTDS) arrays, and the use of Bayesian time-stratified population analysis (BTSPAS) software to provide precise and accurate estimates of juvenile and adult steelhead survival and abundance.

To facilitate further refinements to project activities, an annual adaptive management cycle should be developed and implemented. The proponents suggest that smolt trapping and operation of the IPTDS systems are well established and are thus not targets of adaptive management. Yet, at the same time, it is conceded that trapping locations and upgrades to individual PIT tag detection arrays may need to be reviewed and possibly changed to improve operating efficiency. Other aspects of the project are equally amenable to review and possible change. We suggest that with some re-writing and further elaboration, the tasks described under the project's six objectives could be converted into SMART objectives. A dispassionate appraisal by the proponents on how successful the project has been in meeting its SMART objectives would constitute an important part of an annual adaptive management cycle.

Q4: Results – benefits to fish and wildlife

The use of spawning ground surveys and redd counts to determine the status and trends in abundance of summer steelhead in the Touchet subbasin is often compromised by high river flows and turbidity resulting in incomplete sampling and questionable adult abundance estimation. Variable environmental conditions, including those that are likely to occur due to climate change, may also reduce the utility of spawning ground assessments in other Columbia River subbasins. To circumvent the impacts of variable environmental conditions, the proponents are using a mark-recapture method that uses PIT tagged fish and their subsequent detections to obtain estimates of smolt and adult abundance and survival.

This is a new approach for the project. Preliminary results from a Bayesian model using mark-recapture data obtained from PIT-tagged Touchet summer steelhead, however, are promising, but will require ground-truthing of model assumptions. As part of this approach, juvenile sampling gear (Rotary Screw Trap—RST) was moved to a lower location in the mainstem Touchet allowing for a more complete census of steelhead smolts than has occurred in the past. As the model is refined with additional in-basin data, its results will be useful in life-cycle

models and in the conservation and management of summer steelhead. Additionally, the methods being applied here have the potential to be used in other Columbia River subbasins.

199200900 – Yakima Phase II Fish Screen Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Dept. of Fish and Wildlife

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Not Applicable

Overall comment:

The significance of O&M for fish screens is undeniable, and this project appears to continue to be effective at keeping the screens under its purview operational. However, the proposal fell short in multiple aspects related to a) making a compelling case that the project creates important benefits for fish, b) demonstrating that it has vision and strategy for maintaining the project goal going forward, and c) creating a clear plan for what will be conducted under the next project phase.

The ISRP recommends the following steps to enhance the clarity and function of the project. These issues should be addressed in the next annual report and future work plans, and progress tracked by Council and BPA staff.

1. **SMART objectives.** The proposal identifies its overarching goal of operating and maintaining fishways and screens that are owned (or funded) by BPA. The proposal also identifies some project “objectives,” but they are not measurable objectives and really are just a list of tasks that the project undertakes. The proponents should provide a set of specific SMART objectives (see proposal instructions) that include targets (e.g., number of inspections per year) and standards for assessment of success. Some activities, such as site visits and inspections, could reasonably be combined into a single objective with multiple actions.
2. **Project evaluation.** Expectations for monitoring and evaluation with an O&M project are not as high as for other types of projects (e.g., habitat restoration or supplementation), but some description of how project managers evaluate the project should be provided. The ISRP recognizes that the project does not conduct monitoring, but the proposal did not provide any indication of a strategy for evaluating the effectiveness of the project. The only examples provided in the proposal were the transition away from woven mesh screens to perforated plates when the science and

practice shifted in that direction, and the participation in the Fish Screening Oversight Committee’s quarterly calls and biennial workshops. While both are strengths of the project, a documented strategy for evaluating the project’s successes and needs could help the project adapt. For example, the inspection logs seem to be a missed opportunity for documenting details about the project. Which sites and infrastructure types require the most attention? Which ones are likely to have the greatest need for modification as streamflows change? Etc.

3. **Climate change and prioritization.** Along these lines, the proposal identifies the need for some sites to be modified in response to climate change. How will those changes be identified, prioritized, planned, and funded? What types of modifications would be necessary? Are the proponents relying upon another one-time injection of funds from BPA, similar to the one they received in 2020 for deferred maintenance? More broadly, given the confounding factors identified by the proponents, the project is likely to be decreasingly effective at meeting its goal without some strategy in place for looking to the future and adapting to changes as they come. How are the proponents strategically planning for and adjusting the project going forward?
4. **List of annual work accomplishments.** In a past ISRP review, a request was made for a list of work that has been accomplished for screens and fishways by year. The proponents did not deliver this, leaving the ISRP with questions regarding what work remains, how things get prioritized, and what benefit the screening project is providing to which species.

In addition, the ISRP notes that the proposal contained many typos that made it difficult to read and left the ISRP wondering if important details were accidentally omitted.

200739800 - Yakima Tributary Access & Habitat Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Resource Conservation and Development

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proponents coordinate their restoration activities with a broad range of experts and stakeholders in the Yakima Basin, thereby enhancing probability of success. The proponents

propose to continue their ongoing effort to 1) eliminate salmonid mortality caused by impingement and entrainment into surface water diversions; 2) restore habitat connectivity by providing fish passage at man-made barrier; 3) improve degraded instream habitat resulting in enhanced spawning and rearing habitat for ESA-listed Middle Columbia Steelhead and other native salmonids; 4) restore riparian habitat and function to increase shading, reduce stream temperature, and improve water quality; and 5) complete inventories in key tributaries targeted for salmon and steelhead restoration to identify fish passage and screening needs. The project is well formulated with a strong set of objectives and actions. The project conducts presence/absence monitoring of fishes in the project area, and this low-effort fish monitoring appears to be of some value for evaluating project success. The project relies upon other projects to document trends in steelhead and salmon throughout the basin, but the project needs to demonstrate its linkage more fully to the biological monitoring efforts being done by related projects (e.g., BPA projects 199506325 and 201003000) to understand the fish response and success of their actions.

A summary of project results since 2002, including the project site map, indicates successful completion of many projects in the Yakima subbasin. This long-running project has focused work on passage, flow, and habitat. It has a large geographic. It does a variety of project types and of note is that a lot of work focuses on barriers, which are high reward, low risk type of projects. The project has been successful at what it does and has leveraged other funding to do work. The work encompasses a wide variety of projects and involves many partners. The project funds a group of local conservation entities to do the actual work. Since its inception, the project has restored access to 238 stream miles, planted 16.6 miles of riparian habitat, and secured 69 cfs of water rights for fish.

For this funding cycle, the project is proposing to do 28 projects that they list in an informative spreadsheet. The projects are prioritized, and it is clear they can shift projects using this spreadsheet if warranted. One concern is that proposed projects are mostly on small tributaries. Is there a reason why larger tributaries such as the Teanaway are not being considered?

The proponent has a system for project selection, but few details are provided. A description of Priority Index Numbers and how they are derived would be helpful because that seems key to the prioritization. Also, do they incorporate any fish potential such as capacity? One confounding factor in project selection that should at least be considered is other issues in some of the streams they are working on. For example, it is highly likely some of these systems have water quality and stream temperature issues that affect how they are used by the fish.

The project does some implementation monitoring on some projects, but the subbasin-scale monitoring is covered by other projects. This is extremely important because it makes it possible to assess the aggregate response to multiple projects in a single tributary.

The project primarily monitors fish passage. Who is tracking other types of projects such as how well riparian plants are doing? It would have been helpful if the proponents had provided a summary of what monitoring is done and what results are available. When do they decide to do fish monitoring? No methods are provided for how this monitoring occurs. It was not clear where these data are.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we also encourage the proponents to revise their proposal to reflect these changes, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** While the proponents provide a solid list of SMART objectives and detailed actions associated with each SMART objective, the time frame for achieving each of the objectives is given as 2027, which corresponds to the five years of funding sought. It was not clear which actions will be done in what year(s) during the five-years of the project. Please provide the annual goal for each objective to correspond to annual reporting so that progress towards meeting objectives can be readily tracked. Based on the overall quality of the proposal and the project's track record, the ISRP does not need to review the revised proposal.
2. **Summary of monitoring findings.** The ISRP requests the proponents to fully describe the fish monitoring findings that are conducted as part of this habitat restoration effort and to describe if and how the information has been used to adjust the projects activities and future project selection. Some graphical and statistical analyses would be helpful.
3. **Project selection process.** The ISRP requests a fuller description of the project selection process. In the reviewed proposal, it is stated that the project uses "YTAHP's tried-and-true vetting process" and that "Projects are prioritized based on available Priority Index numbers, alignment with the Priority Actions in the Yakima Steelhead Recovery Plan, and the Primary Resource Concerns for both the North Yakima and Kittitas Conservation Districts." While this appears to be a plausible multi-faceted process, the actual mechanics of the process are obscure. Are fish production potential and habitat capacity incorporated in the prioritization process?

4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat Project (199705100) to summarize the linkages between implementation and monitoring projects in the Yakima River basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The goals of the YTAHP are stated more fully in the summary section than in the Problem Statement. It would have been better to state a single Goal that includes all four of the elements identified as separate goals. What are listed as “YTAHP Goals” in the table provided would be better termed as a set of “Desired Outcomes” rather than goals. A suggestion for an improved Goal statement would be: *Enhance the numbers of steelhead, Chinook salmon, and coho salmon returning to the Yakima River subbasin to healthier levels by eliminating salmonid mortality caused by impingement and entrainment into surface water diversions, restoring habitat connectivity, improving instream and riparian habitats, and decreasing fish passage impediments.*

The proponents provide an excellent description of the significance of the project and its relationship to regional plans.

The proposal provides a useful list of nearly complete SMART objectives and detailed actions associated with each SMART objective, for 4 of the 5 areas; however, the number of project sites or stream miles are not provided for instream habitat restoration. The time frame for achieving each of the objectives is given as 2027, which corresponds to the five years of funding sought. In addition, it would be good to see an annual goal for each objective to correspond to annual reporting so that progress towards meeting objectives can be readily tracked. It is not clear which actions will be done in what year(s) during the five-years of the project.

The proposal provides a succinct chart showing specific quantifiable actions to meet the objectives. Over the next 5 years, YTAHP proposes to implement 28 projects that align with the program’s objectives and contribute to opening three of the four remaining blocked MSAs in the Upper Yakima (Wenas, Naneum, Caribou MSAs) and to meeting the spatial structure criteria in NOAA’s Mid-Columbia Steelhead Recovery Plan.

As the proponent acknowledges, an objective to track the biological response to the actions is not provided. While the proponent identifies that tracking the biological response is “left to other programs,” there is a need of demonstrating a definitive feedback loop to understand the adequacy and success of the past and proposed actions. It is not clear if the information being provided by other projects on biological response is adequate. For example, the described simple detection of presence/absence of adult anadromous fish does not allow understanding of the full impact of the project actions. It is imperative to show if and how the proponents receive this feedback on a regular basis and to indicate how this information is processed and used to potentially change the actions planned. If the Goal of this project is to enhance numbers of focal anadromous fish, then the biological response needs to be an integral part of this project or provided by the lead monitoring and evaluation project (i.e., Project 199506325).

Q2: Methods

The proposed project builds upon previous efforts and methodologies. Methods to complete each of the five objectives were briefly but adequately described.

The habitat objectives will be accomplished following direction provided by a robust team, including a NOAA Fisheries hydraulic engineer, Bonneville Power Administration engineers and environmental compliance staff, WDFW Fish Screening & Passage Biologists and the local YTAHP technical working group consisting of project proponents, engineers, the permit coordinator, biologists, and regulators. Stream assessments will be conducted utilizing Washington Department of Fish & Wildlife’s protocol provided via their Fish Passage & Screening Division; inventoried stream information will be uploaded to the WDFW Fish Passage Barrier and Surface Water Diversion Screening Inventory (FPDSI) database.

The proposal describes a prioritization process to select projects. A description of “Priority Index Numbers” and how they are derived would be helpful, because that seems key to prioritization. It is not clear if fish production potential and habitat capacity are incorporated in the prioritization process.

It is unnecessary and confusing to reword the objectives in the Methods section. The Objectives should read the same as the SMART Objectives given in the Goals and Objectives section. A good amount of detail is provided about the actions to be taken to get to desired outcomes.

Q3: Provisions for M&E

The YTAHP continually monitors its progress in three ways. First, for program function, the Core Team members and partners meet monthly to discuss project development, funding

opportunities, and issues impacting fish recovery within the Yakima Basin. Second, each individual project is monitored for proper installation and performance. If problems with the structure and/or function are discovered during these assessments, adaptive maintenance will be applied as quickly as possible to correct the problem. Third, YTAHP has tracked biological responses before and after project implementation by monitoring fish abundance trends above and below certain barrier correction projects. The proponents describe the location of numerous PIT tag arrays used to monitor fish populations. However, the monitoring of basin-wide fish response is left to other programs with RM&E funding and capacity.

The proponents describe a basic but strong post-project evaluation process from a physical and structural integrity approach. However, the project adjustment process is not clear. Are there examples how projects have been modified in response to monitoring results? The strength of the fish response monitoring is unclear. It is not clear if or how the project uses fish response information to adapt and change their actions. It would be useful to see tables and/or graphs of the fish numbers and fish distribution changes over time, at least since the inception of this project in 2007.

Q4: Results – benefits to fish and wildlife

While the actions to be implemented likely will benefit fish and wildlife, the proposal provides limited direct documentation of these biological benefits. The proponent should have presented a summary of findings of their fish monitoring effort (presence/absence) within the localized restoration project area. Successful reestablishment of anadromy has been observed in some streams after barrier removal, but numbers of fish utilizing the new habitats appear to be unknown.

Since 2002, the YTAHP has screened 448 cubic feet per second (cfs) of surface water diverted for irrigation, restored anadromous fish access to 238 miles of tributary habitat, and placed more than 67.5 cfs into the Trust Water Program through water conservation practices and alternative irrigation sources. This is in addition to more than 16.6 miles of riparian planting on 219 acres where YTAHP projects have been implemented. YTAHP has also partnered with other restoration entities to reconnect floodplain habitat, open side channels, remove levees, and install large wood and other habitat forming materials instream to further enhance habitat. These actions appear to be benefiting steelhead, Chinook salmon, and coho salmon. It is hard to tell the overall effect of multiple projects in a tributary without having a stronger level of monitoring data at the tributary scale.

199206200 - Lower Yakima Valley Riparian Wetlands Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Wildlife, Range & Vegetation

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proponents are to be commended for submitting a concise, easy-to-understand proposal. The primary goal of the Lower Yakima Valley Riparian Wetlands Restoration Project is to permanently protect 27,000 acres of on-reservation floodplain lands along Toppenish and Status creeks and along the lower Yakima River, primarily for wildlife benefits. To date, 21,630 acres (80%) have been protected through land purchase or lease agreements. However, it was not clear if the goal of 27,000 acres of floodplain habitat is still logistically reasonable or sufficient. Other project goals involve habitat restoration and wildlife monitoring.

Although the project seems to be highly successful in terms of protecting 21,630 acres of floodplain habitat, it is not clear how land was prioritized for this protection or what percentage of the total floodplain habitat this represents. But the proponent clearly described what they do and how they do it. The proposal includes an excellent discussion of how they implement their projects.

Goals of the project are presented and have not changed since the last review in 2013. A set of SMART Objectives should be developed for the project. To qualify as SMART Objectives, the proponent should include specific targets per year of the project (e.g., acres of riparian plantings, number, and extent of surveys) and should be accompanied by implementation objectives that describe the intended activities, followed by a description of the appropriate methods to be used under each Implementation Objective. In that most of the information already exists in the proposal, this reorganization is not expected to take a large amount of time.

A list of projects to be completed under this funding cycle is provided in a table. There is no formal project adjustment process for restoration projects, rather the project seems to rely upon experience of the staff to make decisions about project selection and restoration approaches. The lack of a formal adjustment process seems to reflect the project target of simply achieving a net increase in habitat value.

This project mostly meets scientific review criteria, but additional information needs to be provided in a subsequent annual report to satisfy science integrity requirements and to ensure that this project is based on sound scientific principles. The focus of the project is clearly shifting, from land acquisition to land management. So too must the objectives, methods, and monitoring change to adequately depict the new directions that this project is undertaking.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** The proponent should develop a complete set of SMART (see proposal instructions) objectives for this project and incorporate and submit them in a revised proposal, which will provide complete project documentation for future reference on reporting project progress. Based on the overall quality of the proposal and the project's track record, the ISRP does not need to review the revised proposal.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat Project (199705100) to summarize the linkages between implementation and monitoring projects in the Yakima River basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
3. **Project prioritization.** Develop and follow formal project prioritization criteria and project selection methodology. These criteria and methods should help maximize efficiency of actions.
4. **Benefits for fish and wildlife.** Identify benefits for fish, wildlife, ecological function, and cultural aspects. These benefits should be quantified as much as possible. This will require a definitive monitoring effort that is robust enough to track progress on an annual basis. The relevant fish monitoring may largely be satisfied by coordination with monitoring efforts already being done by other Yakima subbasin projects (e.g., 199506325 and 199603501).

Q1: Clearly defined objectives and outcomes

The primary goal of the Lower Yakima Valley Riparian Wetlands Restoration Project is to permanently protect 27,000 acres of on-reservation floodplain lands along the Yakima River, and along Toppenish and Satus creeks. The project also seeks to monitor, adaptively manage, and enhance those lands to realize a net increase in native fish and wildlife habitat values. Another key criterion for project success is that the properties acquired and managed are accessible to Yakama Nation tribal members for traditional hunting, fishing, and gathering practices, and that healthy populations of culturally important species are maintained.

Goals of the project are presented and have not changed since the last review in 2013. No timeline for achieving the primary goal of protecting 27,000 acres is mentioned, though achievement would primarily depend on funding. Other objectives are noted, such as a net increase in habitat values, but the amount of increase was not specified, suggesting a vague low target.

The proposal needs SMART objectives. The information is largely presented in a table, but the use of SMART objective format will help organize the material and help with tracking progress on an annual basis. The SMART objectives should be explicit about targets and desired outcomes for each of the next five years.

Q2: Methods

The operations and activities proposed for this project fall into three categories: acquisition, restoration/enhancement, and management. The proponent states that "Acquisition activities occur when new properties are purchased or leased, and when existing property leases are renewed." The approach for prioritizing areas to purchase or lease is not described, other than stating: "This land is selected for its high value to fish and wildlife populations." The last two categories are not mutually exclusive, as restoration actions may require new management practices for continued benefit.

The methods are generally well described, but the methods need to be organized within SMART objectives (see above). Metrics and targets need to be developed and presented. The timeline and schedules lack the detail necessary to assess progress towards targets.

Q3: Provisions for M&E

A formal adaptive management and project adjustment process is not described. While a description of how projects are reviewed suggests that internal and external review have been

an integral part of the process, the review process appears to have a loose and optional structure rather than a formal, structured review process. As is, the decision as to when more extensive internal or external review is conducted is not clear.

The project has a systematic approach to compliance monitoring based on aerial photos, habitat cover, and bird density. The project's 2007 proposal indicated that a website would be available that will include all monitoring relevant to their project (mostly project compliance monitoring). The ISRP could not find any information about such a website in this proposal or recent annual reports. It is not clear if any fish or wildlife monitoring, regardless of who conducts it, is available on a Yakama Nation website.

Project monitoring work has focused on both clarifying the outcomes of specific projects and on long-term trend monitoring for wildlife populations. The former is accomplished using photo-point surveys and vegetation monitoring, as well as taking individual counts and qualitative notes at planted sites. Pre-and post-project monitoring reportedly takes place. The proposal states "During the implementation phase, wildlife program staff are on hand both to ensure that the project design and environmental protection measures are followed, and to observe which design components are easy to implement and which may require adjustment."

Habitat restoration activities are monitored on selected projects using standard vegetation monitoring techniques (transect/quadrat surveys, etc.). Baseline surveys take place prior to implementation, with follow-up monitoring after restoration activities to document and evaluate their effects. Other monitoring work has included groundwater hydrology surveys undertaken by a collaborating graduate student from Central Washington University, and periodic surveys for rare plant species.

Wildlife monitoring for the project includes waterfowl, sage grouse, upland game birds, and non-game birds. Waterfowl banding activities are conducted during the summer by trained personnel to determine survival rates and migration areas for locally produced ducks. Migration and wintering surveys are conducted using fixed-wing aircraft monthly from October through February. Counts of sage grouse, upland game birds, and non-game birds are conducted seasonally. Hunter effort and success surveys are conducted during hunting seasons, which helps to gauge both use and population levels for waterfowl and upland game birds. However, the relationship of these monitoring efforts to the project acquisition and restoration efforts is not so direct, for they generally appear to be designed to serve a broader purpose (e.g., information for a public hunting program).

Q4: Results – benefits to fish and wildlife

Overall, this project has done an admirable job providing a significant amount of conservation. The main benefits are conservation of land and preservation of cultural traditions. Cultural benefits include providing habitat for native plants used for basketry and first-foods harvesting. Tribal access for traditional cultural activity is an important part of this project.

To date, the Yakama Nation has used Project funding to protect 21,630 acres of habitat (goal is 27,000 acres), including 4,530 acres of National Wetland Inventory (NWI) wetlands, through a combination of land purchases and long-term leases. The YN Wildlife program has completed numerous enhancement projects on its properties, to restore them to a natural state or to enable flexible and impactful management options in areas where larger trends (e.g., Yakima River flow regulation) prevent a return to a truly natural condition. Project funding has been used for many of these activities, typically combined with other funding sources. Restoration actions have ranged from small riparian plantings, to reconnecting long side channels, to large water control infrastructure projects.

Benefits to wildlife such as waterfowl are likely, but the benefits to fish are less clear. While the actual monitoring of Middle Columbia steelhead “is ‘outsourced’ to cooperating organizations such as YN Fisheries,” the information collected is not presented by the proponent. The monitoring information should be used by the proponent to help track the usefulness and progress of the project. The information should also provide a feedback loop for future adaptive changes in the project approach.

199603501 - Yakama Reservation Watersheds Project (YRWP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proponent has described an important habitat restoration and steelhead monitoring effort in select tributaries of the Yakima subbasin. This project has evolved over time. In the 2010

review, it is stated that "The primary objective is to correlate population performance and changes in population performance to habitat conditions or specified physical attributes (i.e., flow, temperature, wood densities, and habitat types) by integrating the project's biological data with the habitat data." This effort to link habitat changes to population performance appears to have been eliminated in favor of more basic biomonitoring of steelhead and projects.

The proponent has done an admirable job of presenting past accomplishments and uses a science-based approach to moving forward with restoration actions. However, in future proposals and reports, we encourage the proponent to provide quantitative objectives, such as those shown in the Timeline table, that can be evaluated for successful implementation. The proposal would highly benefit by following the requested SMART Objective format, which will require restructuring existing information and some addition of new content. As is, the six objectives are more like goals. The specific project list could lend itself to framing of objectives. The proposal should reference specific actions described in the 2009 Steelhead Recovery Plan, and it should describe the percentage of the total actions that would be addressed during the upcoming contract. This information is needed to assess how much more restoration of each type is needed and for fuller understanding of the science-based merits of the proposal.

This project has potential significant benefits to steelhead, both from the perspective of the entire Yakima system and from the perspective of the Middle Columbia ESU. The main way this project determines success is an increase in the abundance and survival rate of salmonids, specifically steelhead. However, it is challenging to impossible to link actions being taken to encourage a steelhead response with the methods being employed. In fact, the juvenile steelhead abundance in the Toppenish watershed is declining. While this might be due to other issues such as ocean conditions, it is also possible that the ability of the project to take positive action is being subsumed by problems in the basin (some of which might be new). The proponent is encouraged to conduct a limiting-factors-type analysis to be sure they are doing the right projects in the right places.

While the proponents describe a project selection process (using various types of scores), does this in fact lead them to doing the right work in the right places (i.e., where the survival and production issues really are located)? Are the projects large enough to make a difference? To address this, the proponents are encouraged to do a new selection process and see if this leads to the same projects. It is important to anticipate future climate change, so the proponents can design restoration actions that will be resilient to changing environmental conditions. Another way to improve project selection is to do comprehensive basin-scale habitat assessments. This might lead to a different set of projects.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat (199705100) to summarize the linkages between implementation and monitoring projects in the Yakima River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The primary goal of the Yakama Reservation Watersheds Project is to restore steelhead populations in the Lower Yakima tributaries to harvestable numbers. The secondary goal is to restore the diverse aquatic and riparian communities that steelhead depend on. Numeric population objectives were reported in the 2009 Yakima Basin Steelhead Recovery plan, e.g., 3,250 fish for delisting, 4,500 fish for short-term recovery, and 16,600 fish for long-term recovery. According to the project report, adult steelhead counts at Prosser Dam peaked near 6,000 fish in 2010-2012 but have declined to about 1,000 fish in 2017-2019.

While the information about what is planned for restoration and monitoring over the next five years of the project is offered in various places and various forms, the clarity of the plan would be much enhanced by following the requested SMART Objective format. The proposal lists six objectives, which are goals rather than quantitative objectives that can be monitored and evaluated to determine whether the project is achieving success. These goals are highly worthwhile and stem from the detailed recovery plan, but they limit the ability to evaluate progress against quantitative objectives. For each SMART Objective (N=6 in the proposal) and each year of the project, the proponents should be explicit about what is to be implemented, how much is to be done (i.e., expected percent of the objective completed), and what is to be measured and quantified to assess outcome. Most of the information to include in these SMART Objectives already exists in the proposal. A seventh SMART Objective should be developed to cover documentation and reports (e.g., timing and content of annual report(s) to be produced).

Quantitative objectives are shown in the Project Timeline in Section 7 (called goals in the table). For example, in North Fork Logy Phase 3, install six-ten BDAs, half-channel spanning and full channel spanning; fell encroaching confers by 2023 (note: "BDA" was not defined in the proposal). These are the type of quantitative implementation objectives that can be evaluated

in a review in about five years. Part of the implementation monitoring should evaluate the intended function of these habitat actions.

Generalized expected outcomes for each Objective are provided, but it is unclear if and how expected outcomes will be assessed. Specific metrics and methods need to be described. For example, what hydrologic function metrics are to be used and documented by year (OBJ-1)? Will changes in range and abundance of salmonids be reported on an annual basis (OBJ-2)? What metrics and trends for abundance, productivity, and survival of salmonids be quantified and reported each year (OBJ-3)? Will metrics for riparian cover and streambank stability be reported each year (OBJ-4)? Will metrics for response from the riparian community be quantified and reported each year (OBJ-5)? What habitat parameters will be measured to determine status and trends in habitat response (OBJ-6)?

Q2: Methods

Methods for prioritizing habitat restoration projects and for implementing them were described in sufficient detail. It is expected, however, that additional methods will need to be described once the proponent uses the SMART Objective format described above. Basin and river reach assessments were briefly described, but more detail could have been provided on how restoration activities are expected to alter habitats and if the changes observed were as expected.

Methods for monitoring steelhead spawner and smolt abundances and water temperature are described along with references to additional details. However, we note that the 2020 steelhead and water temperature monitoring report would have benefited by linking the fish and water temperature monitoring effort more closely to the habitat restoration effort. Furthermore, in addition to steelhead smolt counts and spawner counts, we encourage the proponents to estimate smolts per spawner and to plot this in relation to spawners as a means to evaluate density dependence. It was not clear if quality control assessments were being done, e.g., adjustment of redd survey counts by making many more passes to see what proportion of redds are being seen. While the biomonitoring methods are very focused on steelhead, are other methods being used for other species?

Q3: Provisions for M&E

Although reach assessments are performed, the extent to which restoration projects were properly implemented was not discussed. It is unclear if the number of various proposed restoration projects were successfully implemented as planned, as should have been

mentioned in the quantitative objectives of previous proposals. No lessons learned are described.

While the thought process and data collection at the site level is part of the project selection and pre-planning stage of the projects, it appears that monitoring and evaluation after the restoration efforts are more generalized at the watershed level. The post-project sampling design should be robust enough to assess changes at the project level to promote learning and proper assignment to cause and effect. The proponents document a disturbing decrease in juvenile steelhead abundance in Toppenish Creek watershed (Appendix 1), but then they ascertain that the decrease is due to climatic and out-of-the-subbasin factors rather than a reflection of the success of their restoration efforts in the watershed. What does not appear to be assessed are metrics that capture meaningful changes in juvenile steelhead production at the project level in response to implemented changes.

The fish and temperature monitoring data collected by the YRWP project (flow, water temperature, and steelhead redd locations) are used when selecting, designing, and implementing restoration projects. This information is provided to contractors that prepare reach assessments. The proponents consider the basic information, especially discharge and temperature data, to be critical to planning and designing the restoration projects because they are the critical limiting factors that proponents aim to improve. Staff meet regularly to discuss project schedules, progress, and results. Projects are prioritized once per year.

This project does project-specific monitoring as well as large-scale (subbasin) monitoring of steelhead. The efforts include adequate monitoring of steelhead smolt and spawner abundances in Toppenish Creek, but total smolt estimates are problematic in the other two tributaries, according to the 2020 project report. Water temperature, which is a key limiting factor, is also monitored. The project is conducting a variety of actions where the main evaluation criteria is an increase in the abundance and survival rate of steelhead. For example, they propose to eliminate entrainment of smolts and passage barriers to adults at tributary irrigation diversions and other man-made barriers to increase the survival rate of smolts and improve access to spawning habitats. It was not clear how they propose to estimate survival. For example, is it reach scale, watershed, or subbasin scale? The expected result is an increase in the abundance and survival rate of salmonids, specifically steelhead within the system.

While the project clearly adjusts the restoration efforts, both selecting projects and implementing them, it is not clear if they have a process to adjust their projects based on biological monitoring results. Are there other protocols for salmon and non-salmonids, and if so, do they have results of non-steelhead monitoring? These data are important to understand what species are benefiting from the restoration efforts.

Q4: Results – benefits to fish and wildlife

In general, the suite of science-based and best available practices for restoration actions used to address documented limiting factors can be largely assumed to be beneficial to fish and wildlife. The proponents are encouraged to continue to use and develop meaningful metrics to help measure these benefits and directly assess success of project actions.

It is noteworthy that about 50% of the steelhead in the Yakima system occurs in the three target watersheds of this proposal. Appendix II provides a succinct table of habitat projects and accomplishments, 2012-2020. The 2017 status and trends report (Project 200900200) provides an excellent overview of accomplishments in the Yakima subbasin, but it is difficult to identify accomplishments directly linked to this project versus numerous other projects in the subbasin. A downward trend in steelhead spawner abundance and smolt production has been observed since 2010 as has also been observed across the Columbia Basin for most anadromous salmonid species—reportedly the result of multiple drought years and unfavorable ocean conditions.

Many types of data are being recorded, but not all data are being analyzed and synthesized. For example, the proponents should also estimate and report smolts-per-spawner, when possible; relate spawner counts in the tributaries to counts at Prosser Dam; present findings related to PIT-tag operations; and provide time series of stream temperatures for each year.

199705100 - Yakima Basin Habitat Project

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Tribes and Bands of the Yakama Nation

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP requests the proponents to provide information on the following condition in the next annual report:

- **SMART Objectives.** The proponent needs to revise the SMART objectives to clearly identify the expected outcomes (i.e., desired response) in quantitative terms. To be complete, a SMART objective should be accompanied with quantitative implementation

objectives that describe restoration actions and monitoring actions to evaluate the extent of success. The ISRP recognizes that budget constraints may not allow implementation of all desired monitoring actions at this time. The proponents should provide revised SMART objectives in the next annual report and work plan and use them as a basis for reporting of progress in future annual reports.

In our preliminary review, we requested responses on three topics. Our final review comments based on the responses are provided under each topic:

- 1. SMART objectives.** The ISRP suggested recasting the objectives to explicitly indicate expected outcomes of various metrics for each year of the project. As currently written, Objectives 1-4 simply indicate general intentions to improve conditions (in summary, 1: restore longitudinal connectivity, 2: restart ecological processes and develop heterogeneous aquatic habitat, 3: restore multichannel planforms, and 4: restore native riparian and wetland vegetation). The proponent did not provide updated objectives with explicit expected outcomes, citing that the budget would not allow adding efforts to measure success. Presumably, that means the proponents will not assess possible failure (i.e., not making things better or making things worse) either. While the current objectives describe the various areas to be treated (in terms of miles or acres) over the five years of the proposed project, they do not describe the desired response levels of increase or decrease over baseline conditions.

Because the objectives are not quantitative, it is difficult to understand how much will be done and how success would be measured. For example, Objective 1 states *“Restore longitudinal connectivity (sediment, wood and all fish life stages) to 20+ miles of tributary habitat over the next 5 years (FY21-FY25).”* An example of how to change this to a SMART objective would be: *Restore longitudinal connectivity for transport of sediment, wood, and all life stages of fish by removing or modifying 10 artificial barriers in 20+ miles of tributary habitat over the next 5 years (FY21-FY25).* The addition of one or more Quantitative Implementation Objectives (1.a. 1.b., etc.) would identify specific actions (e.g., barrier types and locations to be removed) that will occur within the 20+ miles, and how much of each action is expected to be completed within a given year. If the objective quantifies the expected outcome, then implementation monitoring could evaluate if the objective was achieved. This implementation monitoring may or may not demonstrate that connectivity increased (i.e., increased fish or wood movement), but there is presumably an assumption that the specific actions would increase connectivity. These assumptions should be justified with existing monitoring information, documented best management practices, and published studies to the extent possible in the proposal and annual reports.

The original ISRP review provided an example for converting Objective 4 to a SMART Objective.

It is assumed that annual reports will document what activities were done and how many stream miles or acres were variously treated. Without additional information about expected outcomes relative to a baseline and a target, it will be difficult for reviewers, and the practitioners, to determine the level of success of this project.

2. **Project selection.** The proponent provided the requested information on the project selection process. As a project is planned and implemented, it will be important to document in annual reports the process by which the project was chosen.
3. **M&E matrix – lead.** The Yakima Basin Habitat Project declined to provide a matrix summary of M&E projects in the Yakima River subbasin. The proponents indicated that preparation of the M&E summary is presently beyond the scope and scale of current project resources and budgets. They indicated that assessments of fish-in/fish-out response to aggregate project activities are conducted at Prosser and Roza dams and that status and trend information and data are provided in annual reports. They state that Yakima subbasin projects are not presently funded to conduct effectiveness monitoring. The ISRP reviewed the M&E components of the different projects in the Yakima River subbasin based solely on the information provided in their original proposals, associated documents, and any information provided as part of the Response Loop.

Though they did not provide the requested M&E summary at this time, they think that a matrix would be helpful in basinwide coordination and development of the regional RM&E. They also indicate that basinwide partners have a general desire to create such a matrix and potentially coordinate through the YTAHP. As the NPCC Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and resources to help create an effective summary for this geographic area. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long-running project that is seeking a name change and a change in focus. The project originally started out focusing on protection, but for a variety of reasons, they are seeking to

shift to restoration with little or no acquisition planned. The proponents provide a good proposal for restoring salmon and steelhead habitat in the Yakima subbasin, including quantitative objectives, well-developed methods, and quantitative results in terms of physical habitat actions. However, the proposal provided little evidence of a strong interaction with other projects that are monitoring response of fish populations and water temperature. This project and other habitat restoration efforts in the Yakima subbasin should clearly describe how each project is coordinating with other habitat projects and fish and habitat monitoring efforts.

If hatchery salmon are released into streams, will they find sufficient habitat to support them? Habitat practitioners, fish biologists, and hatchery managers should be continually collaborating and sharing information. This project is one of the primary habitat restoration projects being conducted in the Yakima subbasin, with others working on other issues such as improving passage and flow. Understanding the cumulative effect of all the habitat projects is critical because an underpinning of the success of the supplementation program being conducted hinges on improving the habitat.

In general, the proponents propose to use a suite of scientifically sound restoration techniques that address known limiting factors in hopes of benefiting the targeted salmonid species. An especially strong point of the proposal is how they conduct a wood project. However, a better linkage to past and expected biological outcomes needs to be documented in the proposal itself.

The ISRP requests the proponents to address the following points in a revised proposal, and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **SMART objectives.** The proponents need to develop a complete set of SMART objectives (see proposal instructions) for this project and incorporate and submit them in a revised proposal, which will provide complete project documentation for future reference on reporting project progress.
2. **Project selection.** Please describe how a project is selected for implementation. Is there a project selection framework? What criteria are used to prioritize a project? How is information used to evaluate potential habitat projects?
3. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other

projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this habitat restoration project, the ISRP is requesting the Yakima Basin Habitat Project (199505100) to summarize the linkages between implementation and monitoring projects in the geographic area. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking monitoring and other implementation projects to assist your project in producing this summary.

Q1: Clearly defined objectives and outcomes

The overall goal of the Yakima Basin Habitat Project (YBHP) is to restore watershed processes to aid the recovery of salmonid stocks in the Yakima subbasin. The proposal provides well defined, largely quantitative objectives. The proponents provide a 10-year habitat plan and a detailed prioritization list of restoration projects.

Some objectives are provided, but it would be helpful for the proponents to convert them into more of a SMART format. One reason why this can be useful is that the use of SMART objectives can be used to guide reporting since reporting can track each objective. It is not clear what objectives 5 and 6 were as they were statements. The useful timeline that is provided shows approximately 30 projects being sequenced and could be converted into a display of objectives for this work. For example, each line in the timeline could have additional details on numbers of stream miles affected, or trees to be planted, and so on and when those are expected to happen. While some variability in the timeline will ultimately happen, this is a useful way to display what the project intends to accomplish.

No monitoring objectives are provided even though the project noted it was doing some amount of monitoring. It is not clear what outcomes the project is looking to achieve. For example, is it doing a certain number of projects, planting some amount of riparian zone, or seeing a particular fish response? These could be more clearly specified. The site prep work (such a LIDAR and flow work) could readily be converted into post-project monitoring for a before and after comparison.

YBHP Objective 4 states:

Restore native riparian and wetland vegetation on 60+ acres over the next 5 years (FY21-FY25) to provide stream shading, bank resistance, allochthonous inputs and LWD recruitment.

The objectives should be recast into SMART objectives. As an example, Objective 4 could be reworded to be:

Obj-4: Restore native riparian and wetland vegetation on 60+ acres in <Xxxx watershed and Yyyy watershed> to provide <30%> more stream shading, <30%> more bank resistance, <25%> more allochthonous inputs, and <50%> more LWD recruitment with equitable progress per year over the next 5 years (FY21-FY25).

When the objectives are recast in SMART format, it becomes much easier if annual progress reports are organized accordingly to assess progress towards targeted outcomes.

The Timeline provided in Section 7 shows how the proponents plan to implement the overlapping restoration efforts (planning, design, and implementation) across the Yakima subbasin. By itself, however, it does not indicate the extent and expected outcomes of the activities (e.g., number of riparian acres planted, number of miles of stream restored).

Q2: Methods

The restoration approach and methodology are appropriate. To achieve the broad goal of restoring watershed processes to aid salmonid recovery, YBHP uses a three-prong approach: 1) Assess watershed, habitat, and fish conditions/status to inform the prioritization of restoration activities, 2) Protect, restore, and enhance priority watershed and reaches, and 3) Provide educational opportunities and public outreach related to salmon, habitat, and water quality and watershed health. Restoration activities are aimed at restoring stream processes by removing or mitigating watershed perturbances and improving habitat conditions and water quality. Protection activities complement restoration efforts within the subbasin by securing refuges and preventing degradation.

Along with the substantial information about restoration approaches and techniques provided in the proposal, an excellent group of supportive materials are provided that helped to elucidate the assessment, prioritization, design, and implementation process for projects. Detailed methods on adding large wood placements are excellent with a design framework, objectives of wood placement, and site evaluation. However, no other methods are provided for other types of restoration. Are large wood additions the only type of restoration actions being implemented?

Restoration projects include both engineered logjams (ELJs) and unanchored or “loose” wood placements to increase instream complexity, side channel activation, riparian restoration, increased floodplain inundation, and removal of lateral floodplain impediments. A technical guidance report for setting unanchored large wood is provided. This document aids YBHP staff for assessment of site suitability and for design of unanchored large wood. Projects with a low to medium risk are designed in-house and projects with a medium-high to high have in-house conceptual designs that are then contracted out to advance with engineering. YBHP staff develop 2D hydraulic models to evaluate and support a number of assumptions about wood placement.

The project notes that some monitoring is done, but no details are provided on what is monitored, why it is monitored, or what methods are used. What is missing is how the metrics listed in the objectives will be measured and assessed for success. Some verbiage should be provided to describe how the following metrics will be assessed: longitudinal connectivity, restart of physical process, restart of ecological processes, heterogeneity of aquatic habitats, increase in multi-channel planforms, increase in overbank flow frequency, increase in shallow water aquifer recharge, reduction in active channel severity, increase in refuge habitat, increase in native riparian and wetland vegetation, increase in stream shading, increase in bank resistance, increase in allochthonous inputs, increase in wood recruitment, increase in the beaver population, and increase in nutrient availability.

While the proposal contains helpful details on how a project can be designed, it provides only limited descriptions of methods for project selection. Are projects selected based primarily on habitat factors or do fish metrics have a role? How are projects identified and prioritized? Are the right projects being done?

The use of repeat LiDAR to assess changes in erosion and deposition described under Section 5 (Project evaluation and Adjustment process) is a good example of how metrics are assessed, and the description should be moved to Section 4 (Methods). The same is true for descriptions of the use of a small-Unmanned Aerial Vehicle (drone), geomorphic change detection tools, and 2D modeling for assessment of success.

The discussion of the impacts of the 2020 FEMA Region X rescindment of the Policy on Fish Enhancement Structures in the Floodway was enlightening. It will be important to document how this impacts the project, and the proponents are encouraged to keep us informed through annual reports and discussions with your BPA Contract Officer.

Q3: Provisions for M&E

The proponents largely rely on the BPA EIS (1996) to guide the project adjustment process. An example is provided that described how the project derived what best combination of treatment and plant source resulted in higher planted vegetation survival. It would be good to see several other examples from across the spectrum of activities performed under this project.

The proponents explain why this project has migrated away from land acquisition and away from passage projects since its inception in 1997. Starting in 2014, these changes were made in reaction to changes within BPA acquisition process and to decrease duplication and interference with other agencies carrying out similar activities. These changes appear to represent a reasonable and needed adjustment to the project.

YBHP uses information gathered from past project monitoring to inform designs of future projects. The effects of management actions (restoration/enhancement projects) are monitored and evaluated at various intensities (qualitative vs quantitative approaches), and successive projects, phases, or project types are modified in response to these findings. Physical data, such as that produced from LiDAR acquisition have been important to evaluating restoration site characteristics and design. Repeat LiDAR datasets have proved valuable in evaluating project success by producing DEM of Difference (DoD) data that enables comparison of two, spatially identical topographic surfaces to determine quantities and areas of erosion and deposition resulting from a project action.

The adaptive management and iterative project review process for the YKFP involves identifying objectives, strategies, operating assumptions, uncertainties, and risks that are reviewed annually by project scientists. The purpose of these annual reviews is to (re)assess project objectives, progress towards those objectives, and to evaluate whether any strategies or assumptions need to be altered in the face of new information gained over the past year. If reassessment is necessary, the YKFP science teams bring proposals to the YKFP Policy Group for consideration and action.

The proposal states that the "YBHP is prioritized to address tributary limiting factors of reduced stream complexity and channel structure, elevated summer water temperature, reduced floodplain connectivity and function, insufficient large wood in channels, and degraded riparian

conditions." The metrics described in the Results section are linked to these limiting factors, except there is no mention of monitoring of water temperature, which might be affected by the habitat actions.

There are almost no details on monitoring, including what is being monitored, why it was selected, and how long it will be monitored. Is another project doing this monitoring? Some project-scale fish monitoring is conducted, but is there basin-scale or larger-scale monitoring that occurs? The YBHP proposal notes that it uses information gathered from past project monitoring to inform designs of future projects. This implies that monitoring is being conducted. The project then notes that the effects of management actions (restoration/enhancement projects) are monitored and evaluated at various intensities (qualitative vs quantitative approaches), and successive projects, phases, or project types are modified in response to these findings. What are the findings being referred to, and is there a database where this information is housed?

The adaptive management process followed was proposed/published in 1996. Is it still viable or is their need to modify what was published nearly 25 years ago?

Q4: Results – benefits to fish and wildlife

The proposal and accompanying documents summarize habitat project results. Since 1997, 1,876 acres of aquatic and floodplain habitat has been purchased and protected. Since the last ISRP geographic review in 2013, two (2) properties (67 acres) have been acquired. Habitat restoration rather than purchase of land to protect habitat has been primary focus in recent years.

The project's focus is on physical aspects of restoration and uses a suite of methods that are generally considered helpful for restoring fish and in streams and wildlife in riparian corridors. However, it is not clear by the information provided by the proponent in the proposal if or how the project attends to biological monitoring at the site level. Furthermore, it is not clear how the project relates and reacts to existing monitoring activities being done by other entities of the YKFP project in terms of assessment of success and change in restoration planning. The proposal briefly references a number of other projects in the Yakima Basin, including projects such as Yakima Basin Steelhead VSP monitoring (201003000) and the Yakima Monitoring and Evaluation Project (199506325). The proposal also notes an action effectiveness study that examined the response of juvenile salmon to large wood placement. However, the proposal did not clearly demonstrate a close working relationship with projects that are attempting to monitor trends in salmon and steelhead including the response to ongoing habitat restoration.

It would be very informative if the proponents could provide the estimated percent contribution that past and proposed project activities have and will likely contribute to the overall goal of the YKFP (“to restore sustainable and harvestable populations of salmon, steelhead and other at-risk species that were historically present in the Yakima subbasin”) and YBHP (“to restore watershed health and stream habitat to aid recovery of native salmonids in the Yakima River Basin”)?

Like most restoration projects, determining if and how it benefits fish is challenging. While showing fish use of a project is more straightforward, linking projects to a change in juvenile or adult numbers is a challenge. Overall, improving habitat is clearly important, so projects such as this are worthwhile to do.

In the summer of 2020, FEMA Region X rescinded the Policy on Fish Enhancement Structures in the Floodway. This action complicates the habitat restoration actions, which often raise the flood elevations to reconnect the floodplain. The proponent predicts that this conflict between restoration and flood prevention within the floodplain will likely limit benefits and increase costs of restoration.

200900200 - Status and Trend Annual Reporting and Information Management

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Plateau/Yakima, Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Wenatchee

Recommendation: Not Applicable

Overall comment:

The objectives of this project are not amenable to scientific review. However, the ISRP provides the following review and makes suggestions for project improvement.

The proponents provide a succinct yet comprehensive proposal that addressed each component of the review process. The Status and Trend Annual Reporting (STAR) project appears to be a very useful outreach effort that describes progress by the large YKFP effort and other efforts in the upper Columbia Basin that involve the Yakama Nation. The effort facilitates communication among the many Yakima subbasin projects conducted by Yakama Nation by

supporting these projects with data management, outreach, and annual reporting, which enables researchers and practitioners to do their work, analyze the data, and share results in decision forums.

The proposal indicates that reporting is conducted at various scales (assessment unit, subbasin/population and ESU/DPS), including reporting of smaller-scale indicators, such as primary limiting factors and restoration actions along with expected benefits. The project has provided excellent, photo-filled annual reports that facilitate information on the progress of projects and trends of species status, and it has largely succeeded in striking a balance between meeting needs for technical and lay audiences. However, many of the fish-trend plots would benefit by showing the quantitative objective for the species. Likewise, when reporting miles or acres of habitat restored, the reports should place this in perspective by stating the number of miles or acres that were expected to be restored in the time period, and how many miles or acres are needed for success (to the extent possible). In any one year, the data for the last time period are presented, but what is the change over time? What are the objectives and expected outcomes for the habitat work? For example, how many more barriers need to be eliminated? While the objectives for this specific project do not attend to these kinds of quantitative metrics, the projects served by this project do have quantified metrics that should be evident and presented.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat project (199705100) to summarize the linkages between implementation and monitoring projects in the Yakima basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

It would help the project to develop a more appropriate goal statement and to develop a full suite of SMART objectives (see proposal instructions), which should be fairly simple to produce from the information provided in the proposal. One objective missing is for a way to gauge how satisfied the clients are with the service, which should include a formal methodology to get feed-back for improvements.

Q1: Clearly defined objectives and outcomes

An overall goal of the project is "to support mitigation described in the 2008 FCRPS Biological Opinion and the obligations of the NPCC Fish and Wildlife Program by annually reporting progress towards salmon recovery efforts relevant to the Columbia Cascade Province and within the Ceded Lands of the Yakama Nation." The activities include procuring, managing, documenting, and distributing the relevant and available data to meet the needs of natural resource managers. A key component for the STAR project is annual reporting to the Yakama Nation Tribal Council, General Council, staff, and other relevant audiences, progress in meeting restoration goals through habitat protection, restoration, and monitoring actions. In addition, progress towards meeting objectives associated with operation of the Federal Columbia River Power System, hatchery supplementation actions, and other topics are periodically summarized.

The proponents list a number of implementation objectives for the project. Most of these objectives seem to be met on an annual reporting basis. A detailed timeline for various project components is provided. However, the objectives are not in SMART format (i.e., specific, measurable, attainable, relevant, and timeliness). This format would help to clearly identify milestones and outcomes, and it would allow a better understanding of progress. Regarding an associated measurable aspect, an example would be Objective 3 where the statement should indicate a target of how many projects and project biologists are to be included in the interviews, which should largely correspond to the project lists given in Section 8, adjusted for potentially new or ended projects on an annual basis. Regarding timeline, the four headers in the timeline table provided in Section 7 do not match up well with the five Objectives given in Section 3.

Q2: Methods

The methods offered are a list of activities for each Objective very little description. It was useful to see methods linked with objectives, but it was not clear how the project prioritizes efforts and products in a given year. It would be more informative if the methods were listed as numbered actions with more description about what will be done when.

Q3: Provisions for M&E

This is an information and data sharing effort. As such, the proponents receive requests from the Yakama Nation Tribal Council, General Council, managers, and other Yakama Nation leadership members. They also receive requests from project managers and biologists. The

project reports on the monitoring and evaluation being done by other projects across the Yakima subbasin.

It is obvious that the project proponents devote considerable effort to collaborate with partners and intended audiences. They state that they request feedback for the different levels of work, and that they engage leadership, staff, information technology consultants, and partners to be able to adapt to changing needs and circumstances. They strive to improve data management and to provide products and services that are useful. What is not clear is if they have considered a formal way to document the total number of people and/or projects using their services, and a way to objectively assess the satisfaction of the services rendered as a feedback mechanism to understand effectiveness.

There are clearly issues to be addressed with this type of project including data compatibility, people being late with their data, backlogs, and so on. This certainly requires problem solving and adjustment by project personnel.

Climate change is listed as a confounding factor, and the proponent is correct that the data they procure and serve may be highly useful in assessing effects of climate change. However, climate change will have no direct effect on the project itself other than perhaps changing emphasis of the data procured and provided.

Q4: Results – benefits to fish and wildlife

The [annual reports](#) provide a highly visual summary of progress made in each subbasin. These reports appear to be very useful to policy makers and stakeholders.

The highly visual online "restoration stories" also provides very useful outreach for policy makers and the public. Although the primary fish webpage was operational, several fish data links on the interactive website did not work (<https://yakamafish-nsn.gov/fish-data>).

Salmon data are uploaded to the Streamnet web-based database (snq.streamnet.org) and the coordinated assessments database (<https://cax.streamnet.org/>). This coordination with other projects is very important.

It is clear that this project serves the data needs of many other projects so they can assess benefits to fish and wildlife. The project may not directly benefit fish and wildlife, but it does provide a way to understand how fish and habitat are performing in a number of subbasins.

201003000 - Yakima Steelhead VSP Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria

Overall comment:

The Yakima Steelhead VSP Project provides valuable information for tracking the viability of ESA-listed steelhead in the Yakima subbasin while also evaluating the effects of critical factors such as flow and habitat quality in the Yakima River mainstem, climate change, survival in the mainstem Columbia and at sea, and the important contribution of resident trout to steelhead production. This steelhead VSP project is closely aligned with the 199506325 Yakima Klickitat Fisheries Project - Monitoring and Evaluation, and other Yakama Nation projects, but it is a separate project at the request of BPA. This project strives to track steelhead population trends in relation to ESA recovery goals.

Overall, this is a strong project that shows adaptive decision making and application of advanced analytical protocols. This project provides important data collection and analyses including telemetry, PIT-tag detection arrays, and life-cycle modeling to monitor and assess steelhead escapement and outmigration survival for all four populations of the Yakima subbasin. The direct connection with gathering VSP data to supply information needs for assessing Yakima steelhead MPGs makes this proposal highly relevant to the recovery of Middle Columbia River Steelhead.

The proponents recognize the importance of steelhead and trout density, which expresses a strong relationship. For example, the project annual report states that productivity appears to peak at about 1,000 to 1,500 spawners and declines at higher spawner abundances. This information could be used to evaluate changes in steelhead capacity in response to ongoing restoration efforts in the subbasin. The project report notes problems with aging of steelhead in the past, which is critical for evaluating productivity trends in response to environmental stressors.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat Project (199705100) to summarize the

linkages between implementation and monitoring projects in the Yakima River basin. During the response loop (September 24 to November 22, 2021), as a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

To strengthen future proposals, annual reports, and work plans, the proponents should address and include the following elements:

1. **SMART objectives.** An explicit statement of the Goal and Objectives of this specific project was not provided, but instead the reader was referred to more generalized proposals for these important statements. The proposal should be a standalone document with a Goal, SMART Objectives, and Methods clearly stated in the proposal at hand. Laying out objectives as SMART objectives (see proposal instructions) and linking those with methods, results, and analysis and interpretations is tailor-made for this project and is needed. Because of the track record of past work and the strong indications of continued science-based work, it is believed that the addition of a Goal, explicit SMART Objective format, and Methods for each Objective will not take too much time to develop and that little to no surprises will result.
2. **VSP parameters.** A table of what the VSP parameter are being collected and a summary of how data collection and analysis are being done for each parameter would be helpful. At times it was hard to figure out which VSP parameters were being addressed and why. One could use distribution of juvenile rearing, and this could be done at the population level or the MPG level looking at all four populations at once. Same thing with diversity: diversity can be biological or genetic or related to habitat conditions. Mapping life history trajectories should consider estuary and ocean as well. Is there enough tagging data to indicate when Yakima steelhead exit the Yakima system and their migration strategies in the lower River and ocean?
3. **Critical data.** The ISRP could not find several types of important data, such as age composition, size, and number of repeat spawners.
4. **Methods descriptions.** Trying to assess the methods was challenging after being referred to several locations that were not that helpful, e.g., project 199506300. It is important to clearly explain how fish are aged and how sources of error and bias are addressed. It will be important to develop an accurate aging protocol to use for each year as the project moves forward.

5. **Management of resident rainbow and steelhead.** In the upper Yakima subbasin, the State promotes a high-quality resident rainbow trout catch and release fishery. Can the resident portion of the population be managed to help and not diminish steelhead production?
6. **Basin comparisons.** It would be useful to the ISRP for the proponent to compare their work and findings in the Yakima subbasin to those in the Klickitat subbasin, especially because many of the same players are involved.

Q1: Clearly defined objectives and outcomes

The vision for this project is to provide long-term population monitoring for steelhead in the Yakima MGP and to document their status relative to recovery objectives. Specific recovery objectives are outlined in the Yakima Steelhead Recovery Plan and in the Middle Columbia Steelhead Recovery Plan. The minimum delisting threshold is to achieve a 10-year average spawner abundance of greater than 500, 250, 1500, and 500 fish for the Status, Toppenish, Naches, and Upper Yakima populations, respectively. In addition, two of the populations should achieve a “viable” rating. The remaining populations should at minimum, be rated as “maintained” in their status assessments.

The proposal provides an excellent summary of past work and outcomes, which formed a solid basis for understanding the future direction of the project. The ISRP commends the definitive and direct connection of their work with recovery goals of Yakima MGPs for steelhead and the Middle Columbia River Steelhead Recovery Plan.

Explicit statements of the project’s Goal and Objectives are not provided. Instead, the reader is referred to other and more generalized documents for these important ingredients. While at the grand scale the objectives are to see certain levels of steelhead abundance, productivity, etc., this project's objectives are not to help populations achieve this but to monitor how they are doing. The proponents should provide an appropriate number of stated Objectives with a description of the expected outcomes on an annual basis for the next five years (e.g., re-runs of models with an additional year of data, reports produced).

The following is an example of a SMART Objective (X=1,2,3,...N) coupled with a set of Implementation Objectives:

Objective X. Document status and trends of adult steelhead abundance by MPG on an annual basis.

Implementation Objective X.1. Generate an annual adult abundance with Coefficient of Variation (CV) for each MPG from the available data.

Implementation Objective X.2. Conduct analyses to assess status and trends of adult steelhead abundance by MPG on an annual basis using all available years of data available.

Key monitoring actions for population-level monitoring include 1) documenting status/trend of natural-origin spawners, 2) determining proportion of hatchery-origin returns, 3) documenting age structure, 4) determining harvest mortality, and 5) understanding the influence of population supplementation efforts.

Q2: Methods

This is a well-established monitoring and evaluation project for steelhead. The introductory information on outcomes produced is excellent. The discussion provides a broad and complete description of information needs, which includes 1) adult and juvenile life history status and trend monitoring, 2) use of the DABON patch occupancy model, 3) a disentangling of the genetic and environmental drivers by modeling the survival and migration histories of PIT tagged *O. mykiss*, 4) an analysis to evaluate how the proposed action changes water flows throughout the Yakima basin during outmigration, and 5) survival relationships to estimate steelhead survival in seven contiguous river reaches from Roza Dam on the Yakima River to McNary Dam on the Columbia River.

The proposal does not provide a description of methods to be used associated with each SMART objective (also lacking—see above). The methods provided are incomplete summaries of what the proponent plans to do over the next five years, and the reader is referred to protocols under the PNAMP website rather than describing them in the proposal at hand. A number of protocols are referenced, as is the monitoring guidance document issued by NMFS for monitoring of ESA-listed salmonids. Additional description of the overall sampling strategy for monitoring VSP would have been useful in the proposal to show how the overall effort worked together to provide VSP metrics. For example, residence time (age) of steelhead in fresh water and at sea is key for documenting productivity (smolts per spawner; adult return per spawner), but aging methods are not described.

The project report notes that age was not determined every year (at least in the past) and average age is used when developing recruitment curves. This approach will affect trends, as noted by the proponents. Aging methodology should be described.

An earlier ISRP review raised questions about adequate sample sizes. The ISRP finds few details on sample sizes in this proposal or much in the way of details about other methods. There is considerable discussion of PIT tagging but not much in the way of details other than locations. The proposal references Project 199506325 for methods, but relevant methods are not covered by that project.

Q3: Provisions for M&E

This VSP monitoring and evaluation project is closely aligned with the YKFP and benefits from the management structure of the larger YKFP project. The YKFP management structure includes a Monitoring and Implementation team (MIPT) made of project specialists from both internal project staff as well as external entities (Tribal, State, Federal, higher ed, and private). The MIPT group reviews project progress annually and advises the project on issues of concern, project implementation, and technical matters. The project participates in the annual YKFP internal project reviews. The project disseminates project information to a wide audience by submitting annual technical reports that are published on the Columbia Basin Fish & Wildlife Website, peer reviewed literature, and via numerous oral presentations at professional/scientific conferences and meetings.

The proponents describe a process that should allow for adjustments to the project. For example, the proponents show model results of how climate change may impact the probability of *O. mykiss* emigration (i.e., steelhead) while also showing how a 10% improvement in habitat conditions may offset adverse climate impacts.

The project proponents have nimbly adjusted their project actions to meet a full spectrum of information needed for tracking status and trends of steelhead in the Yakima subbasin. The proponents are to be commended on their climate change analysis and how they used EDT to incorporate scenarios for different climate changes. The proponents clearly work hard at refining methods and making adjustments.

One of the things that would be helpful is a table that summarizes how they are measuring (and what they are measuring) for the VSP parameters. For example, adult spawner distribution is only one of the ways to look at spatial structure. One can also use distribution of juvenile rearing, and this could be done at the population level or the MPG looking at all four populations at once. Same thing with diversity, for example, diversity can be biological or genetic or related to habitat conditions. Mapping of life history trajectories should consider estuary and ocean as well.

Q4: Results – benefits to fish and wildlife

The project provides both qualitative life history information and quantitative data regarding abundance and productivity of steelhead in relation to quantitative recovery goal objectives. Key metrics include adult natural and hatchery-origin steelhead for the subbasin and in select tributaries (no hatchery steelhead released since 1993), juvenile abundance and productivity, spatial distribution, and diversity. Using genetic analyses, the project has demonstrated significant contributions of resident *O. mykiss* to steelhead production, especially in years when SARs are low. However, smolts that include one or two resident parents tend to have lower survival, potentially a result of past hatchery stocking of trout that have lower fitness in nature.

Recent abundance trends (return years 2018-2021) show a significant, persistent decline in nearly all steelhead populations in the Yakima subbasin. Although survival at sea is an issue, the project also shows adverse effects of regulated flows on smolt survival from Roza Dam to McNary Dam.

The proponents report encouraging production potential for the upper Yakima steelhead population when favorable environmental conditions are encountered, and they suggest recovery delisting thresholds are achievable. However, the findings also indicate the severity and consequential effects that low outmigration survival (mainstem Yakima River) can have on adult abundance, particularly if migratory smolts encounter less than favorable Columbia River conditions and/or ocean conditions simultaneously. Poor survival across the migratory and ocean rearing life-stages highlights the importance of achieving or maintaining habitat quality and quantity in the Yakima subbasin to sustain a high level of intrinsic freshwater productivity, which may allow for population persistence and resiliency against major environmental perturbations.

The ISRP commends the project for its application of telemetry, PIT-tag detection arrays, and a life-cycle model to monitor and assess steelhead escapement and outmigration survival in all four populations. The direct connection with gathering VSP data to supply information needs for assessing Yakima steelhead MPGs makes this proposal highly relevant to the recovery of Middle Columbia River Steelhead. Furthermore, the degree of past documentation of approach and outcomes is exemplary and serves as an important guide for other work in the Columbia River Basin.

The project examined PIT tags versus radio tags for estimating steelhead abundance values in four tributaries. With greater sampling and tagging rate for PIT tagging vs. radio tagging, the expanded population estimates for PIT tags provided a higher level of precision compared to the radio-tagged expanded estimates. With the instream PIT-tag arrays performing at a high

level, the project adopted the use of these and added additional PIT-tag arrays for the purpose of long-term steelhead abundance monitoring at the population scale. Does this mean that radio tags are no longer deployed so that funding can be used for other issues?

It would be useful to see greater coordination effort between the proponents of this proposal and the proponents from Washington Resource Conservation and Development and their proposal (200739800) for tributary access and habitat improvement. There is likely much mutual benefit to plan and work together to understand direct effects of the fish passage and habitat projects. For example, the installation of PIT-tag detectors and PIT tagging aligned with the boundaries and influence of these projects will go a long way to understand the benefits of the work.

199506325 - Yakima River Monitoring and Evaluation

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The ISRP's two recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other Condition in future annual reports and work plans:

1. **Spawner-recruit relationships.** Please present spawner-recruit relationships as a means to evaluate capacity of the habitat to support salmon and steelhead and to help track progress over time. If current data are insufficient to generate these relationships, then please describe efforts to improve data collection.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Yakima Basin Habitat Project (199705100) to summarize the linkages between implementation and

monitoring projects in the Yakima River basin. During the response loop, as a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

The overall Yakima Klickitat Fisheries Project is a very large and comprehensive salmon supplementation and habitat restoration project. This M&E effort reportedly focuses on salmon population dynamics including hatchery supplementation, harvest, and predation effects on salmon but does not specifically describe efforts to monitor fish responses to habitat restoration.

The ISRP is concerned that salmon and steelhead responses to habitat restoration actions in the Yakima Basin are not adequately addressed by the restoration projects and/or this M&E project. Most habitat restoration projects in the Yakima Basin identified this M&E effort as the project that is monitoring salmon and steelhead responses to habitat restoration actions. However, this M&E proposal is clearly focused on supplementation effects, and only occasionally mentions the response of natural-origin salmon to habitat restoration actions. This M&E project should be able to track the basin-wide response of natural-origin salmon and steelhead to habitat restoration actions over the long term while incorporating density dependence and environmental variability into the analyses.

The ISRP encourages the proponents to continue to address comments by the ISRP review of the Yakima Basin Master Plan ([2020-3](#), [2020-9](#)). These comments largely involve supplementation efforts of coho and summer/fall Chinook salmon that have greatly exceeded the EDT and Beverton-Holt capacity estimates. While it is understandable why the proponents target high spawning escapements, it is also important to consider the lower productivity (survival) associated with spawning densities of hatchery salmon that greatly exceed current capacity of the habitat to support the salmon. Higher and higher spawner densities have not produced more progeny. Furthermore, high densities of hatchery origin spawners promote interbreeding with the relatively few natural salmon and will inhibit local adaptation even though the hatchery attempts to use 100% natural broodstock. Recent reviews by Anderson et al. (2020) and the HSRG (2020) indicate that minimizing pHOS is more beneficial to promoting local adaptation than maximizing pNOB. We encourage the proponents to use the collected data to further develop and evaluate spawner recruit relationships for naturally produced spring and summer/fall Chinook salmon, coho salmon, and steelhead. For example, what is the relationship between smolts per spawner (or adults per spawner) and parent spawners, and at what parent spawner densities is smolt production and/or adult maximized? Monitoring of

natural-origin salmon spawner-recruit relationships is critical to the evaluation of salmon responses to habitat restoration activities and to inform adaptive management contingencies.

Q1: Clearly defined objectives and outcomes

The goal of the large and comprehensive Yakima Klickitat Fisheries Project (YKFP) is to restore sustainable and harvestable populations of salmon, steelhead and other at-risk species that were historically present in the Yakima subbasin. Abundance objectives by species for the Yakima Basin were developed in collaboration with the Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee and presented on pages 212-249 of the task force's Phase 2 Report, which was released in October 2020. Specific strategies to achieve these objectives include enhance existing stocks; re-introduce extirpated stocks; protect and restore habitat in the Yakima Subbasin; operate using a scientifically rigorous process that will foster application of the knowledge gained about hatchery supplementation and habitat restoration throughout the Columbia River Basin; and use modeling tools to facilitate planning and adaptive management for project activities. The proposal includes a number of M&E questions related to salmon propagation and supplementation, predation on salmonids, harvest and spawning escapement, and monitoring and evaluation methods.

The proposal would have benefited if species-specific objectives for the Yakima Basin were listed in the proposal itself rather than referenced in the Phase 2 Report.

The proposal does not describe monitoring of the salmon and steelhead response to habitat restoration actions even though most habitat projects stated this M&E effort was providing the necessary information.

Q2: Methods

This very large program involves a wide variety of methodologies, which are very briefly noted in the proposal with links to documents that provide more detail. This approach complicates the ISRP review process, but the ISRP recently reviewed the Master Plan that provides more detail. The proposal states that the Yakama Nation is working to update evaluation methods presented in the 1997 and 2006 Yakima Basin supplementation monitoring and evaluation plans. Most methods appear to be based on sound scientific principles. However, on page 18 of the 2020 annual report, it was unclear why the spawner-recruit analysis assumed no production from hatchery origin spawner and the analysis apparently removed hatchery spawners from the analysis.

Q3: Provisions for M&E

This is an M&E proposal for the very large and comprehensive Yakima Klickitat Fisheries Project. In August 2020, the proponents provided a 378-page M&E annual report including appendices. The report provides numerous data tables along with text that can be used for documenting progress over time. The proponents reportedly review their methods and progress and make changes as needed. The project has also produced over 60 peer-reviewed articles. The effort to go through the peer review process helps ensure that results are properly evaluated and that the project adjusts to acceptable scientific standards.

Many projects involving restoration efforts depend on this umbrella project to provide data and information about the success of their efforts. It is not clear how responsive this project is to the needs of some of the sub-projects (e.g., 200739800; 199206200), which refer to this project for providing the biological monitoring efforts needed for feedback to assess the success of their stream restoration efforts.

Q4: Results – benefits to fish and wildlife

The annual report provides many details regarding the benefits to fish and wildlife, including findings for multiple life stages of salmon. Supplementation has led to greater abundances of salmon returning to the watershed; however, abundances remain very small compared with historical levels. The YN recognize the long-term commitment to rebuild populations through supplementation and habitat restoration.

References

- Anderson, J. H., K. I. Warheit, B. E. Craig, T. R. Seamons, and A. H. Haukenes. 2020. A review of hatchery reform science in Washington State. Washington Department of Fish and Wildlife; Final report to the Washington Fish and Wildlife Commission, January 23, 2020. Available at: https://wdfw.wa.gov/sites/default/files/publications/02121/wdfw02121_0.pdf.
- HSRG (Hatchery Scientific Review Group). 2020. Developing recovery objectives and phase triggers for salmonid populations. December 2020.

199701325 - Yakima River Operations and Maintenance

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Meets Scientific Review Criteria

Overall comment:

The hatchery Operations and Maintenance effort is an important component of the overall Yakima Klickitat Fisheries Project that is designed to increase salmon production and harvests in the region. Details about the O&M effort were not provided in the proposal. Instead, the proposal referenced other documents, such as the Revised Master Plan and the 2020 annual M&E report that contain considerable information regarding hatchery operations and production. The ISRP encourages the proponents to continue to address issues raised by the ISRP ([2020-3](#), [2020-9](#)). Given these comprehensive reports and recent ISRP reviews, the Operations and Maintenance project is judged to meet scientific review criteria.

Q1: Clearly defined objectives and outcomes

The goal of the Yakima Klickitat Fisheries Project (YKFP) is to restore sustainable and harvestable populations of salmon, steelhead and other at-risk species that were historically present in the Yakima subbasin. Specific stock abundance objectives by species for the Yakima Basin were developed in collaboration with the Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee and presented on pages 212-249 of the task force's Phase 2 Report. Specific release goals for Yakima Basin production facilities and programs were stated in the proposal. Nevertheless, the proposal should have provided objectives that describe the functions and expected outcomes from the activities of this specific project, which involve brood stock collection, adult holding, spawning, incubation, rearing, acclimation, and release of fish.

Q2: Methods

Methods and metrics for summarizing annual performance statistics were briefly noted in the proposal, and more comprehensive reports were cited, including the recently reviewed revised Master Plan by ISRP (2020-3).

Q3: Provisions for M&E

The proposal briefly described the adaptive management and annual project review process for the overall YKFP. Reports containing more details were cited. The purpose of these annual reviews is to (re)assess project objectives, to show progress towards those objectives, and to evaluate whether any strategies or assumptions need to be altered in the face of new information gained over the past year. Specific details and examples of this process were not provided.

Q4: Results – benefits to fish and wildlife

The proposal did not specifically describe hatchery production trends, but it did reference the annual M&E report and the Revised Master Plan, both of which have been recently reviewed by the ISRP.

198812025 - Yakima River Management, Research, and Data

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Not Applicable

Overall comment:

This management and data project supports staffing to conduct appropriate and necessary planning and administration of the habitat restoration, supplementation, reintroduction of extirpated species, and harvest augmentation actions in the Yakima subbasin that are needed to fulfill regional conservation goals and to meet regional mitigation and treaty trust obligations. The effort appears to be an important component of the YKFP, but specific details about the planning and data support activities of this project were not provided in the proposal. This planning project is not amenable to scientific review.

As noted in reviews of other Yakima subbasin projects, an important data gap may be present in the Yakima subbasin. Members of this project should be aware of this possible data gap. Most habitat restoration projects refer to the M&E project (199506325) for evaluating fish responses to their restoration actions, but the M&E project is focused on supplementation

effects and does not include fish responses to restoration as a specific objective. The ISRP strongly encourages the Yakama Nation projects to consider this issue and adjust their collective efforts to evaluate fish responses to restoration actions.

Q1: Clearly defined objectives and outcomes

The goal of the Yakima Klickitat Fisheries Project (YKFP) is to restore sustainable and harvestable populations of salmon, steelhead, and other at-risk species that were historically present in the Yakima subbasin; quantitative objectives have been established. The Yakima River Management, Research, and Data project is an important component of the YKFP. This proposal reportedly provides for 1) comprehensive management oversight of all YKFP activities; 2) policy development; 2) preparation of project planning documents (e.g., Master Plans); 3) administrative support for YKFP operations; 4) coordination, development, and maintenance of databases and applications to store and share YKFP data as appropriate; 5) coordination and conduct of internal and external scientific project reviews; 6) preparation of technical reports and manuscripts to communicate results broadly throughout the region; and 7) participation in watershed planning, protection, and restoration initiatives. SMART objectives or specific tasks were not provided. A good start would be to create a SMART objective for each of the seven components stated above.

Q2: Methods

This is a management and data support component for the YKFP. Some methodology is provided in the latest annual report (Fiander et al. 2020). Planning for the YKFP began in the 1980s and culminated with the issuance of a final EIS for the project in 1996 (BPA 1996). The final EIS described the planning process, project management, design, implementation, and administration practices to be employed in the project. The process as described in 1996 continues to this day, according to the proponents.

Q3: Provisions for M&E

Other projects (e.g., Yakima River Monitoring and Evaluation Project 199506325) provide for monitoring and evaluation. The adaptive management and iterative project review process for the YKFP was described in Section 2.2 of the final EIS for the project (BPA 1996). It involves identifying objectives, strategies, operating assumptions, uncertainties, and risks that are then reviewed annually by project scientists. The purpose of these annual reviews is to (re)assess project objectives, to show progress towards those objectives, and to evaluate whether any strategies or assumptions need to be altered in the face of new information gained over the

past year. The proposal did not provide specific examples of the adaptive management process, or how this effort supported specific examples of adaptive management.

Q4: Results – benefits to fish and wildlife

Major achievements to date include partnering to fund and implement the Yakima subbasin Integrated Plan; land acquisition and implementation of a large number of projects designed to address factors limiting productivity and to restore key habitat functionality; realization of the “all stocks initiative” as extirpated coho salmon, summer-run Chinook salmon, and sockeye salmon are all now being reintroduced to the Yakima subbasin; construction and implementation of the Melvin R. Sampson (coho salmon) integrated production facility, and the Levi George (spring Chinook salmon) production facility that has provided major contributions to the published literature on supplementation; completion and NPCC adoption of a Master Plan for summer and fall-run Chinook salmon, coho salmon, and reconditioned steelhead; development and delivery of a high-quality annual Yakima Subbasin Science and Aquatic Management Conference; and continued progress to develop and enhance automated data capture, storage, retrieval, and sharing systems.

199506425 - Policy, Plan, and Technical Support of Washington Department of Fish and Wildlife (WDFW) – Yakima/Klickitat Fisheries Project (YKFP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish and Wildlife

Province/Subbasin: Columbia Plateau/Yakima

Recommendation: Not Applicable

Overall comment:

This project enables WDFW to provide policy and technical support to the overall YKFP and other fish and wildlife efforts in the Yakima subbasin. As such, the proposal is not amenable to scientific review. Ideally, the proposal could have identified specific objectives that are descriptors for what is being addressed. The project appears to provide an important co-manager role.

The ISRP encourages WDFW to consider comments provided by ISRP ([2020-3](#), [2020-9](#)) as WDFW and YN plan steps forward. Key ISRP comments involve recent evidence showing that coho salmon supplementation is greatly exceeding the capacity of the subbasin to support progeny from the coho salmon spawners. pHOS is very high and likely inhibits local adaptation of the natural spawning population even though the hatchery broodstock attempts to use 100% natural origin coho salmon. Recent reports by WDFW and HSRG scientists indicate that local adaptation increases more from minimizing pHOS than by maximizing pNOB. Natural production of spring Chinook salmon is less certain because the program only recently began to mark 100% of hatchery summer/fall Chinook salmon as a means to evaluate production of natural versus hatchery salmon. Trends in natural salmon productivity over time, while controlling for climatic effects, is an important tool for evaluating the response of salmon to ongoing habitat restoration efforts.

As noted in ISRP reviews of other Yakima subbasin projects, an important data gap may be present in the Yakima subbasin. Members of this project should be aware of this possible data gap. Most habitat restoration projects refer to the M&E project (199506325) for evaluating fish responses to their restoration actions, but the M&E project is focused on supplementation effects and does not include fish responses to restoration as a specific objective. This issue needs to be addressed.

The proposal mentions "institutional efficiency" as one of three limiting factors, as it did in previous proposals. However, there was little discussion in the proposal about progress to increase institutional efficiency. This same conclusion was reached by ISRP ([2012-6 RF/Coord](#)).

Q1: Clearly defined objectives and outcomes

This proposal provides for all WDFW management and coordination functions associated with the Yakima Klickitat Fisheries Project (YKFP) and other non-YKFP programs within the Yakima Subbasin, including technical review, environmental compliance documentation, and report and publication writing. Most of the technical aspects of the YKFP are addressed in Yakima River Monitoring and Evaluation 199506325. The quantitative salmon and steelhead production objectives for the overall YKFP were presented in Pearsons et al. (2006) and the Phase 2 Report, but not in the proposal. WDFW proposes to continue involvement with policy and technical oversight of the YKFP. The co-managers of the resource (WDFW and Yakama Nation) will reportedly meet regularly and make collaborative decisions using adaptive management and risk management. As such, this proposal did not have specific objectives describing these activities but instead provided the overall production objectives of the YKFP.

Q2: Methods

Implementation of the YKFP objectives occur through hatchery O&M projects funded by Project 199701325 that are striving to meet implementation objectives set by this project in concordance with Project 198812025. The proponents state "when appropriate, decision analysis tools will be used or developed to facilitate transparent, systematic, and optimal decisions. Tools that may be used or developed include Bayesian belief networks, loop analyses, spreadsheet models (e.g., EDT, AHA), statistical power analyses, and individual-based models." Specific application of these tools is not described in the proposal, although the proposal references some reports and publications.

Q3: Provisions for M&E

Monitoring and evaluation of these objectives are accomplished by Project 199506325 while following guidance from the WDFW project and Project 198812025. WDFW appears to be coordinating activities with WDFW, although details were not described in the proposal.

According to the proposal, the adaptive management and iterative project review process for the YKFP was described in Section 2.2 of the final EIS for the project (BPA 1996). It involves identifying objectives, strategies, operating assumptions, uncertainties, and risks which are then reviewed annually by project scientists. The purpose of these annual reviews is to (re)assess project objectives, to show progress towards those objectives, and to evaluate whether any strategies or assumptions need to be altered in the face of new information gained over the past year. If alteration is appropriate, the YKFP science teams bring proposals to the YKFP Policy Group for consideration and action. Adaptive management actions stemming from the annual review process were not described in the proposal.

Q4: Results – benefits to fish and wildlife

Specific benefits to fish and wildlife were not described in the proposal, although it is implied that policy and technical oversight contributed to progress described in other projects such as the Monitoring and Evaluation project that produced a detailed, comprehensive report on salmon population dynamics.

Upper Columbia Rivers: Wenatchee, Entiat, Methow, and Okanogan

201000100 - Upper Columbia Programmatic Habitat

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Upper Columbia Salmon Recovery Board

Province/Subbasin: Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Okanogan, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP requests the proponents provide information on the following condition in the next annual report and future workplans. Because the proposal is important as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions.

- **SMART objectives.** The proponents should address the ISRP's questions and recommendations regarding SMART objectives in a revised proposal and present those objectives in the next annual report. The proponents should explain how they will assess their project's performance based on regional targets from the 2021 Columbia River System Biological Opinion (CRS BiOp). Briefly describe how the proponents develop the objective for number of projects to be facilitated and implemented by the Upper Columbia Programmatic Habitat project (UCPH) each year.

The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. The Council and Council staff have stated their support for developing summaries and matrices of the types and locations of monitoring efforts across projects in major geographic areas. The ISRP anticipates that the NPCC Fish and Wildlife Program will identify the specific elements and formats for these RM&E summaries and matrices in the future. Though it is not a condition, the ISRP encourages the Upper Columbia Programmatic Habitat project to use its regional expertise and resources to help create an effective summary of RM&E efforts in the Upper Columbia River.

In our preliminary review, we requested responses on two topics, and our assessments of the proponents' responses are provided below:

1. **SMART Objectives.** The revised proposal submitted by the UCPH modified the original Table 2 that identifies targets for flow protected, flow enhanced, entrainment (numbers

of screens), improved habitat access, increased stream complexity, and restored riparian and floodplain habitat for 2021-2036 based on the targets established in the 2021 CRS BiOp. Table 3 repeats those BiOp targets and divides them by 3 to account for the 5-yr duration of the proposal. As such, they are not implementation metrics for the UCPH, but rather are metrics for all associated management and recovery entities in the region.

The proponents do not explain how they will use these targets to assess their progress in achieving their first objective, which is related to the CRS BiOp metrics. The objective simply calls for the project to identify and select robust proposals to produce metrics and help achieve targets. The proposal does not describe the analytical approach it will use to evaluate this objective. Is it based on the proportion of the BiOp target that the funded projects achieve for the period from 2021-2026? The targets are for all entities in the Upper Columbia region and not just the UCPH. As such, the funded projects likely will not achieve the full BiOp target, and the proponents will have no specific metric to evaluate the performance of the UCPH itself.

The ISRP recognizes the important regional coordination function of the UCPH, and the Upper Columbia River Salmon Recovery Board (UCSRB) notes on its [website](#) that their adaptive approach to implementation provides information on “how effective the actions are, ... how the fish are responding, ... and how close we are getting to our goals”. The ISAB ([ISAB 2018-1](#)) praised the UCSRB for their quantitative evaluation of the trajectories of their restoration actions in their integrated recovery program reports and for the development of the Biological Strategy with the Regional Technical Team (updated in 2021). For example, SMART objectives for specific restoration actions for the next funding period could be based on updated trajectories and effectiveness of habitat actions identified in the Integrated Recovery Program Habitat Report (UCSRB 2014) for the period from 1996 to 2012.

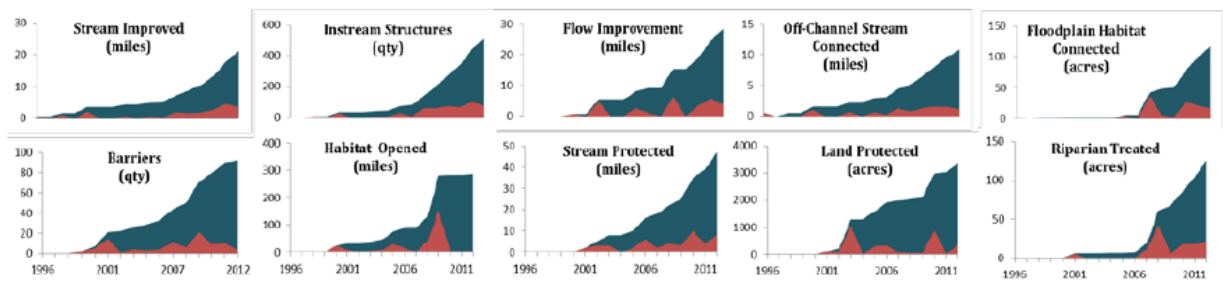


Figure 3.3 in ISAB 2018-1. Assessment of the quantity (miles, acres, numbers) of recovery actions in the UCR between 1996-2012 by year (red) and cumulatively (blue) (UCSRB 2014b).

An example of a SMART objective based on this information would be:

“Increase off-channel stream length by 6 miles from 2022 to 2026, which would restore XX% of the potential off-channel streams that have been identified for the subbasin and increase the miles of off-channel stream reconnected by the UCSRB in the Upper Columbia River by XX%.”

The database of past restoration actions and current landscape conditions would provide the quantitative information necessary to develop such objectives for the UCSRB restoration efforts for the next funding period.

The second and third objectives are quantifiable and can be used to evaluate the project’s progress. The second objective is clearly related to the Biological Strategy. The proposal does not explain how it determined the metric for the third objective—*facilitate implementation of two projects annually*. Is this based on past performance? What is the relevance of the number of projects as opposed to the intended ecological outcomes?

The fourth objective—*manage all UC Programmatic contracts within a budget of \$2,000,000 per federal fiscal year*—is unnecessary because BPA contractually requires all projects to operate within budget and the objective does not address the ecological recovery focus of the four goals. In relation to this objective, the ISRP found the budget narrative and the budget table to be confusing. The budget table reported only the portion of the annual budget that is used for project administration (roughly \$120,000/yr), but the proposal is for the entire \$2,000,000 project funded by BPA. The discussion of the budget should be revised to address the allocation and management of the entire amount of funding for the project.

- 2. M&E Matrix – lead.** The UCSRB declined to provide a matrix summary of M&E projects in the Upper Columbia River subbasin. They indicated that preparation of the M&E summary is outside the UCSRB’s scope of work for the UCPH. They said they would assist others, such as NOAA Fisheries or WDFW, but would not lead the development of the matrix. The ISRP reviewed the M&E components of the different projects in the Upper Columbia River subbasin based solely on the information provided in their original proposals, associated documents, and any information provided as part of the Response Loop. Two of the four goals in the proponents’ revised proposal are designed to “1) *coordinate with the RTT to maintain alignment among the UC Programmatic and the science underpinning the regional Recovery Plan and Biological Strategy* and 2) *target Programmatic habitat improvement actions in priority locations that are anticipated to provide the greatest biological benefits to focal species, based on regional Prioritization.*” Information contained in the collective data of the RTT, existing

prioritization of restoration actions, and the Regional Strategy would provide a more comprehensive foundation for a summary of M&E and habitat improvement actions than is available in many other subbasins.

As the Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and resources to help create an effective summary of RM&E efforts in the Upper Columbia River. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. In addition to providing important information for the NPCC Fish and Wildlife Program, development of an overall summary of the M&E efforts and coordination in the Upper Columbia River subbasin would strengthen the restoration efforts of the UCSRB.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

Management of spring Chinook salmon in the upper Columbia River was reviewed by the ISAB and found to be scientifically rigorous and an example for other projects throughout the Columbia River Basin ([ISAB 2018-1](#)). The Upper Columbia Programmatic Habitat Project has been reviewed extensively over the last 11 years (2010-12, 2010-28, 2013-11, 2014-5, ISRP 2014-10, ISAB/ISRP CU 2016-1, ISRP 2017-2, ISAB 2018-1). The ISRP and ISAB have found that the project has developed one of the more rigorous recovery strategies and prioritization processes for habitat protection and restoration in the region. In conjunction with the Tribes of the upper Columbia River basin, the project coordinates implementation of the Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan (UCSRB 2007).

The project uses the Upper Columbia Recovery Plan as a framework for identifying limiting factors, prioritizing restoration actions, and working with collaborators to implement restoration actions. The project also uses the updated Biological Strategy developed by the UCR Regional Technical Team (RTT) and collaborates with the RTT to incorporate up-to-date information. The project monitors only the initial implementation of projects but does not conduct post-implementation compliance or effectiveness monitoring. The project states that BPA does not provide funds for monitoring through this project.

While the project is exemplary in many respects, it does not provide SMART objectives for their major intended ecological outcomes or specific projects. Instead, the proposal identifies three general programmatic management objectives to use priority assessments, address priority

limiting factors, and generate BiOp habitat mitigation credits for BPA in each project. The previous ISRP review ([ISRP 2017-2](#)) listed a qualification for the project to “develop measurable objectives in advance of the next annual review to evaluate progress towards addressing limiting factors for fish and wildlife from restoration actions. These objectives should support the umbrella projects’ implementation strategy used to identify and select projects.” The programmatic statements in the proposal for this review do not adequately address this qualification of the 2017 review.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **SMART objectives.** The ISRP requests the project to provide measurable objectives to evaluate progress towards addressing limiting factors for fish and wildlife from restoration actions. These objectives would support the umbrella projects’ implementation strategy used to identify and select projects. The proposal indicates that “the UCSRB and BPA are collaborating to refine and develop additional umbrella goals and SMART(er) objectives to improve evaluation and implementation reporting” and acknowledges SMART objectives will focus resources to support recovery needs. The example the proponents provided in the proposal could serve as a template for the SMART objectives (see proposal instructions).
2. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this programmatic project, the ISRP is requesting the Upper Columbia Programmatic Habitat Project to summarize the linkages between implementation and monitoring projects in the Upper Columbia subbasins. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also

should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation projects to assist your project in producing this summary and encourage you to work closely with the implementation and monitoring projects of the Confederated Tribes of the Colville Reservation (Okanogan Subbasin Habitat Implementation Program and Okanogan Basin Monitoring & Evaluation Program) and Yakama Confederated Tribes (Upper Columbia Habitat Restoration Project).

Q1: Clearly defined objectives and outcomes

The previous ISRP review (ISRP 2017-2) listed a qualification for the project to “develop measurable objectives in advance of the next annual review.” The project did not develop specific SMART objectives for projects. Instead, they provide general programmatic management objectives to use priority assessments, address priority limiting factors, and generate BiOp habitat mitigation credit for BPA in each project. The proposal indicates that “the UCSRB and BPA are collaborating to refine and develop additional umbrella goals and SMART(er) objectives to improve evaluation and implementation reporting” and gave an example. The project should submit specific physical and biological outcomes for the ongoing and anticipated projects and to develop SMART objectives for as many as possible given the available information and specific project details.

The proposal identifies nine ongoing projects but specifically identified outcomes for physical habitat for none of them (Table 1). SMART objectives are not included for these projects. The Timeline section lists the nine ongoing projects and then includes only eight in Table 3. The specific projects to be implemented by FY 20225 are not described in detail. The proposal states that the UC Recovery Plan provides thorough documentation of the goals and objectives as well as specific metrics for habitat, species linked to quantified limiting factors (www.ucsr.org/science-resources/reports-plans/recovery-plan/), but the document was produced in 2007. The Recovery Plan website included a document with the 2017 updated implementation schedule, but it did not include any actions beyond 2020.

Several important factors and major uncertainties could affect the success of restoration projects implemented under the Upper Columbia Programmatic Habitat Project. These include climate change, ocean conditions, and predation in addition to known limiting factors.

Q2: Methods (based on sound science principles)

The project uses the Upper Columbia Recovery Plan as a framework for identifying limiting factors, prioritizing restoration actions, and working with collaborators to implement restoration actions. The project also uses the updated 2019 Biological Strategy developed by the RTT and collaborates with the RTT to incorporate up to date information. The process developed by this project and the UCSRB is one of the most rigorous restoration prioritization processes in the region. Curiously, the proposal does not highlight the positive review by the ISAB (ISAB 2018-1).

Management of spring Chinook salmon in the upper Columbia was reviewed by the ISAB and found to be scientifically rigorous and an example for other projects throughout the Columbia River Basin (ISAB 2018-1). The project selection process of the project has been refined by the RTT in 2020 and incorporates improvements suggested in the ISAB review of spring Chinook salmon in the upper Columbia River (ISAB 2018-1). Priorities are integrated with regional recovery plans, thoroughly documented, and publicly available through the Prioritization Web Map (<https://prioritization.ucsrb.org/>).

Q3: Provisions for M&E

The project monitors only the initial implementation of projects but does not conduct post-implementation compliance or effectiveness monitoring. The UCSRB and RTT have developed a rigorous monitoring plan, but the proposal states that BPA does not provide funds for monitoring. The proposal indicates that the PUDs either conduct or fund most of the monitoring in the four basins. These results are evaluated regularly in a series of scheduled technical team and RTT meetings. The project identifies a number of monitoring actions in the four basins but does not describe any specific monitoring that will be conducted. The proposal does not describe how it will coordinate with other monitoring projects, such as the Okanogan Basin Monitoring & Evaluation Program and the Yakama Nation's Upper Columbia Habitat Restoration Project. In addition, a new pilot BPA project (201700300) is attempting to create an Upper Columbia Habitat Action Effectiveness Monitoring Plan. The project intends to develop goals and objectives for habitat action effectiveness monitoring (AEM), select habitat action sites and available control sites, and select metrics to measure fish responses and test hypotheses. The Upper Columbia Programmatic Habitat Project should coordinate with this project as it develops.

The Upper Columbia Programmatic Habitat Project has an adaptive management process that is based on a formal Recovery Plan, a Biological Strategy developed by the RTT, regional database, annual State of the Science meetings, and consultation with BPA.

Q4: Results – benefits to fish and wildlife

Actions to address limiting factors are tracked and reported by the project, and the project has developed thorough syntheses of the landscape-level outcomes of their previous actions. The project has completed quantitative summaries of their actions for habitat ([2014](#)), hatcheries ([2017](#)), hydropower ([2019](#)), and harvest ([2020](#)).

The proposal thoroughly documents the total amount of habitat that the project implementation and its collaboration with other funding partners has restored. They have invested \$20 million to restore high priority areas for spring Chinook and steelhead. Eleven of 28 restoration projects have been completed. The project has restored 6 miles of instream habitat, created 2 miles of side channel habitat, restored 105 acres of floodplain and riparian habitat, protected 38 cfs of flow, removed 4 fish barriers and opened 27 miles of habitat to salmon, steelhead, and bull trout, and screened or removed 17 irrigation diversions. As is frequently the case with programmatic habitat projects, the outcomes are quantified in terms of habitat and less information is presented on responses of fish populations. However, the studies and publications of Polivka et al. (2015, 2020) and others, as well as life-cycle and restoration modeling reviewed in the ISAB 2018-1 report, documented several major examples of positive fish responses to restoration. The project's focus on limiting factors in the highest priority areas and use of the recovery plan and biological strategy as a framework make it a highly likely that these actions are beneficial to fish and wildlife.

200900300 - Upper Columbia Habitat Restoration

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes and Bands of the Yakama Nation

Province/Subbasin: Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP requests the proponents to provide information on the following condition in the next annual report and future workplans. Because the objectives in the proposal provide long-term

guidance and documentation for the project, we encourage the proponents to revise their proposal to include these revised or additional objectives.

- **SMART objectives.** The proponents should address the ISRP's questions and recommendations about their objectives in the next annual report. They should provide quantitatively explicit objectives for their collective restoration efforts and intended ecological outcomes. They should indicate the levels of response or outcomes that they would consider meets these objectives.

In our preliminary review, we requested responses on three topics, and our assessments of the proponents' responses are provided below:

1. **SMART objectives.** In their response, the proponents did not provide explicit objectives for their collective restoration efforts and intended ecological outcomes. The original proposal stated that the overall objective for the project is *"to more than double the linear amount of completed mainstem complexity and side channel restoration treatments in high priority restoration stream segments within the Methow, Entiat, and Wenatchee Subbasins over the next decade."* This indicates the intended length of all restoration actions, but it does not identify the outcomes for habitat or fish and wildlife populations.

While the information does not fulfill the need for SMART objectives, the original proposal provides useful information in the list of priority life stages and limiting factors intended to be addressed for 42 new projects. In their response, the proponents indicate that they use information embedded in the Restoration Prioritization Framework to link the actions of their restoration actions to limiting factors for target fish species. They give an example of one project in the Twisp River that started in 2016 and ended in 2017. The example identifies known limiting factors and a combination of qualitative and quantitative information from the 2015 Reach Assessment that was used to identify the need for restoration and prioritize project selection. It then quantifies the intended physical outcomes for channel structure and riparian cover for this past project.

The response suggests that providing the requested level of detail for roughly 80 restoration sites in this proposal would be beyond the scope of the ISRP review. Of those 80 projects, 27 are planned projects in the Methow subbasin, 5 in the Entiat, and 10 in the Wenatchee for 2021-2026. The other 38 sites were completed in the previous funding cycle.

The example of the past project is useful for helping the ISRP understand the types of SMART objectives that are developed for each project. The ISRP assumes these implementation objectives and metrics for future evaluation are developed after the site has been identified in the Restoration Prioritization Framework process. The original proposal generally describes a process that develops design criteria that conform to streamlined habitat restoration permitting programs, such as BPA's HIP IV conservation measures. While these Best Management Practices may not require intensive effectiveness monitoring, quantitative objectives are still needed for the overall project and specific sub-projects. The ISRP agrees that these design criteria and application of recognized restoration actions are important components of the project, but they do not provide the project-level identification of their intended outcomes for habitat or fish and wildlife populations.

The ISRP recognizes that it may not be clear what type of SMART objective we would consider appropriate for this project. For the 42 new projects in the original proposal, 21 projects identified "side channel and large wood restoration" as the restoration action and 2 identified "large wood restoration" as the type of action. If restoration of amounts of large wood is one of the primary goals of the overall project, the SMART objective should identify the quantitative outcome and timeframe for attaining that outcome that the proponents intend to achieve. An example of a SMART objective for the overall outcomes of this project for large wood would be:

"Restore amounts of large wood to target levels in XX miles of the XX miles of stream by XX [date] in the three subbasins that have been identified as deficient in large wood. Target levels will be based on wood loading amounts identified for unimpaired streams in the subbasins, adjusted for stream size and location."

The ISRP notes that the proponents could provide information on 1) the miles of stream for which wood will be added within the next funding period and/or 2) the miles of stream that meet intended target levels and the timeframe the proponents feel will be necessary to meet the targets.

Because side channel reconnection or creation is another major goal of the overall project, an example for side channel restoration could be:

"Increase length of side channel by XX miles from 2022 to 2026, which would restore XX% of the potential side channel habitat that has been identified as needed in the subbasins based on landscape analysis, and increase the total miles of side channel reconnected by this project since 2009 by XX%."

The ISRP encourages the proponents to contact us if they have additional questions or issues they would like to discuss.

2. **Assessing results.** The ISRP is trying to determine if and how the proponents plan to evaluate their overall restoration outcomes and benefits to fish and wildlife. The proponents' response notes that the Proposal Form Template for this ISRP review does not include a request for this information, but it indicates that they plan to track physical restoration metrics of implemented projects and recalibrate their indicators of ecological condition.

The Proposal Form Template asks the proponents to *“briefly describe the original goals and objectives, and the progress achieved to date. Sufficient detail is needed so that reviewers can understand what was done, what outcomes occurred, and what lessons were learned from the previous work.”* In addition, it asked the proponents to include *“Results – what were the results of the actions implemented for each objective?”* and *“Lessons learned – what was learned from the results, to what degree were the objectives achieved, and how were objectives and actions modified as a result? Describe the broader impacts of the project, including how the project has influenced management, benefited society, informed other projects in the Columbia River Basin, or improved effectiveness and efficiency. Also describe how the results from your project could contribute to broader efforts including status and trend monitoring, life-cycle models, regional actions, and mitigation outcomes.”*

The ISRP considers such assessment to be consistent with the elements requested in the proposal guidance, and we request all long-term projects to evaluate their overall outcomes and benefits. This project is only 12 years old, and we recognize that it may still be early for a thorough evaluation of their program, but we recommend that the proponents begin to develop a plan for such an assessment. After this funding period, they likely will have implemented 80 projects, which should provide a substantial body of information for documenting the benefits of their program to fish and wildlife and highlighting major lessons learned for other projects.

The original proposal describes the Post-Implementation Monitoring Program that evaluates the implementation and assessment of conditions in years 1, 2, 3, and 5 following the construction year. Do the proponents have plans to evaluate the collective outcomes and success of the 38 projects it has implemented to date and 42 projects it plans to implement in the next funding period?

3. **M&E matrix – support.** The proponents indicate that this request is beyond the scope and scale of their project resources. Their cover memo states that they are working with BPA and others to develop a monitoring and evaluation framework to address this area of ISRP and regional concern. They consider project effectiveness monitoring to be important, but it requires more investment than is available in their budget.

As the NPCC Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and resources to help create an effective summary of RM&E efforts in the Wenatchee, Entiat, and Methow subbasins. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. In addition to providing important information for the Fish and Wildlife Program, development of an overall summary of the M&E efforts in the Upper Columbia River also would inform and strengthen the restoration efforts of this project as well.

Additional points for the Council to consider:

The ISRP notes for the Council and BPA that the response from the Yakama Nation emphasizes that it does not support the Confederated Tribes of the Colville Reservation’s proposal to expand the geographic area of OSHIP (200722400) into the Entiat and Wenatchee subbasins. They argue that those two subbasins lie entirely within the Ceded Territory of the Yakama Nation according to the Walla Walla Treaty of 1855. The Council and BPA will need to consider the Yakama Nation’s concerns in determining the proposed area for Project 200722400.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

The Yakama Nation Fisheries Upper Columbia Habitat Restoration Project (YNF UCHRP) conducts restoration projects to restore degraded habitats in the Wenatchee, Entiat, and Methow subbasins. The project has substantial funding through the Accord (~ \$8 million/yr) to restore habitat for fish and wildlife. This long-standing project has undoubtedly improved fish habitat in the upper Columbia. The ISRP appreciates the development of the Yakama Action Effectiveness Monitoring (AEM) Project (201700300), which should provide biological effectiveness monitoring for future actions and lead to a clear evaluation of benefits to fish. The ISRP also appreciates the effort that the proponents took to provide a clear, concise proposal.

The ISRP has questions about potential overlap with the Okanogan Subbasin Habitat Implementation Program (OSHIP; 200722400) conducted by the Confederated Tribes of the Colville Reservation (CTCR) to restore habitat in the Okanogan and Methow subbasins. The OSHIP proponents are proposing to expand into the Entiat and Wenatchee subbasins to become the Upper Columbia Habitat Implementation Program (UCHIP). The proponents of the current project mention OSHIP, but not the OSHIP expansion. The OSHIP proponents do not mention the Upper Columbia Habitat Restoration project. Clarification is needed about efforts of both projects to coordinate their implementation and monitoring.

The ISRP requests the proponents to address the following in a point-by-point response or a revised proposal with highlighted changes:

1. **SMART objectives.** Provide measurable SMART objectives (see proposal instructions) for each project to evaluate progress towards addressing limiting factors for fish and wildlife from restoration actions.
2. **Assessing results.** Describe the project's long-term plan to assess and document the overall contribution of the project to the conservation and restoration of fish and wildlife in the subbasins and the likely benefits to fish and wildlife.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The YNF UCHRP conducts restoration projects to restore degraded habitats in the Wenatchee, Entiat, and Methow subbasins. The project cooperates with a number of other restoration planning, prioritization, and implementation projects. The YNF UCHRP uses the Salmon Recovery Plan Biological Strategy and Habitat Action Prioritization process to evaluate, prioritize, and design restoration actions. The proposal identifies a single goal to enact as many priority habitat restoration actions as possible. This is a simplistic implementation goal.

The proposal does not provide SMART objectives and instead indicates that its objective is to double the linear amount of restoration actions in the mainstem and side channels in the three subbasins within the next 10 years. There is no indication that the project develops explicit quantitative physical or biological objectives, and no objectives are listed for previous projects. Instead, the project lists limiting factors and life stages of Chinook and steelhead present in the selected restoration sites, which are derived from the Biological Strategy and Habitat Action Prioritization process.

Q2: Methods

The YNF UCHRP participates in the overall restoration planning in the upper Columbia River Basin and uses the Salmon Recovery Plan Biological Strategy and Habitat Action Prioritization process to evaluate, prioritize, and design restoration actions. The ISAB reviewed the biological strategy and prioritization process in its report on the upper Columbia River Spring Chinook salmon (ISAB 2018-1) and found them to be scientifically sound and appropriate for landscape evaluation and project prioritization. The prioritization process of the YNF UCHRP appears to differ from the habitat action prioritization process of the Upper Columbia Regional Technical Team (RTT 2020). The process does not appear to consider protection vs. restoration and the weighting system that was proposed by the RTT. Cost effectiveness is based on a simple ranking of high, moderate, or low relative cost. The designation for Benefit-to-Cost is based on dividing the benefit score by the simple three-rank cost score. Feasibility is ranked but is not used in scoring. The text and Appendix do not indicate how the designation is used.

Design and construction is done by professional engineering firms and completed under the BPA Habitat Improvement Program Biological Opinion, which gives guidelines for categories of actions such as installing large wood and improving secondary channel and floodplain interactions. This project does not include that RM&E component, but the proponents are conducting RM&E studies on three other projects. These include two side channels with groundwater inputs and complex thermal refugia in which juveniles and adult spawners can thrive, and an upcoming widespread monitoring project that aims to monitor most future projects with a strong statistical design.

Several key papers indicate that in addition to physical habitat, food webs are very important to the response by fish in these watersheds. Bellmore et al. (2013, 2017) reported that the strongest responses by Chinook salmon are likely to be from reconnecting side channels, which is the focus of some of the proposed projects. In contrast, adding complexity to main channel habitats may create better habitat for other fish like whitefish and sculpin, which potentially compete with juvenile salmon or steelhead for food. Whitney et al. (2020) reported, based on a simulation model, that the effects of habitat restoration can depend on other variables such as

dissolved nutrients from fish carcasses, fish predators/competitors, invertebrates that are less vulnerable to predation and potentially shunt energy away from fish, and riparian vegetation. Hence, limiting factors can vary among sites even within the same basin, reducing the success rate of projects like these that address only a certain suite of factors. Does this project consider these factors in the design and evaluation of their restoration actions?

The proposal provides a simple timeline of the typical annual cycle of overall tasks. The ISRP assumes that the proponents provide more detailed timelines in their annual work plans and annual reports.

Q3: Provisions for M&E

The YNF UCHRP conducts post-project implementation monitoring, typically for 1, 2, 3, and 5 years following the construction year. An engineering team compares the as-built design to the conditions in following years. A concern is that nearly all the measurements are qualitative, based on visual surveys or photo points, rather than specific measurements. A positive aspect is that the guidelines and plan for this monitoring are specific and achievable.

The project does not conduct physical or biological monitoring to determine benefits to fish and wildlife. The proponents assume that such benefits are likely to occur if they base their actions on 1) a scientifically reviewed Biological Strategy, 2) a scientifically reviewed evaluation and prioritization process, and 3) implement practices that regional effectiveness monitoring (e.g., AEM) and local monitoring projects have found to be biologically and physically effective (Best Management Practices).

For biological monitoring, the proponents state that they rely on three other Yakama Nation projects. Two of these projects address specific side-channel restoration projects; however, the reference links provided on pages 25-26 do not provide information on biological effectiveness of the habitat modifications. The proponents rely on a new Upper Columbia Monitoring Project (201700300) and the AEM Project (201600100) to provide answers about which kinds of projects are most effective at increasing fish habitat use, growth, survival, and reproduction. It remains to be seen whether these projects can deliver that information, as the proponents point out for AEM in their Response to the 2013 Geographic Category Review Qualification #1. Understanding the large-scale and long-term effects of these habitat projects remains a major evaluation need.

The project coordinates with several regional projects, but the proposal does not indicate that they coordinate with several other relevant projects, including the Upper Columbia Spring Chinook and Steelhead Juvenile and Adult Abundance, Productivity and Spatial Structure

Monitoring Project (201003400; WDFW), NOAA's survival study, or the Okanogan Habitat Acquisition and Restoration project (200810200; Confederated Tribes of the Colville Reservation).

Yakama Nation Fisheries staff develop annual work plans based on the goals and objectives described above, and adjust plans based on quarterly or bi-annual coordination meetings. These staff participate in the RTT and update them with new data that allows potential changes in priorities. The proponents also update the UCRTT with results from the additional three RM&E projects described above, which may help assess which types of projects will have the greatest effect on fish habitat use, growth, survival, and reproduction.

The YNF UCHRP identifies climate change, out of basin habitat conditions and life stage bottlenecks, land use changes, changing regulations and resource management policies as confounding factors. The effects of climate change, primarily owing to warmer air and water temperatures – more rain vs. snow in winter, less snowpack, earlier runoff, and lower base flows – are expected to reduce habitat suitability for fish and hence their survival and reproduction. The proponents are working with relevant experts to design projects that can supply off-channel cold water refuges under future conditions. An overarching goal is to provide habitat that allows ESA-listed populations to be more resilient to more frequent and larger stresses

Q4: Results – benefits to fish and wildlife

The project reports that it implemented 38 project actions in the Upper Columbia Basin over the last decade, including 16 miles of mainstem treatments, 5.5 miles of side channel treatments, and addition of 4,600 pieces of large wood. However, the actual effectiveness of project actions has not yet been documented. The proposal provides no interpretation of the relative contribution of these actions to benefit fish and wildlife in the three basins, either in terms of fish abundance and productivity, overall habitat conditions, or status and trends. The Habitat Report of the Upper Columbia Salmon Recovery Board (UCSRB 2014) provides a readily accessible context for such an analysis, and the life cycle models and floodplain models in these three basins provides an additional context for reporting the contribution of the project to fish and wildlife. The ISRP recommends that the project use these sources of information to better demonstrate the value of their actions to benefit fish and wildlife in the basins.

References

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- UCSRB (Upper Columbia Salmon Recovery Board). 2014. Integrated Recovery Program Habitat Report. Upper Columbia Salmon Recovery Board, Wenatchee, WA.
- Whitney E.J., J.R. Bellmore, J.R. Benjamin C.E. Jordan. J.B. Dunham, M. Newsom, and M. Nahorniak. 2020. Beyond sticks and stones: Integrating physical and ecological conditions into watershed restoration assessments using a food web modeling approach. *Food Webs* 25:e00160.

200850300 - Studies on Factors Limiting Abundance of Okanogan and Wenatchee Sockeye Salmon

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Inter-Tribal Fish Commission (CRITFC)

Province/Subbasin: Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Okanogan, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The primary emphasis of the project is to monitor and estimate the abundance and survival of adult and juvenile sockeye salmon originating from the upper Columbia Basin (Okanogan and Wenatchee River stocks). The proponents' partnerships with Department of Fisheries and Oceans, (DFO), the Okanogan Nation Alliance (ONA) along with other entities (e.g., GPUD, DPUD, CPUD, USGS, CTCR, YN,) have substantially increased the scope and types of monitoring data being collected. When the project first underwent review by the ISRP in 2009, four issues or questions were raised:

1. What factors were contributing to adult sockeye mortality in the Okanogan River?
2. What are the roles of habitat characteristics and water quality on adult sockeye survival in the Okanogan subbasin?
3. What factors limit sockeye abundance in the Okanogan subbasin?
4. What factors limit sockeye abundance in Lake Wenatchee?

Monitoring data from the project have helped address these questions. Currently, the proponents and their partners are seeking opportunities to upgrade and increase PIT tag detection arrays in the Okanogan River and in the mainstem Columbia to further refine their efforts to track trends in abundance, survival, migration timing, productivity, and spatial distribution of upper Columbia River sockeye.

The value of any monitoring project depends on the questions and hypotheses being investigated and addressed, the accuracy and precision of the data collected, how rapidly these data become available, and how they are utilized by managers, researchers, or other interested parties.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
2. **Use of M&E assessments.** Describe how expected monitoring and evaluation outcomes will be used, and by whom.
3. **Biological goals and objectives.** Describe the biological goals and objectives related to the Problem Statement that will be addressed over the next funding period?

4. **Sockeye adult migration comparison.** Provide additional information to justify the conclusion that adult sockeye entering the (cooler) Similkameen River did not fare as well as sockeye that did not enter the Similkameen River. It is not clear to us from the headings in Table 5 or the accompanying text how survival for these two groups can be compared.
5. **Sockeye response to climate and other factors.** Discuss how detected responses by sockeye would be attributed to changes in climate rather than changes in other confounding factors such as spawning densities, fry outplants, hydrosystem operations, and habitat accessibility.

Q1: Clearly defined objectives and outcomes

The Problem Statement provides background on trends in status and current concerns about the future of the two largest sockeye populations in the Columbia River.

The project's five goals focus narrowly on monitoring and evaluation: maintaining a system for detecting PIT tags, assessing smolt abundance and productivity, assessing juvenile downstream survival, assessing adult upstream survival, and holding sockeye symposia.

The objectives also focus on specific monitoring and evaluation tasks (i.e., are "implementation" rather than "biological" objectives). Each implementation objective is supplemented with a list of definite activities. Although not mentioned specifically, the objectives are annual tasks and thus are time-bound. The fifth goal, to sponsor and lead sockeye symposia at professional meetings, is more opportunistic and is being used by the proponents to share findings from their project. Most of the project's objectives include enough quantitative detail to meet SMART criteria; exceptions are 1.2 and 1.3 which merely state "look for opportunities."

The proponents clearly indicate how their monitoring and evaluation outcomes will be reported for others to use. However, they do not discuss how or by whom these outcomes will be used to achieve larger (unstated) biological objectives or goals. Without this information, it is difficult for the ISRP to judge the value of the expected outcomes from this project.

Q2: Methods

The methods being used to accomplish the project's implementation objectives are adequately described. Statistical analyses that examine survival and migration timing of sockeye smolts by tagging site are conducted by the Fish Passage Center. Additional data on tagged fish are acquired when needed from the Columbia Basin Research DART Tag File Selection tool. Other

project partners — Okanagan Native Alliance (ONA), USGS, Yakama Nation (YN), Department of Fisheries and Oceans (DFO) — participate in the work being performed in Lake Wenatchee. Details on the methods used are included in the lengthy (252 pages) Annual Report for 2019. We judge these to be scientifically sound, with a few exceptions:

1. More explanation is needed to justify the proponents' conclusion that the tag detection data summarized in Table 5 indicate that adult sockeye entering the (cooler) Similkameen River did not fare as well as sockeye that did not enter the Similkameen River. It is not clear to us from the headings in the Table or the accompanying text how survival for these two groups can be compared.
2. The proponents state (on page 12) "this project will provide valuable data on the response of sockeye salmon to a changing climate" but do not discuss how measured responses by sockeye would be attributed to changes in climate rather than changes in other confounding factors such as spawning densities, fry outplants, hydrosystem operations, and habitat accessibility.
3. Statements in the Executive Summary (page iii) of the Annual Report for 2019 about estimates of survival for juveniles migrating downstream are very confusing because the text states "percent survival" which initially seems plausible because the first estimate is "1.036." However, the main section of the report makes it clear that these estimates are actually proportions, which can exceed 1 (i.e., 100%) because of the estimation method used.

3: Provisions for M&E

A formal adaptive management process is not described. However, monthly discussions on the status of the project occur among the project's three principal collaborators (i.e., CRITFC, ONA, and DFO). In person meetings take place twice a year, in December after the Canadian Okanagan Basin Work Group meeting and again in March after the Bilateral Okanagan Work Group meeting. Other participants such as YN, CTCR, USGS, Queens University, WDFW, GPUD, and CPUD may be included in the monthly discussions depending upon the geographic area and topics being considered. Major topics covered change over the year, ranging from the status of ongoing fieldwork to discussing results and planning new work. These frequent communications have allowed the project to adapt to changes in technology and to meet new data needs. Thus, the project appears to have a functioning and productive adaptive management process although not a formal one.

Q4: Results – benefits to fish and wildlife

This project has developed and operated sensor arrays to detect PIT-tagged sockeye at Zosel, Skaha, and McIntyre dams and at the downstream end of the spawning areas for Osoyoos and Skaha lakes. The detection data are used to monitor survival during both downstream and upstream migration and to identify bottlenecks to survival in relation to river temperature and flow. Acoustic trawl surveys to determine juvenile abundance combined with limnological monitoring suggest that Lake Wenatchee provides excellent habitat and capacity for zooplankton production for sockeye fry that are not fully utilized by current spawning escapements.

Expected outcomes will help to identify factors limiting sockeye production and inform decisions about harvest and broodstock management and habitat accessibility.

201003400 - Upper Columbia Spring Chinook Salmon and Steelhead Juvenile and Adult Abundance, Productivity, and Spatial Structure Monitoring

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish & Wildlife

Province/Subbasin: Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Okanogan, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria

Final review comments:

In our preliminary review, we requested responses on the following six topics. Our final review comments, including suggestions to improve the project, are provided under each of the topics:

1. **SMART objectives.** The proponents provided the additional information needed to specify the SMART aspects of their objectives.
2. **Specific thresholds for analysis and performance.** Specific thresholds were provided for the desired coefficients of variation of each VSP parameter or other population metric, as well as the performance standards for operation of the Instream PIT tag Detection System (IPTDS).

3. **Clarify methods and timelines.** Additional details provided in the response were sufficient for the frequency of estimating screw-trap efficiency.

Results of work under a previous objective indicated that a substantial number of spring Chinook salmon redds were not counted (p. 13 of revised proposal). Proponents report that other monitoring programs conduct comprehensive weekly redd surveys that account for observer efficiency to estimate unbiased and precise estimates of hatchery and wild spawners (p. 18 and Table 3). However, the revised proposal also states (p. 23) that WDFW does not perform redd surveys in the Entiat River. Hence, it is unclear whether the unbiased redd counts needed to estimate the desired quantities will be available. The ISRP recommends the proponents clarify this issue in the next annual report.

4. **Clarify sources of habitat data.** Additional details provided were sufficient concerning the sources of habitat data as covariates for analysis of pre-spawn mortality for the future telemetry study.
5. **Project evaluation and adjustment.** The ISRP appreciates that this project provides long-term monitoring and does not address adaptive management of salmon or steelhead. The proponents adequately described how the decision will be made to terminate the PIT-tag based study (when stable relationships between unbiased redd counts and female escapement are achieved), and other decisions required to maintain a working and efficient IPTDS system.

The proponents did not describe adaptations needed if climate change greatly alters the hydrology of these subbasins (e.g., producing large channel-reorganizing floods), or the returns of salmon and steelhead (e.g., by extreme events that cause high mortality). For example, might this require contingency plans to change locations of the IPTDS antennas or habitat surveys, or change the collaboration with other projects because redds are concentrated in different locations? The ISRP requests that in the next annual report the proponents address what decisions will need to be made to anticipate such changes.

6. **M&E matrix – support.** The lead project (Upper Columbia River Programmatic Habitat Project 201000100) declined to prepare the matrix requested. The project addressed here provides critical data for management of salmon and steelhead in the upper Columbia River, so there is no question that they are, and will be, providing needed information. One example is that their future work may reveal habitat characteristics that explain pre-spawn mortality, leading to options for habitat restoration to reduce it.

The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. As the Fish and Wildlife Program develops efforts to identify monitoring activities and coordination between projects in major subbasins, the ISRP encourages this project to contribute its expertise and resources to help create an effective summary of RM&E efforts in the Upper Columbia River.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a core project among those in the Upper Columbia River Basin. It benefits fish and wildlife by providing information critical for assessing status and trends of anadromous salmonids and making management decisions. The ISRP commends the project proponents on a history of conducting high-quality research and publishing the results in refereed journals.

The proponents generally have a clear idea of the work to be done in the next five-year phase of the project. However, there are several areas in which the proposal could be improved to refine the goals and objectives and provide a clear process for adaptive adjustments during the project period.

The ISRP requests that the proponents provide this information in a point-by-point response in a separate document, or in a revised proposal with a brief point-by-point description of where and how the issues are addressed in that document. In either case, the ISRP encourages the proponents to revise their proposal as a record for future project participants and a framework for ongoing evaluation of their project.

1. **SMART objectives.** Revise objectives to include all the elements of the SMART format (see proposal instructions). Objectives need to be Specific, Measurable, Achievable, Relevant, and Time Bound
2. **Specific thresholds for analysis and performance.** Revise objectives to include specific thresholds for statistical requirements for analysis and model performance, and operational performance objectives for the instream PIT tag detection system (IPTDS).
3. **Clarify methods and timelines.** Clarify methods and timelines for estimating screw-trap efficiency and correcting redd counts for observer bias.

4. **Clarify sources of habitat data.** If habitat relationships will be analyzed to assess causes of pre-spawning mortality, clarify what habitat attributes will be measured, or obtained from others, and who will make the measurements.
5. **Project evaluation and adjustment.** Develop and describe a formal adaptive management process that addresses how the project will be managed and decisions made, and what adaptations will be made in the face of climate change to ensure accurate and relevant information is collected on which to base management decisions. As part of the description of the adaptive management process, clarify how the decision will be made to begin the second phase of the study to measure fine-scale movement and distribution of spawners using radio telemetry, and to analyze reach-scale covariates to address causes of pre-spawning mortality.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages among implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan basins. As a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proponents propose to develop a PIT-tag based Spring Chinook Salmon Escapement model for the Upper Columbia River basin, using the same framework as the model developed for steelhead, and to maintain and improve the instream PIT tag detection system (IPTDS). They also will use screw traps to estimate abundance of emigrant Chinook and steelhead from the Entiat River.

The ISRP has several concerns about the objectives:

Two additional objectives include 1) a radio-telemetry study of adult spring Chinook salmon spawners to identify patterns in movement and habitat use that can be related to pre-spawning mortality, and 2) relating pre-spawning mortality to habitat and frequency of recreation in specific reaches to evaluate factors causing this mortality. However, it is unclear whether either objective is achievable within the five-year time frame of this project. ISRP reviewers learned only in the budget narrative at the end of the proposal that the proponents require estimates

of escapement and pre-spawning survival to meet a given precision (CV <10%) before pursuing these additional objectives. This needs to be made clear early in the proposal, stated in the objectives, and included in the adaptive management plan.

The objectives are clearly stated but are not fully specified in SMART format. For example, objectives under Goal 1 do not specify the subbasins in which the work will be done, nor the time period. Likewise, objectives under Goal 3 do not specify which life stages and species will be measured, nor what metrics of life history will be measured over what time period.

Given that the project conducts monitoring and analysis, rather than assessing biological performance of the fish per se, the implementation objectives could be improved by specifying the necessary or desired statistical requirements for the analysis (e.g., levels of accuracy and precision to be achieved for run escapement and composition, and pre-spawning mortality), and the operational performance to be achieved for the IPTDS (e.g., proportion of sampling period during which sites are operating, tagging rates, detection efficiencies for PIT tag arrays and smolt traps). Several of these are reported in Methods and should be explicitly stated in objectives.

Q2: Methods

Overall, the methods are based on sound science, and the ISRP commends the proponents on publishing key methods and analyses in peer-reviewed journals. However, certain details need to be specified:

- How often will estimates of rotary screw trap efficiency be made? Will the redd counts of Chinook salmon in the Entiat River be corrected for observer bias, as described earlier in the proposal for steelhead?
- If pre-spawning mortality will be related to habitat characteristics during this proposal period, what habitat measurements will be made by the proponents, and what habitat data will be provided by others?

Q3: Provisions for M&E

The proponents state that the project does not require an adaptive management process, but the ISRP found that a structured process is needed to address several points:

As described above, the decision process for moving to a second phase and conducting a study of fine-scale movement and distribution using radio telemetry, and relating pre-spawning mortality to reach-scale habitat features, is not described clearly and needs to be specified as part of the project evaluation process.

The proponents are asked to explain the overall management of the project activities on an annual basis, the schedule for such evaluations and decisions, the decision-making process and who is responsible for final decisions, and how these decisions are recorded.

Extreme events and other exigencies caused by climate change have potential to confound many projects addressing fish and wildlife in the Columbia Basin. The ISRP requests the proponents to define how they plan to adjust their monitoring and analysis to address such events and produce the most accurate and relevant information on which to base management decisions.

Q4: Results – benefits to fish and wildlife

This is a core project in the upper Columbia River Basin, which provides valuable information for assessing status and trends and making sound management decisions.

201003300 - Reproductive Success of Hatchery and Natural Origin Steelhead in the Methow

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish and Wildlife

Province/Subbasin: Columbia Cascade/Methow

Recommendation: Meets Scientific Review Criteria

Overall comment:

The ISRP reviewed this project favorably during the 2018 Research Project Status Review, and the project continues to make good progress toward achieving its objectives.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and

where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The three goals and four objectives are well linked to the problem statement. Goal 1 (“Evaluate the genetic effects of hatchery propagation on the wild steelhead in the Methow basin”) was revised to include previous Objectives 1 and 3 (now called Objectives 1A and 1B), which address genetic effects during the first and second generations, respectively. Goal 2 (“Improve understanding of the differences between hatchery and wild steelhead to inform hatchery practices”) includes previous Objective 2 (unchanged). Goal 3 (“Evaluate the reproductive viability of reconditioned wild steelhead kelts”) includes new Objective 3. The “Short Description” section of the proposal refers to the previous objectives rather than the new objectives.

Each of the four objectives is clearly specified by one or more null hypotheses that are measurable, testable, and relevant to the Council’s Program. Timelines for the objectives are clearly specified and being met. The project’s end-date has been extended to test the effectiveness of hatchery reforms and innovations to improve the relative reproductive success (RRS) of hatchery steelhead in the natural environment. The extended study will measure improvements in RRS from using local broodstock and rearing smolts to age 2 and evaluate the reproductive success of reconditioned kelts relative to wild maiden spawners.

Q2: Methods

The proposal includes a comprehensive overview of methods and the most recent Annual Report (Goodman et al. 2020) provides greater detail supported by links through [MonitoringResources.org](https://www.monitoringresources.org) and data. Accepted methods are being used to trap, sample, and enumerate downstream juveniles and returning adults. DNA-based pedigree procedures are used to identify and enumerate parr, smolts, and adults produced by steelhead spawning naturally. A generalized linear model is used to estimate the degree to which reproductive success in male and female steelhead is affected by demographic and biological variables such as fish origin, fork length, run timing, spawner density, pHOS, and somatic lipid content.

Figure 2 shows large variation in the number of offspring in relation to lipid content. It would have been useful to include statistical results for these regressions and to explain the influence of parental type. Might lipid content reflect degree of maturation at the time of sampling such that more mature fish had already incorporated somatic lipids into gametes or metabolism? Was there a seasonal trend?

The proponents acknowledge the ISRP's concern (expressed in ISRP 2010, 2018) that the long history of transplants and hatchery releases into the Methow River might lead to underestimation of genetic impacts of hatchery fish on wild fish in other rivers without a history of transplants. However, they note that historical effects of hatchery propagation are widespread in the Columbia Basin, so the management implications of this study are still relevant.

Q3: Provisions for M&E

Hatchery supplementation necessarily involves multiple jurisdictions and interest groups. This project is closely linked with two other BPA projects: 199305600 (Advance Hatchery Reform) and 200845800 (Upper Columbia Steelhead Kelt Reconditioning). The proponents provide a clear and succinct overview of the process and schedule for planning and coordinating activities among these groups, and for evaluating and adjusting protocols as needed.

The precision of estimates of RRS measured at the adult (i.e., final) stage would be improved if a greater proportion of adults returning to the Twisp River could be trapped and sampled. The proponents indicate in their Annual Report for 2019 that, in some years, more adults spawned below the weir than above it. Accordingly, in 2017, they began releasing hatchery progeny farther upstream, hoping that this new release site would motivate more of the returning adults to migrate past the weir where they could be sampled. The proposal does not indicate if this or other adjustments have improved the sampling rate for adults. Future proposals could be improved by including a power analysis to determine if sampling rates of adults (and juveniles) are optimal (or adequate) for detecting statistical differences in reproductive success within the proposed time frame of the study. That said, results to date provide considerable reassurance that the study can achieve its objectives.

Q4: Results – benefits to fish and wildlife

This project is meeting objectives, successfully testing hypotheses, and generating results that will benefit fish and wildlife.

Results to date span three generations (12 brood years from 2009-2018) and confirm that average reproductive success of hatchery females and hatchery males spawning naturally in the Twisp River was significantly lower than that of their wild counterparts when measured at the age-1, age-2, and smolt life stages. The similarity in survival from age-1 parr to smolt stages in progeny of Wells broodstock suggests that the fitness impacts are occurring at spawning or early in life prior to age 1. Few significant differences in RRS have been detected at the adult stage, but returns of adults are still incomplete for many brood years, and statistical power has

been limited by the relatively small number of adults available for sampling. Note that the caption for Figure 1 is incorrect – female RRS is presented in the top frame, male RRS in the bottom frame.

Knowing the environmental or genetic mechanisms that reduce RRS is key to redesigning hatchery protocols. This project was the first to document the effect of somatic lipid content on RRS. It will now field test recommendations (from the Advance Hatchery Reform project) to release steelhead smolts at age 2 rather than age 1 as a strategy to reduce the prevalence of residual males and minijacks that have adverse consequences for natural populations. Analysis of RRS of second-generation natural spawners is partially complete for the Wells hatchery-origin experiment, but only just beginning for the local Twisp hatchery-origin experiment.

Future proposals and annual reports could be improved by including additional hypotheses and details to explain how the proponents plan to distinguish environmental and genetic effects on fitness. Presumably, persistent differences in RRS of Twisp hatchery-origin fish spawning naturally in the second generation after hatchery release would demonstrate genetic effects on fitness due to hatchery supplementation. In contrast, persistently lower reproductive success in the Wells hatchery line could be attributed to the non-local provenance (i.e., less well adapted traits) of that brood line. However, improvement in RRS over successive generations in the progeny of Wells hatchery-origin would provide evidence for genetic adaptation of non-local hatchery fish to the natural environment of the Twisp River.

The project has already successfully evaluated reproductive success for 11 reconditioned wild female kelts and shown that they are reproductively viable and produce more offspring than maiden-spawning wild females. The proposed adjustments to the project will allow these and other issues related to hatchery reform to be researched more thoroughly.

200302200 - Okanogan Basin Monitoring & Evaluation Program (OBMEP)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Colville Reservation

Province/Subbasin: Columbia Cascade/Okanogan

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This long-running, successful, and adaptive project is integral to several other projects (Restore Salmon Creek Anadromous Fish 199604200, Chief Joseph Hatchery Program 2003023, Okanogan Subbasin Habitat Program 200722400, Okanogan Habitat Acquisition and Restoration 200810200, Land and Water Acquisition 200810400, Upper Columbia Programmatic Habitat 201000100, Upper Columbia Spring Chinook and Steelhead Juvenile and Adult Abundance 201003400) in the upper Columbia River basin and most are conducted by the Confederated Tribes of the Colville Reservation (CTCR). The project has four broad objectives; three are directed toward monitoring and evaluating annual changes in: 1) listed salmonid fish populations, 2) a suite of habitat variables, and 3) VSP parameters in summer steelhead. The fourth objective is to fill recognized data gaps in the status and trends of habitat variables. The proponents use EDT models specific to the Okanogan and Methow subbasins to address information needs.

One of the major strengths of the project is its data management system and publicly accessible dashboards for understanding status and trends of listed salmonids and habitat conditions in the subbasins of the Okanogan and Methow basins. The project is a major contributor to monitoring and landscape evaluation in the upper Columbia River basin.

While reviewing another upper Columbia project, the ISRP became aware of Yakama Action Effectiveness Monitoring (BPA # 201700300), which is a pilot project through 2022 being conducted by the Yakama Nation (YN). The project description in cbfish.org in part states:

“The contract will cover work involved in the creation of an Upper Columbia Habitat Action Effectiveness Monitoring Plan....The contract will include development of clearly defined goals and objectives for habitat action effectiveness monitoring, the selection of habitat action sites and available control sites, the development of at least one testable monitoring question and hypothesis for each project objective, and the selection of metrics and variable that will be used to measure fish response and test hypotheses.”

If UCHIP is doing habitat restoration in the Okanogan, Methow, Entiat and Wenatchee subbasins and OBMEP is providing monitoring and evaluation, the results of the YN AEM project would be of value and should be explored.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Data sharing.** Describe the collaborative sharing of data with other monitoring projects and the use of independent measurements to evaluate the quality of the monitoring data and identify areas that require improvement? The description of these collaborative efforts should indicate how they coordinate with geographically overlapping projects.
2. **SMART implementation objectives.** Provide quantitative characteristics and inherent time frames for tasks in the project implementation objectives.
3. **M&E matrix – support.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan basins. During the response loop, as a key M&E project and partner in the basin, we ask your project to assist them in creating the summary and provide information to them about what, where, and when your monitoring occurs and what is being monitored for and shared with implementation projects in the basin. A map or maps of locations of monitoring actions would be helpful in this regard.

The ISRP suggests that future proposals should be edited to reduce length and redundancy.

Q1: Clearly defined objectives and outcomes

The overarching goals of this long-running monitoring and evaluation project are to continue to monitor the status and trends of habitat and biological parameters in the Okanogan and Methow subbasins and provide that information to other projects (e.g., OSHIP 200722400).

Other projects use the monitoring information to prioritize and evaluate habitat restoration actions.

As the ISRP found for other monitoring projects, some of the objectives stated in the proposal tend toward SMART objectives (i.e., 1, 2, & 3; pages 56-57), but lack quantification such as stating how many reaches of each subbasin will be monitored each year. Other objectives (e.g., 4 through 7; pages 57-59) are actions that the proponents will take to meet their objectives. The proposal does not include quantitative objectives for the biological performance of Chinook and steelhead in these basins, which are the objectives of the CTCR, Upper Columbia Salmon Recovery Board, and WDFW. The objectives stated in this project, therefore, are implementation objectives related to obtaining and analyzing the data. As such, the objectives identify the required actions but do not provide quantitative measures related to the implementation of actions. The objective statements could be improved by including the necessary or desired statistical requirements for the analyses (e.g., variance and error requirements, model fitting requirements, model performance) or the operational performance requirements of the detection sites (e.g., intended proportion of the sampling period when detection sites are operating, tagging rates, detection efficiencies for PIT tag arrays and smolt traps), which could be used to evaluate the performance of the project. Several of these performance measures are reported in the Methods section or Progress to Date section and could be incorporated explicitly into the project objectives.

Q2: Methods

The methods are well described and have been refined or changed when needed to meet project objectives. One of the strengths of the project has been the proponents' practice to overlap new methods with the procedures they are replacing, often for multiple years to ensure that the new procedures meet expectations. From its inception, the project has relied upon the EDT model as an analytical tool to integrate its data, and it has successfully used the model to identify habitat constraints on summer-run steelhead. As the OBMEP project has proceeded, its empirical data have been used to adjust some species-habitat rules of the Okanogan EDT model. The project's methods are scientifically sound and often innovative. Project information is quickly made available for project review, use by other projects and management agencies, and recovery programs.

The proposal does not indicate how coordination with overlapping projects in the same geographic areas occurs, such as the Upper Columbia Spring Chinook and Steelhead Monitoring Project of WDFW (201003400). Do these projects share independently generated data? Do they incorporate collective data into their modeling and data analyses? Do they compare estimates for the same reaches or sub basins developed by different monitoring entities? Such

collaboration and cross comparison will be extremely important for assessing information on salmon and steelhead in the upper Columbia River Basin.

The proponents identify climate change and changing regulatory conditions as potentially confounding factors. The CTCR and their EDT consultants created scenarios of future climate change. It is not clear whether they will consider these and other future climate scenarios in their analyses, and the proposal did not indicate how such projections factor into land management, hatchery operations, and Tribal decisions. Are there major examples where future climate conditions depicted by OBMEP and the EDT analysis have altered and improved the prioritization, design, and implementation of habitat or hatchery projects?

The proponents criticized the CHaMP and ISEMP monitoring programs in several sections of the proposal and indicated that the review by Rosgen et al. (2018) “highlighted numerous concerns including the appropriateness of GRTS random site selection and ‘upscaling’ site level indicators to the watershed level.” In his presentation to the Council, Dave Rosgen noted that the measurements for temperature, large wood, sediment, and riparian vegetation in the CHaMP protocol were scientifically sound. In addition, there are valid statistical justifications for the GRTS random site selection approach for habitat monitoring at the scale of the Columbia River Basin. The ISRP mentions this to clarify the weaknesses and strengths of the CHaMP and ISEMP programs and ensure that the data from those efforts are preserved and used. The ISRP appreciates the experience and participation of the CTCR in developing future regional habitat monitoring.

Q3: Provisions for M&E

The project has a well-developed adaptive management process. The project uses an iterative review process to ensure that the EDT model’s environmental attribute ratings are credible. If they do not, changes are made on how information is gathered. They found, for example, that the field-based methods used to conduct riparian surveys were not obtaining the data needed to parameterize this attribute in their EDT model. A new approach that uses high resolution images and LiDAR plus field verification is now being used to collect this information. The proposal describes how the OBMEP works with its management hierarchy (Fish and Wildlife Director, Anadromous Division Lead, a Senior Research Scientist, and Subdivision Leads). It does not, however, clearly state how decisions are documented for future reference. It is assumed that adaptive evaluation is recorded in annual reports, and the ISRP encourages the proponents to state this portion of the process clearly. We commend the OBMEP for convening an annual adult steelhead project meeting for decision-making. Does it have a similar process for its Chinook salmon measurements and analyses? Given the large number of BPA-funded projects of the CTCR, would it be appropriate to have an annual science meeting of the CTCR projects to

present, discuss, and evaluate outcomes and make future management decisions or does the Upper Columbia Science Conference serve this function?

One critical aspect that requires additional information is how the OBMEP monitors specific outcomes for habitat projects (OSHIP and Restore Salmon Creek) and the land acquisition projects (Land & Water Acquisition and Okanogan Habitat Acquisition and Restoration). These other projects point to OBMEP as one of their primary sources of project monitoring information. The ISRP needs a collective description of the specific monitoring information that is provided to habitat restoration projects, land acquisition projects, and hatchery projects. This comprehensive monitoring documentation should provide a matrix of project-specific monitoring functions and crosswalk of monitoring methods across different projects. Because OBMEP is the primary monitoring project of the CTCR, it is appropriate that this project and all other relevant monitoring, habitat, and hatchery projects in the upper Columbia River basin assist such an effort with the UCSRB as lead.

Q4: Results – benefits to fish and wildlife

The proposal provides a comprehensive overview of the project and how outputs from its EDT model have been used to identify priority habitat restoration opportunities. The project's data on juvenile and adult abundance and distribution patterns along with its measurements of the cumulative effects of the habitat restoration actions that have occurred in the Okanogan Subbasin allow it to track changes in VSP parameters. This type of feedback is critical for fish recovery scientists and habitat restoration practitioners. The proponents' data management system and publicly accessible database provide excellent analyses of status and trends of listed salmon and steelhead in relationship to habitat conditions. In particular, the ISRP commends the project for its rapid synthesis and public availability of landscape level data.

200303900 - Monitor and Evaluate (M&E) Reproductive Success and Survival in Wenatchee River

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: NOAA/NMFS/NWFSC

Province/Subbasin: Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria

Overall comment:

The ISRP reviewed this project favorably during the 2018 Research Project Status Review, and the project continues to make good progress toward achieving its objectives.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Five objectives are listed in the proposal. The first three objectives are updated from the previous (2018) review period: (1) Continue to estimate relative reproductive success (RRS) for Wenatchee River spring Chinook for additional brood years through brood year 2018 (2023 age-5 returns); (2) Continue to evaluate environmental and phenotypic factors influencing RRS, including sex, age, size, run timing, holding and spawning location; and (3) Continue to evaluate second and third generation broodstock effects by evaluating the RRS of hatchery and natural fish with varying numbers of hatchery and natural grandparents. Objective 4 has been added to allow further investigation of new findings and opportunities based on genomic techniques: (4) Characterize genomic diversity in samples of hatchery and wild fish to evaluate differences in effective population size and test for genomic regions associated with fitness differences between individuals. Objective 5 has been added to ensure support for publication of results in

this final phase of the project: (5) Make results available to managers in the form of annual reports and peer reviewed publications.

These objectives are clearly stated, achievable and highly relevant to the Council's Program. Strictly speaking, they could be improved by specifying hypotheses and quantifying expected outcomes. (Objectives 4 and 5 are particularly vague in this respect.) That said, the project's record of scientific discovery, primary publication and influence has been extraordinary, and the ISRP is satisfied with the focus and design of work being proposed in this final phase. Timelines are specified in the supporting text.

Q2: Methods

The proposal includes a brief but informative overview of the methods, but the details are documented in peer-reviewed publications. Standard procedures are being used to trap, sample, and enumerate downstream juveniles and returning adults. DNA samples are analyzed to determine genotypes at 96 SNP loci, which are used to identify the pedigree of parents (i.e., degree of hatchery influence) and to enumerate their progeny at both the smolt and adult stages. Reproductive success (i.e., the number of progeny per spawner) is determined for each parent and linked to co-variables associated with environmental conditions and biological traits.

Statistical analysis and general linear modeling are used to compare RRS in hatchery and natural environments among lineages with different degrees of hatchery influence (Objectives 1 and 3) and to determine causes of differences in reproductive success by analyzing the influence of co-variables (Objectives 2 and 4). Appropriate methods are being used to measure and analyze biological attributes (e.g., adult size and age at maturity, maturation timing, hatchery influence on pedigree, genomic background) and behavioral traits (e.g., spawning location, redd geomorphology, straying rates within and outside of the Wenatchee subbasin).

Q3: Provisions for M&E

The current proposal is to complete the monitoring and evaluation of RRS in Wenatchee spring Chinook during the final five years of this project (2023-2028). It emphasizes evaluation and publication of scientific findings and advice for management of conservation hatcheries.

This project is aligned with three other BPA projects: 198909600 (Genetic Monitoring and Evaluation Program for Salmon and Steelhead); 199305600 (Advance Hatchery Reform Research) and 201003300 (Study Reproductive Success of Hatchery and Natural Origin Steelhead in the Methow). The proponents work closely to coordinate their approaches,

methodology, analyses, and management recommendations. The proponents also collaborate with WDFW and NMFS scientists in developing life-cycle models for Upper Columbia Chinook salmon; participate in periodic Columbia Basin hatchery forums sponsored by the Council, NMFS and CRITFC; and have collaborated with proponents of other Columbia River Basin hatchery projects to publish a review paper that synthesizes results from multiple projects (Christie *et al.* 2014).

The proposal does not include an overview of the process and schedule for planning activities and adjusting objectives or protocols. However, the proponents note (and their publication record attests) that they have been quick to respond to new information and to adopt new technology. For example, new questions related to straying and genetic effects on age-at-maturity arose over the course of the project and were investigated successfully. We commend the proponents for their creative and continuing efforts to distinguish environmental and genetic influences on RRS, and to address potential bias by comparing RRS at different spatial scales among tributaries and for subsets of fish that are known to have survived migration to the spawning areas.

Q4: Results – benefits to fish and wildlife

The project is meeting its objectives and providing information of value to managers in the upper Columbia River and throughout the Pacific Northwest. To date, RRS has been estimated for nine brood years (2004 to 2012; work on brood years 2013-2018 is still in progress). Major findings include:

1. Hatchery Chinook spawning in the wild have, on average, less than half the reproductive success of natural fish (i.e., RRS < 50%);
2. RRS of females (average 52%) is reduced primarily by higher pre-spawning mortality and spawning lower in tributaries in areas of reduced habitat quality;
3. RRS of males (average 29%) is reduced primarily by spawning location and changes in age structure;
4. To date, RRS of hatchery Chinook with two generations of hatchery breeding is not lower than RRS of hatchery Chinook with only a single generation of hatchery breeding, which suggests that RRS is reduced primarily by environmental factors, not genetic factors;
5. The natural-origin progeny of hatchery Chinook salmon “stray” (i.e., disperse) from parental spawning sites to other spawning sites within the Wenatchee River at higher rates than natural-origin progeny of natural Chinook.

The key finding that hatchery rearing and release practices affect subsequent spawning success of released fish will help to refine future hatchery procedures. Advice from the project has also been used to develop escapement goals for hatchery Chinook in tributary streams within the Wenatchee subbasin.

Annual reporting is adequate, and the record of primary publications and conference presentations is excellent. Important analyses and reporting of final results will be completed in 2022 to 2028.

199604200 - Restore Salmon Creek for Anadromous Fish

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Colville Reservation

Province/Subbasin: Columbia Cascade/Okanogan

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The ISRP commends the proponents for their ability to include and gain cooperation with a variety of stakeholders including irrigators, Bureau of Reclamation (BOR), Washington Water Trust, and the Washington Department of Ecology. These collaborations have allowed the proponents to ensure that the lower 4.3 miles of Salmon Creek has a perennial flow for the first time in 100 years. However, the proposal submitted contains no objectives for the 2021 - 2023 period and no budget for 2021 to 2027. It appears that the proponents are waiting for the results of ongoing water monitoring and habitat evaluation to determine their next objective. The proponents also indicate that this project will become part of another project the Okanogan Subbasin Habitat Implementation Program (OSHIP #200722400) in 2023.

Uncertainty exists on whether current conditions in the lower 4.3 miles of Salmon Creek can accommodate summer steelhead. Two independent assessments, by the Confederated Tribes of the Colville Reservation (CTCR) and the BOR, are being conducted to determine if additional water releases or habitat restoration actions will be needed in lower Salmon Creek to support summer steelhead. Information obtained by these studies will be evaluated by the Okanogan Irrigation District, CTCR, BOR, and NOAA.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. If the project is subsumed by OSHIP, the annual report for the OSHIP project should address these conditions, e.g., under a section on Salmon Creek.

1. **SMART objectives.** Provide SMART objectives (see proposal instructions) for each of the major goals and incremental actions.
2. **Project evaluation and adjustment.** Develop an adaptive management plan describing how each of the major phases of the project will be sequenced, coordinated, monitored, and evaluated, with information on known decision points, explicit schedules for evaluation and decision-making, and documentation of decisions and project changes.
3. **Risk of not accomplishing outcomes.** Provide an assessment of the relative risks associated with not accomplishing specific outcomes related to instream flow, instream habitat, entrainment in the diversion canal, and sedimentation and the consequence for the overall project if specific elements are unsuccessful.
4. **Adequate future habitat.** Provide an assessment of the potential for the proposed actions to create habitat conditions that will be adequate for steelhead survival over the next 50 years. It appears that current conditions are marginal, and it is unclear if the proposed actions would create adequate habitat for steelhead in the face of changes in climate and land use.
5. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal identifies two goals: 1) reconnecting Salmon Creek to the Okanogan River to reestablish anadromous steelhead and 2) ensuring that habitat in lower Salmon Creek is adequate to support juvenile steelhead [and returning adult steelhead]. The proposal does not

include SMART objectives. Given what is known about the lower 4.3 miles of the stream, current habitat conditions, and habitat requirements of steelhead, it should be possible to develop clear quantitative objectives with specific time frames.

It appears that the goals of this project are intertwined with that of the Okanogan Basin Monitoring & Evaluation Program (OBMEP 200302200) and that the separate goal of this project is to find ways to reconnect the lower 4.3 miles of Salmon Creek to the Okanogan River to help reestablish anadromous salmonids. The proponents do not clearly state their objectives, and it appears that objectives will be determined between now and 2023 based on the results of other studies. A list of possible objectives is presented in the Methods section of the proposal, and they are not stated as SMART objectives but rather as “There are three factors that are likely limiting production in Salmon Creek.” (Proposal page 11).

Q2: Methods

The Methods section describes a sequence of steps used to address three limiting factors: 1) increase flow, which has two options (increase storage in Salmon Lake for release as needed or increase benefit of flow in the lower reach using inverted vortex rock weirs), 2) increase the effectiveness of irrigation diversion screens, and 3) reduce local sediment inputs to the creek. The proposal does not explain the ecological assessments that determined that these factors were the highest priorities, as opposed to other potential limiting factors or alternative actions. Interestingly, the proponents list sources to fund these actions (e.g., BOR, Okanogan Irrigation District, State of Washington) but do not include BPA. Furthermore, the proponents do not include a budget but state: “By FY2023 this project is projected to be encapsulated to what is currently the Okanogan Subbasin Habitat Improvement Program. Therefore, no budget is identified for this project.” (Proposal page 27).

The proposal involves multiple steps and analyses to accomplish its overall goals. As such, the proposal should present the anticipated actions in a series of phases. Each phase should have explicit targets necessary for completion before moving onto the next phase. The current description of the assessment of three potential limiting factors and subsequent steps to address them needs to be prioritized. If any one of the three are unsuccessful, it is uncertain whether the project should proceed further. The proponents have sufficient information to do a risk analysis to determine thresholds for proceeding with the project. The project should incorporate such a risk analysis as an initial step before proceeding with the three options to deal with limiting factors.

To provide additional instream flow, the proponents identify two options: 1) additional storage in the reservoir and 2) additional instream storage. The additional-storage option for the

reservoir requires moving utilities and septic systems of lakeside residences, a step that would require additional funding from Washington State. It also requires a survey of the integrity of the dam and potential risks. The proposal also lists Option A1, which creates more storage in the current channel with existing flow by building rock weirs. The proposal indicates that these structures would provide rearing habitat for juvenile steelhead and would not increase stream temperatures substantially. The proposal does not explain how these pools and the increased in-channel residence time would not result in greater rates of warming from solar radiation. The proponents should assess the potential for increased stream temperatures as a result of the rock weirs.

A second limiting factor is entrainment of fish in a diversion canal. A series of remedial actions have been taken previously, but fish are still being trapped behind drum screens. Negotiations for operation of a pump station are underway, but the outcome is uncertain.

A third limiting factor is sedimentation. Most of the reach currently lacks riparian vegetation and has steep vertical banks. Proponents propose to install instream structures to deflect high velocity flow away from banks, plant riparian vegetation, fence livestock away from the stream, and move agriculture practices back from the adjacent stream banks. All of these actions will require landowner approval. The proposal does not indicate how long it will take for these collective actions to change the rate of sedimentation and the degree to which sedimentation is anticipated to be reduced. It is not clear how the instream rock structures would be consistent with high quality habitat for juvenile steelhead and spawning by adult steelhead.

Q3: Provisions for M&E

No formal adaptive management cycle is described. The proponents indicate that two independent habitat assessments on the lower reach of Salmon Creek are planned. Results from these assessments will be used to determine the next steps for the project. A companion project, OBMEP estimates the abundance of adult and juvenile summer steelhead in Salmon Creek. These data will be used to track trends in abundance over time.

Although it is not clearly stated, it appears that the proponents of this project are tasked with overseeing restoration of the physical environment (i.e., flow and sediment) of Salmon Creek and that OBMEP will monitor the abundance of juvenile and adult anadromous salmonids (primarily steelhead). There is no description of how results of OBMEP monitoring will influence the actions of this project. The proposal indicates that monitoring will be conducted for some of the options for addressing limiting factors but does not describe an evaluation process that will be used.

The proposal indicates in Attachment E that the BOR will conduct an instream flow and habitat assessment study in spring and early summer 2021. There is no description of how the assessment will be conducted or evaluated. As examples, will the instream flow analysis also examine flows during winter? Is habitat in lower Salmon Creek adequate for overwintering for juvenile steelhead, or will they be forced to move to downstream reaches in the Okanogan River to survive through winter? How will the project determine the abundance of steelhead as opposed to resident rainbow trout? The proposal indicates that instream structures will be monitored to determine their ability to remain intact during high flows. It is unclear what the project would do if observations demonstrate the structures have been changed. No performance criteria are described. Additionally, the proposal indicates juvenile steelhead will be enumerated to determine if their utilization of the lower reach increases. No information is provided on how this will be monitored or if other monitoring projects of the CTCR will assist.

The proposal does not describe any monitoring related to actions to increase the effectiveness of diversion screens. Minimum performance criteria should be identified and used in assessing advisability of proceeding.

The proposal does not describe any monitoring related to actions to decrease sedimentation in the 4.3 miles of lower Salmon Creek. The EDT analysis conducted by OBMEP could provide a basis for estimating the degree to which sediment conditions could be improved and the degree to which these could potentially influence steelhead survival. This information could be used to develop performance metrics and identify monitoring methods and timing.

The proponents should provide more complete descriptions of the collective monitoring and evaluation of attempts to improve conditions in the lower Salmon Creek.

Most importantly, the project should identify an explicit sequence of adaptive evaluation steps for the major phases of this project. This sequence should include the specific decisions, participants in the decision-making process, timing of meetings and decisions, and alternative modifications of the project based on potential outcomes.

Proponents identify climate change as one of the most significant confounding factors. They indicate that the NorWest model projects water temperatures in the lower reach of Salmon Creek will average approximately 9°C by 2040; however, data loggers recorded maximum temperatures as high as 22.6°C in 2020. The proponents hope that increased stream flow will provide better thermal conditions and offset potential adverse temperatures in the future, but no evidence or analyses are provided to support that desired outcome. Other potential confounding factors that are not identified in the proposal are future changes in land use,

increases in human population, and changes in water quality. Have the proponents conducted a worse case analysis to determine the risks they face in moving forward with this project?

Q4: Results – benefits to fish and wildlife

The proponents' ability to increase the amount and availability of water in Salmon Creek has had positive benefits to fish (i.e., steelhead). The number of juvenile *O. mykiss* are among the highest in Okanogan River tributaries since 2014. It is not clear whether these are steelhead and not resident rainbow trout. Additionally, the proportion of natural origin returning (pNOR) adult steelhead in the creek has been increasing consistently since 2009. The absolute number of natural origin adult steelhead, however, has remained about 30 during that time.

200810400 - Land and Water Acquisition

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Colville Reservation (CTCR)

Province/Subbasin: Columbia Cascade/Entiat, Columbia Cascade/Methow, Columbia Cascade/Okanogan, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria

Overall comment:

The ISRP commends the proponents for their past success in acquiring and protecting important habitat and water rights in the Wenatchee, Entiat, Methow, and Okanogan subbasins. They have developed a strong selection framework for identifying priority projects by understanding that acquisition opportunity is a key driving factor. The Confederated Tribes of the Colville Reservation (CTCR) is a major partner in developing the Biological Strategy of the Upper Columbia River Regional Technical Team (RTT 2019) and the Habitat Action Prioritization process (RTT 2020). The proposal provides a clear explanation of their priorities and processes and identifies the past potential benefits to fish and wildlife that have resulted from their acquisition of land and water resources.

The ISRP recently reviewed the methodology for prioritizing land acquisitions and water transfers as part of the CTCR landscape approach for habitat restoration (ISRP 2020-1). The proposal also addresses aspects of the Independent Scientific Advisory Board's *Review of Spring Chinook Salmon in the Upper Columbia River* (UCR Report) (ISAB 2018-1) and *Review of the*

Upper Columbia United Tribes' Fish Passage and Reintroduction Phase 1 Report: Investigations Upstream of Chief Joseph and Grand Coulee Dams (Reintroduction Report) (ISAB 2019-3). This proposal addresses most of the areas where the ISRP requested additional information.

Proponents of Okanogan Subbasin Habitat Implementation Program (OSHIP 200722400) have proposed that this project (200810400) and Restore Salmon Creek Anadromous Fish (199604000) be subsumed, and the three projects be renamed the Upper Columbia Habitat Implementation Program (UCHIP). The CTCR are proponents of all three projects. If the Council and BPA approve this combination, the ISRP could review the integrated project.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The ISRP review in 2020 recommended that the proponents should “*modify the objectives into quantitative, time-specific (SMART) objectives, at least in terms of implementation. The objectives could include estimates of the acres, the length of fish bearing stream channels, and water volume they plan to protect by specific dates.*” In response, the proponents identified five overall SMART objectives to be implemented by 2026. These include purchasing or protecting five properties adjacent to ESA-listed fish spawning grounds, 2 km of stream front with ESA designated critical habitat, 15 acres of riparian habitat adjacent to ESA designated critical habitat, 400 acre-feet of water rights in stream reaches where water quantity has been identified as a limiting factor, and three properties where restoration projects were implemented to address EDT or the RTT Biological Strategy for restoration potential. The proposal does not explain how these objectives were determined or how they were derived from the Biological Strategy or the Recovery Plan. In the next Annual Report, the proponents should provide a description of the basis for each of the five overall objectives. The ISRP recommends the proponents provide information on how the specific quantities in the five new objectives were developed in the next Annual Report.

The objective for acquisition of ESA-designated critical habitat seems surprisingly low. Because it calls for 2 km of stream front, the objective could be met with the acquisition of 1 km of stream length.

The 2020 ISRP review also recommended that the proponents should “*indicate how protection of high-quality habitats would be prioritized or weighted relative to restoration of degraded habitats. The proposal should clarify how the relative benefits of protection and restoration will influence the prioritization of land acquisitions and water transfers.*” The current proposal states that priority will be given to acquisition of properties that currently contain high quality habitat but are at risk to be degraded through development. It appears that this is an initial step after all information has been evaluated for the potential projects but before actual ranking. The proponents should clarify this explicitly in the formal guiding document for the process if it has not been included.

Q2: Methods

The proposal describes how EDT and RTT biological strategy information are used in the prioritization process. There is no explicit cost benefit analysis and prioritization decisions are based on professional judgment of cost effectiveness. Water transactions are carried out based on their own criteria for protection that inherently focuses on protection of instream flow in areas that have been identified as high priority flow-limited watersheds. The ISRP 2020 review requested information about protection of high-quality habitats, and three of the specific objectives focus on current high priority habitats.

The proposal identifies climate change and changes in land use practices in areas adjacent to properties as two major uncertainties. To assure that the benefits will occur in the face of climate change, priority is given to properties that are located in stream reaches where models indicate the reach will be habitable in 2040 based on NorWest model of stream temperature and the 2040 model run of the EDT tool. Do the future scenarios include projections of climate-related changes in streamflow? The proponents propose to deal with potential land-use changes by trying to acquire large parcels and to target parcels that are adjacent to other properties that are protected through conservation easements or other forms of protection.

The proposal provides a typical time frame for acquisition and implementation of the different types of acquisitions and restoration, but not specific details. The ISRP recommends that the project provide specific timelines in annual reports and work plans.

Q3: Provisions for M&E

The project coordinates with the Okanogan Basin Monitoring & Evaluation Program (OBMEP 200302200) Project to obtain information on habitat quality. Restoration projects are

monitored through their respective BPA projects. The OBMEP project monitors fish presence and distribution of all life stages to ensure that acquired properties and water rights remain accessible and beneficial to ESA-listed fish. Acquired water rights are monitored through Qualified Local Entities. The proponents coordinate with the Okanogan Habitat Acquisition and Restoration Project to confirm that post-acquisition management is in accordance with the original intent of the project.

The proponents have updated the prioritization process to use recently improved evaluation tools, which are updated with new data from EDT, the Biological Strategy or the UCSRB Prioritization Web Map. In addition, they have developed new strategies to cluster acquisition projects to safeguard the acquisitions and expand restoration project opportunities using adjacent habitat quality and diversity. Larger properties are targeted to make the acquisition process more efficient.

Q4: Results – benefits to fish and wildlife

The project has acquired 17 properties for \$5,482,174 since 2008. The acquisitions have benefited fish and wildlife through the protection and restoration of 858 acres of riparian habitat, 9.8 km of stream length, 120.5 acre-feet/year of groundwater rights, and acquisition of 63.39 cfs of instream flow. The project has determined that improved habitat conditions have been documented through EDT analysis in areas that include past acquisitions.

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RTT (Regional Technical Team). 2020. Habitat Action Prioritization within the Upper Columbia River Basin. A report to the Upper Columbia Salmon Recovery Board.

<https://www.ucsrb.org/mdocs-posts/rtt-habitat-action-prioritization-strategy-draft-updated-11-25-20/>

200722400 - Upper Columbia Habitat Implementation Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Colville Reservation (CTCR)

Province/Subbasin: Columbia Cascade/Okanogan

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proposal is well written, and the goals and objectives are well stated. The primary purpose of the project is to engage in habitat improvement actions that address prioritized limiting factors in specific watersheds. Initially this approach was implemented in the Okanogan subbasin and subsequently enlarged to the Methow subbasin. The current proposal has expanded the coverage of the project to also include the Wenatchee and Entiat subbasins. The proponents' state that many of the actions needed to recover salmonids (e.g., floodplain and side channel reconnection, and increasing river sinuosity) require large land areas. It is acknowledged that such projects often face two obstacles. One is to obtain permission from landowners to conduct interventions at this scale. Reconnection to side channels and floodplains often takes farmlands out of production. Secondly, the effectiveness of these projects may be affected by the actions of nearby landowners, a process referred to as fragmentation. Consequently, willing landowners with large property holdings are needed for such projects to go forward. A companion CTCR project (200810400) has acquired large properties that can accommodate such improvements in all the above subbasins. Having a common owner and implementer (CTCR) enhances the likelihood that largescale restoration actions can be successfully carried out by the proponents.

The proposal does not explicitly state how restoration projects are prioritized. However, it appears that prioritization is based on the 2020 report on Habitat Action Prioritization within the Upper Columbia River Basin that was developed by the Regional Technical team (RTT), which was cited in the OBMEP proposal (page 20). The proponents should clarify this explicitly in the future.

The proponents are proposing that this project subsume two other projects (Restore Salmon Creek Anadromous Fish 199604200 and Land & Water Acquisition 200810400) and become the Upper Columbia Habitat Implementation Project (UCHIP). The ISRP agrees that this combination makes sense as those projects are also conducted by the CTCR, many of the staff work on all projects, and the objectives are much the same.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans:

1. **Documentation of methods.** The ISRP would appreciate knowing where the methods have been documented and if there is a summary document that describes the project's methods in detail.
2. **Guidance for Okanogan Habitat Acquisition and Restoration Implementation Project.** The ISRP believes that the new UCHIP should also subsume Project 200810200 (Okanogan Habitat Acquisition and Restoration Implementation). UCHIP should provide this project with guidance to identify ecological objectives and endpoints by the next annual report.
3. **Strategy for working with landowners.** Does the UCHIP have an established strategy for working with landowners based on existing relationships? Please provide this as part of your next annual report.
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored

for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The overall purpose of the project, to assist in the recovery of upper Columbia spring Chinook and summer steelhead in the Okanogan, Methow, Entiat, and Wenatchee subbasins by implementing habitat restoration actions is well described. The proposal's Timeline provides additional information on when implementation tasks associated with each objective are expected to occur by subbasin. Expected results are shown in both the project's objectives and Timeline chart.

The proposal includes SMART objectives for most of its goals. Most of the objectives are implementation objectives for habitat restoration actions (e.g., numbers of pieces of wood, acres of floodplain reconnected, mile of stream with riparian planting and fencing, miles of side channel created or reconnected, numbers of barriers removed). The ISRP commends the proponents for developing quantitative objectives with explicit time frames. The objectives do not, however, identify the intended biological outcomes (e.g., juvenile abundance of salmon and steelhead, numbers of outmigrating smolts, numbers of returning adults, numbers of redds, proportions of natural-origin adult salmon and steelhead). Do the proponents have explicit outcomes that can be developed and evaluated in coordination with OBMEP? Does the project assume that designing and implementing its restoration actions based on up-to-date landscape assessments, subbasin planning, regional recovery strategies and priorities, regional prioritization processes that have been reviewed extensively, and best management practices, make it unnecessary to develop quantitative biological and physical objectives? The ISRP also commends the proponents' development of a sound landscape framework for their restoration actions, but we encourage the proponents to develop explicit physical and biological objectives for specific projects where the intended outcomes have been identified during planning and design. This will be especially true as OSHIP becomes UCHIP with newly subsumed projects and expands into two new subbasins.

Q2: Methods

Project restoration actions are based on information and prioritization processes that are part of the Okanogan Subbasin Plan, Methow Subbasin Plan, Upper Columbia Regional Technical Team Biological Strategy, UCSRB Prioritization Web Map, Habitat Action Prioritization, and Okanogan and Methow Ecosystem Diagnosis and Treatment tools. The proposal refers to the Biological Strategy from 2017, but the most recent update is from 2019. It is not clear if the

project is using the most recent version of the Biological Strategy, but we assume they are doing so based on their participation in the RTT.

RTT (Regional Technical Team). 2019. A biological strategy to protect and restore salmonid habitat in the upper Columbia region. A report to the Upper Columbia Salmon Recovery Board. Previous versions in 2000, 2003, 2008, 2013, and 2019.

<https://www.ucsr.org/science-resources/reports-plans/recovery-plan/#>

The proposal describes overall methods and types of actions but does not describe the methods used or cite a document where the methods have been documented. If the methods have not been summarized in a document, we encourage the project to create a compendium of its most used methods as a basis for training future employees, collaborating with other groups, preparing future proposals, and recording the history of the project's action and evolution.

Q3: Provisions for M&E

The proposal indicates that projects have been evaluated using habitat analysis in EDT and biological evaluation of juvenile production and adult returns through OBMEP. The proponents indicate that future projects will be evaluated using results from OBMEP, but do not explain which projects, quantitative objectives or physical and biological outcomes will be monitored. The ISRP is asking the Upper Columbia Programmatic Habitat Project (201000100) to work with other projects like OBMEP and OSHIP to create an overview of the specific monitoring provided for each habitat restoration project. We ask the proponents of this project to work with Upper Columbia Programmatic Habitat Project and OBMEP to create this matrix and crosswalk of restoration actions and monitoring methods.

Under lessons learned, the project indicates it will reestablish side channels to be inundated seasonally during emigration (April thru July) only to reduce the amount of habitat for non-native species while maintaining some benefit to native salmonids of off channel habitat improvement. Would this negate the refuge benefit of floodplain reconnections and side channel creation during earlier winter floods? Are rain-dominated or rain-on-snow floods in winter substantial events under the hydrologic regimes of these streams? Is flood refuge during winter floods in these streams an important habitat function for native species, including anadromous salmonids?

Given that the project proposes to expand its geographical scope, it would be useful to describe how the project intends to coordinate with other major restoration projects in the Okanogan, Methow, Entiat, and Wenatchee basins. In particular, the proponents should describe their

plans to coordinate with the Upper Columbia Programmatic Habitat Project and the Upper Columbia Habitat Restoration Project.

Q4: Results – benefits to fish and wildlife

The proposal lists nine selected projects completed since 2007 but does not indicate how many projects have been completed in total or what was accomplished overall. It provides some quantification of the area, length of channel, changes in road density, numbers of screens, and barriers removed as part of some of the selected projects but describes other outcomes only generally. Biological outcomes are reported only as anecdotal observations of the presence of fish. Given the abundance of landscape-level habitat information, monitoring results, and body of scientific studies in the basins, the project should be able to describe the overall projected benefits to fish and wildlife based on its past actions and intended outcomes. The ISRP encourages the proponents to develop such a comprehensive assessment of their contribution to fish and wildlife to document the successes of the project and serve as a model for other projects and geographic areas.

200810200 - Okanogan Habitat Acquisition and Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Bonneville Power Administration

Province/Subbasin: Columbia Cascade/Okanogan

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The Okanogan Habitat Acquisition and Restoration project is an Operation and Maintenance project that maintains properties acquired by the Confederated Tribes of the Colville Reservation (CTCR) until they are incorporated into restoration and land management projects. Primarily, the project controls native vegetation or converts previous non-native plant communities to native vegetation and constructs/maintains fencing to protect lands until the CTCR incorporates the lands into their overall land management. As a result, it tends to fall between the CTCR Land & Water Acquisition Project and the Okanogan Subbasin Habitat Implementation Program (OSHIP or soon to be UCHIP). These lands and stream reaches might also be monitored by the Okanogan Basin Monitoring & Evaluation Program (OBMEP).

Currently, the project tends to convert and maintain the plant communities to native grass and herbaceous vegetation to reduce erosion, reduce or prevent invasion of non-native weedy plants, and fence properties and riparian areas. The project does not identify future ecological conditions for the sites and does not manage the property to move toward a desired ecological outcome for fish or wildlife. It uses agronomic practices and NRCS plant community types but does not implement long-term restoration of the properties.

The proposal provided by the proponents appeared to be in the midst of review, had not been well edited, and still included track-changes and numerous typos and grammatical errors.

The ISRP recommends that the project be subsumed within the OSHIP project to integrate the acquisition, maintenance, and restoration of acquired properties to meet the conservation goals of the CTCR. As such, it could continue to manage lands with BPA easements and transition their acquired conditions to long-term desired future conditions. OSHIP could provide an ecological framework for their management based on the habitat evaluation and prioritization framework it has developed for these basins. Furthermore, as with other OSHIP actions, the ecological outcomes of actions by this project should be evaluated by OBMEP.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Integrate with OSHIP.** Coordinate with the Land & Water Acquisition Project and OSHIP to integrate this project with OSHIP and create efficient coordination between land acquisition and incorporation into CTCR conservation programs.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan subbasins. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The ISRP wonders why the proponents have not proposed ecological objectives, either physical or biological, for the specific properties? While the overriding goal of the project is to replace invasive plant species with native plants to benefit native wildlife on lands acquired by the CTCR, how, where and when the proponents will accomplish that is much less clear. The objectives for the project simply are statements of actions and are not stated in the SMART objective format (see proposal instructions). For example, “Objective 1a Identify nonnative vegetative (*sic*) presents (*sic*) and how best to begin removal” (Proposal table page 3). As SMART objectives, this might be stated as:

- Obj. 1a. By May 2021 identify the presence of nonnative vegetation on 5 acres of land and determine the best method to remove the nonnative plants.
- Obj. 1b. Remove the nonnative vegetation on 5 acres and begin the reintroduction of native plants by September 2021.
- Obj. 1c. Complete the reintroduction of native plants and evaluate the success of the selected methods by July 2023.

These dates and specific actions are just examples and may not be reasonable for the project. Again, additional objectives with biological outcomes for the lands being managed are needed.

In the text, the proponents mention construction and maintenance of fencing and miles of fencing is shown in the table of results, but there is no mention of fencing in the objectives table.

Q2: Methods

The methods to remove nonnative plants and reintroduce native plants appear to be based on sound agricultural (scientific) methods. The photos in Appendix C (Proposal pages 15 - 20) illustrate how a specific project proceeded and required five years to complete successfully. Other methods that should be described are such things as: 1) How are parcels (Proposal, Appendix D) prioritized for action? 2) How is the decision made to use mechanical or chemical removal on a given plot? The ISRP is concerned that the description of herbicide applications simply indicates that the proponents are using poisons permitted by the BPA herbicide handbook. It does not describe any criteria for application based on pest management principles and determination of risks to native plant communities. Likewise, there is no description of how they develop the plan for the intended ecological outcomes. What are they trying to attain and how did they determine their intended outcome? What species are they

planting and why? Are they intended to provide specific ecological roles for nutrients, erosion control, soil formation, water efficiency, fire resistance, food for wildlife or aquatic communities? No information is provided other than they plant native plants and use techniques to make the planting successful in terms of survival.

Several BPA-funded projects implement similar actions to improve lands acquired as part of fish and wildlife mitigation. Coordination and interaction among these projects is encouraged as it would promote sharing of methods and lessons learned making each project more effective. Please see the report for other projects ([ISRP 2017-7](#)).

Q3: Provisions for M&E

The proposal does not include methods for monitoring and evaluating the work. The proponents state: “An evaluation of the project’s management strategies is continuous throughout the year of the contract cycle.” (Proposal page 5). This evaluation appears to be at the project management level as opposed to evaluating the outcome of on-the-ground actions to determine how successful the actions have been, but no information is presented to describe past implementation success. The photos in Appendix C show a successful project completed in 2017, but what has become of the land over the last three years? Have the native plants continued to thrive? Perhaps more importantly, has there been an increase in wildlife use of the area? Are the plant communities providing the intended ecological functions? The answer to this last question would require monitoring wildlife use before and after actions. Several years of before and after treatment actions would be needed for statistical validity. The proponents should describe their implementation monitoring methods, evaluation process, and reporting process for implementation success.

Q4: Results – benefits to fish and wildlife

The proposal does not summarize the overall benefit to fish and wildlife. It lists acres of chemical application, acres of mowing, miles of fence maintenance, miles of fence construction, and vegetation planting. These actions likely benefit fish and wildlife, but the proponents should describe the benefits in terms of functional or restored habitat and the likely response of fish and wildlife to those improved landscape conditions. Perhaps their collaborating partners could assist in preparing this overall summary of the benefits to fish and wildlife.

200302300 - Chief Joseph Hatchery Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Colville Reservation (CTCR)

Province/Subbasin: Columbia Cascade/Okanogan

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The Chief Joseph Hatchery Program encompasses the operation and maintenance of the hatchery as well as research, monitoring, and evaluation of the hatchery's summer/fall and spring Chinook programs. The proponents have well-defined and comprehensive in-hatchery standards for broodstock collection and survival, survival of green or eyed eggs to the smolt stage, disease monitoring, tagging, marking, and release numbers. In combination, the post-release goals for the project's four Chinook programs are designed to meet trust commitments and conservation needs. Issues preventing the project from consistently meeting program objectives have been identified (e.g., warm water leading to high pre-spawn mortality) and potential solutions have either been identified or implemented. This reflects an effective adaptive management process. The proposal is well written and organized, especially the section on goals and objectives. There are, however, some objectives that lack quantification and time specification (see Question 1 below). The project has been through the Three-Step Review required of new hatcheries, and ISRP questions and suggestions have been addressed during those steps. The proponents have developed a hatchery program with monitoring and evaluation elements that will enable the hatchery releases to meet objectives.

As described in section Q3 of this review, the relationship between several of the CTCR projects is unclear in the proposal. Specifically, on proposal page 51, the proponents state that OBMEP collects habitat data used in EDT modeling, but the responsibilities of each project are not clearly stated. The OSHIP project is proposing to expand their geographic scope and state that OBMEP will provide biological monitoring, but OBMEP does not mention this in their proposal.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Straying rates.** The proponents report straying rates (2% or so) from the perspective of emigration from the Okanogan basin but not from the perspective of immigration to

receiving basins. The immigration rates should be examined and reported in future annual reports.

2. **M&E matrix – support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Columbia River Programmatic Habitat Project (201000100) to summarize the linkages between implementation and monitoring projects in the Wenatchee, Entiat, Methow, and Okanogan basins. During the response loop, the ISRP ask this project to assist them and requests that the proponents of this project, OSHIP and OBMEP provide a brief description showing who collects what data, subcontracts the EDT modeling, relates this to VSP and uses the results to make management decisions for the projects.

Q1: Clearly defined objectives and outcomes

The Chief Joseph Hatchery program examines within-hatchery and post-release performance of the summer/fall and spring Chinook it produces. Although not presented as formal goals or objectives in the proposal, the project has clear within-hatchery standards for pre-spawn survival, fecundity, and survival rates across life stages during the rearing period as well as objectives for release numbers. These expectations meet SMART objective criteria. Data on within-hatchery performance has been collected since the beginning of hatchery operations for each of its four Chinook programs (Integrated NOR summer Chinook; Segregated HOR summer Chinook; Segregated spring Chinook; Integrated Methow Comp 10j spring Chinook).

However, there are issues with some objectives. As one example (proposal page 29), Goal 3 lacks a quantitative, time-bound objective. An example could be: Provide 100 Chinook for tribal harvest and 25 Chinook for non-tribal harvest by 2027. Similarly, other objectives (e.g., Objectives D, E, F) are not quantitative and time bound. Other objectives are repetitious, for example, Goal 7 and Goal 8 (which is repeated on the next page) are basically the same, although Goal 7 provides more detail. The ISRP encourages the proponents to develop SMART objectives for all project objectives to improve project evaluation and adjustment in the future.

Q2: Methods

Methods for the in-hatchery evaluations of performance are not described but descriptions of the procedures being used can be found in MonitoringResources.org, annual reports and the Fish Cultural Manuals (Volumes I & II) developed for the hatchery. A link to the project's annual reports provides more details on project methods. Suitable summaries of the methods in the

project's Rotary Screw Trap (RST), juvenile beach seining and PIT tagging, adult weir, spawning ground survey, creel survey, Coded-Wire laboratory, eDNA, genetic monitoring, and database operations are presented. All methods appear to be scientifically valid. We note that straying rates for project fish are only reported as the percentage of project fish that strayed into other subbasins. This metric measures the loss of hatchery fish to their expected destination, but not the potential genetic cost of straying to adjacent populations, which needs to be measured.

The project also has developed a database that could be used by staff to archive historical data, maintain current data, and be used by biologists and managers to quickly summarize information. It is not clear whether the database is available to the public, either openly or by user-generated requests. If not, we encourage the proponents to make their data available to the extent possible to benefit managers and researchers throughout the Columbia River Basin.

Q3: Provisions for M&E

The project's Annual Program Review process is used to identify issues where adaptive management or changes in operations may be needed. At this meeting, a series of key management questions are asked. Answers to these questions are used to guide upcoming operations. The process appears to be robust, contains a formal structure, and uses an established tool (ISIT) to help with broodstock collection rates.

The proponents identify climate change as a potential confounding factor. They indicate that the hatchery will attempt to ensure that the natural environment drives adaptation rather than the hatchery. This is a sound strategy. Additional considerations could include identification of hatchery-related risks to wild populations if numbers of Chinook and steelhead continue to decline. The proposal also acknowledges floods, drought, extreme temperatures, wildfire, and invasive fish as additional confounding factors. While these factors are identified, the proposal does not indicate how the project would respond or adapt to them. The ISRP encourages the project to develop adaptive adjustment alternatives for these confounding factors as anticipatory steps rather than reactive responses after the fact. The proponents provide a more thorough discussion of in-hatchery confounding factors, such as disease and decreases in fecundity.

The Chief Joseph Hatchery Program relies on the Okanogan Basin Monitoring & Evaluation Program (OBMEP 200302200) to provide habitat metrics used in EDT modeling, which in turn is used to indicate the status of salmonids in the Okanogan basin relative to VSP criteria. Okanogan Subbasin Habitat Implementation Program (OSHIP 200722400) also cooperates with the hatchery program. All these projects are part of the CTCR Anadromous Fish Division, but it is not clear what the relationship will be going forward. OSHIP is proposing to expand their

geographic reach to include the Entiat and Wenatchee basins and become the Upper Columbia Habitat Implementation Project (UCHIP), but OBMEP does not mention that they will be assuming additional monitoring in their proposal. As these projects are interrelated, it is important that the proponents of each project understand and accept their responsibilities to each other.

Q4: Results – benefits to fish and wildlife

The proposal clearly presents the results of the project and describes the relative success of the project in meeting quantitative biological targets in detail. The benefits to fish and wildlife are described clearly. The primary purpose of the hatchery program is to meet trust obligations by providing harvestable fish for ceremonial, subsistence, and cultural functions. Simultaneously the hatchery is serving an important conservation goal by augmenting the abundance of summer/fall Chinook and reintroducing spring Chinook back into the Okanogan subbasin. The hatchery program consists of 2 million summer/fall and 900,000 spring Chinook. Pre-spawning mortalities and lower than expected fecundities have kept the hatchery from meeting this release goal. Nevertheless, the project is providing substantial cultural, harvest, and conservation benefits. The project's monitoring and evaluation program is focused on such metrics as keeping the number of hatchery strays and the proportion of hatchery-origin spawners (pHOS) on the Okanogan basin spawning grounds low. There are, as yet a small number of returning adults but it is expected that, in time, the project will meet its goals. When the hatchery goals are met, excess production of summer/fall Chinook might become a donor stock for reintroduction into blocked habitat above Chief Joseph and Grand Coulee dams as was noted by the Independent Science Advisory Board ([ISAB 2019-3](#)).

199604000 - Upper Columbia Production Projects

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Yakama Nation Fisheries Resource Management

Province/Subbasin: Columbia Cascade/Methow, Columbia Cascade/Wenatchee

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP has specific recommendations and comments for each of the major components. The ISRP recommends the following conditions be addressed in the next annual report and future work plans (details provided below):

- Part-1: Coho Reintroduction: Meets Scientific Review Criteria - Conditional
 - Modify Objectives and Tasks
- Part-2: Spring Chinook and Steelhead Acclimation: Meets Scientific Review Criteria - Conditional
 - Modify Objectives and Tasks
 - Project Evaluation and Adjustment - Adaptive Management
- Part-3: Kelt Reconditioning: Meets Scientific Review Criteria

Part-1: Coho Reintroduction

In our initial review of the Upper Columbia Production Projects: Mid-Columbia Coho Reintroduction project (199604000), the ISRP requested more information on 1) the objectives and tasks planned over the next funding period, 2) the methods used to conduct M&E activities, and 3) the adaptive management process employed by the project. A revised proposal was submitted that partially addressed our requests. Some shortcomings in the proposal remain, which we have highlighted and identified as conditions.

Modify Objectives and Tasks:

Condition: In the next annual report and work plan, provide SMART objectives that describe planned tasks (implementation objectives), metrics used to evaluate their completion, and expected timelines for each task. This needs to be completed so that annual work performed by the proponents in each subbasin can be clearly delineated and assessed. We encourage the proponents to revise their proposal to include SMART objectives to provide a record of changes made.

Comment: Overall, the proponents have made impressive progress in their reintroduction efforts. They have established productive partnerships with local PUDs, private landowners,

ODFW, WDFW, and the USFWS that have helped them accomplish parts of their five-phase program to reintroduce coho into the Wenatchee and Methow subbasins. The reintroduction effort in the Methow is now in the fourth or Natural Production Supplementation Phase. Efforts in the Wenatchee subbasin are not as far along. In this subbasin, it remains in the second phase (Broodstock Development Phase 2) as attempts to establish broodstock that can migrate over Tumwater Falls are still ongoing.

We requested and anticipated that the proponents would develop and use SMART objectives to identify annual tasks linked to specific goals of their overall reintroduction plans for the Wenatchee and Methow subbasins. Instead, additional information was added to Tables 3.1 (“Wenatchee Basin program overview”) and 3.2 (“Methow basin overview”) that provide further clarification on the project’s overall goals for the upcoming funding period. Goals for broodstock numbers, types of adults to collect (origin and maturation status) and collection points, abundance objectives for juvenile releases, and within subbasin release locations for the Wenatchee and Methow subbasins, for example, were included in the new text.

Although this text is informative it does not provide SMART objectives or a chronological overview of the work that the project plans to complete on an annual basis during the new funding period or over the long term. No specific or measurable outcomes are clearly articulated. Implementation objectives for the project, which were specifically requested, are missing. For instance, in the Wenatchee subbasin, it is unclear if project personnel are responsible for collecting and transporting adults collected at the Dryden Trap and at Tumwater Dam to holding areas (e.g., Peshastin Incubation Facility, Leavenworth National Fish Hatchery). Further, it is unclear if the proponents will monitor adult survival and participate in spawning and incubation work at these sites, or whether other partners will perform this work. The Master Plan indicates eggs will be incubated to the eyed stage at each adult holding site. Have fertilization and green-egg survival targets been established and if so, will the proponents be responsible for collecting these data? At the eyed stage, collected eggs are transported to lower river hatcheries (Willard NFH, Cascade Fish Hatchery) for rearing to the pre-smolt stage prior to their eventual release in the Wenatchee subbasin. The task(s) that the proponents will be responsible for during this phase should be delineated along with those linked to the release of juvenile coho into the Wenatchee subbasin.

Text added to the bottom of Table 3.1 indicates that a project goal is to establish an over-wintering acclimation site (Trinity) located on the Chiwawa River in 2023. Planned work at this site includes the installation of three above-ground circular tanks, an evaluation of water quality, a pilot rearing program, and eventual releases of coho smolts from this site. Additionally, it appears that efforts will also be expended to increase the number of acclimation sites in the Wenatchee subbasin over the next funding period (e.g., in Nason Creek, White River, and Little Wenatchee River). It is not clear, however, if the proponents will be solely

responsible for this work or if partners will participate as well. Similar questions exist about what tasks the proponents will be accountable for in coho reintroduction efforts taking place in the Methow subbasin.

Explanation of Methods:

Adequately addressed. The ISRP appreciates the enhanced methods section with the detailed explanations provided in the revised proposal.

Project Evaluation and Adjustment - Adaptive Management Process:

Additional text was added to further clarify the adaptive management process the project is currently using. This text indicates that annual calculations of metrics that evaluate the biological performance of project fish are routinely made and compared to project norms. For example, Recruits/Spawner for both NOR and HOR fish, SAR values, and smolt-to-smolt survival rates from a release location to various downstream locations, and so on are annually ascertained. One thing this approach does not easily do, however, is track whether yearly tasks or implementation objectives are being met and whether improvements in these protocols are needed. Adding an annual list of SMART implementation objectives as subheadings under the relevant primary objectives for the project's work tasks, as suggested above, will provide the proponents and reviewers an opportunity to see if tasks are completed as expected or if modifications to existing protocols are needed to meet objectives.

Part-2: Spring Chinook Salmon and Steelhead Acclimation

In our original review of this portion of this project, we found that the project's two primary objectives were clearly presented. However, linkages between these objectives and many of the qualitative desired outcomes of the project (e.g., improving VSP parameters and refining supplementation efficacy) were needed.

Modify Objectives and Tasks:

Condition: Provide a table in the next annual report showing the tasks each partner (i.e., the PUDs, WDFW and USFWS) is expected to perform under each objective or research question. This table should also be included in future project proposals.

Comment: Revised text added to the Goals and Objectives, Methods, a new detailed Timeline, and an added Appendix substantially clarifies project goals and objectives. As it is now presented, the project has three clearly defined objectives to: a) determine if short-term acclimation in rearing ponds can alter the spawning ground distribution of hatchery origin spring Chinook Salmon and steelhead, b) ascertain the proportion of acclimated fish that home back to their original rearing facility as opposed to their acclimation site, and c) compare performance metrics (growth, condition, pre- and post-release survival, and SAR values) of

acclimated and reference groups of non-acclimated fish. Linkages between the project's results and the overall goal of supplementing spring Chinook Salmon and steelhead in both the Methow and Wenatchee subbasins are clear.

The revised Timeline provides a useful overview of planned work, when it is scheduled to take place, and where it would occur. The new Appendix plus the revised text placed into the Goals and Objectives, and Methods sections of the proposal provides necessary details on data acquisition and analysis.

Project Evaluation and Adjustment - Adaptive Management:

Condition: The process being used for annual within-project reviews should be described in the next annual report. If such a review does not occur, we urge the proponents to establish such an annual process because reviews and modifications to implementation objectives and adjustments of management approaches are important parts of the adaptive management cycle.

Comment: The revised proposal indicates that Douglas, Chelan, and Grant PUDs, WDFW, USFWS, Yakama Nation, Colville Tribe, National Marine Fisheries Service with their associated Hatchery Committees (e.g., Wells and Rock Island/Rocky Reach HCP and Priest Rapids Coordinating Committee Hatchery Sub Committee) review and approve the project's efforts and thus are providing important oversight and adaptive management services. What is missing is a brief description of how the project reviews and modifies its own implementation objectives. For example, does the project annually conduct an internal review of the protocols used by the project to gather and analyze data, identify needed improvements, or implement tasks like transporting and releasing fish into acclimation sites?

Part-3: Kelt Reconditioning

Suggestion for improvement: Consult with a statistician, internally or externally, to help design and identify a method to ensure appropriate evaluation of variables influencing kelt survival.

Comment: Answers to specific questions and requests for further information were aptly addressed by the proponents. The proposal has three objectives: a) to collect and recondition steelhead kelts, b) expand the release of reconditioned kelts into the Wenatchee subbasin, and c) evaluate the importance of a suite of factors on kelt survival during the reconditioning period. The locations and collection targets for NOR kelts in the Methow and Wenatchee subbasins and mainstem Columbia were identified. The second objective of the project describes future steps that will be taken by the project to initiate the release of reconditioned NOR steelhead kelts into the Wenatchee subbasin. The proponents indicate that three conditions need to be met before this part of the project can occur. First, WDFW and Chelan County PUD must agree to live-spawn steelhead at their hatcheries. Currently, live-spawning of

steelhead occurs at the Winthrop National Hatchery and NORs among these fish have become important targets of reconditioning by the project. Second, the Rocky Reach hatchery committee will need to approve the expansion of kelt reconditioning into the Wenatchee subbasin. And finally, a reconditioning facility adjacent to WDFW's Eastbank Hatchery will need to be designed, built, and tested (2023-2026) before full project expansion can occur.

The project's last objective is to evaluate the importance of several factors on kelt survival during the reconditioning phase: fish age, fork length, date collected, somatic body fat percentage at collection, and type of prophylaxis used to treat copepod infestations. Ideally, the potential role of these factors should be looked at simultaneously. We recommend that the proponents contact a statistician to help them design and identify a method that can be used to make such an evaluation. They also indicate that they will be evaluating when mortality occurs, and whether it arises more often during initial reconditioning (first 120 days) or more often during the last 120 days a fish is held. It is likely that some of the factors that they are examining above are also linked to when a fish may die while being reconditioned. Again, the help of a statistician is advised to determine the best way to examine this issue.

Finally, in our initial review of this project, we asked several specific questions. For example, how will the stock origin of reconditioned kelts be identified, where will the fish be released, will skip spawners be held for another year prior to release, and what might account for a recent decrease in overall survival rates during reconditioning? New text added to the proposal provides suitable answers to these questions.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The ISRP commends the YN for its continuing efforts to reintroduce coho salmon and recover and enhance spring Chinook salmon and steelhead in the upper Columbia River Basin. This proposal encompasses this work by combining three separate proposals. One proposal describes efforts to reintroduce and create locally adapted, naturally reproducing coho populations in the Wenatchee and Methow river subbasins. Another is exploring the benefits of using acclimation ponds to expand the spawning distribution patterns of spring Chinook in the Methow and Wenatchee subbasins. And the third project is investigating whether reconditioned natural origin (NOR) steelhead kelts can be used to increase productivity in upper Columbia River steelhead populations. The overall goals, general objectives, and justifications for these projects are generally described. Additionally, results produced from each project appear promising and efforts have been made to work with regional partners for the

acclimation pond and kelt reconditioning projects. The ISRP recognizes that the creation of such partnerships can be challenging and time consuming. Nevertheless, as in these two projects, they can bring about substantial biological benefits and cost savings.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

- **Modify objectives.** In all three proposals, details on the implementation objectives that are planned for future work are missing. The acclimation proposal presents multiple goals that include enhancing homing, improving VSP status of spring Chinook and steelhead, and improving efficacy of supplementation. No objectives are provided with these goals. Please modify the objectives to address the deficiencies highlighted below.
- **Explanation of methods.** In the coho reintroduction and acclimation projects, the methods being used in each of the monitoring and evaluation tasks need to be explained more completely.
- **Project evaluation and adjustment.** The adaptive management process is described generally for each project, but more information is needed on adaptive management in the coho reintroduction and acclimation pond projects. See below for further details.

Q1: Clearly defined objectives and outcomes

Coho Reintroduction: The overall goals, general objectives, and anticipated cultural and ecological benefits of the proponents' efforts to reintroduce coho into the Wenatchee and Methow subbasins are clearly described. Specific escapement objectives for natural origin coho in both subbasins are presented along with desired harvest rates on project coho. Additionally, management goals and brief descriptions of the strategies used to sequentially move the project from its initial stages to a final desired biological state are presented in two tables. One for each subbasin. These tables along with descriptions of the overall goals provide a general overview of the project. Yet, connectivity between the goals and objectives is poor, and details on the objectives and tasks that are being planned for the next funding period are absent. The Timeline provided a list of in-season activities that helped add some clarity by identifying generic tasks and by indicating when they are scheduled to take place. But specifics on the implementation objectives that will be employed to accomplish these tasks are missing and need to be added to the proposal as SMART objectives.

Steelhead & Spring Chinook Acclimation: The proposal presents multiple goals that include enhancing homing, improving VSP status of spring Chinook and steelhead, and improving

efficacy of supplementation. The project's two objectives – to test whether several salmonid species can be simultaneously held and reared in acclimation sites without impacting their growth and survival, and to determine if acclimation sites can be used to expand the spawning ground distribution of returning adults – are clearly presented. Yet, they do not address many of the qualitative desired outcomes presented in the project's goal statements, especially those for improving VSP parameters and supplementation efficacy. Additional objectives are clearly needed. The Methods Section describes how both objectives will be evaluated, but annual implementation objectives are also needed that include specific quantitative desired outcomes and timelines as well as an indication of where and when acclimation research will occur during the project's new funding period. It appears, for example, that work will continue at the Goat Wall acclimation site (Methow subbasin) and that similar efforts will also take place in the Wenatchee subbasin and in other sites in both subbasins.

Access to fish and acclimation sites depend on partnerships and agreements between the project, local PUDs, the USFWS, and WDFW. Consequently, some uncertainty may exist on where new work will occur. Nevertheless, for completeness, the sites where work is currently planned need to be identified in the proposal. The ISRP recognizes that additional sites may be added, or some may be dropped as the project progresses.

Kelt Reconditioning: The project's overall goal of reconditioning natural origin kelts to help recover depressed populations of steelhead in the upper Columbia River is clearly presented. Justification for the proposed work is satisfactorily presented. Background material, for example, indicates that naturally breeding populations of steelhead in the upper Columbia are not self-sustaining and may face extinction unless substantial increases in productivity can be achieved. The proponents are investigating whether reconditioned kelts can be used to increase productivity in naturally spawning populations of steelhead. The project's general objectives have evolved. Initially work was directed toward determining how best to recondition kelts and to collaborate with other projects to assess the breeding success of naturally spawning reconditioned kelts. In this proposal, three additional objectives have been added. One of them meets SMART objective criteria in that it provides a measurable and time-bound objective. With some additional thought, the other two objectives, to expand the reconditioning project into the Wenatchee subbasin, and to continue performing research on reconditioning methods, could be recast as SMART objectives. In addition, the three research questions need to be revised as specific hypotheses to be tested or specific monitoring questions. As stated, they do not provide clear enough direction to guide the studies or evaluate success. We recommend that these proposal modifications be done as it will help the project's adaptive management process and provide structure to annual work plans and actions.

Q2: Methods

Coho Reintroduction: A succinct overview of the M&E objectives of the project is provided in the table that lists M&E activities/tasks, what they are measuring, when they are expected to occur, and whether other programs or agencies will participate. The methods used to carry out each M&E activity, however, are not fully described or explained. Instead, key words like PIT tags, predation control, etc. are used to represent the strategy or approach that will be used to carry out the M&E activity. For completeness and clarity, clear and detailed descriptions of the methods being used to accomplish each M&E objective and task are needed to ensure that valid methods are being employed. There is little information provided to understand the spatial and temporal scale of the monitoring, the metrics, field collection methods, or statistical analytical approaches. If final protocols are published in Monitoring Resources, they should be cited.

Steelhead & Spring Chinook Acclimation: General descriptions of the methods that will be used to evaluate the effects of an acclimation period on juvenile and adult performance are provided. Null hypotheses and the statistical procedures used to test them were also shared. The approaches taken for these two objectives appear to be appropriate. There are no methods provided for assessing project success in improving VSP status or efficacy of supplementation. We do offer one suggestion for the proponents to consider when comparing the spawner distributions of adults originating from hatchery and acclimation site releases. A two-sample Kolmogorov-Smirnov test can be used to detect differences in location (central tendency) dispersion, and skewness. The test could be used on redd as well as female carcass locations.

Kelt Reconditioning: Adequate descriptions of the methods being used to capture, recondition, and evaluate both in-hatchery and post-release performance are provided. In addition, details describing how reconditioned kelts were compared with maiden NOR spawners were well described. The methods being employed are scientifically appropriate.

Q3: Provisions for M&E

Coho Reintroduction: The M&E activities of the project have been split into three categories, “project performance,” “species interactions,” and “genetic adaptability.” Project performance activities are used to examine how well introduced coho are surviving, ascertain whether hatchery protocols should be modified, and assess the impacts of harvest. Those examining species interactions evaluate the impact of introduced coho on native fishes. Genetic adaptability will be monitored to determine if a local broodstock has been created, one that is distinct from lower Columbia River stocks. Past monitoring and evaluation results have been used to adjust project methods, objectives, and goals. Project objectives are scheduled to be

reviewed every six years (or two coho generations). This is a well thought out approach. Some description of the adaptive management process being followed, however, is needed. How, for example are decisions to make changes made, who makes them, and how is new work proposed and approved.

Steelhead & Spring Chinook Acclimation: The proponents have successfully compared physiological, morphological, and behavioral performance of fish reared and released from acclimation sites to that of fish released directly from hatchery locations or direct plantings. Results from these comparisons have been used to adjust future work. It became clear, for example, that large differences in size-at-release targets for steelhead (57-75 g), coho (25-28g), and Chinook (25-28 g) juveniles made it impractical to co-mingle these species at acclimation sites. Because of the project's monitoring tasks, information from future work is well suited for an adaptive management process. It is unclear, however, if a regularly occurring adaptive management cycle occurs, and if so, who might participate in the process. The proposal indicates that a review of project results over the past five years will occur in 2021. Will project partners, e.g., Grant, Douglas, and Chelan PUDs and other parties participate in this review process? Additionally, no information is provided on how the project reviews its own methods and determines if changes are warranted. Both processes should be briefly described.

Kelt Reconditioning: The proponents provide an acceptable description of how within project actions are examined on an annual basis and modified if needed. They also participate in biannual meetings with other regional kelt reconditioning projects where findings are shared and refinements to existing methods are discussed. In combination these procedures provide the project with an appropriate adaptive management cycle.

One of the key information needs of the project is estimating the reproductive success of reconditioned kelts. This was beyond the scope of the project, so the proponents partnered with a WDFW project that is comparing the reproductive success of NOR, HOR, and reconditioned kelts in the Twisp River. The ISRP commends the proponents of both projects as these types of arrangements reduce redundancies and costs while maximizing information gains.

Q4: Results – benefits to fish and wildlife

Coho Reintroduction: The proposal provides a summary of the progress made on efforts to reintroduce coho to the Wenatchee and Methow subbasins. One key accomplishment has been the continuing development of a locally adapted broodstock. Coho had been extirpated from the Wenatchee and Methow subbasins. Consequently, lower Columbia River coho were originally used as broodstock, but fish originating from the project have become numerous

enough so that it has been possible to exclusively use coho returning to both subbasins as broodstock. It is unclear, however, if separate broodstocks, one for each subbasin, are being developed. The creation and use of basin-specific broodstocks would likely speed up local adaptations and move the project more rapidly toward its abundance goals. Coho have successfully spawned in both subbasins and their spatial distribution within the subbasins has been expanding. Studies that looked at possible losses of juvenile spring Chinook and sockeye due to coho predation were completed and indicate that predation on both species is limited. Superimposition of coho redds on spring Chinook salmon redds was also evaluated and found to be insignificant.

One challenge the project has faced in the Wenatchee subbasin is getting naturally spawning coho through the Wenatchee Canyon and over Tumwater Falls. Substantial amounts of rearing habitat are available above the falls, and thus this portion of the Wenatchee subbasin is an important colonization target. Currently, a selective breeding program is underway that is designed to produce coho adults that can reach Tumwater Falls and spawn naturally in that part of the subbasin.

In general, the project is meeting its objectives and providing cultural, harvest, and ecological benefits. It was assumed that the lower river hatchery coho stock used as the founding population had enough genetic variation for successful adaptation to very novel conditions. This appears to be true. However, to maximize long-term project benefits it is important to be patient and allow natural selection to operate separately on the fish returning to the two subbasins.

Steelhead & Spring Chinook Acclimation: The project's evaluations of acclimation ponds as tools to enhance homing fidelity and guide returning adults to favorable spawning areas will be of interest to many across the entire Columbia River Basin. Initial results indicate that two species can be held in the same acclimation sites without adverse effects if rearing and growth patterns can be coordinated. Size differences can be accommodated if rearing areas in the same acclimation pond can be segregated. Because acclimation sites are a limited commodity, the practice of rearing two or more species simultaneously in the same pond helps increase rearing opportunities without the need for additional facilities. Early results of the project have prompted other agencies in the upper Columbia to co-mingle species in their acclimation programs. The project has used fish per pound (fpp) as a metric to compare growth rates between acclimated juveniles and juveniles reared in hatchery ponds. This is a poor metric that should not be used to compare growth. A change of 6 fpp for fish that are 20 fpp represents a much different growth rate than a change of 6 fpp for fish that are 10 fpp. Use grams per fish when assessing and comparing growth rates.

Short-term holding in acclimation sites also appears to affect subsequent adult spawning areas. Preliminary results from fish acclimated at the Goat Wall acclimation site have led spring Chinook to spawn in more favorable habitat than those released from the Winthrop and Methow hatcheries. In summary, the project results are helping to emphasize the conservation, recovery, and potential harvest benefits that can be realized by using suitably sited and managed acclimation sites.

Kelt Reconditioning: Study findings showed that kelts leaving upper Columbia River subbasins had extremely low return rates (~1%) as spawners. Conversely, approximately 50% of the kelts undergoing reconditioning survived and approximately half of these released fish were detected during the spring spawning season. The decreasing trend in survival and maturation from 2013 to 2020 is not discussed in the proposal. What are the causes of this decreased performance? Measurements made on the fish prior to release showed that the project's reconditioned kelts had greater condition factors (K) and fat levels than maiden NORs. It is hypothesized that these differences may provide reconditioned kelts with higher over-winter survival rates than maiden NORs. Additionally, levels of estradiol in reconditioned kelts and maiden NORs were not statistically different suggesting that both were in similar stages of maturation six to seven months prior to the spawning season. Recent breeding success results produced from the Twisp River project showed reconditioned kelts had produced offspring at a rate equal to or slightly greater than maiden NORs and HOR females. These results show the promise and potential benefits that the reconditioning program may offer to steelhead populations in the upper Columbia River.

The proposal indicates that a next step for the project is to begin a reconditioning program for the Wenatchee subbasin. Kelts intercepted at Rock Island Dam will apparently be targeted for this effort. Since this work is planned for the next funding period, the proposal should address the following questions: How will the stock origin of the intercepted kelts be determined? They could be from the Wenatchee subbasin, but they could also come from other subbasins above the dam. Where will these fish be released? If they are released in the reservoir above Rock Island Dam, the fish will likely home to their spawning areas. Some of these fish will undoubtedly be skip spawners. It is not clear when skip spawners are released by the project. Are they held for an additional year?

Lower Snake, Tucannon, and Asotin Rivers

200740100 - Kelt Reconditioning and Reproductive Success Evaluation Research

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Inter-Tribal Fish Commission

Province/Subbasin: Columbia Plateau/Snake Lower

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proponents provide an excellent summary of their research and evaluation of steelhead kelt reconditioning. When the project first began in 2000, little was known about how to recondition steelhead kelts. The project's initial research focused on how to collect kelts, and how to successfully rear them, appraise their maturation status, and when (seasonally) and where (in the Columbia River Basin) they should be released. In earlier reviews of the project, the ISRP raised four questions:

- What benefits do reconditioned kelts provide to receiving populations?
- What is the reproductive success of reconditioned kelts?
- What do we know about the physiology of kelts, and how does that knowledge inform project decisions?
- What is the homing fidelity of reconditioned kelts?

The proponents have made substantial progress in answering all these questions over the past decade.

The proposal makes it clear that possible refinements in fish husbandry and release strategies will be evaluated over the next funding period. Releases of reconditioned kelts will also continue to occur in the Snake and Yakima river subbasins. However, at this point the project is ready to shift into production mode and broader management application once additional holding facilities for kelts have been constructed. We suggest that existing genetic tools be used to identify the population origins of collected kelts. This information, particularly in the Snake subbasin, could be used to further test homing fidelity. More importantly, however, it may allow for focused kelt enhancement efforts in populations where the number and diversity of adult spawners have been persistently low and in populations where adult-to-smolt increases in productivity seem possible. Ideally, spawner-recruitment curves would be used to help identify

and prioritize populations where kelt reconditioning could be most beneficial. Understanding extant spawner recruitment relationships would help alleviate possible density-dependent effects and provide the greatest benefits with the least risk of possible density-dependent effects.

Although this is a high performing project and a well-written, sound proposal, there is a need for more specificity in the goals, objectives, and methods related to transferring the kelt reconditioning technology to other populations and areas on a management scale. There were no details provided, and this is a critical step for the project that will influence its overall success.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Kelt reconditioning on a management scale.** Please develop a plan for this process including the co-manager entities that should be involved to ensure basinwide needs and considerations, the criteria (population status, unique life history characteristics, habitat conditions and trends, climate change resilience, etc.) to assess highest priority populations and locations for implementation, capacity scale and scope, and a timeline. Include this plan as a chapter in the next annual report.
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this kelt project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The project's overall goal is clearly described: to investigate the potential use of reconditioned natural origin kelts to increase the abundance, diversity, productivity, and stability of steelhead populations. The overarching goal directly addresses the problem of severely depressed rates and proportions of repeat spawning steelhead in most natural steelhead populations in the

Columbia River Basin that has resulted from construction and operation of dams. Repeat spawners play an important role in the population dynamics of steelhead. When the project first began, there was little known about how or if steelhead kelts could be reconditioned for release as potential future spawners or if the release of such fish would provide any benefits to receiving natural populations. The proponents created four sub-goals to guide investigations to determine if kelts could be reconditioned and to examine the potential benefits and risks of using this strategy. Under each of these subgoals, two to four general objectives were established to direct future work. Extensive progress has been made on accomplishing all the project's general objectives. The proposal demonstrates excellent continuity and connectivity from the problem statement through the goals and objectives.

SMART objectives were not used in the proposal, and thus specifics on work planned for the next funding period and when tasks were expected to be completed were not readily apparent. Details in the Methods and Timeline portions, however, clarified the new and ongoing work being proposed. A fifth sub-goal, "Project Wrap Up" and its objectives helped identify tasks that will commence once planned facilities designed for kelt reconditioning are built. These new facilities are expected to be completed and functioning between 2023-2025.

There is a need to provide more specificity related to Goal 5, Objective 5.3, which identifies the plans for transferring kelt reconditioning technology to additional populations and subbasins. A more comprehensive description of the planning and implementation process that will be used is needed.

Q2: Methods

The methods used to achieve most of the project's sub-goals and associated objectives are comprehensively described and scientifically valid. In a few instances – e.g., controlling fungal infections on kelts during reconditioning – new methods will be tried to determine if further improvements in kelt survival can be achieved. The methods used by the proponents to capture kelts, transport them to reconditioning facilities, recondition them, release, and evaluate post-release performance are well established and have been derived from careful comparative studies. A more complete description of the process and criteria the proponents plan to use to identify high priority populations and locations for transfer of the kelt reconditioning approach on a management scale is needed. Clearly, this will need to be a multiagency co-manager effort.

Q3: Provisions for M&E

The project regularly reviews the effects of its hatchery operations on kelt survival, growth, and physiological status while the fish are undergoing reconditioning. It also performs studies that

examine the post-release performance of project fish. For example, the project evaluates homing and straying rates and the relative reproductive success of reconditioned kelts.

No description of a broader scale formal adaptive management process is given, but opportunities for project adjustments occur on a regular basis. Twice-yearly meetings among collaborators, for example, are used to report progress and to propose changes in methods or protocols. Additionally, CRITFC commissioners receive project updates, review the project's annual work plan, and provide advice on project goals and objectives. During 2008-2019, RPA Action (#33) required the Corps of Engineers and BPA to produce annual Snake River Kelt Management Plans in conjunction with NOAA Fisheries. The proponents provided project data and assisted in the development of these plans, which included an adaptive management component that guided future work and anticipated infrastructure needs during those years. The project has many lessons learned that have been used to make important project adjustments.

Q4: Results – benefits to fish and wildlife

Since the advent of the kelt reconditioning program in the Yakima subbasin, adult productivity is trending upward relative to other steelhead populations located above Bonneville Dam. The proponents acknowledge this could be due to their kelt program, to ongoing habitat restoration, or a combination of these factors. What is likely, though, is that the kelt reconditioning efforts in the Yakima and Snake River subbasins have increased the number and life-history diversity of adult steelhead spawning naturally. Evaluations of the reproductive success of reconditioned kelts released into the Yakima subbasin showed that they produced progeny under natural conditions and that their lifetime-reproductive success was generally higher than that achieved by fish that had just one spawning season. The proponents also evaluated the homing fidelity of reconditioned steelhead to their natal subbasins and to spawning locations within a subbasin. Stray rates were less than 1% (5/948) for subbasin homing and no within-subbasin strays (0/137) were detected. Consequently, judicious releases of reconditioned kelts are expected to provide conservation benefits by enhancing spawner abundance, increasing genetic diversity, and promoting population stability. Additionally, the proponent's comprehensive physiological assessments made on kelts and rainbow trout helped develop protocols that are now being used to capture, rear, recover, and successfully release reconditioned steelhead kelts.

The broader recovery, conservation implications, and potential application of kelt reconditioning are well described. The project has a strong record of information sharing as illustrated by numerous publications and professional presentations. The decision to construct

new facilities and to expand the implementation of this approach are strong demonstration of the project's accomplishments and relevance.

201007700 - Tucannon River Programmatic Habitat Project

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Snake River Salmon Recovery Board (SRSRB)

Province/Subbasin: Columbia Plateau/Tucannon

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our initial review, we asked the proponents to provide an M&E Matrix to summarize the linkages between implementation and monitoring projects in the subbasins. They provided a thorough summary of M&E efforts in the Tucannon subbasin and linkages between implementation and monitoring projects in their response. They explain their coordination with other partners, the Asotin Creek IMW, development of critical studies, use of prior data, development of HSI with CTUIR, data storage with the CTUIR Centralized Data Management System, and creation of a web map. The response also explains the linkages between the habitat implementation projects, hatchery projects, and monitoring elements for each. The proponents provided five maps that identified the location and type of monitoring throughout the subbasin. In addition, they produced a matrix of the M&E activities in the subbasin for 17 BPA-funded projects, which describes the types of monitoring actions, locations, timing of monitoring, and projects responsible for the monitoring. They also created a table that identifies the M&E actions associated with 27 project areas that are currently ongoing. The table includes information on the biological and physical components that are monitored, the timing of the monitoring, and the project sponsors. Working with their partners, the Tucannon River Programmatic Habitat Project coordinated the development of a thorough and informative summary of M&E activities in their subbasin and the linkages between monitoring and implementation and hatchery projects. The framework should serve as a valuable foundation for their continued collaborative efforts and provides a useful model for other proponents to follow to summarize M&E activities.

The thoughtful response from the proponents on linkages between physical habitat restoration and fish population response, however, highlights a key confounding issue:

“Hatchery management for both spring Chinook and steelhead have recently played an important role in maintaining the populations and in meeting NOAA ESA criteria, but these

actions have limited the value and ability to conduct biological monitoring as a response to habitat improvements made through the Program or to continue the work initiated by Crawford (2019).”

It is important for decision-makers to understand that implementing multiple management actions at the same time (changes in hatchery production and habitat restoration) may make it difficult or impossible to separate their individual effects, especially if all hatchery fish are not marked or tagged. In other words, benefits of habitat restoration will be much harder or impossible to quantify, thus complicating decisions on future investment in habitat or hatchery projects. Many marked and unmarked steelhead from other watersheds enter the Tucannon River each year, which complicate evaluations according to WDFW. Regardless, we encourage investigators in the Tucannon watershed to monitor trends in abundance and productivity of natural origin steelhead and Chinook salmon.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

This proposal does a thorough job of describing the hierarchy of objectives, the history of actions and accomplishments, the methods, and the project evaluation and adjustment process. Based on the documentation of habitat improvements and the insightful discussion of lag effects, high flows, and climate change, the implementation of habitat work and its physical effects on fish habitat are being well evaluated.

Our only major concern with the proposal is that monitoring, evaluation, and adjustment is restricted to physical metrics (e.g., LWD, pools, flood plain reconnection, substrate). The ISRP expects projects that focus on restoration of fish habitat to be closely collaborating with projects that monitor fish populations and to demonstrate this collaboration by providing some details about the response of targeted fish populations to habitat improvements.

Unfortunately, there is no mention of measurements of biological conditions and processes such as fry and parr densities, egg-to-fry survival, or juvenile growth rates in the proposal. The proponents briefly mention some biological data related to escapement and smolt production. This limitation was also identified in the ISRP’s 2017 Umbrella review and the 2013 Geographic Review. The lack of biological information in the current proposal, in spite of a repeated recommendation from the ISRP on this topic, suggests that little progress will be made on this front.

Biological observations are critical to link physical changes resulting from restoration actions to biological effects. The proponents state they have “no influence or funding in the monitoring or management of biological resources within the basin but will continue to support fish co-managers in filling critical data gaps necessary for project prioritization and adaptive management.” (p. 23). We encourage the proponents to establish the linkage between physical restoration outcomes and biological benefits. We are concerned by the lack of discussion in the proposal on the existing biological data and how it will be used in the future.

The ISRP requests a response from the proponents to address the following items:

- **M&E matrix – lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this programmatic project, the ISRP is requesting the Tucannon River Programmatic Habitat Project to summarize the linkages between implementation and monitoring projects in the basins. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist this project in producing this summary.

Q1: Clearly defined objectives and outcomes

The linkage between goals and actions is clearly described. Future annual reports and proposals should include descriptions of what biological states and vital rates are expected to improve

given the quantitative implementation objectives (Fig. 3-1). This might better define the biological monitoring needs, and also highlight what data that is currently available will be useful in this regard.

Q2: Methods

The proposed methods are scientifically valid and are useful for evaluating physical responses to restoration actions. There is no biological monitoring conducted as part of the proposed actions, and the proponents rely on other groups to provide this information. Given the absence of biological results in the current proposal, this interaction does not appear to be effective. The ISRP expects habitat restoration practitioners to be working closely with the projects that monitor fish responses to the actions. For example, WDFW is implementing the Tucannon River Steelhead Supplementation M&E (201005000) that is monitoring natural and hatchery steelhead productivity, spawning escapement, and distribution in the Tucannon watershed which is providing data that may be useful for evaluating habitat response.

Q3: Provisions for M&E

The monitoring and evaluation of physical states and processes influenced by habitat restoration is well described. There is no mention of how biological monitoring and evaluation will be conducted.

Q4: Results – benefits to fish and wildlife

The proposal does a good job summarizing the physical changes that have resulted from restoration actions. There is a lack of biological information, so benefits to targeted fish populations have not been determined, and this is the sole but significant weakness of the proposal.

199401806 - Tucannon Stream and Riparian Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia Conservation District

Province/Subbasin: Columbia Plateau/Tucannon

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This project is an important component of a larger restoration effort that encompasses many projects and entities. The Columbia Conservation District (CCD) has been a valuable partner in accomplishing habitat restoration in the Tucannon subbasin. Besides supporting on-the-ground restoration, the CCD has worked with local landowners and accomplished important changes in land uses via conservation easements and tillage operations. Additionally, it has been successful in acquiring outside funds from federal and state sources. These additional monies have provided needed support for the habitat restoration actions occurring in the Tucannon subbasin.

The project has an impressive list of accomplishments, including extensive contributions to numerous plans and habitat assessments, which have provided sound scientific guidance for this project and others. The emphasis on revising and updating assessments and plans has been important to the project success. In addition to these achievements, the project has successfully implemented and evaluated many restoration actions with a high degree of success. The project coordinates with numerous other projects in the subbasin. It has responded effectively to past Council and ISRP recommendations as demonstrated by a shift in focus from instream active restoration to broader floodplain and geomorphic-ecosystem function. The current proposal has a clear and complete timeline for the upcoming five-year period.

The proposal would be improved by expanding the description of how the restoration actions will improve productivity, capacity, or diversity and thus build resilience to climate change and other ongoing habitat degradation. In addition, the size of the areas that will be targeted for restoration during the upcoming 5-year period needs to be further defined. The budget appears appropriate for the proposed work described and the leveraging of the projects funding to secure up to 67% additional matching funds for action implementation is important added value.

The ISRP's one major concern with the proposal is that monitoring, evaluation, and adjustment is restricted to physical metrics (e.g., LWD, pools, flood plain reconnection, substrate). There is almost no mention of measurements of biological conditions and processes such as fry and parr densities, egg-to-fry survival, juvenile growth rates, or basic inputs and outputs (e.g., escapement in, smolts out). These biological observations are critical because they can be used to link physical changes resulting from restoration actions to biological effects. This limitation was previously identified in the 2007-2009 ISRP review:

"Some data is reported on fish density, but it is not clear that the project personnel are adaptively managing based on these data. It's not clear that the structures are actually benefiting the fish."

There was no information in the proposal on observed biological responses to restoration actions completed to date, or specifics on how that information would be used to adjust the projects. The lack of discussion of biological information in the current proposal suggests that little progress on this front has been made. This is a significant concern and, in large part, led to the ISRP's recommendation of Conditional.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Purpose and limiting factors.** Describe the location, purpose and limiting factors being addressed by the work scheduled to occur in 2021-2024
2. **SMART objectives.** Provide SMART objectives (see proposal instructions) for projects PA-26 Phase I/II and PA-26 Phase III and any other project that lacks SMART objectives.
3. **Methods.** Briefly describe the methods that will be used in the PA-26 Phase I/II project.
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this

implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Goals and objectives are well stated with clearly desired outcomes. It appears that considerable thought and analyses have gone into linking the overarching problem with the goals, objectives, strategies, and outcomes. The proposal provided a comprehensive description of past goals and objectives as well as revised future goals and objectives. The overall goal of enhancing habitat is partitioned and expanded into programmatic goals for improving floodplain, riparian, channel complexity, pool quantity and quality, and bed local sediment. The six programmatic objectives are well stated and contain the essential components of SMART objectives including quantitative desired outcomes. In addition to the overarching programmatic goals and objectives, the proposal includes prioritization goals and objectives for the years 2020 and beyond. These prioritization goals and objectives are well linked with the programmatic objectives and strongly informed by the recently completed Geomorphic Assessment and Restoration Plan (GARP). The project is addressing critical limiting factors that influence Chinook salmon, steelhead, and bull trout, all listed as threatened under the ESA. The project is well supported by the subbasin plan and the ESA Recovery Plan.

We compliment the proponents for the extensive descriptions and connectivity provided, which linked goals and objectives with limiting factors, restoration strategies, expected outcomes, and assessment needs. The full set of goals and objectives will guide the project effectively into the future.

The proposal, however, does not link the work scheduled to occur over the next funding period with the six objectives. The Timeline portion of the project shows that five projects, identified by an alpha numeric abbreviation (e.g., PA-26 Phase I/II) are either ongoing or scheduled to take place in the future. The proposal's Timeline Section shows when general activities (project design/permitting, pre-project monitoring, construction, post project monitoring as built, riparian planting, and post project monitoring) are expected to occur. However, no information about the location, purpose, and the limiting factors being addressed by each of these restoration projects is provided. SMART objectives for one or two of the projects should also be developed to provide further information about how projects are managed and expected to progress from the design period to post-project monitoring.

Q2: Methods

The overall methodology used by the CCD is guided by a scientifically sound well-designed adaptive management approach that incorporates the essential elements of planning, evaluation and outreach, project design, treatment, monitor and evaluate, and adapt strategies and actions. Specific steps within each of these key elements are thoroughly described. The planning process appropriately incorporates consideration of habitat condition assessments, limiting factors, geomorphic processes, outreach, restoration strategies, and prioritization methods.

The GARP is used extensively in the selection of project areas and site-specific restoration actions. The GARP document is valuable, providing updated geomorphic assessments and guidance built from prior assessments, successes, and failures, and incorporating new knowledge and techniques. The overall approach considers the unique conditions of each potential restoration area and the importance to specific life history stages.

The project has adapted methods over time with stronger emphasis on restoration strategies that promote geomorphic and ecological processes needed to restore ecological function. This shift has resulted in increased emphasis on flood plain reconnection/side channel development, instream structure and pool enhancement, riparian zone improvement, and increased wood recruitment.

The project appropriately relies extensively on habitat and geomorphic assessment and life stage specific limiting factors analyses to prioritize treatment areas and restoration strategies and actions. The ongoing process of updating habitat and geomorphic assessments has been important for adapting prioritization and implementation strategies and actions.

The proposal provides detailed descriptions on how the CCD selects and prioritizes projects. It was initially guided in this process by a model river watershed plan. Later comprehensive geomorphic assessments were made in the Tucannon subbasin. These assessments were used to create conceptual restoration plans that identified and prioritized regions of the basin where restoration should take place. The most recent assessment (Anchor QEA, 2021) identified four geomorphic processes in the subbasin that were impaired: in-channel structure (wood), modified sediment delivery and transport, reduced floodplain connectivity, and diminished riparian condition and function. The proposal provides some general descriptions of the methods that are being used to increase LWD, briefly discusses gravel augmentation, and levee/berm removal and installation. No methods, however, are linked to the project's scheduled work. The proponents indicate that restoration actions/methods must be customized to the area where the work is taking place. The ISRP agrees. The Timeline indicates

that construction is planned for project PA-26 Phase I/II for July and Aug of 2021. A description of the methods being used for this project need to be provided.

Q3: Provisions for M&E

This project evaluation and adjustment approach relies extensively on new information and knowledge provided in the GARP and other planning documents. The project has well established monitoring and evaluation programs that provide results that feed back into the adaptive decision process.

The proposal highlights and incorporates the importance of monitoring and evaluation at many steps in the planning, implementation, and adjustment stages. Extensive habitat and geomorphic process assessments and limiting factors analyses have been completed and are used for planning and action implementation. Much of the RM&E that provides effectiveness assessment is conducted by other projects including WDFW's Fish-in and Fish-out project. The methods used for the most recent habitat and geomorphic assessments appear scientifically sound.

The evaluation and adjustment process are well characterized. The cyclical method for development and implementation of habitat restoration actions (Figure 4-1) along with detailed considerations described for each step in the cycle provide a solid framework for application of evaluation results. The process has multiple feedback loops that bring into consideration new evaluation results and confounding factors. Evaluation results are not just applied to specific restoration area actions but are also incorporated into strategic guidance.

The specific project treatment level evaluation process occurs in a logical stepwise progression for eight steps beginning with the treatment. Included in the project's evaluation process are rapid habitat assessments of the treatment area within 5 years, qualitative and quantitative assessments after five years to assess response relative to desired change targets, incorporation of new fish information relative to use in the treatment area, restoration success assessment, additional area treatment needs, and lastly repeat the process if additional actions are warranted. Overall, the monitoring and evaluation and adaptive management approaches have served the project effectively and represent a major step forward.

Q4: Results – benefits to fish and wildlife

This is a long-term project focused on restoration of salmon and steelhead habitat in the Tucannon River subbasin. It is an important project because Chinook salmon, steelhead, and bull trout are severely depressed and listed as threatened under the ESA. Habitat degradation

has been extensive in the subbasin and habitat conditions are considered a key threat to the persistence and recovery of the listed species.

The project has an impressive list of accomplishments including major contributions to numerous plans and habitat assessments. These plans and assessments have provided essential and sound guidance for this project as well as other projects that are components of the overall restoration efforts. Emphasizing continuous updates to plans and assessments has provided valuable new information on the status of the habitat and limiting factors allowing for improved strategies, prioritization, techniques, monitoring and evaluation, and adaptive management.

The proponents have been engaged in habitat restoration in the Tucannon subbasin for about 26 years. Project actions, for example, have installed LWD, improved river length, increased floodplain and side channel connectivity, removed berms, improved available river flow, screened irrigation diversions, removed fish passage barriers, reduced sediment inundation, planted trees and shrubs, installed exclusion fencing to protect riparian areas, and built off-site livestock watering facilities. In aggregate, these activities have improved in-river conditions in the Tucannon subbasin; however, the proposal does not describe how the subbasin's salmonid populations have responded to these restoration actions. Nevertheless, the actions taken have increased habitat complexity, added stability, and improved water quality, which are expected to benefit salmonids.

200820200 - CTUIR Tucannon Basin Fish Habitat Enhancement Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of Umatilla Indian Reservation (CTUIR)

Province/Subbasin: Columbia Plateau/Tucannon

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The project is a major contributor to a large multi-agency coordinated effort to improve degraded habitat conditions in the Tucannon River watershed. This is a sound proposal that demonstrates major improvements in many aspects of the project from planning through implementation, evaluation, and adaptive management. The project is productive with important past accomplishments that were well documented. The project is addressing a long

legacy of human induced impacts that have resulted in severely degraded habitat conditions for all life stages of salmon, steelhead, and bull trout. The project is supported by numerous plans, principles, and guiding documents and is consistent with the Council's Fish and Wildlife Program. Overall, this is a sound project that is guided well by plans, assessments, and strategies and important Tribal cultural perspectives. The project has made major changes in goals, objectives, restoration approaches, evaluation, and adaptive management that have greatly improved the likelihood of project success.

We compliment the proponents for a very effective integration of cultural values and vision into the overall goals and adaptive management processes. Incorporation of First Foods reciprocity, River Vision, traditional ecological and cultural knowledge, and CTUIR's mission with western science approaches provide integrated and informative goals. There was a clear connection illustrated between important tribal perspectives and the project goal to restore resiliency and ecosystem function. We also acknowledge good progress in revising past goals to focus on "restoring a dynamic river ecosystem that supports natural production of First Foods and CTUIR community." The goals and objectives provide a much clearer set of future desired outcomes in comparison to past proposals. The project incorporated objectives for monitoring and evaluation, as well for as education and outreach, and both are important to project success. The addition of evaluation objectives directly addressed past ISRP recommendations.

Our only major concern with the proposal is that monitoring, evaluation, and adjustment is restricted to physical metrics (e.g., LWD, pools, flood plain reconnection, substrate). There is no mention of measurements of biological conditions and processes such as fry and parr densities, egg-to-fry survival, juvenile growth rates, or basic inputs and outputs (e.g., escapement in, smolts out). These observations are critical because they can be used to link physical changes resulting from restoration actions to biological responses. The lack of biological information in the current proposal was identified in the ISRP review of the previous proposal. We are asking your project to assist the Tucannon River Programmatic Habitat Project (201007700) to create a summary of monitoring and identify linkages between implementation and biological outcomes.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **SMART objectives.** Provide representative SMART objectives (see proposal instructions) for some of the pending or ongoing restoration projects planned for implementation by the proponents.

2. **Restoration methods.** Provide general descriptions of the methods being used to reconnect floodplains, increase channel complexity, and reduce stream velocities.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proponents list three general biological objectives for their restoration work: (a) decreases in redd scour to be accomplished by the addition of large wood, (b) improvement in over-winter survival of juvenile salmonids by reconnecting floodplains and removing levees, and (c) improving adult survival by reducing channel incision and creation of low velocity pools. Five general physical objectives designed to accomplish these biological objectives are also described. These physical objectives have quantitative end targets. Two of the five—floodplain connectivity and channel complexity—included yearly implementation targets. The other three—creation of functional riparian areas, percentage of riparian vegetation in various height classes, and frequency/quality of pools—did not have yearly goals. Instead, these improvements were expected to occur over a longer time period.

The proposal's timeline indicated that the proponents will be working on ten projects during the upcoming funding period. SMART objectives that could be linked to these projects were not presented in the proposal. For further clarity, the ISRP requests that examples of SMART objectives across some of the projects be described. For example, in PA-13 Phase II riparian and wetland planting is expected to occur from Jan-Mar in 2023. What specific implementation objectives will be established for that work? Similarly, examples of the implementation objectives in PA 1.1 GA during the scheduled construction period of July-August of 2023 would also be useful. Post project monitoring appears to occur in September, examples of specific objectives for this work also need to be provided.

Q2: Methods

Restoration planning, implementation, and evaluation methods are founded on sound biological principles as well as recent geomorphic assessments and limiting factors analyses. The project uses a Riverine Ecosystem Management Planning process to integrate all strategic guidance and new information in a five-step approach beginning with project scoping and ending with evaluation and adaptive feedback loops. The methods used to prioritize areas and develop specific restoration actions are sound and will serve the project well.

The proponents and their restoration partners, SRSRB (201007700) and CCD (199401806) are using “Rapid Habitat” surveys to obtain pre- and post-restoration habitat metrics. Examples of how these metrics have changed from pre- to post-project values are provided in the proposal. Data collected from the surveys seem well suited to track the prevalence of LWD, perennial side channel length, river complexity, area of floodplain inundation, and pool frequency and depth. However, what is lacking is a general description of the restoration methods being used. The primary objectives of the new work being proposed is to reconnect floodplains, increase channel complexity, and reduce scouring. For completeness, we ask that general descriptions of the methods used to reach these objectives be provided as requested in the conditions above.

Q3: Provisions for M&E

The project has adopted an improved adaptive management framework that provides opportunity for information feedback at multiple stages in the restoration planning, implementation, and evaluation steps. The project has a solid list of accomplishments. The proposal included some excellent examples of past accomplishments to date with detailed descriptions, photos, data summaries, and graphics illustrating actions and responses.

In the early stages of the project, monitoring and evaluation were identified as a project weakness by the ISRP. The proponents have responded with much improved objectives, methods, and timelines for pre- and post- action implementation and effectiveness monitoring. The Tucannon River Monitoring Plan (Cramer Fish Sciences, 2021), along with the 2021 Plan, has provided much needed framework and approaches for the project. The monitoring approach incorporates rapid surveys to assess metrics associated with wood, pools, side channels, and includes photo points to complete pre- and post- assessments.

The revised adaptive management approach adopted by the project aligns well with past ISRP recommendations and provides multiple opportunities for evaluation results to feedback into the decision framework. The proposal included an excellent example of how the adaptive management process was applied in the completion of a multi-year restoration project.

Q4: Results – benefits to fish and wildlife

The Tucannon River subbasin is important as it supports production of ESA listed Chinook salmon, steelhead, bull trout, and other native species including lamprey and mussels. The Tucannon River supports the only extant population of Spring Chinook salmon in the lower Snake River major population group, which is required to reach sufficiently high levels of viability for the ESU to meet delisting status. The project is an integral and important part of comprehensive multi-agency restoration programs. The proponents work closely with the SRSRB, Tucannon Implementation Work Group, WDFW, CCD, Nez Perce Tribe, irrigation districts, and private landowners to accomplish large restoration projects. The project has also contributed to geomorphic assessments, limiting factors assessments, and conceptual restoration strategies, which guide this project and others. The proponents are commended for their extensive education and outreach efforts, which are essential to project success.

In the proposal's Part 2: "Progress to Date" section and in some of the proposal's appendices, results from previous restoration actions in the subbasin are described. It is clear from the data presented that these efforts have had beneficial effects. Tabular results from the Rapid Habitat surveys, for example, were quite helpful and showed that the proponent's restoration actions were producing desired changes in habitat conditions. How these changes may be influencing salmonid populations in the Tucannon River were not addressed. Such responses will likely have to be quantified by other agencies (e.g., WDFW) working in the Tucannon but with contributing effort from this project (see Condition 3 in the overall comment above).

201005000 - Tucannon River Steelhead Supplementation M&E

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish and Wildlife

Province/Subbasin: Columbia Plateau/Tucannon

Recommendation: Meets Scientific Review Criteria

Overall comment:

This is an ongoing hatchery supplementation project with goals to rebuild the naturally produced steelhead population and provide adults for harvest mitigation, while also

contributing to spring and fall Chinook recovery. The effort is largely a M&E effort to evaluate hatchery performance and assess the contribution of the hatchery to natural production.

The proposal provides data and an informative discussion about limitations for increasing the abundance of NOR steelhead from the current supplementation/conservation program, which was fully implemented more than a decade ago (2010) and replaced the Lyons Ferry stock harvest mitigation program. Owing to a high proportion of out-of-basin strays to the Tucannon River, including unmarked fish, the natal source of natural broodstock used for hatchery production in the new program is uncertain. This may limit the ability of the current program to rebuild natural production. The proposal also outlines issues with smolt quality and residualism and relates them to use of non-domesticated broodstock, though rearing differences (relative to Lyons Ferry) could also cause be causing these problems. Nevertheless, problems with smolt quality and residualism limit the effective production from the hatchery and could have impacts on natural production of steelhead and survival of hatchery-produced Chinook. While the outcomes from the hatchery effort have been disappointing, this project has been very effective in documenting these limitations, providing decision-makers with valuable information they could use to make adjustments. At this point in time, the data suggests that the hatchery program is not meeting its conservation or harvest mitigation objectives and significant changes may be needed to achieve the management goals.

As stated in the proposal, it is difficult to evaluate the improvement in productivity of NOR steelhead resulting from hatchery efforts relative to the original Lyons Ferry supplementation program given the large number of out-of-basin strays. This is a fundamental limitation to the effectiveness of the project, and the proponents discuss using an exclusion fence (which is likely costly) to partially mitigate this problem (at least for HOR strays, requiring marking of all HOR fish from all hatcheries in the Snake River Basin and beyond). However, the ISRP thinks it is still worth estimating NOR productivity from this project's data even though the effects of straying, hatchery broodstock changes, and habitat actions cannot be separated. It would be helpful for investigators to see if productivity is increasing or declining even if the cause for any change cannot be determined. More years of data are required to build-up the sample size to estimate informative spawner-smolt stock-recruitment models, especially if they allow for time-varying productivity or capacity terms via state-space modelling approaches.

The ISRP was glad to see the proposed effort to estimate the abundance of the residualized *O. mykiss* from HOR steelhead releases. These fish could have a substantive negative effect on NOR productivity by reducing survival rates of steelhead and Chinook fry and parr.

The proposal clearly describes links to other projects in the area. In regard to habitat restoration efforts, which began in the 1990s, the proponents note, "determining a fish

response from these habitat restoration activities is a common request of project personnel but determining such relationships is challenging and not possible in all cases given the current scope of funding directed at the collection of the biological data." Nevertheless, the ISRP encourages the proponents to continue to improve upon high level metrics such as size-at-age of steelhead smolts, smolts-per-spawner in relation to spawning escapement (to the extent possible), water temperature, and other metrics that might be used to help evaluate fish responses to habitat restoration actions.

Although the proposal meets scientific criteria, we suggest that the proponents provide support in development of an M&E matrix for the Tucannon River.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The goals and objectives are well stated, and we appreciate the proponent's clarification that their goal of evaluating the efficacy of the hatchery program for increasing the productivity of NOR steelhead is unlikely to be achieved due to high levels of out-of-basin straying. Fundamentally then, the program is unlikely to meet its key objective. We agree with the proponents that the data being collected is useful, especially if straying rates are reduced in future. The data being collected from this project serves as a baseline to evaluate changes resulting from future actions.

Q2: Methods

Methods for each task are summarized in the proposal. Additional details are provided in the recent project report and online links provided in the proposal. The project has been applying the same methodology for many years. WDFW recognizes issues with estimating the spawning escapement of steelhead associated with the very high stray rate of out-of-basin natural and hatchery origin fish, and the problem of Tucannon River fish bypassing the river and migrating above Lower Granite Dam. WDFW suggests that a trap in the lower river could help solve the out-of-basin problem, but additional funds would be needed.

The proponents show that steelhead smolt size has steadily declined since 2000, and they suggest possible reasons for this decline. To better understand whether this decline is related to growth or age at migration, we suggest that the proponents examine length at age, i.e., for age-1, age-2, and age-3 smolts.

The proponents propose a new effort to examine residualism in hatchery steelhead using a hook and line capture mark-release approach. Data on unmarked presumably natural origin trout should also be documented and related to estimates of hatchery steelhead abundance. Natural origin steelhead in the Tucannon River are known to produce microjacks and presumably many natural trout also reside in the river.

The number of PIT-tagged NOR returns at the fence must be very low given that only 3000 are PIT-tagged as smolts and that the current smolt-adult survival is < 0.5% (i.e., < 10 returning PIT-tagged NOR adults would be captured at the fence). Thus, determining the distribution of NOR fish with PIT antennas upstream of the fence must be very uncertain, which is a significant problem given the objective of this project. It may be worth PIT tagging NOR fish at the fence to increase sample size to get a better understanding of their distribution.

Q3: Provisions for M&E

The proponents provided a comprehensive and useful M&E report that incorporates relatively long time series of data. Adaptive management in response to quantitative objectives and project results has occurred over the years. The proponents state that nearly all changes have been directed at improving hatchery smolt quality at release, and/or release locations and timing. Also, given continued difficulties with rearing fish that originate from NOR parents (high CV's, high K-factors), which can lead to high rates of residualism, the proponents have proposed residualism surveys in the Tucannon River beginning after the 2022 release.

A previous radio telemetry study by the Corps of Engineers at Lower Granite Dam aimed to better understand the overshoot of Tucannon River steelhead, but it did not address the problem as fish had already passed the Tucannon. To answer the question, WDFW recognizes that Tucannon River steelhead should be radio tagged at some location below the mouth of the Tucannon River, so their migratory routes can be observed as they pass the mouth of the Tucannon River. This study, while not yet proposed here, could help identify environmental and/or behavioral mechanisms involved with straying above Lower Granite Dam.

Adjustments to this project are based, in part, on metrics for steelhead smolt quality, and the residualism study that is proposed is a good addition to evaluate potential impacts of supplementation- and conservation-focused stocking. A fundamental limitation of the evaluation process is the inability to determine if unmarked steelhead returning to the Tucannon River originated in this system or were NOR strays or unmarked HOR strays from

other systems. Is there any way of separating the Tucannon NOR component via genetic sampling and analysis? This may not be possible due to the long history of using out-of-basin broodstock and high levels of out-of-basin straying into the Tucannon, but perhaps this could be accomplished from microchemistry of otoliths collected from NOR carcasses. Some exploration of alternate approaches to tracking the Tucannon NOR component of NOR returns seems warranted.

Q4: Results – benefits to fish and wildlife

The proposal is clear on the project accomplishments and limitations. To date, the project has been particularly useful in quantifying total escapement and spawning escapement, the contributions of HOR and NOR fish including contributions of HOR fish from other basins, smolt production, and smolt-adult survival. The proposal also includes a new project that begins to evaluate impacts of hatchery releases by estimating the size of the residualized population. The proposal is very clear about the challenges in evaluating potential benefits of increasing use of in-basin broodstock given high levels of out-of-basin strays.

The proposal and the recent project report provide a comprehensive summary of project results and conclusions. The general findings include:

- Substantial numbers of Tucannon River steelhead (both hatchery and wild origin) continue to bypass the Tucannon River and overshoot to locations above Lower Granite Dam.
- Large numbers of hatchery and other natural origin summer steelhead from other populations/programs outside the Tucannon River spawn in the Tucannon River. Many of these “stray” steelhead have overshoot their intended return location (Mid-Columbia River populations) and end up in the Tucannon River to spawn as a last resort.
- To date WDFW has only been able to estimate the number of steelhead escaping into the Tucannon River based on in-stream PIT tag detections. Accurately determining how many steelhead are spawning has not been possible because many of the assumptions used to estimate the number of spawners have not been validated.
- Some type of adult trapping near the mouth of the Tucannon River is desired for the long-term management of this population. Managing steelhead straying and/or hatchery fish entering the Tucannon River that do not belong is difficult when relying on harvest efforts alone to control the number of hatchery fish on the spawning grounds.

199401805 - Asotin County Enhancement and Restoration Project

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Asotin County Conservation District

Province/Subbasin: Blue Mountain/Asotin

Recommendation: Meets Scientific Review Criteria

Final review comment:

We thank the proponents for submitting a revised proposal as well as a point-by-point response addressing all of the topics identified in our preliminary comments. Our final comments based on the response are provided after each topic:

- 1. Monitoring and evaluation objectives.** The proponents provided an additional paragraph to address the ISRP's request for SMART objectives. This new paragraph lists three monitoring activities that would be used to assess project performance: 1) Visual assessment of pre-restoration habitat conditions, 2) Implementation monitoring, and 3) Effectiveness monitoring using site evaluation methods scheduled with input from BPA. These statements are too vague to meet our criteria for SMART objectives because they lack specific measurable or timeline elements. Thus, the proponent's response falls short of fully satisfying our request. However, the added paragraph and description are a good start when combined with the added text in response to our second request for information on the project's monitoring and evaluation. The ISRP suggests that it would be valuable and relatively easy for the proponents to use their added text to develop a concise list of SMART objectives and a description of how they will be assessed. These fully specified SMART objectives and description of how they will be assessed should be provided in the next annual report and in future proposals. These additions would clarify and adequately document the objectives of the project.
- 2. Monitoring and evaluation methods.** The proponents added substantial new text about the monitoring methods; however, additional clarity is needed for key aspects of the monitoring plans. They state that their monitoring and evaluation will focus on measuring implementation without any additional detail.

Although effectiveness monitoring is acknowledged and mentioned, the revised proposal simply states that the objectives will be identified for specific project actions

based on whether the desired resource response was achieved or not. No further details are provided.

The added text and detail, with an additional appendix and video, is much more complete for implementation monitoring. Depending on the project's actions, monitoring activities include assessment of erosion control, plant survivability in riparian zones with exclusion of livestock, visual assessment of in-stream conditions, and integrity of fish passage structures. While extensive details are not described, given the diversity of project actions, the implementation monitoring was sufficiently documented.

- 3. M&E matrix – support.** The proponents responded they will continue to work closely with partners in the watersheds and that documentation and coordination of monitoring efforts is essential. They strive to ensure project monitoring results are incorporated in the evaluation of recovery actions at multiple geographic scales. The ISRP encourages the proponents to continue to contribute to these synthesis efforts. The ISRP addresses the issue more broadly in this report's programmatic comment on habitat restoration M&E.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long running project focused on restoration of salmon, steelhead, and bull trout habitat in Asotin County, Lower Grande Ronde River tributaries, and Lower Snake River tributaries. This proposal successfully combines two past projects. The proposed project is important as habitat conditions are severely degraded and considered a key threat to the persistence of steelhead and bull trout. The project is soundly supported by subbasin plans and NOAA's Recovery Plan. The project has extensive partners and collaborators and is a key component of the overall recovery strategy for steelhead and bull trout in Southeast Washington.

The project has an extensive set of accomplishments. The past focus has been mostly on upland management improvements in crop and livestock production. The project's success in these endeavors is impressive as illustrated by the fact that 95% of the land designated as cropland in Asotin County now uses minimum tillage and direct seed or has been converted to perennial grass.

The project has also made major strides forward in application of a sound science-based approach for planning, implementing, and evaluating restoration projects. Past efforts focused on opportunistic projects mostly in the uplands with little or no response evaluation. Completing geomorphic assessments and conceptual restoration plans has provided the project with much needed information on impaired processes and limiting factors. The adoption of an adaptive management approach for planning, implementing, evaluating, and adapting is an important step for the project. In addition, the transition from upslope restoration to instream strategies is consistent with past ISRP recommendations. The addition of implementation and effectiveness monitoring and evaluation (although lacking in detail) has enhanced the scientific foundation for the project and the likelihood of success.

We appreciate the comprehensive goals and detailed objectives that were provided. The methods for most objectives were well described and appropriate. The proponents are requested to address the following items in a revised proposal and include a brief point-by-point response to the ISRP referencing where and summarizing how the issues were addressed in the revised proposal:

1. **Monitoring and evaluation objectives:** Please add specific SMART objectives (see proposal instructions) appropriate for the monitoring and evaluation elements of the project. The evaluation component is very important to the project's ability to implement an effective adaptive management approach and document achievements. It is essential that the project develop clear monitoring and evaluation objectives to guide the assessment of project performance.
2. **Monitoring and evaluation methods:** Please provide a detailed description of the methods that will be used for the pre- and post-site restoration response monitoring.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

This proposal integrates two separate habitat restoration projects in Asotin County and the lower Grande Ronde River. The combined project is addressing long-term habitat degradation impacts throughout the project area. Current habitat conditions have a significant negative impact on the survival and persistence of steelhead, Chinook salmon, and bull trout, all of which are listed as threatened under the ESA. Improving spawning and rearing habitat is an essential component of the recovery efforts with highlighted importance to summer steelhead. The project goals, to improve spawning and rearing habitat for salmon, steelhead, bull trout, and lamprey by restoring naturally functioning conditions and processes, are supported by subbasin and recovery plans. The project is consistent with the Council's Fish and Wildlife program principals.

The proposal provides an extensive list of project objectives that are aligned with and support goal achievement. The objectives are clearly stated and are specific with quantitative targets and specified timelines, key elements of SMART objectives.

The objectives have been revised from past proposals in an effort to address previous ISRP concerns that the project lacked a strategic plan and approach that incorporated current conditions, understanding of key habitat limiting factors, and a process to establish priority restoration locations and actions. The project contracted and completed geomorphic assessments and conceptual restoration plans for Asotin County and Lower Grande Ronde River tributaries. These plans provided much needed information for planning, prioritizing, implementing, and evaluating restoration efforts. The objectives of the proposal were formulated with consideration of new information and guidance provided by the plans. The project focus shifted from mostly upslope project work addressing agriculture and livestock management impacts to instream habitat improvement. Specific objectives with quantitative outcomes are provided for each of the four restoration strategies including: protect and maintain natural processes, remove barriers and reconnect habitats, restore long-term processes, and restore short-term processes.

Although the proposal identifies evaluation as critical to project success, there are no clear objectives provided for monitoring and evaluations. Progress to date is a list of restoration activities that have been conducted (e.g., number of trees and shrubs planted). Project performance going beyond construction-based measures is a critical element identified in the proposal and was also highlighted in previous ISRP project reviews as essential for providing information for learning, adaptive management, and improving future restoration actions.

Q2: Methods

The project is undergoing a major shift in emphasis and has adopted an adaptive management approach to guide the identification, development, and implementation of projects. Past work focused mostly on upslope projects that occur in cases where landowners were cooperative, and there was little in-stream focus. The new emphasis targets actions to address key limiting factors and impaired natural processes in high priority locations. The primary focus will be on improving instream and floodplain conditions.

The proposal describes an excellent eight-step process, which guides restoration actions from identification of restoration areas through implementation and effectiveness monitoring. There are specific considerations detailed at each step for erosion control projects, riparian and livestock projects, and instream projects. These new planning, implementation, and evaluation steps are much improved from previous proposals and methods.

Although we strongly support the addition of the evaluation step in the overall process, the proposal does not describe the information that will be collected and the analytical approach to evaluate and compare pre- and post- treatment data. In addition, no details are provided describing the specific data types that will be updated for future geomorphic assessment and limiting factors analyses. The project adjustment process that is summarized says that the projects will be adjusted based on data collected, and details about how such information will be obtained and analyzed (compliance, implementation, effectiveness) for the important evaluation step is needed.

Q3: Provisions for M&E

Past ISRP reviews have highlighted the need for the project to develop adequate implementation and effectiveness monitoring and evaluation as well as a science-based adaptive management framework. The proposal shows significant progress in addressing these shortcomings.

The first and critical step taken was contracting and completing a geomorphic assessment and conceptual restoration plans for Asotin County and the Lower Grande Ronde River. These plans provided valuable current conditions and geomorphic process assessments, updated limiting factors, and identified restoration priorities. The project has adopted a new guiding adaptive management framework with sequenced steps for planning, implementing, evaluating, learning, and adjusting.

Of specific importance are the details for the evaluation and the learning and adapting steps, steps that were not taken in the past. The proposal states "Implementation and effectiveness monitoring will be key to evaluate the benefits and success of projects." The evaluation step involves pre- and post- project evaluation as well as future updates to the geomorphic assessment and limiting factors analyses. A detailed description of the methods that will be used for the pre- and post-site restoration response monitoring is needed. Information should include the metrics, spatial and temporal scales, sampling techniques, statistical analytical techniques, and evaluation criteria. Sources of information include the implementation monitoring done by the project, along with leveraging other information and linking to M&E monitoring done by others.

Q4: Results – benefits to fish and wildlife

The project has a long history of success. The original focus was ridge-top to ridge-top with actions focused mainly on impacts from crop and livestock management. The project's success in facilitating upland management improvements is quite impressive as illustrated by the fact that 95% of the land designated as cropland in Asotin County now uses minimum tillage and direct seeding or has been transferred to perennial grass cover. The partnership and utilization of various conservation programs to facilitate this conservation transition has been essential.

In addition to the upslope restoration, a large number of critical passage and screening projects have been completed. The project is also complimented for pursuing completion of the geomorphic assessments and conceptual restoration plans. We view the project's transition to a formal science based adaptive management approach for planning, implementing, and evaluating projects and the shift in emphasis to restoring natural processes as important and major steps forward.

200205300 - Lower Snake River Steelhead VSP Monitoring

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Washington Department of Fish and Wildlife

Province/Subbasin: Blue Mountain/Asotin

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our initial review, the ISRP requested a response on the topics listed below:

1. **Clarify goals and objectives**
2. **Methods for new goals and objectives**
3. **More detailed description of methods**
4. **Project evaluation and adjustment**
5. **Influence of take limits**
6. **M&E matrix – support**

The ISRP thanks the proponents for their efforts to prepare the revised proposal and provide point-by-point responses. The responses and revisions to the proposal were extensive, comprehensive, and addressed all of the major and minor issues. The ISRP appreciates the detail and completeness of the responses by the proponents. The revised proposal provides much improved goals, objectives, and tasks with clearer continuity and connectivity. The revision of the Methods section to align with the objectives and tasks, along with the additional detail, improved the proposal significantly. The enhanced description of the evaluation and adjustment process clarifies the project's adaptive management approach. The ISRP also wants to recognize the contributions and cooperation of this project with the Tucannon Programmatic Habitat Project (201007700) to produce a broader scale synthesis of M&E in the subbasins.

The ISRP offers a few suggestions for future improvements that we believe will further enhance project success. We recognize the difficulty in formulating monitoring and evaluation objectives in SMART format; however, we suggest that the proponents consider adding measurable criteria when possible. For example, Task 2 could be improved by specifying what "high level performance" represent for estimates of juvenile abundance. Moreover, for Task 4, by providing the specific types of estimates of productivity that the project produces.

Adaptive management processes occur at multiple scales from the project level to major management decisions. We encourage the proponents to consider the project's role at all levels in the adaptive management processes.

In response to the request from the ISRP for more information on population-level analysis, the proponents removed the objective to provide analysis related to population dynamics throughout the hydrosystem and in the marine environment. The development of stock recruitment models and a life cycle model were deemed outside the scope of the project. Although we are not expecting the proponents to add this objective back into the project, we suggest that project staff consider, as time permits, ways to get assistance from and collaborate with others (e.g., AMIP Life Cycle Modeling workgroup) on the broader population-level analyses and modeling. Utilization of the extensive datasets generated by the project in these types of analyses would provide valuable information.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This research, monitoring, and evaluation project was initiated in 2002, and the proposal continues the focus on providing viable salmonid population (VSP) data needed to assess status and trends of the ESA listed Asotin Creek steelhead population. The project provides invaluable data on aspects of the production dynamics of a summer steelhead population that experiences minimal effects from hatchery fish. Owing to high sampling effort and use of relatively advanced analytical methods, the project provides reliable estimates of natural origin escapement and emigrant (parr and smolt) abundance. Increasing use of PIT detection antennas in tributaries, combined with PIT tagging of all fish at the mainstem fence, is an innovative and robust way of estimating tributary-specific escapements, which will be helpful in evaluating benefits of habitat restoration. This project is well under way to being one of a few long-term steelhead production studies.

The information provided by the project is essential for conducting ESA status assessments that include parameters for abundance, productivity, spatial structure, and diversity. The project is soundly supported by the Subbasin Plan and NOAA Recovery Plan. The project has been successful in achieving the original basic objectives and tasks of providing baseline VSP parameter data and coordinating relationships among other projects that use the data.

The proposal characterizes past objectives and accomplishments well, including adaptive changes to field sampling and analytical approaches. The project has clearly generated useful information on steelhead.

The proponents are requested to address the following items in a revised proposal and include a brief point-by-point response to the ISRP referencing where and summarizing how the issues were addressed in the revised proposal:

1. **Clarify goals and objectives.** Clarify, reformulate, and make consistent the goals, objectives, and tasks of the project, including consistency with the SMART objective format.
2. **Methods for new goals and objectives.** Realign and expand the methods section to be consistent with the new goals, objectives, and tasks.
3. **More detailed description of methods.** Expand and add detail to the methods for the escapement estimates, juvenile outmigration, the validity of some of the key assumptions, and plans for developing stock-recruit relationships (see Methods section of this review for details).
4. **Project evaluation and adjustment.** Describe the adaptive management process more thoroughly.
5. **Influence of take limits.** Complete an assessment of whether take limits will impact future sampling and identify what adjustments can be made to address any identified limitations.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Tucannon River Programmatic Habitat Project (201007700) to summarize the linkages between implementation and monitoring projects in the Lower Snake, Tucannon, and Asotin geographic area. We ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The goals and objectives section is incomplete and needs revisions to be consistent with the guidance provided in the proposal form template. A goal related to population dynamics

assessment (stated later in the proposal) should be added to the statement of the four goals. SMART objectives should be stated for each goal, as they describe the elements necessary to achieve the goals.

The proposal has four stated goals for the future operations:

- maintain existing data sets for VSP ESA assessments
- develop tools that prioritize and evaluate management and restoration actions
- maximize collaboration with stakeholders and conservation partners
- use innovative methods to inform conservation and recovery.

In addition to the goals that are provided in the goals and objectives section, the following goal is stated elsewhere in the proposal: (5) Evaluate population dynamics within the subbasin and in the hydropower system and ocean. However, the objectives provided appear to be primarily associated with a single combined goal that includes the individually stated goals. In addition, no clear objectives are provided for information sharing or participation in adaptive management decision processes. Also unclear was how the tributary-specific escapement estimates, in the absence of tributary-specific juvenile production estimates, will be used.

The ISRP also requests that the proponents provide details and plans for addressing a key objective of this study of developing a stock-recruit relationship to describe production dynamics for a population that is minimally affected by hatchery-origin fish. This would include estimation of adult recruit-per-spawner and smolt-per-spawner relationships (or egg deposition instead of spawner abundance given information on size/age/sex at return). The ISRP encourages the project team to begin estimating these stock-recruit relationships and more advanced versions that attempt to explain some of the variation in recruits-per-spawner by including environmental covariates (e.g., flow, water temperature, which could include metrics influenced by habitat efforts).

Q2: Methods

The methods appear sound although it is difficult for the ISRP to fully evaluate them. The methods provided for objective 1, and the associated tasks that focus on VSP parameter data, are clear. In general, the methods need additional details and need to be tailored and clearly described in relation to the revised goals and objectives. In addition to relating methods to newly formulated and clarified goals and objectives (and tasks), other issues to consider for revising the methods are:

- Escapement estimates are based on mark-recapture because fish may move upstream of the weir site prior to installation or move past the weir undetected during high water (this should be clarified in the proposal). As the ISRP understands it, the escapement estimate is based on a two-event closed mark-recapture model, where any unmarked fish are marked during upstream passage over the weir and detected as kelts during downstream passage. The proportion of kelts with a mark is used to estimate the capture probability of the weir during upstream migration. Thus, there are two unstated key assumptions of the approach: a) 100% of kelts moving downstream past the weir will be detected; and b) there is no mortality between upstream and downstream passage. Is there any data to support these assumptions, especially b)?
- A Bayesian approach is used to estimate sex-, origin-, and age-specific escapement. The latter is critical for stock-recruit analysis that depends on assigning each returning spawner to its brood year. Owing to limitations in the model description, we were unsure whether age-specific escapement estimates account for the uncertainty in age assignment. In some years, the number of scales collected can be low, and given a relatively large number of freshwater-marine age combinations, assignment error to any one total age category would be high. Clarification of the model being used to estimate outmigrant abundances and how it relates to other commonly used models would strengthen the methods and ensure comparability with other analyses.
- Additional methods should be added related to the stock-recruit analysis to estimate productivity. Only recruit-per-spawner vs time plots were provided in the proposal. Without a stock-recruit analysis, which could include covariate effects (e.g., habitat, flow, marine condition indices) the causes for variation in the relationship are not defined (density-dependent or other covariate effects). When a more formal analysis is done, a state space modeling approach (e.g., Fleischman et al. 2013, Stanton et al. 2017) should be considered to account for the uncertainty in brood year assignment.
- Addition of details about release locations and timing of releases (day or night). Key assumptions or factors should be stated. For example, confirmation that fish move past the trap within a week (assuming a diagonal version of a weekly-stratified estimator is being used) and whether fish are being released far enough away from the traps to not violate the assumption that marked and unmarked fish are fully mixed by the time they reach the trap.
- Any evidence or proposed analyses to address whether age or size significantly affects capture probability, and whether uncertainty in age assignment is propagated forward through the estimation of age-specific run sizes.
- Information on the role of strays in influencing the project outcomes.

References

Fleischman, S.J., M.J. Catalano, R.A. Clark, and D.R. Bernard. 2013. An age-structured state-space stock-recruit model for Pacific salmon (*Oncorhynchus* spp.). *Canadian Journal of Fisheries and Aquatic Science* 70:401-414.

Stanton, B.A., M.J. Catalano, and S.J. Fleischman. 2017. From sequential to integrated Bayesian analysis: Exploring the continuum with a Pacific salmon spawner-recruit model. *Fisheries Research* 186: 237-247.

Q3: Provisions for M&E

The project has been successful in generating basic VSP parameter data for abundance, productivity, spatial structure, and diversity. The project team has made effective modifications and improvements to field sampling protocols and analytical approaches, shifting from spawning ground surveys to PIT-tagged adult distribution to assess spatial structure and adding Bayesian analyses to improve parameter estimates related to determining abundances. These are two good examples of adjustments that have been made within the project.

There were major elements requested in the proposal preparation guidance related to the adjustment process that were not addressed. There were no descriptions of the adaptive management process or decision framework used to evaluate outcomes, adjust goals, objectives, actions, monitoring, or methods. In addition, the proposal did not describe time frames for adaptive adjustments, who is involved, how information is shared and utilized in the process, and how adaptive decisions are documented. The project evaluation and adjustment process section needs further description.

Another issue is the question of how some sampling methods may be impacted by take limits. We were unclear whether take issues would affect the number of fish that can be measured, scaled, and marked, or will it also limit the period of operations for the weir or RST. Given the potential for this issue to seriously impact this project, a more detailed discussion and perhaps planning for contingencies is warranted.

Q4: Results – benefits to fish and wildlife

The project has provided extensive results that address the basic original objectives and tasks. An excellent summary of the data related to VSP parameters for abundance, productivity,

spatial structure, and diversity was provided. The results produced to date have been valuable and essential for completion of the Asotin Creek steelhead population viability assessments. For example, the project results showed a recent decline in spawner abundance and recruits-per-spawner since 2016 that have remained low. There was no presentation of results related to higher-level questions associated with uncertainties in parameter estimates, spawner-recruit relationships, and full life cycle population dynamics. Such analyses would expand the value and further link project outcomes to management needs.

Grande Ronde and Imnaha Rivers

198402500 - Grande Ronde and Umatilla Fish Habitat Improvement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish and Wildlife (ODFW)

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria

Overall comment:

This project has implemented stream restoration and riparian protection for 37 years. Overall, this productive project relies on collaboration and well-vetted planning and design protocols to implement projects in priority basins. The project has faced recent budget cuts and staff reductions but is still implementing higher numbers of restoration projects than through most of its history. The project's activities are based on sound scientific approaches for using landscape information to protect and restore critical habitats, and the proponents have responded adequately to previous ISRP qualifications.

While no formal response is required, we are asking the proponents of this project to assist in the following process:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. If you have a map or maps of locations of monitoring actions, please provide it to the lead project.

Q1: Clearly defined objectives and outcomes

The proposal clearly describes the history and overall goals of the project and discusses the current status of anadromous salmon and steelhead in the Grande Ronde and Umatilla basins.

The goal statement is supported by generally quantitative objectives by subbasin, which are mapped to actions and measures. The proposal provides a clear work plan for the next project phase, which involves large wood addition, floodplain connection activities, and fish passage improvements. In addition, the project will maintain existing projects and work with private landowners and public outreach related to native salmonids. The proposal also explains its relationship to the Atlas, Fish and Wildlife Program, recovery plan for Snake River Chinook and steelhead, recovery plans for Chinook and steelhead in the mid-Columbia, subbasin plans, biological opinions, and recovery plans for bull trout.

Most objectives are quantitative, but specific SMART objectives are not provided for each project. The proposal indicates that miles of fencing, water development operations, and maintenance and inspections are documented in annual statements of work. The ISRP encourages the proponents to restate the social objective (p. 14) as a SMART objective. The ISRP encourages the proponents to provide these objectives in their future annual reports.

Q2: Methods

The proposal lists the sequence of methods for prioritization, implementation, evaluation, and maintenance. While this list does not describe the details of specific on-the-ground methods, it clearly describes a high level of coordination through the formal review process in the basin. The proponents also work closely with BPA to implement Best Management Practices. The methods are appropriate and involve substantial coordination and extensive review. An important aspect is coordination with the Atlas and development of a database documenting the location and date of restoration actions.

Implementation actions will be limited to the Grande Ronde basin because of reductions in funding and staff, but the project will coordinate closely with the CTUIR in the Umatilla River Basin on potential projects.

The ISRP notes that a recent publication (Justice et al. 2017) documents positive responses in salmonid populations. As well, the ISRP strongly supports the effort to investigate water quality in the lower Grande Ronde Valley, as it should address a critical gap in knowledge about the system.

Q3: Provisions for M&E

The project coordinates closely with the Grande Ronde Model Watershed and the Atlas for prioritization, implementation, and evaluation in the Grande Ronde basin. These data-driven projects have developed an effective evaluation process, which includes regularly scheduled

meetings for planning, evaluation, and decision-making. The proponents collaborate with the GRMW, ODFW, CTUIR, NPT, UCSWCD, USFS, Trout Unlimited, CRITFC, NMFS, BPA, BOR, and USFWS. The habitat project monitors implementation, status, and maintenance requirements for specific projects. Monitoring of biological objectives is provided by basin research partners, including ODFW, CTUIR, CRITFC, and NPT.

The proposal identifies climate change as a major confounding factor and discusses actions to mitigate its impact. Regional climate projections are considered in project prioritization and design. Work with collaborators, including CRITFC, has modeled potential impacts of climate change in the upper Grande Ronde, and results of that work suggest that the restoration actions will help offset future climate impacts. This type of collaboration demonstrates effective consideration of potential confounding factors. The project also collaborates with the Grande Ronde Model Watershed, which is assessing effects of downstream water quality on fish and wildlife benefits.

The proponents note that the AEM Program will soon be completing analysis of regional floodplain projects, and these results will be incorporated in future restoration designs. The proponents should indicate in the next annual report when the AEM analyses of regional floodplain projects will be completed and when they anticipate incorporating the findings into future restoration designs. Are AEM data readily available to this project? How do the proponents anticipate integrating the results into the project prioritization, design, and evaluation plans? The proponents should describe their plans for these specific analyses and how they will be incorporated into future designs in their annual report.

Q4: Results – benefits to fish and wildlife

The project has implemented on-the-ground restoration for 37 years. The proposal clearly describes restoration actions implemented each year since the 2013 Geographic Review. However, it does not summarize the overall area of restoration, stream miles restored, or any biological outcome. The synthesis articles in Appendices D, E, and F summarize some accomplishments by this project and others in the Grande Ronde basin, but not all. Some individual efforts (e.g., Justice et al. 2017) have evaluated benefit for prioritizing restoration actions. The article in the journal *Fisheries* by White et al. (2021), in particular, provides several basin-level benefits of the collective efforts of many projects in the Grande Ronde basin. However, while the project is conducting activities believed beneficial for target species, and reports on the number of projects completed, the proposal does not directly address benefits to the fish they aim to help recover. Given the availability of data in this basin, it is important for the proponents to provide empirical evidence from the monitoring data that fish

performance measures (e.g., carrying capacity, growth, survivorship, spawning success, and so forth) are improving, or not, in future annual reports and proposals.

Reference

Justice, C., S.M. White, D.A. McCullough, D.S. Graves, and M.R. Blanchard. 2017. "Can stream and riparian restoration offset climate change impacts to salmon populations?" *Journal of Environmental Management* 188: 212-227.

199202601 - Grande Ronde Model Watershed

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Grande Ronde Model Watershed Foundation

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP appreciates the leadership and positive impact of the Grande Ronde Model Watershed (GRMW) on habitat restoration in the Grande Ronde and Imnaha rivers, the time they invest in responses and dialogue with us, and the importance of this group of subbasin projects for the Fish and Wildlife Program. The response addresses most issues raised in the preliminary review; however, one significant issue remains.

The ISRP requests the proponents to provide information on the following condition:

- **Synthesis Report.** The proponents should submit the completed Synthesis Report to the Council and BPA for ISRP review by May 1, 2022.

In our preliminary review, we requested responses on the following topics:

1. **Synthesis report.** The GRMW confirmed that it is committed to providing a revised Synthesis Report to include the ISRP's request for a "comprehensive empirical evaluation of the effectiveness of restoration actions on fish populations and demonstrated progress at the landscape level" by May 1, 2022. The ISRP acknowledges that this is an ambitious task but believes it is very important. The agreement by BPA to allow the project to use BPA funds to complete this task is essential to its completion and success. We encourage BPA to ensure that adequate funds are provided for

completing the synthesis, a product that will be valuable for other projects in the Columbia River Basin.

The GRMW outlined an approach for completing the revision of the Synthesis Report, which includes much of the original information on the history of the project, details on restoration projects completed by the GRMW, the M&E matrix summary requested by the ISRP in this response loop, the GRMW's updated adaptive management process, and an integrated implementation and evaluation approach. The implementation and evaluation approach will include information on physical and biological responses to their restoration actions and results from a life cycle model (depending on timing of availability). They will use LIDAR for much of this analysis, which will limit their evaluation to the period from 2009 to the present. The ISRP understands this limitation, but we encourage the proponents to analyze their available data to the extent possible and summarize the results.

The brief description of the proponents' plans for completing the Synthesis Report appears to address the original ISRP review of the Synthesis Report. We refer the proponents to the 2018 ISRP review of the Synthesis Report ([ISRP 2018-11](#)) for elements needed in the report. The GRMW has made substantial progress on many of the recommendations from this review, especially related to development of an adaptive management process and development of life cycles models, which the ISRP sees as major accomplishments of the GRMW and its collaborators.

The GRMW Response asked for an explanation of how the ISRP and Council will use this report. First, the ISRP emphasizes that the primary purpose of our past recommendations to develop the Synthesis Report is to guide the GRMW in their efforts to understand the degree to which it has accomplished its ecological objectives, identify major programmatic needs, and identify high priority actions for the future. The Atlas, life cycle models, and analyses of specific fish populations and habitats all provide valuable information, but they do not provide the integrated landscape strategy and assessment of benefits to fish and wildlife that this 29-yr project potentially produced. Readers will want to know if the current restoration strategy is working, and what *targeted* steps will be taken to address areas that require improvement. Second, the GRMW has made significant progress in developing an effective adaptive management process, and the description of their process for evaluation and adjustment could serve as a model for other projects. Third, the Synthesis Report will provide critical information on effective methods and landscape-level strategy for regional conservation efforts in the upper Columbia River and Snake River region. The ISRP reviews many projects with far fewer technical resources than the GRMW, and such projects would greatly benefit from seeing how the GRMW strategy has been developed, implemented,

and evaluated. Furthermore, the ISRP anticipates that the information on quantitative responses to past restoration actions and lessons learned over the duration of the project will be valuable for the NPCC Fish and Wildlife Program and individual projects and cooperators in the basin.

The ISRP greatly values the dialogue we have had with the GRMW in recent years. We have gained a much better understanding of the project and the challenges and limitations the proponents have faced. More importantly, we have learned much about the successes and leadership of the GRMW in the region. We continue to be available to discuss the proponents' plans for completing the Synthesis Report and to clarify any scientific issues raised in our reviews.

2. **SMART objectives.** The proponents provided the additional information needed to specify the SMART aspects of their objectives. The GRMW provided objectives for physical and biological processes, implementation, and social processes by river basin and by sub-watershed. We appreciate the inclusion of explicit programmatic management goals, which provide information for tracking management effectiveness, and all objectives include metrics for measurement.

We requested additional information about how the proponents ensure that collaborators and other sponsors develop SMART objectives for their joint efforts. The response from the GRMW indicates that it requests all sponsors working with the GRMW to provide SMART objectives in step 3 of their Stepwise Process. The proponents' response provides an example of how the online proposal format developed by the GRMW is designed to guide collaborating sponsors in developing SMART objectives. In the example provided in the SMART objectives spreadsheet, the sequence of worksheets for the specific Atlas project, limiting factors, restoration actions, and indicators provides a framework for SMART objectives that is more informative than most approaches we have seen. We encourage the proponents to ask sponsors to explain how the indicators will be measured, who will conduct the measurements, and who will compare the data to the specific desired outcomes. Such information often is lacking or overly brief.

3. **M&E matrix – lead.** The GRMW provided an Excel spreadsheet that identifies the biological and physical M&E efforts related to 90 implementation projects in the Grande Ronde/Imnaha subbasins. The spreadsheet includes information on seven types of biological responses (parr abundance, benthic macroinvertebrates, mussels, redd surveys, prespawn mortality, smolt abundance, smolt survival) and seven types of physical responses (habitat survey, water temperature, toxics, flow, riparian condition, groundwater, floodplain condition). The spreadsheet indicates the evaluation design for

both project monitoring and basin-scale monitoring. The spreadsheet also identifies the project that was responsible for the monitoring, the watershed and biologically significant reach, and the project initiation or completion years. Seven BPA-funded projects provided information for the matrix. The GRMW did not request information for AEM sites in these two subbasins. The Nez Perce Tribes did not participate in developing the summary or providing information on their M&E efforts. In summary, the proponents provided initial information on all aspects of M&E that the ISRP requested in the response loop, though it did not include a narrative summary of monitoring efforts or maps of the locations.

The proponents intend to provide a more complete version of the M&E summary in their Synthesis Report and include information on monitoring efforts of AEM, USFS, SWCD, BOR, and others in the subbasins. They plan to provide maps, and overall summary of the M&E efforts, and description of the linkages between projects in the final version in the Synthesis Report. With this additional information, the summary will serve as an excellent example of the cooperation between projects and collaborative identification of monitoring and evaluation in a geographic area that the ISRP envisioned in our request for M&E matrices.

The Council and Council staff have stated their support for developing summaries and matrices of the types and locations of monitoring efforts across projects in major geographic areas. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. We anticipate that the Fish and Wildlife Program will identify the specific elements and formats for these RM&E summaries and matrices in the near future. The proponents of this project should coordinate with Council staff to align their effort with future M&E summaries for geographic areas.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The Grande Ronde Model Watershed (GRMW) has developed a comprehensive watershed management approach and collaborates successfully with partners. The proponents have completed three Atlases, developed and implemented a structured decision-making tool for project identification, prioritization, and design, and obtained a Focused Investment Partnership from the Oregon Watershed Investment Board to provide \$7 million in additional funding for restoration. They also have completed several major restoration projects,

investigated potential toxic substances in the lower river, formed a place-based integrated water resources management plan with Union County, developed technical capability for remote aerial habitat surveys, produced the first draft of the 25-Year Synthesis Report, and partnered with more than 15 agencies, programs, and organizations. In addition to its achievements in recent years, the proponents have responded positively and constructively to recommendations from the ISRP and Council.

The ISRP requests the proponents to address the following issues in a point-by-point response to assist our review of the proposal:

1. **Synthesis report.** The ISRP requests a description of the plans to revise the 25-Year Synthesis Report, including planned analyses, summary information, links to future project prioritization and planning, and the anticipated timeline for completion of the different elements and final report. The proponents recognize that more analysis and synthesis are needed. They indicate that they are committed to creating a comprehensive synthesis of the program's benefits for fish and wildlife, as well as how the project has addressed limiting factors for key life stages. The ISRP strongly encourages the Council and BPA to allow the GRMW to use BPA funds to produce this fundamental programmatic element of a large-scale, long-term restoration program.
2. **SMART objectives.** The project coordinates restoration actions in the Grande Ronde basin, and the proposal identifies the limiting factors and proposed actions for each project. No specific objectives are identified. Please explain how this project ensures that their partners develop SMART objectives for each project and whether SMART objectives are required in the Stepwise process.
3. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this programmatic project, the ISRP

requests the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist your project in producing this summary.

The ISRP recognizes that this task may require more than two months to complete, but we will appreciate any progress that can be made, as well as updates on plans for their completion.

Q1: Clearly defined objectives and outcomes

The Grande Ronde Model Watershed (GRMW) is one of the longest running habitat restoration projects funded by the Council's Fish and Wildlife Program. It has developed a comprehensive watershed management approach, collaborating successfully with partners including Oregon Department of Fish & Wildlife (ODFW), Columbia River Intertribal Council (CRITFC), U.S. Forest Service (USFS), and Bonneville Power Administration (BPA). Substantial improvements in its program since the 2017 Umbrella Review are evidenced in project outcomes, including:

- Completion of three Atlases— spatially explicit landscape databases for Catherine Creek, Upper Grande Ronde, and Wallowa/Imnaha — to track resource conditions and identify limiting factors, critical life stages, data gaps, and priorities for habitat protection and restoration
- Implementation of Stepwise, a structured decision-making tool, for project identification, prioritization, and design
- Acquisition of a Focused Investment Partnership from the Oregon Watershed Investment Board to provide \$7 million in additional funding for restoration
- Completion of several major restoration projects, including fish passage for Beaver Creek and the Lostine River, and a large-scale restoration of the Catherine Creek in cooperation with the CTUIR
- Formation of a place-based integrated water resources management plan with Union County

- Development of a remote aerial survey system
- Preparation of the first draft of the 25-Year Synthesis Report.

The proposal presents a thorough description of the program's background history and location, which reflects the information assembled in the initial version of the 2018 Synthesis Report. The proposal includes an informative history of key developments and implementation, as well as coordination of more than 280 projects by the GRMW since 1992. Based on Council recommendations in the 2013 Categorical Review, the GRMW focuses on coordination of restoration efforts rather than implementing projects. They have developed the expertise and infrastructure to conduct mapping and resource assessment, remote aerial surveys, and habitat suitability modeling.

The proposal includes quantitative information on the GRMW's progress for major subbasin plan objectives: fish passage improvement, protection of high-quality habitat, watershed processes, channel conditions, riparian function, sediment reduction, and flow improvement. In addition, the proposal documents their achievements in bull trout recovery, project assistance, and public education and outreach. Objectives related to outreach and engagement ("Social goals and objectives") are an important strength of this proposal that can serve as a model for other umbrella and Council projects. Achievements in all aspects have been significant and demonstrate the program's effectiveness. The effectiveness of their collaboration and assistance is supported by their contribution to peer-reviewed publications with CRITFC and ODFW (Favrot and Jonasson 2020, Favrot, Jonasson, and Peterson 2018, Justice et al. 2017, Crump et al. 2019, White et al. 2021). Several of these peer review publications provide publicly available information sources for critical analyses and resource assessments that are related to the project.

The proposal provides SMART objectives for physical and biological processes, implementation, and social processes by river basin and by sub-watershed. The proposal also includes explicit management goals, which provide information for tracking management effectiveness. All objectives include metrics for measurement. While objectives are presented by the basin scale, SMART objectives specific to individual projects are not provided. The ISRP encourages the GRMW to ensure that associated implementation projects develop SMART objectives and document them in proposals and annual reports.

The proposal identifies several major confounding factors, including toxic substances, locations of major fish mortality in the lower watershed, human population growth, and climate change. The ISRP commends the project's identification of approaches to address these potential

factors, as well as application of their data and analyses in aiding future project selection, prioritization, and design processes.

Q2: Methods

The GRMW no longer implements restoration projects and now coordinates projects with partners, providing analytical resources (Atlases), project prioritization, selection and design (Stepwise), and data management (Atlases). The proposal provides brief descriptions of the databases and decision-making process, which are described in greater detail in Appendix B and on the GRMW website (<https://www.grmw.org/>). The data layers in the Atlases provide extensive information on historical distribution, habitat conditions, biological data, water quality, and social attributes.

Projects anticipated for 2021-2027 (44 titles) are listed in Appendix A, including information on major fish population group, priority population, priority watershed, limiting life stages, limiting habitat conditions, prioritized habitat action types, project titles, proponent organizations, exact location, and proposed year of implementation. While the limiting factors and proposed actions are described for each project, specific SMART objectives are not provided for each. Do the partners develop SMART objectives for each project? Is that a requirement in this Umbrella Project's Stepwise process?

The proposal includes an overall project timeline from 2022 to 2027 and a Gantt chart for specific work elements by quarter.

Q3: Provisions for M&E

The GRMW proposal notes the funding for monitoring was reduced for all partners, not just the GRMW. They are both using data and information from the three Action Effectiveness Monitoring sites (AEM) and applying the AEM findings and conclusions in project selection and design. The GRMW has a long history of collaborating effectively with ODFW and CRITFC to obtain fish and habitat data, results of landscape modeling, and results from the life cycle models for Catherine Creek and the Upper Grande Ronde River. They have developed a model of habitat suitability that provides spatially continuous, reach-specific information on habitat conditions and suitability for Chinook and steelhead. They are using the life cycle models for projecting juvenile Chinook responses to restoration actions and the contribution of the projects to improving viable salmon population parameters and capacity.

The GRMW has responded positively and effectively to past ISRP recommendations to develop adaptive management processes. The proposal and Appendix B describe their adaptive

management plan in detail. They have used the State-of-the-Science annual meetings and their collaboration with CRITFC and ODFW to create an ongoing process linking every phase of the planning, implementation, evaluation, and decision making. Much of this approach is captured in a recent peer-reviewed publication (White et al. 2021), which is valuable resource to all projects supported under the Fish and Wildlife Program. Nevertheless, the description of the adaptive management plan raises questions about how, by whom, and when are the final recommendations made and recorded after conclusions are reached at the State-of-the-Science meeting, and when are the recommendations presented to the Board, TAC, and IT?

The ISRP commends the proponents for continuing to pursue efforts to understand limits to recovery in the basin. The two-year surface water quality assessment of the Grande Ronde River and Catherine Creek is critical to understanding whether poor surface water quality plays a role in historically high levels of outmigrant Chinook salmon smolt mortality observed between February and May. They detected elevated concentrations of copper at four locations, which may be related to the ongoing smolt mortality in the lower reach around La Grande. This has been a major uncertainty and limit on the success of their program for several decades. It will be important to continue working with state and federal agencies to better understand and possibly address the serious water quality issues.

As an Umbrella project dedicated to coordinating restoration and conservation efforts in the Grande Ronde, Wallowa, and Imnaha basins, the GRMW has developed effective working relationships with many partners, including the CTUIR, Nez Perce Tribe, CRITFC, ODFW, NOAA Fisheries, AEM, Lower Snake River Compensation Plan, USFS, USFWS, NRCS (SWCD), OWEB, Freshwater Trust, Trout Unlimited, Wallowa Resources, and counties.

Q4: Results – benefits to fish and wildlife

The proponents thoroughly describe the accomplishments of their past actions in terms of numbers and types of projects, as well as amounts of habitat restored or conserved. The GRMW produced an initial 25-Year Synthesis Report in response to a qualification from the ISRP, even though BPA would not allow BPA funds to be used to develop the report. The ISRP reviewed the report and commended them for completing the draft in spite of the difficulties faced.

However, the ISRP also found that a comprehensive empirical evaluation of the effectiveness of restoration actions on fish populations and demonstrated progress at the landscape level remains to be completed. The ISRP requested the proponents to provide a comprehensive empirical evaluation of the effectiveness of restoration actions on fish populations and demonstrated progress at the landscape level. This proposal starts to provide some of the

information on the benefits of their actions on fish and wildlife resources. The project tracks four biological indicators and six habitat indicators as part of its SMART objectives and adaptive management plan. The ODFW Grande Ronde Salmonid Life Cycle Monitoring Project provides annual estimates of Chinook and steelhead growth and survival. The proponents recognize that more analysis and synthesis is needed. They indicate that they are committed to creating a comprehensive synthesis of the program's benefits for fish and wildlife, and the ISRP encourages the Council and BPA to allow them to use BPA funds to produce this fundamental programmatic element of a large scale, long-term restoration program.

References

- Crump, C., L. Naylor, A. Van Sickle, Z. Mathias, and G. Shippentower. 2019. Monitoring and Evaluation of Supplemented Spring Chinook Salmon and Life Histories of Wild Summer Steelhead in the Grande Ronde Basin. Island City: CTUIR.
- Favrot, S.D. and B.J. Jonasson. 2020. Fall and Winter Movement Dynamics of Naturally Produced Spring Chinook Salmon Parr in Two Neighboring Interior Pacific Northwest Natal Rivers. *Transactions of the American Fisheries Society* 149:532-551.
- Favrot, S.D., B.J. Jonasson, and J.T. Peterson. 2018. Fall and Winter Microhabitat Use and Suitability for Spring Chinook Salmon Parr in a U.S. Pacific Northwest River. *Transactions of the American Fisheries Society* 147:151-170
- Justice, C., S.M. White, D.A. McCullough, D.S. Graves, and M.R. Blanchard. 2017. "Can stream and riparian restoration offset climate change impacts to salmon populations?" *Journal of Environmental Management* 188: 212-227.
- White, S.M., S. Brandy, C. Justice, K.A. Morinaga, L. Naylor, J. Ruzycski, E.R. Sedell, J. Steele, A. Towne James, G. Webster, and I. Wilson. Progress towards a comprehensive approach for habitat restoration in the Columbia Basin: Case study in the Grande Ronde River. *Fisheries*, December 4, 2020, fsh.10562. <https://doi.org/10.1002/fsh.10562>

200739300 - Protect & Restore NE OR & SE WA Watershed Habitat

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Not Applicable

Overall comment:

In response to the decision of the Council and BPA, the project does not implement any on-the-ground restoration actions but collaborates with Umbrella projects, primarily the Grande Ronde Model Watershed and Snake River Salmon Recovery Board, and other regional partners to develop proposals, assist in identifying high priority habitats, and work with watershed groups. As such, the scientific criteria and benefits to fish and wildlife are developed and documented through the collaborating programs. The proposal and previous letters of support from the Grande Ronde Model Watershed and Snake River Salmon Recovery Board demonstrate that the Nez Perce Tribe is working effectively with these other groups. A new project director was hired in 2018. Since 2018, BPA increased funding for the project based on project refinement, development of stronger partnerships, and the need for restoration on private land.

The previous ISRP review (ISRP 2014-1) recommended that the project was “Not Applicable” for scientific review. The ISRP finds that the previous recommendation continues to be appropriate and recommends that this proposal also is Not Applicable for scientific review because the project does not implement restoration actions but rather coordinates with other projects that are responsible for restoration prioritization and implementation. However, if the project does transition towards its “longer-term objective... to more on-the-ground habitat improvements,” ISRP review of future proposals would be appropriate.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

In response to the decision of the Council and BPA, the project collaborates with Umbrella projects and partners to develop proposals, assist in identifying high priority habitats, and work with watershed groups to develop projects. The proponents contribute to the prioritization and planning of restoration projects involving floodplain reconnection, fish passage replacements, flow restoration, channel reconstruction, riparian planting, and road decommissioning. The project refers to several major regional recovery plans to identify limiting factors and participates in project prioritization and selection through the Atlas process. Major project goals and SMART objectives are provided, but the proposal does not explain how these objectives were developed. It does not clearly identify the specific entity or project that developed each objective or is responsible for implementation. For some, it is possible to relate them to projects described in the previous Methods section. The ISRP encourages the proponents to clearly explain the sources and scientific basis for its goals and objectives in future documents.

Q2: Methods

The project works with other groups to prioritize and plan restoration projects in the Grande Ronde and Imnaha subbasins in northeast Oregon, and the Tucannon River, Alpowa Creek, and Asotin Creek watersheds in southeast Washington. The proponents assisted the Grande Ronde Model Watershed and Snake River Salmon Recovery Board in developing tools such as the Atlas, Tucannon Subbasin Plan, and Salmon Recovery Plan for SE Washington, and Asotin County Conceptual Restoration Plan. They participated in the Tucannon 2021 Assessment. No timeline is provided in the proposal, and methods for how the proponents contribute to the individual projects was not always clear. Because the scope of this project is somewhat vague to the ISRP. Given the known planning and evaluation meetings of the larger groups, it would be reasonable for the proponents to provide an overall timeline and structure for the known collaborative meetings and other activities in which they participate. The ISRP requests that the proponents include such a timeline in their next annual report.

The proponents make it clear that “The main objective of the project is to coordinate with the two umbrella projects in the area.” Nevertheless, they provide a vision for the future: “The longer-term objective for this project is to shift to more on-the-ground habitat improvements.” If this transition occurs, a future proposal should be reviewed by the ISRP.

Q3: Provisions for M&E

The project participates in prioritization and planning of restoration projects with basin partners. As such, the primary implementation and effectiveness monitoring is conducted by

the other programs. It would be beneficial to identify the specific monitoring that was conducted or will be conducted for the specific projects listed. Overall results were provided for most projects.

The proponents appear to be using recent results and recommendations from AEM to select and design restoration projects.

No structured evaluation or adaptive management process is identified. It would be useful for the proponents to identify their specific steps and schedules for evaluation of the project. This should be included in the next annual report.

Question 4. Results: benefits to fish and wildlife

Overall, the project and its cooperators replaced or removed three culverts, screened an irrigation diversion, constructed three miles of riparian fencing, replaced two mainstem irrigation passage barriers, participated in the Wallowa Lake Dam Rehabilitation Project, participated in an irrigation consolidation feasibility study, implemented a side channel and floodplain restoration project, and assisted in the development of the Wallowa County Atlas. There is no landscape-level assessment of the project's benefits for fish and wildlife. The Atlas project provides an ongoing tracking, mapping, and summarization of the contributions of the restoration efforts at the basin scale. Even though the project is not responsible for implementing or leading the planning of the restoration projects, at some point it is important for the project to clearly document its contribution and relative influences on habitat conditions within the basins.

199701501 - Imnaha River Steelhead Status and Smolt Monitoring

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Blue Mountain/Imnaha

Recommendation: Meets Scientific Review Criteria

Final review comment:

We appreciate the proponents' effort to provide thorough point-by-point responses that partially address all six topics. We requested a revised proposal as a component of the

response, but it was not provided. Although the point-by-point response touches on all the topics, we provide a few suggestions below to address remaining issues that were not adequately covered in the response, including a recommendation to revise the proposal to incorporate information provided in the response.

In our preliminary review, we requested a response on the topics listed below. Our final comments and suggestions based on the response are provided after each topic:

1. **Timelines for implementation objectives.** Timelines for the implementation objectives were provided. We recommend that the proponents revise the proposal to add these timelines prior to contracting as a record for the additional implementation timelines and for future reference.
2. **Methods for adult recruits-per-spawner.** We suggest that the proponents should provide a brief description in the next annual report to clarify terms, definitions, and methods for adult abundance, spawner abundance, and adult recruit-per-spawner productivity specific to Imnaha River steelhead. The response includes an expanded description of the methods used to determine adult abundance and recruits-per-spawner at the MPG and population levels. It also clarifies that the tributary escapement estimates are not combined with the subbasinwide estimate because they “are inherently included in the subbasinwide estimate.” However, some confusion remains regarding definitions and methods for estimating adult abundance and spawner abundance. Based on the descriptions in Kinzer et. al. (2021), adult abundance and recruits-per-spawner estimates are for escapement of adults returning to the lower Imnaha River IPDS location. Therefore, the abundance estimate does not directly represent the number of natural origin spawners, nor does the estimate of recruits-per-spawner represent a direct estimate of spawner-to-spawner productivity. Productivity calculated from adult escapement data at the lower Imnaha River IPDS site may vary from estimates based on spawner abundance depending on annual variability in pre-spawn losses resulting from harvest, catch and release mortality, pre-spawn mortality, and natural origin broodstock removed. ICTRT population viability assessment criteria are based on natural origin spawner abundance, and productivity is based on spawner-to-spawner data. Development of approaches to convert the escapement-based estimates to spawner-based estimates should be considered, if possible, thus allowing for direct comparisons with ICTRT VSP criteria in the future.
3. **Number and proportion of natural spawning hatchery fish.** We appreciate the extensive presentation and timeline associated with estimates of pHOS and PNI, which further highlighted the critical need to finalize the methods for estimating pHOS and abundance of naturally spawning hatchery fish. Our primary issue with not estimating pHOS and natural spawning hatchery fish abundance was related to

the influence of hatchery spawners on viability assessment of total spawner abundance and productivity. Our main concern relates to positive bias in productivity that results when a substantial number of hatchery fish spawn naturally but are not counted as parents and thus their offspring are attributed to natural origin spawners. The description of future plans and the timeline for developing methods for estimating pHOS directly addressed our request and provides a clear path forward. We are confused why pHOS values are used to calculate PNI estimates, yet they are not used to estimate total spawner abundance. We suggest that a brief description addressing this issue be included in the next annual report.

4. **Life cycle model.** The proponents effectively addressed our concerns, and we appreciate the willingness to participate in the AMIP Life Cycle Modeling workgroup and consider opportunities for model development. We believe the development of a full life cycle model would be very informative and have broad application because the Imnaha River steelhead dataset is one of the best available in the Snake River basin.
5. **Project evaluation and adjustment.** The response provides the requested clarification as well as an extensive list of adaptive decisions and changes that have resulted from past review and management adjustments. We suggest that the appropriate additional text be added to the proposal to provide a record of the additions.
6. **M&E matrix support.** We recognize the challenges of adding additional objectives within restricted budgets. The Council and Council staff have indicated that developing summaries and matrices of the types and locations of monitoring efforts across projects in major geographic areas would provide important information. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. The Fish and Wildlife Program may identify the specific elements and formats for these RM&E summaries and matrices in the near future. We encourage the proponents to participate in future efforts to characterize linkages between habitat implementation efforts and M&E as the expertise of this project would strengthen future coordinated M&E summaries. The project is providing valuable population level performance information that may be useful for assessing long-term population response to changes in habitat conditions.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The ISRP thanks the proponents for providing a proposal that includes many of the essential elements requested and successfully integrates two projects—Imnaha River Smolt Monitoring and Imnaha River Steelhead Status Monitoring. The project has been underway for many years and addresses critical data gaps for smolt migration performance and viable salmonid population parameters, including adult abundance, productivity, life history diversity, and spatial structure. It provides population status and trend information for Imnaha steelhead MPG, one of the important steelhead populations in the mid-Columbia. It also provides critical information to a number of co-managers and recovery plans in the Columbia River Basin and informs VSP analysis. These data also are used to fulfill the FCRPS BiOp requirements. The 26-year data set is an important component of trend analysis for steelhead in the Snake River basin.

The project has achieved past objectives and provides critical data for a variety of assessments and management decision processes. The status and trends of Imnaha River steelhead are concerning with poor smolt-to-adult survival, low and declining abundance, and adult returns per spawner below 0.5 in most recent years. Thus, the information collected by the project is critical.

The goals are well described and provide clear qualitative desired outcomes. A comprehensive set of biological and implementation objectives along with monitoring questions are provided that directly support the goals. Most objectives are specific, measurable, and timebound, all of which are essential elements for SMART objectives.

In general, the methods are complete and scientifically sound. The integration of a diverse set of field and analytical methods functions well to address the extensive set of monitoring questions, the broad geographic area of study, and the diversity of environmental conditions. The ISRP commends the project for completing finalized protocols published in Monitoring Resources. There is the need for additional information in the objectives and methods sections that we detail at the end of this section.

The project is guided by an eight-step adaptive management decision process; however, details related to timelines, schedules, participants, and documentation are not provided.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between

implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Timelines for implementation objectives.** No timelines are provided for Objectives A.1, B-1, and B-2. These objectives address the important need to estimate number and proportion of natural spawning hatchery fish and improving Proportion Natural Influence (PNI) estimates. Please modify the proposal to add a start and finish timeline for each objective.
2. **Methods for adult recruits-per-spawner.** The abundance/productivity viability assessment approach developed by the ICTRT and now executed by NOAA as part of the five-year ESA status reviews requires spawner-to-spawner data. It is unclear how the basinwide and tributary escapement estimates are combined and used to produce the spawner-to-spawner estimates. Please describe this calculation more thoroughly in the Methods section of the proposal.
3. **Number and proportion of natural spawning hatchery fish.** The productivity analysis relies on the assumption that no hatchery fish are spawning naturally, an assumption that is likely to be false and can create unknown positive bias in the productivity estimates. The proposal properly highlights the need to estimate abundance and proportion of hatchery origin natural spawners but lacks details on how this will be accomplished and who will participate. Please modify the Methods section to describe the steps for developing and evaluating efficacy of the two options provided in the proposal. How will you facilitate, "further consideration and discussion among researchers and co-managers" to ensure success?

In the future, when hatchery spawner abundance estimates are available, the ISRP encourages the proponents to consider incorporation of the results of the NOAA-ODFW relative reproductive success study on Little Sheep Creek in the recruit-per-spawner analyses. The project can derive estimates in two ways: 1) aggregate hatchery and natural origin spawners to estimate a combined productivity, and 2) partition

productivity for hatchery and natural fish utilizing hatchery origin spawner abundance and hatchery origin relative reproduction success based on Little Sheep Creek studies. This second approach was recommended by the ICTRT when population specific reproductive success information is available. Please explain if the proponents disagree with these analytical approaches or propose an alternative approach.

4. **Life cycle model.** The ISRP recommends the proponents synthesize their information and embark on developing a life cycle model. The accumulated data are impressive, and there is substantial potential for further in-depth analyses. The project should collaborate with others engaged in life cycle modeling to plan and develop the modeling efforts and include it as an objective in the revised proposal. Results should be presented in future annual reports and as part of the next major proposal. If the proponents already have perspectives or plans for developing a life cycle model, then please describe the plan in the response.
5. **Project evaluation and adjustment.** The proponents should revise the proposal and describe in more detail the process for evaluation and adaptive adjustment with information on known decision points, explicit schedules for evaluation and decision-making, and documentation of decisions and project changes.

Q1: Clearly defined objectives and outcomes

This proposal represents an integration of the Imnaha River Smolt Monitoring and the Imnaha River Steelhead Status Monitoring Projects. Both projects have been underway for many years. The project addresses critical data gaps for smolt migration and survival information as well as adult abundance, productivity, life history, and spatial structure. Information provided by the project is essential for assessing viability status for the ESA listed Imnaha MPG.

Two overarching goals clearly describe the qualitative desired outcomes for the project. The goals specify the need to provide status and trends information for sound scientific management of Imnaha River steelhead and to improve the projects effectiveness from lessons learned and application of sound adaptive management.

The proposal includes 9 biological objectives, 14 implementation objectives, and 10 key monitoring questions associated with goal one. There is strong connectivity and continuity between goals, objectives, and monitoring questions. The monitoring questions address critical information needs and uncertainties. The objectives are basically implementation objectives, calling for the completion of monitoring tasks. While this is a common characteristic of implementation objectives, the existing objectives could be improved by defining the necessary time frames, geographic representation, and extent. We strongly support the new work

focused on increasing knowledge of hatchery steelhead spawner abundance and distribution to improve estimates of PNI.

The old objectives from the earlier projects seem to continue as the objectives of the new merged project. However, it would be helpful to clearly explain the integration of old and new objectives so that there is continuity over time.

Q2: Methods

The project uses a diverse set of field and analytical methods to address the extensive set of monitoring questions, broad geographic scope of the project, and diversity of habitats in the watershed. The project uses a creative mix of techniques, including juvenile traps, adult weirs, spawning ground surveys, scale analyses, temperature and flow monitoring, PIT tagging and array detections for data collection.

Detailed methods are presented for each of the monitoring questions. For the most part, the overall sample designs are well described and appropriate, but it is unclear how the information is synthesized to describe the overall status and trends of the Imnaha River steelhead population. The project is applying standard analytical protocols that provide probabilistic estimates. Basinwide adult abundance estimates are derived through linked model outputs from DABOM and STADEM, and tributary adult abundance estimates are derived from weir counts or PIT array observations. Juvenile abundance estimates are derived with use of the Bailey mark-recapture model with variability estimates from bootstrapping.

The project has assembled a large body of information since 1997, which is sufficiently rigorous to support a more detailed full life cycle assessment of the status and trends of this steelhead population. Have the proponents explored the potential development of a life cycle model for Imnaha River steelhead? Much can be gained from the analysis with a moderate investment of effort. The accumulated data are impressive, and there is substantial potential for further in-depth analyses. If a deeper dive into the data cannot be supported under project funds, the ISRP encourages the proponents to pursue other options, including collaboration with universities or other agencies with modeling expertise. The project has reached an important stage in its development. The ISRP recommends the proponents develop a plan to collaborate with partners to create a synthesis and life cycle model. The project should begin the synthesis and modeling efforts soon and try to complete the life cycle model during this funding period. The project can provide information on their approach and progress in annual report and the next proposal.

There is lack of clarity regarding methods for adult recruits-per-spawner estimation. In addition, there is no description of a timeline and process for developing and evaluating alternative approaches for estimating PNI. Specifics requests related to these issues are provided in the Overall Comment section of the review.

The ISRP commends the proponents for their investment in development of a centralized data management system and their sharing of information through the Streamnet Coordinated Assessment Database. In addition, the project has demonstrated a strong commitment to documenting methods with finalized protocol publications in Monitoring Resources for most methods.

Q3: Provisions for M&E

The project is guided by the Nez Perce Tribe's eight-step adaptive management decision process. The proponents indicate that they follow an eight-step process but do not describe the process for adaptive evaluation such as with regularly scheduled meetings, known decision points, and documentation of decisions. We recognize that such formal decisions may be made through a series of project, committee, and Nez Perce Tribal Council meetings, but the proposal does not provide information about this. The proponents should describe the process for adaptive evaluation with information on known decision points and explicit schedules for evaluation and decision-making.

The proponents provide some good examples of application of project adjustment, including expansion of smolt trapping time frames to achieve better estimates, assessing influence of spill on smolt survival, identifying poor quality PNI estimation methods and seeking alternatives, and actively meeting with co-managers to identify alternative management approaches to improving the abundance and productivity of salmon and steelhead in the Imnaha River subbasin. The proponents also describe numerous project changes that were implemented in response to past ISRP/ISAB review recommendations.

The proposal identifies habitat alteration, climate change, and predators as potential confounding factors. The proposal emphasizes the use of monitoring and hatchery production to address the effects of confounding factors on meeting mitigation goals. Other than increased use of hatcheries, the proponents do not identify any particular actions or strategies for dealing with climate change or increased abundance of predators. The proponents should identify more explicit strategies for dealing with recognized potential confounding factors and include that information in future annual reports.

Many of the answers to the objectives (stated as questions) in the Progress-to-Date section of the proposal present a logical development from the data collection to analyses and the systematic presentation is informative. The analyses of the data are mostly descriptive using graphs and linear regression (GLM is reported on later in the proposal). What is missing, however, is the final conclusion for each objective that explains how the steps lead to actually answering, as well as possible, the monitoring question. The text nicely leads the reader down a path but then stops short of getting to detailed progress on answering the question. To illustrate, question 5: What are the impacts of the hydropower system on Imnaha emigrant survival? The project estimates the difference in average survival rates, but is there any more than that? Similarly, question 8 about environmental and habitat features that may serve as limiting factors – a nice start is made on analyzing discharge and temperature data, but it seems more can be done. Given the long time series and wealth of data, a deeper dive into the analyses with a full life cycle model should be considered in order to extract even more information.

Q4: Results – benefits to fish and wildlife

The project has a strong record of meeting objectives and providing valuable information for assessing status and trends of steelhead abundance, productivity, life history diversity, and spatial structure. The proposal includes extensive time-series of data for each past objective. Some key findings that are concerning include 1) the decline in adult escapement from a high of 3,270 in 2011 to levels below 1,000 from 2017-2020, 2) smolt-to-adult return rates that are highly variable, generally poor, and well below the Council's goal of 2-6%, and 3) recruit-per-spawner estimates that have been below 1.0 since 2011, with only one brood year above 0.5. Although SARs have declined, juvenile survival to Lower Granite Dam and McNary Dam have been relatively constant or slightly increasing. The project also determines the age structure, sex ratios, size at emigration and return, migration timing, spatial distribution within the basin, and potential limiting factors. The proponents describe these general trends but provide little interpretation about the implications for management actions or potential changes in status and trends.

199800702 - Grande Ronde Supplementation: Lostine River Operation and Maintenance and Monitoring and Evaluation

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This project provides important monitoring and evaluation data to partners in the Grande Ronde Basin Endemic Spring Chinook Supplementation Program (GRESCSP). Results from the project's monitoring actions are designed to explicitly test numerous assumptions about the benefits and potential costs of using hatcheries as agents of salmonid conservation. Consequently, project findings are also of interest and value to other groups engaged in spring Chinook supplementation efforts throughout the Columbia Basin.

The proposal is well written and generally uses graphs and tables effectively to communicate prior results and plans for the next project period. Broadly, this is an important project that not only benefits spring Chinook salmon in the Grande Ronde basin but also produces information of interest to fishery managers throughout the Columbia River Basin.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **SMART objectives.** Place expected time bounds on the implementation tasks (e.g., repetitive annual tasks, and one-time actions that may need several years to complete).
2. **Project evaluation and adjustment.** Describe the overall project adjustment process used by the project and specifically the process used to appraise its own actions to make any necessary changes to fieldwork protocols, data collection, analyses, etc.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation

and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal clearly defines the primary purpose of the project—to help operate and evaluate whether a spring/summer Chinook supplementation program occurring in the Lostine River is meeting its four overall goals. Under each of the project’s four goals, the proponents list one to four general objectives. Altogether, ten general objectives are described. To determine if progress is being made in meeting these objectives, the proponents developed 27 questions that their monitoring effort is addressing. Forty-one specific implementation objectives were developed to answer the management and monitoring questions presented in the proposal. The ISRP commends the proponents for developing monitoring questions that are largely applicable and useful to salmonid supplementation projects throughout the Columbia River Basin. Additionally, results from the project’s previous monitoring efforts were presented along with lessons learned. The data, figures, and discussion in the proposal unambiguously show the value of the O&M and M&E work being done.

The project’s implementation objectives, however, are not presented in a SMART objective format. Many appear to be reoccurring annual tasks, but others, such as the creation of a population model specific to Lostine Chinook, will likely take longer to complete and are not on an annual cycle. Consequently, the ISRP is uncertain about when tasks will occur and be completed. We ask that the proponents indicate when each of their implementation tasks will be completed and whether they occur annually.

Q2: Methods

The proposal provides adequate general descriptions of the methods being employed. Standard and well-established protocols are followed when collecting field data. New field data are entered electronically and downloaded into databases for further analysis. A table in the proposal links the project’s implementation objectives to the MonitoringResources.org website, where further details on the methods are described.

Q3: Provisions for M&E

Data and findings produced from the project are used by the GRESCSP in an adaptive management cycle. Cooperators in the GRESCSP (Nez Perce Tribe, Confederated Umatilla tribes, ODFW, and USFWS) develop Annual Operating Plans that are informed and modified by project data. The proposal presents examples of how the Lostine spring Chinook project has changed its operations due to monitoring results in the proposal's "Lesson Learned" segments.

Several questions regarding how adaptive management proceeds, however, need to be addressed. First, does the project have its own internal adaptive management process? Seemingly, such a process would allow the proponents to regularly review whether specific tasks were performed as expected and if any changes in objectives or methods are needed. Second, the proposal lacks a general description of the adaptive management process used by the GRESCSP, which should include a brief description of the process being used, how frequently it occurs, and how decisions are documented for long-term reference. The proponents mention that a supplementation workshop occurs every five years—is this when the GRESCSP evaluates progress and determines if any changes need to occur? If so, are those results summarized and reported somewhere?

Q4: Results – benefits to fish and wildlife

Quantitative findings produced by the project are clearly presented in the "Progress to Date" part of the proposal. For example, the project has met its goal of acclimating and annually releasing 250,000 spring Chinook smolts into Lostine River for 9 out of the past 10 years. Additionally, adult returns from HOR smolts have consistently been greater than for NOR adults, indicating that the hatchery program is providing a demographic boost to the Lostine population. However, the most important contribution of the project may be the testing of key assumptions associated with supplementation. Data on HOR and NOR spring/summer Chinook are being used to examine a broad suite of assumptions about the benefits/costs associated with supplementation. These range from assessing and comparing HOR and NOR juvenile and adult survival rates, relative reproductive success, age-at-maturation, maturation timing, spawning ground distribution, productivity, genetic diversity, straying rates, and so on. Results are also being used to parameterize life cycle models.

199608300 - CTUIR Grande Ronde Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The CTUIR Grande Ronde Watershed Restoration project has been a major player in the restoration of the Grande Ronde River basin for several decades. They have worked effectively with the Grande Ronde Model Watershed Umbrella project, CRITFC, ODFW, and other land managers in the basin. Overall, the ISRP recognizes that the CTUIR has a productive program, one that has successfully implemented important projects, effectively developed many collaborations, and met significant challenges. The project's strengths are their leadership in GRMW, their many partnerships (CRITFC, ODFW, Bureau of Reclamation, and others) and their integration of science and Tribal processes in project review and adaptation.

Additionally, the ISRP appreciates the links to outreach materials as well as the time and attention that CTUIR invested in preparing an easily understood proposal. However, the proposal lacks quantitative objectives for the physical activities, justification for other objectives, and clarity on the quality and application of monitoring data in documenting benefits for fish and wildlife.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and workplans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **Use of monitoring data.** The project cooperates with CTUIR Grande Ronde RME project (200708300) and Biomonitoring Project (200901400) to monitor the physical and biological outcomes of restoration actions. How are the data collected under those projects used by this project? How useful are the data collected by these projects in informing the benefits of restoration actions? What process is used when the monitoring data are discovered to be inadequate or otherwise unusable for the project's purposes?

2. **Benefits to fish and wildlife.** The proponents need to provide a summary of how fish populations are responding to the restoration actions. A few preliminary analyses (e.g., abundance, growth rates, survivorship) would be helpful with the understanding that full documentation will be forthcoming in the near future as part of the revised Grande Ronde synthesis.
3. **SMART objectives.** Overall, the proponents' restoration projects are guided by River Vision, First Foods, Upland Vision, and the Atlas process. The proposal includes a general qualitative description of their objectives for restoration projects (Table 8 in proposal), but the proponents should develop SMART objectives (see proposal instructions) for the physical restoration projects to provide more specific desired outcomes for the associated overall objectives listed in Table 8. These SMART objectives should clarify the desired/achievable future outcomes and relate specific restoration actions to those outcomes.
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The project is guided by a broad goal to protect, enhance, restore resources for First Foods, but the proposal does not identify quantitative/SMART objectives for the physical actions. Table 8 (page 14) provides an outline of the physical features being targeted as well as the action and criteria for monitoring the projects but does not provide targets or timelines for these objectives. For example, how much protected acreage is expected to be achieved over the next project period? Table 9 (page 35) provides a very clear outline of what actions are planned for six projects under the next funding period, though it is not related to outcomes.

Q2: Methods

Methods for planning, design, monitoring, collaboration/coordination, and outreach are based on established best practices at the local and broader levels. All are widely accepted and

appropriate. In some cases, the proponents are using state-of-the-art technology and database management.

The CTUIR Grande Ronde Watershed Restoration project has participated in the development of the Atlases for Catherine Creek, upper Grande Ronde, and Wallowa/Imnaha rivers. These Atlases provide spatially explicit information and processes for evaluating habitat conditions at landscape scales, prioritizing restoration alternatives, and designing restoration actions with the greatest landscape level benefit. Incorporation of the First Foods Policy into the evaluation and prioritization process provides an important integration of Tribal values and traditional ecological knowledge. The project participates extensively in the development of restoration actions throughout the Grande Ronde River basin and is a critical partner in the collective efforts to accomplish the goals and objectives of the Fish and Wildlife Program.

The proposal describes the overall approach and also gives a detailed description of methods used for project planning and design, construction and implementation, measurement of effectiveness, and data management. These methods are also documented in previous reports and planning documents. The project has more than 25 years of experience in implementing restoration actions and working with collaborators. The project design process has been developed in close coordination with BPA. As well, the project provides an explicit list and details of upcoming projects for 2023 to 2027.

Q3: Provisions for M&E

The proposal describes multiple processes for reviewing and guiding the project, which incorporate both western science and Tribal processes. In addition to applying the Atlas process as the basis for integrating science and adapting the program, CTUIR also has multiple additional processes that support evaluating and steering the project. These processes include the engagement of the CTUIR Board of Trustees in program-level decision making, an annual open house that includes the CTUIR Department of Natural Resources and the broader Tribal community, the application of the Riverine Ecosystem Planning Approach for steering the Fisheries Habitat Program, and a semi-annual three-day meeting for supervisors, biologists, and technicians in the Fisheries Habitat Program to review communication, coordination, and technical processes. While the interactions between these processes are not entirely clear and not reflected in a concisely described adaptive management program, the summary demonstrates that multiple mechanisms are in place for evaluating the project and for using science and Tribal priorities to guide decision making.

This project benefits from the data collected by CTUIR's two monitoring projects, the CTUIR Grande Ronde RME project (200708300) and Biomonitoring Project (200901400), as well as

through their participation in the GRMW. The project also coordinates with the Action Effectiveness Monitoring Program to follow the effectiveness of their restoration projects, with several of the AEM sites located within the project area. Monitoring includes multiple dimension of the salmonid life cycle (e.g., adult and juvenile abundance, pre-spawn and parr survival, SAR, redd density), as well as various high-resolution measures of the physical habitat. However, the proposal did not provide clear indication of how those data are being used to evaluate the benefit of, or adjustment needs for, the work being conducted. The ISRP recognizes another project (Project 200708300) is responsible for processing the biological data. However, the inclusion of some of those data, a brief summary of the plan for analyzing those data, and a clear explanation for how those data are used to inform the restoration actions would have been valuable in this proposal.

The proposal thoroughly describes potential confounding factors and the CTUIR's actions to address the consequences of these factors. It uses regional temperature information and the 2015 Climate Change Vulnerability Assessment for the Aboriginal Titled lands to provide a quantitative framework for addressing the effects of climate change. The proponents use conceptual frameworks, such as process-based restoration, to guide them, and apply the results of CRITFC's models for the Grande Ronde and Catherine Creek watersheds. This project also has been a major player in the collective efforts of the Grande Ronde partners to understand potential causes of mortality observed in the lower reaches and in the State Ditch. The proponents are investigating hydrological and contaminant related factors that could be responsible. They are leaders in floodplain restoration and reconnection in the basin. In addition, the project works closely with the local weed control agency to remove invasive plants.

Q4: Results – benefits to fish and wildlife

Since the 2013 ISRP review, the project has successfully acquired fee titles and sponsored watershed projects on 4,135 acres of permanent habitat conservation (fee title acquisitions and permanent easements), 606 acres of term conservation easements, 348 acres of floodplain reconnection, 14 river miles of habitat restoration/ enhancement, creation/enhancement of 248 large and small pools, and over 400 miles of fish passage improvement. Restoration actions from 2014 to 2021 have reconnected 455 acres of floodplain habitat, protected 1,083 acres of floodplain, upland, and riparian areas through conservation easements, restored 157 acres of floodplain and riparian habitat planted with over 47,000 native trees and shrubs, restored 13.5 miles of main channels, constructed 8 miles of side channels, created or enhanced 147 large main channel pools, created or enhanced 74 side channel pools, and installed 589 large wood structures. Detailed outcomes are described for six major projects and several smaller projects.

The proposal does not translate these actions into potential benefits for fish and wildlife but instead points to other regional studies, such as AEM, that demonstrate the importance of these actions for fish and wildlife. To some degree, the project's contributions in the Grande Ronde basin are represented in the recent report by White et al. 2021. Nevertheless, given that CTUIR is one of the few projects with an RM&E program capable of tracking fish response, some indication of the benefit of these substantial efforts should be available and included in the proposal, as well as used in guiding project decision processes.

A serious bottleneck to salmonid recovery is resolution of the State Ditch issue. The diversion resulted in an approximate 35-mile reach, once occupied by both the Grande Ronde River and Catherine Creek (which is currently occupied by Catherine Creek), of entrenched, low gradient flow with generally poor habitat complexity, winter icing, and potentially high predation rates. The proponents are working with those seeking a solution, but resolution may not occur soon.

Additionally, predation of salmonids by both aquatic and terrestrial native and non-native species and the effects on juvenile salmonid mortality have not been evaluated comprehensively in the basin. The Bureau of Reclamation has a proposal to investigate predation, which is expected to be presented to the Valley Subgroup for further development in the near future. The objective is to determine current status of predation, potential effects on mortality, and possible remedial actions.

Agricultural chemicals and transportation, and urban generated pollutants, remain potential confounding factors that are largely unquantified and poorly understood in terms of the potential effects on aquatic productivity and fishery resources. Pollutants have been identified as a potential source and confounding factor associated with Chinook salmon smolt mortality. While the GRMW initiated a water quality assessment in 2019 to evaluate pollutants and toxic chemical presence in Catherine Creek, the evaluations are not complete. The ISRP encourages the proponents to put their support behind initiatives to better characterize pollutants in the Grande Ronde valley and their consequences for juvenile salmonids.

200820700 - CTUIR Priority Stream Corridor Conservation and Protection (Umatilla Tribe Protection and Capital Acquisition)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The CTUIR Priority Stream Corridor Conservation and Protection Project cooperates with other groups to acquire easements and property to secure permanent protection for core anadromous fish habitat in CTUIR's aboriginal area. The project has been successful, permanently protecting 5000 acres. The proponents adequately describe their relationships to other projects but do not indicate the relative contributions of their project-specific activities to the collective restoration efforts in the targeted basins.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **Project evaluation and adjustment.** Provide a description of the formal process for reviewing, evaluating, and adjusting the program broadly.
2. **Restoration sites.** Provide a summary (map, table) of the sites conserved up to this point and those in process, some basic biophysical characteristics of the properties, and the target species for the sites.
3. **Application of monitoring data.** Indicate how quickly data and analyses are received from the monitoring projects and, as well, how the analyses/results influence the process used for future purchases and easements.

4. **Outcomes for Objective 1.** Explain how the intended annual outcomes for Objective 1 were determined.
5. **Benefits for fish and wildlife.** Meet the 2013 Geographic Review qualification by providing *“additional detail regarding CTUIR monitoring and how acquired parcels will be accounted for within the context of the regional framework for habitat status and trend monitoring.”* Presumably this would include a landscape level analysis of the contribution of these acquisitions to the overall habitat quality available for fish and wildlife.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The project has an overarching goal of securing permanent protection for core anadromous habitats in CTUIR’s aboriginal areas, and the goal is supported by a set of objectives. Objective 1 is clear and quantitative, but the subsequent objectives basically describe tasks required to achieve Objectives 1. While the proponents define the scope of the proposed efforts, objectives 2-8 are not really objectives. Many are methods and should be placed in the Methods section. In addition, most objectives are not in a SMART format, although the intentions are clear.

While the proposal provides quantitative and time bound outcomes for Objective 1, the remaining seven objectives are primarily implementation actions necessary to accomplish Objective 1 in a way that is technically sound. Further, the proposal does not explain how the quantitative outcomes in Objective 1 were developed from subbasin and recovery plans. The proponents need to explain how the intended annual outcomes were determined and should document this in the revised proposal.

Q2: Methods

The proponents emphasize the urgency of land acquisition and easements. The Priority Stream Corridor Conservation and Protection Project works closely with CTUIR’s established Land Acquisition Program to coordinate the acquisition of property and ensure consistency with

CTUIR land and resource management goals. The proponents have developed thorough and effective methods for acquisitions and easements. In addition, other projects and BPA provide thorough ongoing review. To streamline property evaluations, CTUIR is developing an online ArcGIS application to better assess the potential benefits of a land acquisition prospect. Finally, the ISRP commends the proponents for expanding their partners and opportunities, including exploring the use of FEMA funds in recently flooded areas to acquire lands and remove infrastructure.

The Priority Stream Corridor Conservation and Protection Project coordinates with other projects within the CTUIR, as well as with the Umbrella and Programmatic projects in the Grande Ronde, Tucannon, and John Day River basins, to acquire and protect habitats for fish and wildlife. The project integrates the First Foods Policy into the landscape evaluation, prioritization, and acquisition process. While the project states that it collaborates with the Umbrella and Programmatic projects in these basins, the proposal does not mention the approaches used with those projects, such as using the Atlases, which have received favorable review from the ISRP.

The list of habitat project evaluation and prioritization criteria in Table 3 is informative. However, it does not provide special weighting to protect high quality intact habitat as opposed to degraded habitat that would be valuable for restoration. Given the high value of functional habitat, the project should consider expanding the criteria to protect ecologically healthy intact habitat.

The ISAB previously recommended land acquisition programs in the upper Columbia Basin to consider cost effectiveness in their ranking system (ISAB 2018-1). It is not apparent that the CTUIR criteria include any measure of cost effectiveness. We encourage the project to consider including some measure of cost-effectiveness in their ranking process.

Q3: Provisions for M&E

The proposal does not address either monitoring or project evaluation and adjustment (e.g., adaptive management process), but instead reviews the prioritization scheme for acquisitions. It is not clear if the project has a process for reviewing and evaluating their success in meeting program objectives, and whether the project has a decision process for modifying the direction or activities of the project if objectives are not being met.

The ISRP notes that monitoring the acquired parcels and easements is the responsibility of other projects, which are listed in Table 4. However, it is not clear how quickly the proponents receive analyses from these projects concerning the monitoring results, and how these analyses/results affect the process used for future purchases/easements. The ISRP assumes the

review and cooperation from CTUIR and BPA supports the project evaluation and adjustment process, but a summary of the strategy should be provided.

The proposal briefly mentions climate change and uncertain market values as potential confounding factors. It does not discuss any of the components of climate change and how they will factor those into project priorities and actions. The proponents should provide a more thorough description of how potential confounding factors are considered in their prioritization process, especially climate change and related factors.

Q4: Results – benefits to fish and wildlife

The project has permanently protected 5,000 acres since 2015, which is impressive, with 2,500 more acres being actively considered for protection. However, while the ISRP appreciated the concise nature of the proposal, it does not include any detail on where those properties are located, which species benefited, and so forth. The ISRP made a similar request in prior reviews, which the proponents responded to with an explanation for why it is not realistic for them to tie monitoring to target species. Rather than a complicated monitoring plan, some basic information is needed on the properties already protected, both to better understand the project and to communicate effectively about its benefits. An example summary could include a map of the sites protected and a table of the site names, attributes of the land (e.g., area, priority, specific features), the type of conservation mechanism (easement, fee title), and the benefits (e.g., species benefited, connectivity to other habitats, ecosystem services, human values). There are a number of existing frameworks (Google “land conservation metrics”) that could be used as a template for such a summary.

There are inherent benefits to fish and wildlife by acquiring critical properties and having conservation easements. However, the proponents have not quantified how previous purchases/easements have improved habitat for fish and wildlife populations. This may be an issue of having and analyzing the monitoring data, and it needs to be addressed in future annual reports, work plans, and proposals. While the proposal lists the completed acquisitions for the five basins, the majority of which are in the Grande Ronde and Tucannon basins, it does not summarize the anticipated contribution of these acquisitions in terms of fish and wildlife or landscape level analysis of the relative benefits. The 2013 Geographic Review included a qualification for the CTUIR to provide *“additional detail regarding CTUIR monitoring and how acquired parcels will be accounted for within the context of the regional framework for habitat status and trend monitoring.”* The project still needs to provide a landscape level analysis of the contribution of these acquisitions to the overall habitat quality available for fish and wildlife.

In response to previous ISRP comments, the proponents note that identification of willing sellers is accomplished either through monitoring the market or by “prospecting” via reaching out to owners in priority river reaches and watersheds. The latter has the potential to elevate

the expectations of the owners by exposing the high priority conservation status of the property, potentially in the absence of strong and timely motivation to sell. Similarly, a comprehensive ranked list of priority conservation targets can artificially elevate land values by creating the appearance of increased demand. Nevertheless, the ISRP would appreciate *general descriptions* of properties and easements being sought in order to better understand the restoration potential of properties being considered.

200820600 - Instream Flow Restoration

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Confederated Tribes of the Umatilla Indian Reservation

Province/Subbasin: Blue Mountain/Grande Ronde, Columbia Plateau/Umatilla, Columbia Plateau/Walla Walla

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP requests the proponents to provide information on the following two conditions in the next annual report and future workplans.

1. **Objectives and priorities.** The proponents should report their strategy and progress for collaborating with the CBWTP to establish objectives and priorities *for their geographic area* in their annual reports during this funding period and in future proposals.
2. **Scope of work.** The proponents should explain the scope of work for the subset of CBWTP projects that it implements, its evaluation and adjustment process, and the location of publicly available data for their projects in the next annual report.

The response indicates that the staff in this project seek and implement on-the-ground water purchases associated with the lands of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) that are prioritized and funded by the Columbia Basin Water Transactions Program (CBWTP). They essentially suggest that this project is Not Applicable for scientific review due to administrative decisions, and that the scientific review of the CBWTP under project 200201301 meets the requirements for scientific review. The Council staff determined that this project, funded through BPA, would be submitted for this review process. The ISRP recommends that the project continue to receive scientific review because it contains science elements and to ensure that coordination between these two BPA-funded projects meets

scientific requirements. We recommend that the proponents describe the coordination of this project and the CBWTP and their collaborative development of SMART objectives. Such objectives should be summarized for the fish and wildlife species within the geographic area addressed by this project. The proposal indicates that the CBWTP and CTUIR are jointly developing quantitative objectives. Past ISRP review of this project and the CBWTP have called for development of SMART objectives. The proponents should report their strategy and progress for developing these objectives for their geographic area in their annual reports during this funding period and in future proposals.

Although the 2019 ISRP review found that the CBWTP (200201301) Met Scientific Review Criteria, the ISRP still expects the proponents of this project to explain the scope of work for the subset of CBWTP project that it implements, its evaluation and adjustment process, and the location of publicly available data for their projects. Important questions to address include: Do the proponents participate in the Project Evaluation and Adjustment activities described by the CBWTP (e.g., biannual coordination conferences)? How has progress on the development of resiliency criteria been implemented into the program?

The ISRP found it difficult to understand how the activities of this project are connected to the CBWTP and what tasks and scope are attributable to this project over the next contract period. The proposal and the response do not provide the requested information. The proponents should provide this information in the next annual report. The proposal from Idaho MOA/Fish Accord Water Transactions ([200860800](#)) may serve as a useful example of the type of information the ISRP is expecting regarding the Conditions listed above.

The ISRP agrees that the previous review of the instream flow methodology of the CBWTP (200201301) is sufficient for this review.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The proposal describes a program for restoring flows to priority subbasins, supporting the broader CBWTP in addressing over-allocation of flows, a limiting factor for ESA-listed species. While the project has successfully secured water for rivers, several weaknesses in the proposal need to be addressed.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal:

1. **SMART objectives.** Please provide SMART objectives (see proposal instructions) based on intended project outcomes. Even if flow target analyses for specific reaches have not been finalized, the proponents can provide examples and explain thoroughly how the objectives for flow are determined and how they are related to intended ecological outcomes. In addition, project-based objectives may be appropriate that do not involve specific flow targets for individual reaches.
2. **Scope of work.** Clarity on the scope of work for the full proposed project period is needed.
3. **Project evaluation and adjustment.** Describe the process for how the vision and strategy for the project are developed and how the projects are evaluated and adjusted. Describe the internal process for evaluation and adaptive adjustment, including information on known decision points, explicit schedules for evaluation and decision-making, and documentation of decisions and project changes.
4. **Instream flow analysis methods.** Provide additional detail on the proposed methods for evaluating instream flow needs for the basin. When the proponents contract this assessment to others, how do they verify the scientific credibility of the analysis? How do these assessments include development of the natural, unimpaired flow as a context for developing the objectives and future management?
5. **Publicly available database.** Provide a description of the plan to create a publicly available database and the associated education and outreach capacity to accompany the database.
6. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal does not provide SMART objectives that are quantifiable and have explicit time frames. In the text that follows the objectives, the proponents should explain the basis or

justification of each objective. The current objectives are not measurable, though some of the narrative beneath them gets close to SMART objectives. For example, the first objective is to “Improve the instantaneous rate of flow through a defined stream reach,” which is not a SMART objective. However, the text that follows the objective clarifies that the proponents aim to acquire “roughly 10 cfs in flow restoration improvements” annually, based on what they were able to achieve in the prior project period. Similarly, while Objective 3 is not a SMART biological or physical objective, it is an implementation objective of completing one flow target analysis per year.

Objective 2—“Improve the total volume of water restored to a defined stream reach over a period of time”—is more problematic, for reasons the proponents acknowledge (e.g., variation in irrigation season, difficulty in estimating total volume based on measurements, and so forth). The ISRP questions the value of this objective if it cannot be defined quantitatively or measured.

The ISRP recommends eliminating Objectives 4-6. Objectives 4 and 5 are not SMART, and Objective 6 is not a complete sentence. It is not clear what Objective 6 aims to achieve. Objective 4 does not use an accurate measure of the egg to smolt survival ratio. Egg deposition depends on the size of the adult; therefore, the number of redds will not provide an accurate estimation of eggs. In addition, data are collected by other RM&E monitoring projects. Who conducts the necessary analyses for evaluating this objective, and what trends are evident after many years of acquiring water rights? Objective 5 does not seem realistic. Increasing off channel habitat requires large quantities of water, particularly during the irrigation season. Given that Objective 1 aims to increase instream flows by only 10 cfs across the entire basin, how feasible is Objective 5?

The prior ISRP review also identified the need for defining SMART objectives. In their response this comment (page 18), the proponents point to the need to complete the flow targets analysis to define quantitative objectives. However, while flow targets for individual reaches are potentially useful for guiding the project and prioritizing efforts, these flow targets are not necessary for defining quantifiable objectives for the project itself. For example, Objective 3 reflects a project objective that is an outcome or deliverable of this project’s efforts. Are there other outcomes that this project achieves as part of the process of restoring specific flow rates in specific reaches?

As the proponents point out, no data are collected to support any objectives beyond the first two. It is hard to understand how the proponents will know if they are meeting their objectives, and thus whether their approaches should be modified.

In summary, ISRP expects quantitative objectives, such as the 10 cfs per year identified under Objective 1, that directly link to and justify project activities. Objectives 4-6 are either unnecessary, unmeasurable, or infeasible.

Q2: Methods

The methods are described in the proposal as including “the identification and acquisition of priority water rights.” The project summary on CBfish further clarifies that: “CTUIR will work with CBWTP to help provide local planning and coordination to identify instream flow project opportunities in the Umatilla and Walla Walla Basins. CTUIR will assist CBWTP QLEs and the National F&W Foundation (current BPA contractor) in researching and establishing water right purchase opportunities.” While the specific CTUIR activities associated with identifying and acquiring water rights are not described in the proposal, it is unlikely that such activities are relevant for scientific review. However, the proposal was unclear on what activities would be conducted (and by whom) under the next project period. For example, the development of the GIS-based project evaluation tool sounds useful and some details about the tool were provided in the section on prior ISRP reviews, but it is not clear if this work is still ongoing and what tasks remain to be continued into the next project period for the tool to be launched. Thus, the ISRP requests proponents provide a description of the plan to create a publicly-available database and education and outreach capacity to accompany the database.

The project prioritization, compliance monitoring, and review process that is supported by the technical advisory committee are relevant to our scientific review. These aspects are strengths of the program. Though not described in detail within this proposal, they are described in the proposal from CBWTP and were examined by the ISRP in the 2013 Geographic Review.

A new scope is introduced in this proposal regarding the use of IFIM/PHABSIM to establish targets for instream flows for the priority subbasins. The description of this work does not provide sufficient information for scientific review. While IFIM/PHABSIM is still widely used, it has many limitations (National Research Council 2008) and many improvements (e.g., Naman et al. 2020, Rosenfeld and Naman 2021) have been introduced since the original implementation. These limitations and application of advancements can significantly affect the usefulness and relevance of the results. Description on this effort is needed. Are all contractors using the same techniques and where are those methods described? In addition, are these IFIM/PHABSIM analyses based simply on existing flow or do they develop a hydrologic context based on natural, unimpaired flows?

Q3: Provisions for M&E

The proposal provides links to documents describing the compliance monitoring conducted by the QLEs but does not describe how decisions are made about adjusting the project's direction more broadly. The proposal contains many examples of the proponents making strategic decisions. For example, how was the decision to use project funds for analysis of flow targets made? Or the decision to use Accord funds to integrate more real estate expertise into the project? Alternately, since flow data are so critical to compliance, how will project leaders make decisions about adjusting compliance protocols or project resources to address this need? Finally, it appears that the project is moving in the direction of land acquisition to secure water rights. How will those lands and water resources be managed strategically after acquisition? In asking these questions, the ISRP seeks clarity on how the project is evaluating and adapting to meet project objectives that ultimately benefit fish.

The response to the ISRP's second prior qualification (page 18, Results and Adaptive Management) is not adequate. As noted above regarding the GIS-based tool, the ISRP re-emphasizes that better access to project accomplishments and data is needed.

Q4: Results – benefits to fish and wildlife

The proposal summarizes the water rights secured since the 2008 Accords (page 7), though it is hard to place the total volume in a fish-related context. Is ~70 cfs (+5000 AF) protected between 2015-2022 a meaningful level of flow across these subbasins, either individually or collectively? What does this represent in terms of available fish habitat or proportion of the region's seasonal or annual discharge? This issue was raised in the 2013 Geographic Review. The proposed IFIM/PHABSIM analyses to prioritize where restoration of instream flows may be most beneficial in meeting flow needs potentially will provide an indirect indication of benefit to fish. The ISRP emphasizes that these analyses need to be conducted and interpreted and the project will need to highlight the overall outcomes and potential benefits to fish and wildlife.

References

- Naman, S.M., J.S. Rosenfeld, E. Jordison, M. Kuzyk, M and B.C. Eaton. 2020. Exploitation of velocity gradients by sympatric stream salmonids: Basic insights and implications for instream flow management. *North American Journal of Fish Management* 40: 320-329. <https://doi-org.ezproxy.proxy.library.oregonstate.edu/10.1002/nafm.10411>
- National Research Council. 2008. *Hydrology, Ecology, and Fishes of the Klamath River Basin*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12072>

Rosenfeld, J.S., and S.M. Naman. 2021. Identifying and mitigating systematic biases in fish habitat simulation modeling: Implications for estimating minimum instream flows. *River Research and Applications* 37: 869– 879. <https://doi-org.ezproxy.proxy.library.oregonstate.edu/10.1002/rra.3803>

200901400 - Biomonitoring of Fish Habitat Enhancement

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Umatilla Confederated Tribes (CTUIR)

Province/Subbasin: Blue Mountain/Grande Ronde, Columbia Plateau/John Day, Columbia Plateau/Tucannon, Columbia Plateau/Umatilla, Columbia Plateau/Walla Walla

Recommendation: Does Not Meet Scientific Review Criteria

Final review comment:

The ISRP recommends that the project "Does Not Meet Scientific Review Criteria" and suggests that the project be fully restructured as necessary to raise the scientific foundation of the project to an acceptable level. Based on the original project proposal, revised proposal, and responses provided to the ISRP's preliminary review, we find that the monitoring program is not scientifically adequate for either evaluating effectiveness of restoration actions or for determining the status and trends of Chinook salmon, steelhead, or bull trout populations. Fundamentally, many details of the monitoring program are unclear, and at times contradictory.

The ISRP concludes that a major proposal revision and resubmittal are necessary for this project to meet scientific review criteria, and the ISRP should review the revised proposal. The revised proposal should address the issues identified in our preliminary review, response request, and the comments that follow.

The ISRP is particularly concerned that the issues raised in this review are essentially the same as questions and conditions/qualifications raised in previous ISRP reviews of the project. In the 2018 Research Status Review ([ISRP 2018-8](#)), the ISRP evaluated the project's progress and concluded that it was underperforming. At that time, the ISRP felt that the project needed to be re-examined because of the extensive changes to the project and the future uncertainty of three basinwide monitoring programs (i.e., CHaMP, AEM, and ISEMP). In that review, the ISRP recommended that the project should redefine and update monitoring questions, quantitative objectives, and realistic timelines. Further, the review recommended that the proponents

develop “an explicit project framework that describes the research/monitoring path for future activities.” The ISRP also recommended that “the proponents need to re-group and seek sustained (multi-year) scientific mentorship, both internally and externally,” suggesting that “scientific mentorship perhaps could be provided by CRITFC or independent advisors with experience on similar projects.” Additionally, in the [2010 Review and 2012 ISRP Follow-up](#), the ISRP asked that the proponents provide a summary of data collected, results, and program modifications after three years, which would have been due in 2015. To the ISRP’s knowledge, this progress report was not submitted.

The ISRP has major concerns about the project’s scientific rigor. Because the monitoring activities conducted by this project are essential to several other projects, the ISRP recommends that this project submit a fully revised proposal, preferably by December 31, 2022. As suggested in the 2018 Research Status Review, the project should obtain substantial assistance, both internally and externally, from either CRITFC or other external advisors with experience in the design of monitoring programs and data analysis.

In our preliminary review, we requested additional information and clarifications on the eight topics listed below. The CTUIR responded to some – but not all – of the eight topics. Two requests for responses — 7. Guidance on Monitoring Methods, Design, and Analysis and 8. Confounding Factors — are not addressed by the proponents in their response or in the revised proposal. Additionally, the proponents’ other responses do not directly address our specific queries and much of the longer explanations are redundant with responses provided earlier in the document. The proponents did, however, make an effort to respond to the ISRP’s request to support the development of an M&E matrix, which is greatly appreciated. Our final comments below are based on responses received from the proponents, as well as an examination of the revised proposal:

1. **M&E Matrix – Support.** The proponents added a matrix (Table 1) to the revised proposal giving locations of monitoring actions with links to specific restoration projects. They pointed out that they require additional time (beyond the Response Loop deadline) because their project is not limited to the Grande Ronde Basin and they are working with several other groups, and the ISRP understands this time limitation. As the Fish and Wildlife Program develops summaries of monitoring and evaluation for the geographic areas, the ISRP encourages the CTUIR to contribute their information and expertise, which will benefit projects monitored under this program, as well as other projects within those subbasins. See the ISRP’s programmatic comment on habitat restoration M&E in this report.
2. **SMART Objectives.** While the proponents agree that SMART objectives are needed, they did not actually provide them. Rather, they indicated that they would be

forthcoming in the future, and then gave an example of SMART objectives for recruiting college students. The objectives in the revised proposal are marginal improvements, but generally do not meet criteria for SMART objectives. While some components of SMART objectives are included, some specific components of the new “SMART” objectives are insufficient.

Importantly, the objectives do not include quantifiable expected outcomes and do not identify the metrics to be used in measuring outcomes. The proponents also misinterpreted our use of “Time-bound.” We intended them to identify the timeline in which the expected benefits will occur. Also, note that the term “evaluate” should be replaced by “quantify or measure” in the new objectives.

Examples of SMART objectives are provided on page 5 and Figure 2 in the Proposal Form Template. The ISRP also encourages the proponents to contact us to discuss developing their SMART objectives.

3. **Results of Past Monitoring.** The responses under “Overall Conclusion” are tangential to the ISRP request to describe clear and complete results of past monitoring. We expected the response to include summaries of key findings and the data to support those findings.
4. **Benefits for Fish and Wildlife.** The ISRP requested a summary of the project’s benefits to fish and wildlife that is scientifically rigorous, explicit, unambiguous, and quantitative. Further, where benefits have not been realized, the ISRP requested that the proponents identify specific adjustments and changes in the program to address problems in achieving desired outcomes. The proponents’ responses describe methods to be employed, what they hope the outcomes for fish and wildlife might be, and a strategy for implementation. In the revised proposal, the proponents should explain how the results of their project will be used to determine the benefits to fish and wildlife, including how their project will quantify benefits to fish and wildlife, what their project has already quantified, and what other projects will use their information to determine benefits.
5. **Project Evaluation and Adjustment.** The ISRP requested a thorough description of the project’s evaluation and adaptive adjustment process, both within the project and how the proponents communicate with projects receiving their monitoring results (for instance, their input on the monitoring study designs, mechanisms for regular data and information transfer). The ISRP expects a full description that includes information on known decision points, how data are used to support evaluation of this project in meetings its objectives, explicit schedules for evaluation and decision-making, and

documentation of decisions and project changes. The CTUIR responses do not address these issues. Further, the description of Adaptive Management does not provide adequate details for evaluation. The proponents did, however, add several useful flow charts (Figures 2, 3 and 4) to the revised proposal showing general programmatic linkages for 1) policy and management structure, 2) adaptive management pathways, and 3) oversight, planning and coordination.

The ISRP notes that the project evaluation and adjustment section appears to provide details for a different CTUIR project. The plan described in the response seems reasonable, but the updated proposal does not align with this plan or provide an indication that the project is actually following these steps. The plan requires quantitative objectives or hypotheses, reporting empirical data, establishing biological targets, and applying decision rules. How is CTUIR implementing these for the Biomonitoring project?

6. **Monitoring Design.** No response was provided by CTUIR and this section of the revised proposal remains largely unchanged from the original. The ISRP expected a description of the process for developing monitoring actions, including statistical design and analyses, modeling, and field and laboratory methods. As well, the ISRP expected to learn 1) how the project coordinates with projects that are implementing restoration actions as a way of improving monitoring methods, design, and analysis, and 2) how the project obtains comprehensive review and assistance of its monitoring efforts and analyses. The ISRP recommended that a steering committee with specific technical expertise, as well as internal CTUIR and ad hoc external scientific assistance, would greatly strengthen the project, if such technical guidance is not already formally established. The CTUIR did not respond to this important recommendation.

In addition, the ISRP was confused about inconsistencies within the response and between the response and the updated proposal. One example is regarding the number of sites that are in pre-restoration monitoring. At various places, the response states that “a majority,” “all,” “5,” and “half” of the projects are in pre-restoration monitoring, which does not align with the information presented in Table 1 of the updated proposal. Without this basic information, it is impossible for the ISRP to provide a scientific review of the monitoring design.

Going forward, it appears that the project will include a blend of site-scale and reach-scale monitoring. This raises a number of fundamental questions that are not addressed in the proposal or in the response: How will those datasets be related to each other? How will measurements at difference scales be integrated and synthesized? Furthermore, the response frequently indicates that the proponents “anticipate” doing

things in “in the future,” but the ISRP needs a definitive monitoring plan so we can review it. When will that plan be available? And what are the steps the proponents will undertake to complete that plan?

7. **Guidance on Monitoring Methods, Design, and Analysis.** The proponents did not list this as a response category and did not provide a response to this request.

The ISRP requested that the proponents: “Explain how the project obtains comprehensive review and assistance of its monitoring efforts and analyses. The ISRP recommends that a steering committee with specific technical expertise, as well as internal CTUIR and ad hoc external scientific assistance, would greatly strengthen the project, if such technical guidance is not already formally established.” Perhaps the proponents felt that they responded to this in the previous item.

8. **Confounding Factors.** No response was provided by the CTUIR. The ISRP asked the proponents to thoroughly describe potential confounding factors that would directly limit the effectiveness of this monitoring activity, and how the project is responding to those factors, rather than factors that generally limit restoration recovery. This does not appear to have been changed in the revised proposal.

An Additional Consideration

In the 2017 Wildlife Project Review ([ISRP 2017-7](#)), the ISRP encouraged the CTUIR to use the River Vision and First Foods concept for monitoring and evaluation in addition to traditional monitoring methods from western science, and the ISRP continues to encourage this approach for this project. We acknowledge that the CTUIR project based on the River Vision and First Foods paradigm will have unique characteristics that reflect cultural values, and we anticipate these will strengthen the relevance and scope of the outcomes from monitoring and evaluation. The framework and methods for monitoring and evaluation still need to be explicit regardless of whether the program is based on Tribal and/or western values and experiences.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

The Biomonitoring project is a central component in the CTUIR’s restoration efforts in five basins. The need for the program is well justified in the Problem Statement, and it is clear that other projects depend on this effort to understand the benefits and limitations of their restoration efforts. However, the project appears to be a somewhat *ad hoc* collection of

monitoring efforts that lack a coherent strategy and statistical robustness. Based on the information provided, the ISRP cannot determine if the monitoring program is scientifically appropriate for either evaluating effectiveness of restoration actions or for determining the status and trends of Chinook salmon, steelhead, or bull trout populations.

In a revised proposal, the proponents need to demonstrate that they have a robust and logical monitoring program, one that directly supports understanding and enhancing the benefits of restoration, which is the project's broader goal. The proposal is currently deficient in the development of goals and SMART objectives, description of methods, the analysis and presentation of project results and findings, the development of a clear adaptive evaluation process, and the documentation of overall benefits to fish and wildlife. A much more rigorous interpretation of the datasets is needed. These deficiencies raise important questions about functional linkages with the separately BPA-funded habitat projects, which rely on the monitoring results produced by this project. The revised proposal and response should clearly demonstrate that the habitat restoration projects are receiving reliable, relevant, and timely information from this monitoring and evaluation project.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal. As well, the proposal needs to be reformatted according to the Council's guidance for proposal preparation.

1. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. We also ask this project to assist other lead projects that are developing M&E summaries of other basins where this project is operating. We ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
2. **SMART objectives.** Provide a single description of goals and SMART objectives (see proposal instructions). Where objectives are not completely quantifiable with biologically and physically relevant metrics, the proponents should be as explicit as possible about the desired characteristics and outcomes of implementing actions to achieve specific objectives.

3. **Results of past monitoring.** Describe clear and complete results of past monitoring for each of the three focal species, as well as the actions and/or basin characteristics that have been monitored. The proponents should summarize and explain overall conclusions for the major monitoring components. For instance, a summary could address the fundamental conclusions from the monitoring program as well as the implications for future actions and management directions. If monitoring has demonstrated that restoration actions have not been effective, then explain how the CTUIR will modify the BPA-funded restoration projects and the CTUIR Natural Resources Program.
4. **Benefits for fish and wildlife.** Provide a clear empirical description of the project's benefits and its related restoration actions for fish and wildlife. This is a fundamental criterion of projects funded under the Fish and Wildlife Program. The explanation of benefits to fish and wildlife should be scientifically rigorous, explicit, unambiguous, and quantitative. Where benefits have not been realized, the proponents should identify specific adjustments and changes in the program to address the lack of desired outcomes.
5. **Project evaluation and adjustment.** Provide a thorough description of the project's evaluation and adaptive adjustment process, both within the project and how the proponents communicate with projects receiving their monitoring results (for instance, their input on the monitoring study designs, mechanisms for regular data and information transfer). The description should include information on known decision points, explicit schedules for evaluation and decision-making, and documentation of decisions and project changes.
6. **Monitoring design.** Describe the process for developing monitoring projects, including statistical design and analyses, modeling, field methods, and laboratory methods. This description should also include how the project coordinates with projects who are implementing restoration actions.
7. **Guidance on monitoring methods, design, and analysis.** Explain how the project obtains comprehensive review and assistance of its monitoring efforts and analyses. The ISRP recommends that a steering committee with specific technical expertise, as well as internal CTUIR and ad hoc external scientific assistance, would greatly strengthen the project, if such technical guidance is not already formally established.
8. **Confounding factors.** Thoroughly describe potential confounding factors that would directly limit the effectiveness of this monitoring activity, and how the project is responding to those factors, rather than factors that generally limit restoration recovery.

Q1: Clearly defined objectives and outcomes

During the 2018 Research Status Review (ISRP 2018-8), the ISRP concluded that this project was underperforming. At that time, given the extensive changes to the project, as well as the general uncertainty regarding funding and the future of three Basin-wide monitoring programs (i.e., CHaMP, AEM, and ISEMP), the ISRP felt that the project needed to be re-examined and re-defined with updated monitoring questions, quantitative objectives, and realistic timelines. Most of these concerns still apply. The current proposal only reinforces the impression that the project is fragmented in many ways. The proposal makes it very difficult for the ISRP to understand where and why data are being collected, how appropriate statistical analyses are being used to support study design and synthesis of monitoring data, how the monitoring data support key findings about restoration actions, and how those key findings are being used to adjust existing habitat restoration projects.

The objectives need to be in a SMART format. Without a SMART format the activities cannot be adequately evaluated during the next review. While a list of 11 qualitative objectives are provided, they do not seem feasible, and the activities defined under the Methods section do not clearly align with those objectives. In addition, based on the text on page 31, it is unclear if the project is still relying on the objectives (and methods?) of CHaMP and AEM, or if they have modified these. If these were modified, explain how the new data are expected to crosswalk with data collected under the prior objectives and methods? The project may be more effective if it focuses instead on fewer objectives and on objectives that are well framed for evaluating the effects of targeted restoration actions.

Further, the project's goals and objectives are presented in two sections: 1) Progress to Date and 2) Goals and Objectives. The two descriptions of goals and objectives are not consistent. The Progress to Date section lists a single goal and 5 objectives. The Goals and Objectives section lists 3 goals and 11 objectives.

In the "Progress to Date" section, most objectives are general statements of desired actions or outcomes. Only a few objectives are quantitative. Explicit time frames are not provided for the subset of objectives that are quantitative, and the proposal does not explain the biological or ecological basis for any objectives. Further, there is a list of a "Summary of the Physical Benefits of Restoration Monitoring" and list of a "Summary of the Biological Benefits of Restoration Monitoring," but the lists are actually potential physical or biological outcomes that the project desires rather than benefits quantitatively determined via monitoring. Even in the list provided, the physical or ecological benefits are not relevant for all focal species or for all locations within the river network. Separate outcomes for salmonid abundance and salmonid densities are

listed even though the two are intricately related and equivalent in most locations. Some separate types of outcomes are mistakenly combined in a single outcome.

In the “Goals and Objectives” section, separate goals are indicated for 1) biological monitoring of treatments and controls for restoration projects, 2) physical monitoring of treatments and controls for restoration projects, and 3) biological and physical monitoring of reference reaches. The objectives are implementation objectives that call for different types of monitoring activities or analyses, they are not SMART objectives (quantitative or time bound). The proposal repeats the importance of monitoring at appropriate spatial scales but neither monitors nor applies analytical methods for a range of spatial scales. In particular, no approach for basin-scale monitoring and analysis is described in the proposal.

Q2: Methods

The methods indicate that five activities will be conducted:

- PIT tagging of spring Chinook in the upper Umatilla River and at Meacham Creek
- Seasonal snorkel events for juvenile abundance at treatment and control reaches
- Analysis of redd surveys conducted by project partners
- Macroinvertebrate sampling
- Physical habitat monitoring at 1,3,5, and 10 years post project.

Unfortunately, there was no clear overarching logic plan for what is monitored where and why, and the proposal contradicted itself in multiple places. Some examples are noted below.

Basic information about site selection is needed. While the proposal indicates that sites were selected according to the same methods as CHaMP and AEM protocols, the proposal does not describe those methods or the sites that were selected. Furthermore, the Meacham Creek site was selected, despite not having pre-project data, because it embodies one of the largest ongoing restoration efforts for addressing instream and floodplain function, but that justification is not consistent with site selection in CHaMP or AEM. It is also not clear how many sites are being monitored, or where those sites are located. At different places within the proposal, the text indicates that there are 9, 11, or 16 sites.

In addition, descriptions of methods are missing or unclear, particularly related the analysis of data. For instance, the project conducted WUA analysis and concluded that it increased for some of the projects. However, given the many analysis decisions and limitation of WUA-type

analyses, more information is needed on how the analysis was conducted. As well, some basic information is missing, such as in Fig. 8. Why are the proponents showing only the highest correlated physical values (pool area), and what are the correlations to? In addition, do the proponents plan to continue the WUA analysis under the next project period?

Interpretation of prior data is also problematic, particularly about whether fish abundances and densities increased as a result of restoration actions (i.e., pages 12, 36, and 40). The text contradicts itself in multiple places, and the findings do not always appear to be based on the data. Furthermore, the data (as presented) do not include evaluation of variability or uncertainty in interpreting the significance of any differences. In other cases, the proponents use vague words like “increase” to reflect differences between a treatment and control, rather than empirical changes at a site over time.

More specific concerns are bulleted below. Taken together, these issues reduce confidence in the findings.

- Figure 3 and 4: Years need to be placed on these plots to help understand the context for identifying and understanding the pre-post years. Were they hot and dry, cold and wet, or moderate years? How are the proponents interpreting data to evaluate causality? Also, is there a time series of data that are condensed somehow into a pre- and post-dataset?
- Page 18: It is not clear how juvenile PIT tags will be used in evaluating restoration effectiveness. Please clarify.
- Pages 19 -21: What did the proponents learn from the drift monitoring studies?
- Page 25: If it is likely that redd abundance will not be sensitive to site-scale restoration, then why are the proponents monitoring redds? Also, the subsequent text suggests that the program may move in the direction of monitoring spawning suitability rather than counting redds. Is this what is being planned for the next project period?
- Page 27: The proposal indicates that coordination with habitat restoration implementers will continue, but it is not clear what kind of coordination is currently happening and what more may be needed.
- Please clarify how this project relates to the PHaMS effort. What complementary monitoring and methods are being referred to and how are the data and personnel coordinated?
- Page 35: The proponents “propose to integrate surveys of reference areas to compare with our treatment and control sites.” Why? If there are indeed multiple years of data,

why is this necessary? It seems like critical information will be lost concerning annual variability at a site.

- Page 37: What are the results of the 2019 field test of the rapid instream physical habitat monitoring methods? And against what criteria are those methods being tested?
- Page 41: Benthos are being monitored annually, but previously the text said that this effort had ended. Will this effort be continued in the next project phase? If so, please justify given that the proposal earlier reported them to be of limited value.
- Page 45: What was the process for coordination with experts in the field? Who were the experts and what disciplines did they represent? Does the project receive ongoing guidance from these experts? How was the protocol modified as a result?
- Page 46 (Table 1): It is not clear how this is related to the project since the actions in the table do not reflect the actions undertaken by CTUIR's habitat restoration project (199608300), and it is not clear how the proposed monitoring actions align with the touchstones in the Table.

Finally, information is needed to explain how the project intends to synthesize the results of monitoring other than before and after comparisons of specific sites. Methods for basin scale monitoring or synthesis need to be described in the revised proposal. While the proposal indicates that CHaMP and AEM protocols are employed, the proponents do not indicate which protocols are used. It does not appear that these methods are documented in MonitoringResources.org, but they should be.

Although a positive aspect of the project is the storage of data in the Tribe's CDMS and the Sitka Tech's GeoOptix program, the data management process is not adequately described. This component is critical for data archiving and retrieval. Have the proponents documented the structure and details of the data management system and metadata documentation?

Q3: Provisions for M&E

Basic linkages to the project adjustment process are not readily apparent. The proponents are involved with other projects, but the mechanisms for data and information transfer need to be transparent.

While the proposal mentions that adjustments are "frequently suggested by oversight committees and/or local oversight groups, and annual operating plans," it is not clear who those oversight groups are or how the proponents consider and respond to those suggestions. The ISRP assumes they are the groups identified in Table 1 (page 51), but it is not clear what

information or process is used to evaluate the program. Although the ISRP and Council review process provides an important opportunity for project adjustment and evaluation (page 52), the ISRP is not the appropriate venue for regular project evaluation and adjustment processes because of the multi-year intervals between ISRP reviews and the limited discussion between the project collaborators. The project needs a strategic and structured process for evaluating whether it is meeting its objectives and for steering the project's vision.

The ISRP agrees that (p. 27) "Expanding the collaboration of monitoring efforts beyond salmon centric projects to include other significant species such as mussels and lamprey is critical to inform effects of restoration on CTUIR First Foods." Do the proponents have plans and capacity to expand in these directions?

While the proponents believe that the conclusion, discussion, and recommendations from annual reports to BPA are important inputs for adaptive management, they do not complete the cyclic adaptive management process. How are these recommendations communicated to the related projects in a timely manner for them to make project modifications? While the proponents mention that (p. 61) "CTUIR RM&E and CRITFC are also part of the Adaptive Management sub-group and are co-authors on a recent collaborative adaptive management paper," it is not clear that they are involved in regular adaptive management or structured decision-making processes for this project.

In the present narrative, the proponents do not address the potential compounding factors that would limit the effectiveness of a monitoring project. Issues such as poorly managed livestock and irrigation activities, stream channelization, pollutants, and improper fish passage are mentioned. However, the ISRP feels that factors such as (for instance) up-to-date training, staff turnover rates, vandalism at sites or to equipment, or a mismatch of data collected and the objectives for specific restoration actions would more directly influence project performance.

The project incorporates the River Vision Touchstone Relationships in their monitoring plan. This is a positive integration of cultural knowledge and perspectives, and the ISRP encourages the project to continue to make such linkages even more explicit.

Q4: Results – benefits to fish and wildlife

The goal of the Biomonitoring project is to assess the effectiveness of CTUIR's habitat restoration actions for spring Chinook salmon, summer steelhead, and bull trout populations. The reporting of the project's monitoring results is confusing and unclear. Many details of specific findings are lost in overall averages for sites or species.

The proponents present significant information and analyses on fish abundance and density for a variety of pre-treatment and post-treatment situations. Even though significant improvements in physical habitat conditions are documented, the fish data mostly show no statistically significant difference in average abundance and density for the vast majority of sites. While there may not have been adequate time after restoration actions to reveal positive fish responses or the sampling may have been too limited in spatial scope, the fact remains that the majority of sites are not adequately responding to restoration measures. The results are equivocal in most cases. Why? The proponents do not explore this question. However, it is their responsibility to see that the key information becomes part of the adaptive management process of the individual implementation projects so that it might be used to adjust restoration actions. Unfortunately, that essential link is not clearly evident in the proposal narrative. Another interpretation might be that, since it is not clear that the project is informing or improving restoration actions, there is no evidence of benefit to fish; a significant finding for which the associated habitat projects should be making adjustments.

Specifically,

- Project results are presented for juvenile salmonid density and abundance, but all salmonid species are combined. The results often are not consistent within or between projects, and the proposal does not discuss or explain why they are not consistent.
- Physical monitoring results also are presented collectively for five different projects, but the outcomes for channel and floodplain area and pool area are combined for all sites as overall averages (separate values are graphically illustrated). The proposal reports that wetted usable area for juvenile Chinook and steelhead increase as bankfull area or total wetted area increases, which almost inherently has to be true, and does not document the effectiveness or success of restoration.
- Numbers of PIT-tagged juvenile Chinook captured in screw traps are reported but the data are not analyzed to estimate survival, migration timing, or anything other than the percent of tagged fish observed in the downstream trap (2-3%). If this is correct, the survival rates for out-migrating Chinook juveniles are shockingly low and a major cause for concern.
- Graphs of macroinvertebrates are included for eight restoration sites, but it is not clear whether the results are benthic invertebrates or drift (both terms are used), and the outcomes are not discussed or explained. Few if any sites exhibited differences in these measures of macroinvertebrates before or after restoration, indicating that restoration is not influencing macroinvertebrate communities. Unfortunately, the proposal does not explain the findings or draw conclusions.

- The proposal uses two graphs to illustrate redd densities for Chinook in 2020 and steelhead from 2009-2020. The proposal states that the project has “seen no difference in redds/km when comparing the treatment and control reaches (Figure 14 and 15). With future habitat projects in the mainstem Umatilla, we might see these densities change.” The data for treatment and control sites are not presented, and the hopeful conjecture is not supported by data or explained.

Finally, the proposal states that “responses at the population and watershed level will require a much broader analysis and incorporation of methodology within each basin” but provides no proposed analyses, models, or monitoring approaches that would provide a coherent landscape analysis. The discussion of overall findings for fish abundance and physical habitat responses is confusing, contradictory, and largely provides reasons why the restoration has not been effective, or the monitoring has not been sufficient to detect a response.

200900400 - Evaluating salmonid and stream ecosystem response to conservation measures and environmental stressors in the Columbia River basin

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Columbia River Inter-Tribal Fish Commission

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria

Overall comment:

This Columbia River Inter-Tribal Fish Commission project provides critical research and monitoring for the Grande Ronde River basin. They provide information and analyses that are used by the Grande Ronde Model Watershed Umbrella Project as well as by a large number of habitat restoration projects, state and Federal agencies, recovery plans, and the Fish and Wildlife Program. The proponents provide clear responses to past Council recommendations and ISRP reviews. It is an exemplary project that balances rigorous primary research with monitoring of status and trends of habitat conditions and populations of salmon and steelhead. This is among the most productive projects in the Columbia Basin in terms of peer-reviewed publications, publicly accessible databases, methods development, and integration reports. They have developed a strong reputation as a valued cooperator and leader in conservation

and restoration within the Basin. The proposal is clearly written, informative, consistent with the requested format, and could serve as an example for other projects.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop (September 24 to November 22, 2021) , we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proponents provide clearly written goals and objectives and integrate them with the description of methods and the project timelines. While the objectives are not quantitative and SMART, they do clearly outline the scope of the project. Revising objectives to be more quantitative (SMART) would make assessing their achievement simpler and more obvious. As they stand, they are essentially implementation targets for RM&E efforts. The ISRP encourages the proponents to make their objectives quantitative and time-bound where possible. These improved objectives can be included in future annual reports or included in a revised proposal that the proponents can use for project operations and internal evaluation.

Q2: Methods

The proposal clearly describes the methods for each objective, with additional documentation, information in appendices, and details in MonitoringResources.org. The project proposes a series of high-impact activities that will benefit the Grande Ronde and Minam rivers and will refine methods that likely will be used by others in the Columbia River Basin. The proposal includes a robust plan for managing and sharing data, including dissemination of the life cycle model.

Two key examples stand out with respect to contributions beyond this project. First, the use of a life cycle model for evaluating restoration actions is an effective and meaningful way to understand restoration benefits that addresses issues of natural variability and out-of-basin factors. This practice should be encouraged in other basins. One example of an important and distressing finding from the life cycle modeling efforts is that extinction risk is certain for the Upper Grande Ronde population. If results are confirmed with the updated model and data,

they will have major implications for ongoing restoration efforts in the basin and beyond. Second, the White et al. 2021 *Fisheries* publication is an important resource for other programs in the basin, and Council should work with the authors to find a way to broadly disseminate it.

Q3: Provisions for M&E

The proponents have responded positively to past ISRP conditions and recommendations. The project not only has developed a thorough and careful annual evaluation process both internally and externally but has also assisted the Grande Ronde Model Watershed in its development of an excellent adaptive evaluation process. Further, the project has reported on its approach to adaptive management in the peer-reviewed publication in *Fisheries*. This project clearly is a regional leader in the Pacific Northwest and provides value added for both Tribal and non-Tribal projects in the Columbia River Basin.

The proponents' discussion of potential confounding factors includes climate change, food webs, land use change, and a development of life cycle models. They not only describe these confounding factors, but they also explicitly describe how their work and published products inform regional resource managers in addressing these critical confounding factors through restoration actions.

Q4: Results – benefits to fish and wildlife

The proposal contains extensive and detailed description of the project's accomplishments, quantitative outcomes, and benefits to fish and wildlife. Many of their achievements and ecological analyses have been documented in recent peer-reviewed literature. Their description of Progress to Date in Appendix B was extremely impressive and informative, and supplemented an already impressive description of benefits to fish and wildlife in the proposal text. Their results provide information and regional syntheses sorely needed by the Fish and Wildlife Program. While the results may not always be what others want to see, they are charting a way forward that will reap important benefits for fish and wildlife.

Reference

White, S.M., S. Brandy, C. Justice, K.A. Morinaga, L. Naylor, J. Ruzycski, E.R. Sedell, J. Steele, A. Towne James, G. Webster, and I. Wilson. Progress towards a comprehensive approach for habitat restoration in the Columbia Basin: Case study in the Grande Ronde River. *Fisheries*, December 4, 2020, fsh.10562. <https://doi.org/10.1002/fsh.10562>

199202604 - Grande Ronde Salmonid Life Cycle Monitoring Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Oregon Department of Fish and Wildlife

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Response requested - pending

Overall comment:

The ISRP is waiting for a response to determine whether this project meets scientific review criteria. The Grande Ronde Salmonid Life Cycle Monitoring Project is a critically important project for the Fish and Wildlife Program, regional assessments and life cycle modeling, and ongoing management decisions in the Grande Ronde and Imnaha basins. This project provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for spring Chinook salmon and summer steelhead. A large number of habitat restoration projects in the Grande Ronde and Imnaha River basins use the project for monitoring information. The Fish and Wildlife Program relies on this monitoring project to assist the regional Umbrella project by providing specific monitoring information for specific habitat restoration projects. This project also provides specific information to the Grande Ronde Model Watershed that it then uses to evaluate basin-scale responses to restoration actions.

Unfortunately, the proposal does not document the overall outcomes from the project and does not describe the implications for basin-scale restoration or status and trends of spring Chinook salmon and summer steelhead, provide specific objectives, or explain the specific uses for the monitoring data in detail. These issues were raised in prior ISRP reviews. The proponents' responses have not produced a summary of the achievements thus far or how the data are used in the projects being served.

Considering the project's central importance for understanding trends and sustaining Chinook and steelhead populations in the Grande Ronde region, the monitoring activities are essential. Nevertheless, the proposal for activities during the next phase is incomplete and lacks several required sections, an explanation of Progress to Date, as well as tables and appendices referred to in the text. Further, climate change and accelerating land use are never mentioned as serious confounding factors, and guiding scientific concepts are not apparent. The proponents must provide a complete revised proposal for review with detailed responses to specific requests from the ISRP. This project is nearing its third decade, and a scientifically rigorous proposal and synthesis are essential for the Grande Ronde and Imnaha subbasins and the Fish and Wildlife Program overall.

The ISRP requests the proponents to participate in the development of an M&E matrix and to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Goals and SMART objectives.** Develop specific goals for this project, ones aligned to a complete set of SMART objectives (see proposal instructions).
2. **Application of data for standard fish habitat monitoring methods.** Clarify how the data are being used to help implement a standard set of fish habitat monitoring methods in select watersheds of the Columbia River basin.
3. **Application of data for Columbia River Basin evaluation.** Explain how the data will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River Basin, as indicated in the proposal.
4. **Use of IMWs and CHaMP.** Clarify the confusion about the use of IMWs (implementing a tributary habitat action effectiveness strategy) and CHaMP (systematic habitat status and trends) in this project.
5. **Data analysis and management.** Describe the methods and strategies for data analyses, data management, and data sharing protocols. Indicate the specific responsibilities of the new data analyst for data analyses, life cycle modeling, and preparation of a comprehensive synthesis of fish and wildlife responses to previous restoration actions.
6. **SIM guidance and application.** Describe how the SIM provides temporal guidance for where and when to aggregate implementation projects and provide an illustrative example.
7. **Timeline for project period.** Provide a comprehensive timeline in terms of tasks and years.
8. **Responses to previous ISRP qualifications.** Describe how the project has responded to qualifications from previous ISRP reviews. Provide detailed responses or documentation of previous responses to each qualification.
9. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. The proponents of the Grande Ronde Salmonid Life Cycle Monitoring Project and the GRMW

recognize that more analysis and synthesis are needed. As requested in the ISRP review of the GRMW Synthesis Report, the final synthesis should contain a comprehensive analysis of the benefits of restoration actions to restore fish and wildlife, as well as how the GRMW project has addressed limiting factors for key life stages. The Life Cycle Monitoring Project is expected to provide much of the essential data as well as much of the landscape level synthesis and life cycle modeling to establish the benefits to fish and wildlife. Consequently, we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The Grande Ronde Salmonid Life Cycle Monitoring Project has an overall goal to investigate the habitat and ecology of spring Chinook salmon and summer steelhead in the Grande Ronde and Imnaha River subbasins. Specific goals are not presented in the proposal but should be developed as a framework for aligning goals with a series of objectives. The objectives in the proposal are essentially implementation objectives for the monitoring effort. While the ISRP has encountered similar types of objectives in other basin monitoring projects and specific SMART biological and physical objectives may be evident in regional recovery plans and some habitat restoration projects, generally monitoring projects only provide information about basin characteristics and trends in targeted fish populations and habitat. Nonetheless, basin-scale RM&E projects, such as the Life Cycle Project, are expected to develop more specific and semi-quantitative objectives, such as numbers, locations, and geographic extent of monitoring locations, specific quantitative inputs to models (e.g., Catherine Creek life cycle model), and information required by regional biological strategies. Revising objectives to be more quantitative would make assessment of the project's achievements simpler and more informative.

The outcome of the activities appears to be the data collected. However, the proponents allude (p. 4) to the data being used to cooperate with the implementation of a standard set of fish habitat monitoring methods in select watersheds of the Columbia River Basin. They indicate that the fish habitat monitoring methods have been developed to capture habitat features driving fish population dynamics. In addition, the proponents state that the 26 selected watersheds maximize the contrast in current habitat conditions and represent a temporal gradient of expected change in condition through planned habitat actions. However, they do not indicate where this is documented or who is funding the activity. They also indicate that data from this project will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River Basin, but no reference or further information

is provided. The proponents also indicate involvement in implementing a tributary habitat action effectiveness strategy across the Columbia River basin (p. 4) using Intensively Monitored Watersheds (IMW). However, they have recently deleted the IMW from their strategy in favor of another approach (see p. 34). All of these issues should be clarified in a revised proposal to clarify the collective confusion about how the project is contributing to these efforts.

The proposal also states that CHaMP will result in systematic habitat status and trends information. The information will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies. The proposal describes support for CHaMP collaborators, which is confusing because CHaMP has been discontinued. The "TABLE" referred to in the text on page 5, as well as all other tables cited in the proposal, are not included in the proposal. The text may be residual unintended text from prior proposals or documents, but an explanation is required for the ISRP to understand what is being described and what role the project plays in the effort.

Q2: Methods

The project has thoroughly documented the methods in previous reports, in MonitoringResources.org, and in this proposal. The described methods appear acceptable and well suited to the specific activities. Specific calculations are adequately described. Note, however, that methods and strategies for data analyses are not described, nor are data management and sharing protocols.

Q3: Provisions for M&E

The project participates actively and effectively in the adaptive evaluation processes in the Grande Ronde basin and regional management programs. Their work with the Grande Ronde Model Watershed, the Atlas, the GRMW database, CRITFC, Comparative Survival Study, NOAA life cycle models, and many other regional programs is exemplary. The review and adjustment processes are strengths of the program, as is the level of dissemination and outreach that is occurring under this RM&E project.

An illustrative example would have been useful to understand how the SIM provides temporal guidance for where and when to aggregate implementation projects. The ISRP is not sure how aggregating these projects (where possible) in a more temporally compressed fashion allows the proponents to structure monitoring to most effectively detect changes.

Some very general information was provided in the section on Relationships to Other Projects, but it was not enough to assess the how these data from this project are actually supporting the implementation of restoration or otherwise informing decisions.

The proposal does not adequately address potential confounding factors, especially those that could affect future monitoring effectiveness and success of salmon and steelhead recovery programs. It briefly mentions a list of factors (i.e., predation from birds and warm water fishes, point and non-point source pollution, the unique hydrography of the spring run-off due to the state ditch and its relationship to Catherine Creek) but provides little or no further discussion or explanation. As well, while detecting change in stream temperature and quantitatively incorporating it into assessments of salmonid population productivity in freshwater is important, it is not clear how the proponents are incorporating these data into the assessments. An illustrative example would improve the ISRP's understanding of the project's future approach to existing and emerging confounding factors.

The ISRP commends the proponents for publishing monitoring results, using the Grande Ronde as a case study (White et al. 2021).

The timeline is truncated in terms of tasks and years but should include all major elements of the project and the full time period for the proposed work elements.

Q4: Results – benefits to fish and wildlife

This project produces essential monitoring data for the Fish and Wildlife Program, life cycle models, VSP assessments, SARs assessments, and regional biological strategies. The project has been productive, producing eight peer-reviewed publications and several informative annual reports from 2016 to 2021. However, the proposal simply provides 12 pages of graphs of trend data for the Grande Ronde and Imnaha basins with no discussion or explanation. These essentially are provided in previous annual reports, publications, and proposals. Unfortunately, the proposal does not synthesize the information nor describe the biological relevance for targeted populations in the Grande Ronde and Imnaha subbasins. The project should explain the trends in spawner abundance and distribution, smolt abundance, smolts-per-spawner, smolt survival, life history characteristics (age, size, timing of migration), juvenile abundance and distribution, and habitat characteristics, as well as the relationships between these trends, rather than just inserting a series of graphs without text or discussion.

The 2010 ISRP Review called for these analyses and evaluations of trends and success of supplementation.

“This major project, ongoing since 1994, seems to have substantial accomplishments, but this was not evident from the results presented in the proposal. There were tables and graphs on timing of movements of juvenile steelhead and Chinook and on smolts per redd for spring Chinook, but the proponents presented little explanation and interpretation of the data. They often stated what they did, and then referred the reviewer to a table or graph with little interpretation of what those results mean, no general conclusions being drawn. Also, it would have been helpful for the proponents to present tables in more concise and understandable form. The oral presentation provided interpretation that alleviated some of the interpretive deficiency. The ISRP requests that future proposals contain narrative interpretation and discussion of the project’s data.”

This proposal, as well as previous reports, continue to lack narrative interpretation and discussion of the project’s data. How do their data inform the region about limiting factors and effectiveness of past management actions? Has the supplementation program been successful? In cases where populations are declining, does that mean that supplementation and restoration have been ineffective, or would the declines have been worse without these actions? While the information is valuable by itself, a program in operation since 1994 should have provided comprehensive analyses and interpretations and offered suggestions as to how the trends might be reversed.

These same syntheses were also requested as part of the Grande Ronde Model Watershed Synthesis. The ISRP concluded that the Synthesis that was eventually produced did not provide evidence that “actions and associated changes in the physical habitat have contributed to addressing limiting factors.” This project produces the most relevant data to assess the contribution of past restoration actions to reducing the effects of limiting factors, but the proposal provides no evidence of such progress. It is clear from their role in regional assessments and peer-reviewed publications that they are conducting rigorous monitoring, but they have not told the story of what it means, either in this proposal or in an overall synthesis. Given the long history of the project and its valuable data, a complete and coherent proposal and a comprehensive synthesis are critical.

Overall, the responses to comments from previous ISRP reviews are meager. Many central issues and questions from previous reviews are not addressed, in spite of the wealth of information and synthetic collaborations with other projects (e.g., life cycle models, landscape assessments). This needs to be rectified in the very near future.

200708300 - Grande Ronde Supplementation Monitoring and Evaluation (M&E) on Catherine Creek/Upper Grande Ronde River

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Umatilla Confederated Tribes (CTUIR)

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

In an earlier review of the CTUIR Monitoring and Evaluation program (ISRP 2010), the ISRP expressed uncertainty about the overall functions of the project. The ISRP recommended that the project place the goals and objectives funded by BPA into the broader context of the entire M&E program. This proposal provides such an overview. Activities of the CTUIR's M&E project both in and outside of the Grande Ronde subbasin are summarized. The project is using this BPA support and additional funding from the LSRC, BOR, NPT, CRITFC, ODFW and other partners to monitor and evaluate the effectiveness of habitat restoration actions and salmonid supplementation programs.

The ISRP also commends the proponents for the effort they have made to establish useful partnerships with other natural resource agencies operating in the Grande Ronde subbasin. Duplication of efforts are avoided, and resources, personnel, and ideas are being shared to everyone's benefit.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** Extend the flow diagrams for one supplementation assessment under "GOAL 1" and one habitat restoration evaluation under "GOAL 3" in a manner that ends with a suite of SMART objectives (see proposal instructions). These objectives should clearly express what tasks need to be accomplished and when each should be finished.
2. **Accounting for stray steelhead in SAR calculations.** Discuss how stray steelhead are accounted for in calculations of SARs and recruits/spawner values. It is not apparent

from the proposal that stray adult summer steelhead entering Lookingglass Creek are being accounted for in the proponents' efforts to estimate SARs and recruits/spawner values.

3. **Project adjustment process.** Provide additional detail on the process for evaluation and adaptive adjustment with information on known decision points, explicit schedules for evaluation and decision-making, and documentation of decisions and project changes.
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Grande Ronde Model Watershed Project (199202601) to summarize the linkages between implementation and monitoring projects in the Grande Ronde and Imnaha geographic area. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Many of the project's implementation objectives and subsequent monitoring activities are repetitive and use standardized methods. As a result, the proponents chose to insert representative goals and objectives for several components of their M&E program rather than just presenting the relevant goals and objectives associated with work being supported by BPA funds. Top-down flow charts that illustrate the three major goals (one supported by LSRCP funds) are used to demonstrate how goals and objectives are linked together. The flow charts depict a logical hierarchy that starts with an overarching goal and, through a series of steps, eventually leads to general implementation actions. None of the representative implementation objectives, however, are presented in a SMART format. The Methods and Timeline portions of the proposal provide needed details about prospective implementation objectives. For example, the periodicity of occurrence and the seasonal timing of different types of implementation work are disclosed in these sections.

The proposal would have been more complete and clearer, however, if the proponents had restricted their flow diagrams to the ongoing and prospective activities that will be supported by BPA funding. We ask that the proponents extend the flow diagrams for one supplementation assessment under "GOAL 1" and one habitat restoration evaluation under "GOAL 3" in a manner that ends with a suite of SMART objectives. These objectives should clearly express what tasks need to be accomplished and when each should be finished. These objectives could

build off the comprehensive work plans for each of their supplementation and habitat restoration evaluation efforts and the Grande Ronde Model Watershed and its framework of SMART objectives. Incorporating SMART objectives into a workflow schedule will help guide the within project adaptive management process.

Q2: Methods

The methods being used to collect biological and physical data are adequately described and suitable. However, the analysis and interpretation of some of this information, specifically in some assessments of fish responses to habitat restoration, do not appear to be entirely appropriate. For example, the proponents are using redd counts made pre- and post- habitat restoration to assess percent changes in habitat use by salmonids. However, these estimates are being made without considering adult return numbers and often with minimal pre-restoration data. This approach is problematic. In this type of Before-After comparison, redd counts need to be adjusted by adult return numbers as a greater or lesser number of spawning females will affect potential redd numbers. Simply using raw counts may disguise true effects.

The above example is representative of the challenge multiple projects throughout the Columbia Basin are facing. How can the effects of restoration actions on salmonid use, survival, growth, productivity, and abundance be objectively evaluated? Recently the ISAB ([2018-1](#)) completed a review of spring Chinook restoration efforts in the upper Columbia River. We encourage the proponents to refer to a section (4.2) in this report that identifies and critiques approaches that can be used to measure the effects of habitat restoration. In addition, Appendix E in the ISAB report reviews the assumptions made in BACI analyses and the diverse types of reference streams that can be used in this type of analysis. The project may find that more potential reference or control streams are available than previously thought.

Q3: Provisions for M&E

A formal adaptive management process has been developed for the Grande Ronde Atlas, and information gathered by the project's fieldwork and analyses are incorporated into this process. Similarly, project data are used when Annual Operating Plans are developed for the Grande Ronde's spring Chinook and steelhead supplementation programs. In some instances, information obtained by the project has also been used to adjust its own activities. It is not clear, however, if the project uses a structured internal adaptive management process to assess their own methods and their effectiveness or if the AOP, State of Science Meeting, or other venues are used to make such changes. Clarification is needed.

Q4: Results – benefits to fish and wildlife

Project objectives that are supported by BPA funding include: 1) biomonitoring of seven habitat restoration sites in the Upper Grande Ronde and Catherine Creek, 2) assessing the success of the spring Chinook supplementation programs occurring in Catherine Creek and the Upper Grande Ronde, and 3) determining the life-history of summer steelhead in Catherine Creek and the Upper Grande Ronde. Results from the project's annual biomonitoring efforts, for instance, have revealed decreases in water temperature in restored habitats, increases in the spawning distribution of steelhead, and snorkel surveys showed increased juvenile usage/presence in some of the restored habitats, particularly in re-established floodplains.

Although the Chinook supplementation efforts have not yet reached population abundance goals on a consistent basis, the programs are contributing to the viability of the Catherine Creek and Upper Grande Ronde populations. Pre-spawning mortality has been identified as a potential issue, and a radio-tracking study started in 2019 is providing information on fish holding areas and possible survival bottlenecks. These and other results indicate that the project has supplied information that is being used to guide and improve ongoing restoration and supplementation actions in the Grande Ronde subbasin and some are also being used to populate developing life-cycle models.

199800703 - Grande Ronde Supplementation O&M on Catherine Creek and upper Grande Ronde River

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: CTUIR

Province/Subbasin: Blue Mountain/Grande Ronde

Recommendation: Meets Scientific Review Criteria

Overall comment:

This operation and maintenance project is helping preserve and maintain endemic spring Chinook in the upper Grande Ronde and Catherine Creek. It has two main goals: 1) collect adult spring Chinook from these two areas for use as broodstock at the Lookingglass Hatchery and 2) rear, acclimate, and release smolts from acclimation sites. Current objectives for adult broodstock collection and smolt release numbers have been consistently met over the past

decade or more. Fish produced from the project have helped protect and maintain spring Chinook endemic to the Grande Ronde subbasin. We offer a few suggestions related to both tasks for the proponents' consideration. We also encourage the proponents to develop SMART implementation objectives and include them in future annual reports and proposals.

Q1: Clearly defined objectives and outcomes

The project's objectives, along with its expected quantitative outcomes, are clearly presented in this straightforward operations and maintenance proposal. SMART objectives per se, are not presented. Nevertheless, the tasks being performed and timelines for its two overall objectives (collection of broodstock and rearing and release of juveniles from acclimation sites) are clearly described and explained. Objectives for broodstock, smolt releases, and eventual adult returns are bound by mitigation agreements contained in the Lower Snake River Compensation Plan (LSRCP) and in recent U.S. v. Oregon production mandates. Specific objectives for the project in the Upper Grande Ronde River and Catherine Creek drainages are presented in Annual Operating Plans (AOPs) produced by the multi-agency Grande Ronde Endemic Spring Chinook Salmon Supplementation Program (GRESOSP). The GRESOSP was established to preserve, recover, and eventually provide harvest opportunities on endemic spring Chinook in the Grande Ronde subbasin. Under current conditions, the project's contributions to salmon supplementation in the Grande Ronde are necessary to prevent eventual extirpation.

Q2: Methods

The methods employed to capture broodstock, and rear and release juvenile spring Chinook are clearly summarized and are scientifically sound. Although these tasks are not directly the responsibility of the proponents, the ISRP offers several suggestions that the proponents and their M&E partners may wish to consider. First, the determination of the sex of prospective broodstock is a key information need. It appears that visual cues are currently being used for this purpose. The sex of spring Chinook adults can be difficult to establish, especially several months prior to maturation. The proponents may wish to consider using hand-held ultrasonic sensors to make such assessments. This approach is used throughout the Basin and has proven to be highly accurate. For example, in the Wenatchee River, fish biologists are using Honda Electronics Hs-101V Ultrasonic scanners equipped with a HLV155 5.0MHz Linear Rectal Transducer to successfully sex potential broodstock. For more information see https://www.rmpc.org//files/nwfcc/2008/20081203/session5/4-Chad_Herring-ultrasound.pdf

Second, 50 fish from each raceway (200 total per acclimation site) are sampled just prior to release to obtain weight and length information. If these fish were sacrificed, the proponents could use simple visual inspections to obtain an estimate of the percentage of males destined

to become 2-year-old minijacks. Precocious maturation in spring Chinook reared in integrated hatcheries can be substantial. Lack of knowledge of their presence will likely lead to underestimations of juvenile and adult survival rates. Third, forced releases of smolts from the acclimation sites take place during daylight hours. If stream flows and turbidity are relatively low and water temperatures are rising, immediate post-release mortality could be high. The proponents may wish to investigate the potential benefits of releasing their fish during darkness. In other settings, such releases have increased initial survival rates.

Q3: Provisions for M&E

The proposal narrative indicates that other GRESCSP projects are responsible for monitoring and evaluating the project's activities. Project protocols and results are reviewed by the GRESCSP when annual operating plans (AOPs) are developed. This process is not described. The proposal does, however, refer to several operational changes resulting from the annual review process. For instance, originally, five-year rolling averages of fecundity, pre-spawning mortality, and egg-to-smolt survival were used to set broodstock needs. Three-year averages are now being used to account for recent decreases in fish size. The AOP process also developed restrictions on when adult broodstock can be collected due to water temperature concerns. Additionally, volitional releases of smolts from the acclimation sites was curtailed to increase the likelihood that project fish would be intercepted at Lower Granite Dam and barged down the mainstem. These adjustments demonstrate that, while not described in the proposal, an effective adaptive management process is in place and is used to adjust the project as needed.

Q4: Results – benefits to fish and wildlife

Tables of smolt release numbers at both acclimation sites and returns of project adults in the proposal show that the project has consistently met its broodstock collection and smolt release objectives over the past decade. Changes in project practices have occurred over time and have been driven by monitoring and evaluation data collected by other partner projects. In summary, the project clearly has helped preserve and maintain endemic spring Chinook populations in Catherine Creek and the upper Grande Ronde. Continued support for the project is warranted given its conservation benefits and potential to provide needed within-subbasin harvest opportunities.

Lower Snake and Clearwater River

199005500 - Idaho Salmon and Steelhead Monitoring and Evaluation (M&E) Studies

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Department of Fish and Game

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proposal describes an extensive monitoring and evaluation project for determining the status and trends of natural origin steelhead and spring/summer Chinook salmon in the Snake River Basin (this project does not monitor ESA listed fall Chinook salmon). The proposal reflects the integration of two previously separate projects for steelhead and Chinook salmon. Goals and implementation objectives are well defined, methods are described with sufficient detail along with links to additional detail, and results are nicely summarized. Detailed annual reports on status and trends have been provided along with references to numerous peer-reviewed publications. The proposal indicates that they cooperate with habitat restoration projects and hatcheries by coordinating with them and providing data that helps them evaluate fish responses.

The ISRP suggests the following items be addressed to further leverage the usefulness of the results. The proponents should assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and provide information to address the other items in future annual reports and work plans.

1. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop, we ask this project

to assist them in creating the summary and provide information to them about what is being monitored and shared by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

2. **Overview of project.** Document how the various monitoring and analysis components of the project fit together.
3. **Contribution of natural versus hatchery-origin.** Clarify how well the data can be used to separate the contribution of natural versus hatchery origin smolts and returning adults.
4. **Comparability of project metrics with other estimates.** Confirm that the analysis procedures include (but need not be limited to) generation of results (metrics) in terms of scale (population, MPG, ESU) ensure easy comparison to historical datasets and are consistent with how other groups use the results. Consider performing a formal analysis that compares PIT-antenna based escapement estimates with historical estimates, which account for spawner abundance at the population scale and account for pre-spawn mortality.
5. **PIT versus redd counts.** Compare escapement data from weirs/antennas to redd counts to determine the efficacy of redd counts for quantifying abundance.

Additional ISRP suggestions on project improvement and comments on minor issues are included in the comments in the Methods section below and can be addressed as the project moves forward.

Q1: Clearly defined objectives and outcomes

The purpose of the Idaho Salmon and Steelhead Monitoring and Evaluation Studies (ISSMES) is to monitor and evaluate the status and trends of wild Chinook salmon and steelhead populations in Idaho. ISSMES is the central repository of information for wild Chinook salmon and steelhead in Idaho. The project estimates abundance, productivity, spatial structure, and diversity at the scales of the individual populations and major population groups.

The proposal provides an excellent list of project goals and implementation objectives that will be used to achieve the goals. The data and methods are then linked to the implementation objectives.

Q2: Methods

The methods of data collection and analyses are well documented, as expected from a long-standing project. A large number of intensive and/or advanced methods are used for this

project, including daily trapping of adults and outmigrating juveniles, genetic stock and sex ID, hierarchical methods for analyzing RST data to estimate juvenile outmigration abundance, and state space models for integrating age and abundance data from Lower Granite Dam. The Chinook redd count data is used to estimate tributary specific Chinook escapement for streams without weirs and can be subject to high uncertainty. Tributary-specific steelhead and Chinook escapement is based on application of PIT tags on returning spawners at Lower Granite Dam (on fish that were not previously tagged) and detection of PIT tags from remote antennas in tributaries.

A general comment is that with the many different types of data being collected and then analyzed somewhat independently from each other, it would be helpful to see an overview of the generation of data and information at the project-level, including a brief description of the variables being measured, the temporal aspects (years, frequency) and spatial aspects (locations on a map) of the sampling across activities, and how the individual data collection activities fit together. This exercise has undoubtedly been done, to an unknown degree, by the project team when they design each activity and then when they process the data. Therefore, the ISRP suggests that a more formal (can be brief) documentation of how the pieces fit together be developed, with a few tables and figures (perhaps maps). Such an overview would add context to the individual activities as well as to the project as a whole.

Some specific aspects of the methods to be addressed are:

- Are all hatchery fish sufficiently marked or tagged to estimate natural versus hatchery origin smolts and returning adults, and how far back in the historical data is this separation possible? On the spawning grounds, the estimates of HOR and NOR fish can be derived without bias if the fraction of hatchery releases that are not marked is known (which it is). In this case, the HOR estimate on spawning grounds would be based on expanding the clipped estimated by the constant marking fraction. The tricky part is that the broodstock for the clipped and unclipped releases may be different, so survival rates may be different. This can lead to error in the constant marking fraction approach. Clarification of how well the data can be used to separate the contribution of natural versus hatchery origin fish is needed.
- What proportion of the population/habitat is monitored with PIT tags versus redd counts? Have more accurate escapement data from weirs/antennas been compared to redd counts to determine the efficacy of redd counts for quantifying abundance?

- Are there opportunities to quantify (if not done already) detection probabilities for Chinook redds, redd survey life, the extent of redd superimposition, and the number of spawners associated with each redd?
- How are changes in spawn timing accounted for in the redd surveys? If previous studies have established relationships between known abundance and redd counts, please provide citations.
- Some further exploration of the apparent pattern (seems counter-intuitive) that there is less density-dependence in the tributary-specific results than in the aggregate Lower Granite Dam (LGR) relationship. The integrated female escapement-smolt stock-recruit curve at Lower Granite Dam (Fig. 7) has a much steeper initial slope than the tributary-specific relationships for the Middle Fork Salmon River MPG (Fig. 8). In the proposal, these results are described as *“Fish-in, fish-out monitoring has allowed for close scrutiny of adult-to-juvenile productivity at the population scale. Stock-recruit modeling has shown that smolt production in some populations is limited by density-dependence (Walters et al. 2013), although this pattern does not appear to be occurring across all Idaho populations.”* Wouldn't one expect the opposite patterns, with tributary-specific flat-topped relationships with different carrying capacities leading to a less asymptotic relationship for the aggregate?
- Clarification on how the steelhead and Chinook salmon parr data were being used across populations, such as in spawner-recruit relationships, informing life cycle models, etc. Examples where more information and analysis would be helpful are (a) confirming that the parr abundance estimates are greater than the outmigrant estimates, (b) evaluating how the two sets of estimates covary over time, (c) determining if there is evidence of density dependence between parr and outmigrant stages?
- Further comparison of escapement goals for natural spawning Chinook salmon and steelhead, and how they align with capacity of the systems.
- Confirmation that the analysis procedures include (but need not be limited to) generation of results (metrics) in terms of scale (population, MPG, ESU) that ensure easy comparison to historical datasets and are consistent with how other groups use the results. The current PIT-antenna approach to estimate escapements to a tributary only reflects abundance upstream of the antennas. In contrast, historical estimates may have estimated escapement for all or a larger portion of the tributary. In addition, many runs will pass the antennas well before spawning and therefore experience considerable pre-spawn mortality between enumeration at the antenna and spawning. In contrast, historical estimates have been made closer to the time of spawning. Are these inconsistencies a significant problem, and if so, how will historical and current PIT-based

escapement estimates be combined? If these differences cannot be accounted for, how will PIT-based estimates of escapement be compared to historical targets that were based on historical spawner abundance estimates?

Q3: Provisions for M&E

It is important to note that this is an M&E project and thus is (and should be) strong on monitoring and analyses within the project. The project team conducts post-season reviews and pre-season planning as a group. IDFG staff attend meetings with collaborators to discuss the utility of data collected as part of this project for informing broader regional efforts such as status and trend monitoring and life-cycle modeling (e.g., PNAMP and NOAA's life-cycle modeling group). Field work is coordinated annually in collaboration with various other agencies (e.g., Lower Granite Dam sampling requires coordination with the U.S. Army Corps of Engineers, NOAA/NMFS, WDFW, ODFW, NPT, IPC, and others).

Q4: Results – benefits to fish and wildlife

The data from the projects covered in this proposal have been intensively analyzed and include synthesis and estimation of productivity and adult stock-recruit models. This project provides support for the evaluation of habitat restoration in the basin and numerous examples of data and results being used are cited. This project has led to a substantive increase in our understanding of Snake River summer steelhead and spring/summer Chinook salmon population dynamics, and this information is integrated into ESA-driven viability assessments. An excellent opportunity to leverage the usefulness of these data would be to further pursue the identification of covariates (including hydrosystem and habitat effects) that explain variation around the spawner-recruit relationships and to include this information in life cycle modeling.

199102800 - PIT Tagging Wild Chinook

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: NOAA Fisheries

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proposal describes a very extensive capture and PIT tagging program for wild spring/summer Chinook salmon from the Salmon River drainage of the Snake River. This project provides critical information on migratory timing and survival rates from a number of tributaries of the Salmon River to their lower portions and in the mainstem Snake and Columbia rivers. The project also collects information on growth rates through recaptures of previously tagged individuals and provides information on the proportion of fish migrating during key seasons along with their associated survival rates. Information collected from this project supports information needs and life cycle models, in particular, for this ESA listed ESU. This project has been underway for almost two decades and has paved the way with development of approaches adopted by many other similar projects implemented by the states and tribes. The project has a long track record of success and a good publication history. Furthermore, migration survival studies for wild populations are rare, and this study captures and recaptures enough individuals to provide relatively precise estimates.

The project meets scientific review criteria, but the ISRP makes the following suggestions for project improvement. Progress towards addressing these suggestions can be described in future work plans, annual reports, and proposals along with participation in the M&E matrix development.

1. **Clarify goals and objectives.** The ISRP suggests that the goals and objectives stated in the proposal should be further clarified to ensure project continuity and clarity, as their presentation is inconsistent across sections in the proposal.
2. **Usefulness of project results.** Provide a more comprehensive listing of how the project results are used to ensure the full benefits and application of the project results are recognized.
3. **Expand the methods.** Some details about the methods (e.g., eDNA) are lacking, and the proponents should consider methods for estimation of tributary-specific parr abundances.

4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Willowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored and shared by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The initial statement of the goals is clear and addresses a high priority management need to fill critical information gaps related to ESA listed Chinook salmon populations. Five tasks were described with multiple sub-tasks that are stated like, and can serve as, implementation objectives. The tasks clearly describe the implementation activities consistent with SMART objectives.

There is some confusion about goals and objectives as presented in the proposal. In the short description section, there are three objectives listed. These are combined into one objective in the Goals and Objectives section. There are then one to several tasks and subtasks under this one combined objective. In the Problem Statement, there are four goals listed that somewhat align with the two listings of objectives. None of the tasks seem to address the objective of determining which environmental factors influence patterns in migration and survival. Indeed, there is not a task about data analysis, but the statistical analyses are described as part of the methods. Finally, the Goals and Objectives section starts with “The primary goal of this project is recovery of wild Snake River spring-summer Chinook salmon, and the ultimate goal is sustained healthy and robust populations throughout the Snake River basin. These should be clarified so that the project contributions to achieving these broad goals can be better understood. The proposal would benefit from a fresh look at what exactly are its goals, objectives, and tasks so that there is good connectivity, continuity, consistency, and clarity throughout the proposal.

The proposal appropriately justifies its outcomes and products as being used by others. The data collected is undoubtedly vital to effective modeling and management. Section 8 has a

narrative about the relationship of this project to others, but it seems to be limited to examples and does not say which information was used. A more comprehensive listing with additional details may already be done, and including such a listing in the proposal in the future would be helpful and ensure the full benefits and impacts of the project are recognized.

Q2: Methods

Clear and concise methods, including sampling and analytical experimental designs, were presented for all field sampling, data collection, and data analysis. The project uses a variety of standard and customized methods for PIT tagging, instream PIT tag monitoring, tag detection at dams, migrant trap and dam recaptures, collection of environmental data, and statistical analyses. The methods have been thoroughly reviewed in past ISRP reviews as well as in project reports and publications. The methods are scientifically sound and produce probabilistic estimates for important parameters that document juvenile status and trends. The project has modified methods for numerous parameter estimates to address invalid or weakly supported assumptions, thus improving the precision and accuracy of estimates. The improvement in the number of PIT detections at Lower Granite Dam in 2020 is impressive (>165,000), as is the separation-by-code system to capture individuals to measure growth rates and other smolt characteristics.

One missing element, which was mentioned in a previous ISRP review, is better use of electrofishing and seining data to estimate tributary-specific parr abundances. A second pass of sampling effort could be used to estimate parr abundance via closed population models. Also, additional information on the methods for relating environmental variables to migration/survival would be helpful. This subset of the analyses is important and also quite challenging because of the different time and space scales (including lags) of the environmental data (as explanatory variables) compared to the response variables (migration/survival). The project is very well positioned for more integrated analyses, such as relationships between migratory timing or survival and escapement and parr density, or how physical covariates like flow and water temperature influence survival rates or migration timing (one of the goals identified in the proposal).

Exchange of methods being used and integration of findings with other groups with similar data would further leverage the usefulness of this project. The project team should consider looking at how other project teams analyze similar data as a way to share methods across projects and ensure as much comparability as possible across systems. Also, many examples of past analyses that used project data heavily depended on collaborators not directly funded by the project. This is strongly encouraged and shows the usefulness of the data, but it also adds some uncertainty to how the data will be used because such analyses are subject to the willingness and availability of the collaborators.

Q3: Provisions for M&E

This is a comprehensive research, monitoring, and evaluation project that provides data used in numerous analytical frameworks including, life cycle modeling, COMPASS, and parr-to-smolt survival relationships. The project has solid experimental and sampling designs. Information is used in numerous higher-level management decision forums such as the FCRPS within-season flow management.

The project has simple but effective project adjustment processes. Regular meetings are held following completion of each field season to plan future sampling, discuss ongoing analyses, and explore expanded application of results to additional uncertainties. The project has implemented many adjustments in data collection and statistical analytical approaches over time. The application of the project results has expanded considerably since the project was initiated.

The analytical methods used to evaluate the data from this project seem robust and can be used to adjust sample size/effort to achieve desired levels of precision on migratory timing and survival rates. Sampling effort and captures for tagging are currently adjusted based on redd counts to minimize handling effects when escapement is low. Employing a two-pass sampling effort to estimate parr abundance would be useful in this regard, since the proportion of the population that is handled could be calculated and compared to ESA take levels. Currently, that proportion is unknown, so decisions on reducing effort to limit take are uncertain. As mentioned above, these abundance estimates would also be useful for developing spawner-juvenile stock-recruit relationships and more robust parr density-survival relationships, which are likely an important element of the life cycle modeling, such as the modeling by Crozier et al. (2020) that is cited in the proposal.

Q4: Results – benefits to fish and wildlife

This is one of the longest running projects in the Columbia River Basin, which is providing precise and accurate estimates of spring-summer Chinook salmon juvenile abundance and survival. Strengths include the extensive, long-term datasets along with relationships established between fish performance and density, habitat quality, exotic species, fish size, environmental conditions, and climate change. The project has a well-described adjustment process with numerous examples of improvements in sampling and analytical approaches. Information is shared effectively through numerous reports, publications, and databases.

The information provided by this study is foundational to other important assessment and management endeavors. The data are integral to life cycle modeling and COMPASS. The

modeling integration of environmental data and climate change predictions with juvenile survival and movement information provides powerful insights into potential future status and trends and limiting factors. One particular strength of the project is the analyses of numerous relationships between juvenile salmon movement patterns and survival with densities, habitat conditions, non-native species, fish size, environmental conditions, and climate change.

199608600 - Clearwater Focus Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Governor's Office of Species Conservation

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Not Applicable

Overall comment:

This is a long-running project that has played an important role in the implementation of restoration activities in the Clearwater River and lower Salmon River subbasins. It is clear the funded coordinator position directly assists with a wide range of activities and various entities that support overall program implementation. The work and organization for this proposal by the new coordinator is much appreciated.

Despite the apparent success of this coordinator position, there appears to be a number of changes and/or adjustments that should be considered to benefit the program. Given the recent change in personnel for the position, it may be timely to consider and incorporate these changes in the near future (2-3 years). These include:

1. **SMART objectives.** Development of a full set of program objectives that meet SMART criteria (see proposal instructions). Many of the current "objective" statements could be easily modified to be quantitative and time bound.
2. **Strategic actions.** A more pro-active effort to prioritize and line out annual activities that are likely to have the highest benefit to the overall program. This could include selection of one or more strategic actions to be added to the "normal" set of program actions. This would be done by key players after the review of past year activities and planning for future year work. One possibility would be to provide evaluation and reporting that describes and compares the effectiveness of alternative restoration planning and

implementation approaches for the many different implementing agencies in the Clearwater River basin. Currently, each appear to use somewhat different strategies. This reporting should identify some key topics and lessons learned that will have broader application for the science community.

3. **Coordination with the Nez Perce Tribe restoration program.** The proponents should describe more clearly how the funded coordinator position interacts and coordinates with the Nez Perce Tribe restoration program. Although this need was identified in past reviews, this explanation could not be found in the current proposal.
4. **Public outreach and communication actions.** Describe how the coordinator is involved in public outreach and communication actions. The proposal does not indicate that the coordinator is involved in these activities, but the coordinator position appears well suited to develop them.
5. **Project evaluation and adjustment.** Development of a more transparent process for project performance evaluation and program/project adjustment. Although it appears that this is occurring, it should be more clearly documented in annual reports.
6. **Monitoring.** Develop potential alternatives for project-specific implementation and effectiveness monitoring. There is a notable lack of objectives and discussion related to these activities. Numerous Clearwater River subbasin habitat restoration project proposals identified severe limitations in the ability to conduct even basic implementation monitoring and evaluation, and few projects, if any, are conducting effectiveness monitoring. Developing potential alternative approaches and funding mechanisms to address these serious monitoring deficiencies appears to fit well within the objectives and scope of this coordination project.
7. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect this project (Clearwater Focus Program 199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask these projects to assist the lead project in creating the summary and provide information to them about what is being monitored for implementation projects and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal highlights the importance of the coordinator position and provides a long listing of various work activities and annual accomplishments. Currently activities of the coordinator appear to be reactive to the needs of the programs that it services, and there does not appear to any process to define and prioritize strategic actions that could benefit multiple participants and provide better guidance for the multi-year plan of work.

The proposal does provide major program goals and social objectives with numerous implementation objectives for each. The goals and objectives address the overarching management problem. Unfortunately, the project's social objectives and all but one of the implementation objectives do not meet SMART criteria, they are qualitative and not time bound. The one implementation objective is an exception. It states, "Increase the number of coordination and collaboration meetings by 10% between watershed groups by 2030." It could serve as a template to revise other objectives. For example, under Social Objective 1: Enhance support to assist restoration project proponents to maximize benefits to ESA-listed fish from project implementation, there are a number of implementation objectives including 1.1.1 Increase watershed coordination and 1.1.2 Assist in developing projects in high priority watersheds. These could be revised to state (1.1.1), By the end of 2021, provide at least 2 quarterly watershed manager coordination meeting and provide minutes to all participants and (1.1.2), Fully develop at least 1 restoration project for each of the priority watersheds by the end of 2021.

The proposal does not address any problems to be solved by the coordinator, but it is clear that the position is a valuable member of the basin team and is an asset in providing a number of services to benefit implementation of the overall program. The proposal states that the Clearwater Focus Program goal is to, "increase the efficacy for program delivery." Although there is substantial discussion about activities completed, there are no objectives or examples given that the position has increased efficacy of delivery. Finding a metric to use for tracking this is challenging but would be a valuable addition to test in future proposals. Also, it does appear that there are opportunities to better define and address a limited number of high priority major strategic actions (development of a more formal adaptive management process, planning and implementation of an annual meeting to review accomplishments, outcomes and new information/ lessons learned, and development of some targeted public outreach and communications activities). Select items should be identified during outyear work planning and incorporated into the program of work. Specific accomplishments and outcomes targeted for that work year could be identified and added to program objectives.

Because this project coordinates efforts of many different implementing agencies that use somewhat different strategies, it seems appropriate for it to compare the effectiveness of alternative restoration planning and implementation approaches. The project should identify some key topics and lessons learned that would have broader application for other projects in the Columbia River Basin.

Q2: Methods

The proposal adequately discusses methods used to accomplish most major work categories. The project relies on numerous watershed assessments, management plans, limiting factors analyses, and coordination processes to achieve objectives. These plans provide solid guidance for the development, implementation, and coordination of restoration strategies and actions. The methods would be improved by including discussion of future steps to be taken to address and coordinate funding and implementation of project level monitoring and evaluation.

Q3: Provisions for M&E

The proposal does not describe any specific process for monitoring and/or evaluation of planned activities by the coordinator. There is a notable lack of objectives and discussion related to implementation, compliance, and effectiveness monitoring and evaluation. A very complete table of activities and annual accomplishments is provided and indicates that there is a process for tracking completion of planned actions. The proposal explains that monitoring and evaluation are outside the scope of the project. However, numerous Clearwater River subbasin habitat restoration project proposals identified severe limitations in the ability to conduct even basic implementation monitoring and evaluation. Habitat restoration projects had planned to use data and information generated by the ISEMP, CHaMP, and AEM monitoring and evaluation projects for restoration effectiveness assessments and adaptive management. ISEMP and CHaMP were terminated and AEM studies in the Clearwater River subbasin were reduced. In addition, project specific monitoring funds were also cut. Helping to address these serious monitoring deficiencies appears to fit well within the objectives and scope of this coordination project.

The proposal does identify a number of lessons learned but does not describe any process for project adjustment by the coordinator position. It does appear that development of a process, perhaps using an annual program review and information sharing meeting, could be used as a tool for this important set of activities. Given that the new coordinator started in 2020, incorporating this sort of strategic planning could be a timely and valuable change to current operating procedures.

Q4: Results – benefits to fish and wildlife

It is clear that the position provides a wide range of services to benefit implementation of the overall program. A very complete listing of annual accomplishments is provided that demonstrate strong support for the program.

200860400 - Potlatch River Watershed Habitat Improvements

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Governor's Office of Species Conservation

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The ISRP greatly appreciated the proponents work to prepare the revised proposal and point-by-point responses, including coordination with companion project 200206100 in developing the document. The revisions provide much needed detail and improve the overall clarity of the proposal. Some responses, however, did not fully address our concerns. Three of these concerns are included as conditions for the project that need to be addressed: **1) revise objectives for restoration outcomes, 2) revise objectives for M&E and support, 3) describe plans for flow enhancement.** This can be done in development of the next annual report and project work plans. Additionally, we suggest that the proponents should revise their proposal to include the information provided to address the three conditions. This revision would serve as a valuable record for the project and facilitate tracking these changes in future reviews. Details on the conditions and specific comments for each response item follow:

1. Revise objectives

Objectives to describe desired outcomes of restoration treatments

Condition 1 – The proponents should revise the proposal to provide a core set of SMART objectives that describe expected outcomes from stream channel restoration designed to improve rearing habitat and for floodplain/riparian restoration to improve floodplain connectivity and vegetation. These objectives provide the foundation for planned project-level effectiveness monitoring.

Comment – Changes made to revise the proposal provide a generally solid set of goals and SMART objectives to track implementation. Except for the fish passage objective, the revised objectives generally lack statements that describe measurable desired outcomes that are expected to result from planned restoration actions to increase habitat complexity and improve floodplain and riparian area function. For example, the objective for improvement of habitat complexity for juvenile steelhead rearing habitat lists the number of miles to be treated as a desired outcome. This is a good measure to track project implementation; however, there is no description of basic habitat metrics to describe desired outcomes of this restoration, which are needed to determine the success of treatments. It is noted in the proposal that, “The PRSME project documented a strong correlation between the amount of wood and juvenile steelhead density in the upper Potlatch River watershed.” A potential outcome objective could be a description of the increase in large wood loading or the desired total wood density per mile. Another option to assess improved habitat complexity would be an objective describing the desired increase in the number of primary pools per mile in restored reaches.

Measurable outcomes for objectives addressing meadow and riparian/floodplain restoration are also needed. Given the extended time frames to achieve the expected outcomes for increases in streamflow from these treatments, one or more of the following measures should be considered as outcome objectives to determine near to mid-term effectiveness of these treatments. These potential measures include target species of trees per acre surviving 3-5 years following planting, increase in percent stream surface shading and/or total percent of vegetative ground cover within a specified number of years following treatment. It is noted in the proposal, “Further monitoring used to guide adaptive management of projects will include site specific project monitoring completed by Latah SWCD and IDFG to assess project functionality and success.” These objectives describing desired outcomes should provide a useful foundation for evaluation of project success. We encourage the proponents to coordinate with the Latah SWCD partner project (200206100) to describe desired habitat restoration outcomes for these objectives.

Condition 2 – Revise the proposal to provide an objective that identifies and briefly describes planned project level effectiveness monitoring activities to be conducted by this project (or others) and provide a basic description of methods to be used.

Comment – The set of new objectives for programmatic activities is appreciated. They are a useful addition to the proposal and provide additional detail for tracking implementation actions. Objective 4.2.2 addresses implementation monitoring, but there is no mention of project level tracking of outcomes. It is noted in the proposal,

“Further monitoring used to guide adaptive management of projects will include site specific project monitoring completed by Latah SWCD and IDFG to assess project functionality and success. Conditions evaluated may include stream flow, water temperature, vegetation success, and *O. mykiss* abundance. These indicators will educate the PIG group on project performance ultimately allowing future adaptive management of projects.” An objective to describe this set of activities, planned for implementation in the next five years, is needed. Additionally, a basic description of how this M&E will occur, who will do it, and where it will be conducted should be included in the Methods section.

2. Road Condition Assessment. The additional information is appreciated and addressed our concerns.

3. Description of planned development of water sources for flow enhancement

Condition 3 – Revise the proposal to identify priority locations for pond/reservoir development likely to be implemented in the next five-year time frame for the project.

Comment – Additional information is provided that generally clarifies the flow enhancement component of the proposal. It is noted that research has shown that releases from small reservoirs and ponds can successfully be used to augment summer low flows and extend the range of perennial flow. It is noted in the revised proposal that there are numerous sites that have been identified with potential for development to meet this need. However, no specific locations of potential priority locations for development or timelines for treatment are provided. This information would better describe planned restoration work within the proposal time frame.

4. M&E Matrix. We support the project’s commitment to participate in the development of the M&E matrix summarizing linkages between implementation and monitoring projects when the effort is undertaken. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

This is a clearly written, well-organized proposal. It provides a very complete description of the project, its complexity and effective coordination with the Latah SWCD Potlatch River project

and with the many different players and partners. It emphasizes the importance of restoring steelhead abundance and productivity in the Potlatch River necessary for improving the viability status of the Lower Clearwater River population and the Snake River steelhead ESU. The work invested in the preparation of this proposal is appreciated.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal and to participate in the development of the M&E matrix:

1. **Revise objectives.** A revision of the objectives in the proposal is needed to provide specific desired outcomes for the five-year time period ending in 2027 and to add objectives for coordination, outreach, adaptive management, and monitoring and evaluation. Special attention is requested for Goals 2 (habitat complexity) and 3 (improved stream flows). This is discussed in further detail in the following sections 1 and 2 of this review. This is similar to the need as described for its companion project, the Potlatch River Restoration Project (200206100), and the responses should be coordinated. A good deal of information, likely useful for developing these objectives, is contained in annual and monitoring reports discussed in the proposal.
2. **Road condition assessment.** Discuss if a road condition assessment to identify likely sources of accelerated sediment input to streams has been completed. If not please explain the rationale for not completing it or provide a schedule for its completion.
3. **Water sources for flow enhancement.** Provide a summary of potential water sources, along with quantity and quality descriptions, that might be available for future flow enhancement actions.
4. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

The requested response items are similar to those requested for the companion Potlatch River Restoration project (Project 200206100). Providing this information for the requested responses should be coordinated between the projects.

Q1: Clearly defined objectives and outcomes

This project is a companion to the Latah SWCD Potlatch River Restoration project. As noted in the proposal, “Contracts associated with Project 200860400 (Idaho Accord) are coordinated with contracts associated with Latah SWCD's Project 200206100. The primary focus of 200206100 contracts is the identification, planning, development, and identification of funding for restoration actions that will be implemented through contracts associated with Project 200860400 (Idaho Accord).”

The Potlatch River is the largest tributary to the lower Clearwater River and supports a substantial proportion of steelhead production in the Lower Clearwater Steelhead population. Restoration of abundant and productive steelhead in the Potlatch River is essential for recovery of ESA listed Snake River steelhead. There is a complete discussion of major problems and limiting factors for the watersheds, and it is backed by past assessments and research findings. A number of assessments and watershed scale analyses have been completed as well as an amended River Management Plan (2019) produced to replace one created in 2007. A number of maps are provided that display sub-watershed boundaries, land ownership, and land use patterns within the main river basin. These provide context for better understanding the proposal.

One weakness, however, is that the proposal identifies “suitable spawning and rearing habitat” as a limiting factor. It seems most likely, based on the discussion that rearing habitat, particularly for 1+ juvenile steelhead, is likely the dominant factor. If this is the case, it would be useful to focus future restoration on rearing habitat. Also, it was previously noted that upslope conditions played a role in influencing instream and riparian area conditions. Roads, particularly side-cast construction, and inadequate drainage were identified as a major contributor to increased sediment inputs to streams and accelerated routing of run off reducing infiltration. It was also noted that a road condition assessment had been planned. It is not mentioned if this was ever completed or what the findings and related restoration treatments resulted from the assessment.

The two projects share objectives for restoration implementation and effectiveness. Similar to comments for the Latah SWCD project, this proposal does an adequate job describing implementation objectives in each of three major categories: fish passage, spawning and rearing habitat improvement and improvement of instream flows. These objectives for habitat

and streamflow improvement are a bit vague in only describing miles of restoration treatment by stream name and could be improved by providing more detail on the specific types of treatment planned (numbers of structures, pieces of LWD, acres of riparian planting, miles of fencing etc.) and more specific treatment locations. The major failing, however, is the lack of SMART objectives for Goals 2 and 3 that describe desired outcomes of the planned restoration. For Objective 2, questions include: what counts as “suitable” habitat? What counts as “improved?” For Objective 3, how will this project measure “restored perennial flow”? Is that to previous perennial levels? How much flow? How would the proponents quantify “meadow restoration” or effective “floodplain connectivity?” The need for a better description of desired outcomes is similar to Qualification 1 in the 2013 Geographic review, “There remains a lack of meaningful project level objectives describing the expected outcomes of the proposed work.” Some examples of potential project objectives could include 1) within 5 years following restoration treatment, extend the duration of base flows (0.23 cfs or greater) for at least one month, 2) increase stream surface shading to at least 60% on all perennial streams, and 3) achieve at least 80% survival for all riparian plantings. Such objective statements provide a more valuable, quantitative description of desired post restoration conditions/outcomes and establish a clear basis to assess the effectiveness of restoration treatments. In addition, the project needs objectives for coordination, outreach, adaptive management, and monitoring and evaluation.

Finally, the majority of objectives have an achievement timeline of 2042, and it is unclear why this year was selected and why objectives, providing a clear description of desired outcomes for the proposals five-year implementation period (2023-2027) were not included.

Q2: Methods

The proposal does a generally complete job of discussing methods for a variety of restoration activities and provides links/references to methods for various monitoring activities. Overall, the restoration efforts are guided by the 2019 Potlatch River Watershed Plan and the Snake River Steelhead ESA Recovery Plan. The Potlatch Plan identifies high priority watersheds for focused restoration and provides a sound framework for planning, decision making, design, implementation, and monitoring and evaluation. Five-year implementation plans are developed for each priority watershed.

The proposal provides a comprehensive description of methods for project selection, planning, and implementation as well as specific approaches for the implementation of a process for adjusting management and treatment approaches. The methods section is appropriately organized by objective with specific and extensive descriptions for each objective. The restoration strategies described for each objective are sound and appear to address both

watershed scale as well as local scale habitat impairments. Additional detail, however, would be useful for passage restoration activities and flow augmentation. For passage, it is noted there is a need to “identify and evaluate” passage barriers and future project sites, but there is no mention of how that would be done in the methods. For flow augmentation actions, referred to in multiple objectives, there is limited and inadequate discussion of the full suite of opportunities available for enhancing flow.

Metadata and data are appropriately shared through numerous accessible databases.

Q3: Provisions for M&E

A wide range of comprehensive monitoring and evaluation activities are described in the proposal. The bulk of the effectiveness monitoring is done by Idaho Department of Fish and Game’s (IDFG) Potlatch River Steelhead Monitoring and Evaluation (PRSME) project that is designed to measure the success of restoration efforts at multiple scales and is the sole habitat and fish population restoration effectiveness monitoring program within the Potlatch River watershed. Latah SWCD also does the monitoring of groundwater levels and also photo point monitoring of individual projects. A USGS stream gauge monitors stream flows. Overall, there is an abundance of excellent monitoring information to support evaluation of restoration treatments at multiple scales. A variety of “state of the art” sampling and analytical techniques are employed. The sample designs, metrics, and evaluation criteria are well described and adequate. Numerous examples and links to various publications are provided.

The project adjustment process is clearly articulated in the proposal. The Potlatch Implementation Group (PIG) implements the process in conjunction with the IOSC’s Clearwater Focus coordinator. The group is expansive with over 50 participants representing many entities and disciplines. It was organized to provide a forum for discussion, exchange of information, and review and prioritization of restoration projects. As noted in the proposal, “The PIG utilizes annual RM&E reports from IDFG to review project effectiveness and determine how steelhead are responding to restoration efforts in the priority watersheds. This monitoring effort informs the PIG on what techniques appear most effective and where project implementation should be focused.” The group meets multiple times each year to evaluate monitoring data in an adaptive decision process to adjust strategies and actions as well as modify planning and implementation guiding documents.

Although there is active coordination to consider project effectiveness and for the proponents to adjust as related to the monitoring data, there is little discussion of this evaluation cycle, nor whether there are any thresholds for adjusting strategies and actions. Numerous examples of using this process to adjust management practices are provided as well as a number of

different lessons learned linked to individual projects and treatment types. However, the proposal would be improved with a more complete summary description of major adaptive changes to management that have been implemented to date.

The proposal provides a detailed response to Qualifications from the ISRP 2013 Geographic Review. The response is more detailed and complete than was provided in the Latah SWCD project proposal for the Potlatch. Two of the three qualifications are fully addressed. The third qualification addresses completion of various assessments. Of note, fish passage assessment has been completed but the road conditions assessment to identify potential road related sediment delivery sources to nearby streams is not addressed. This is unfortunate since accelerated sediment loading of streams is mentioned as a major issue needing attention.

Q4: Results – benefits to fish and wildlife

The proposal identifies a wide range of restoration accomplishments and provides a number of examples showing direct benefits to fish passage, habitat, and fish populations. The progress section provides a comprehensive summary of accomplishments to date. A significant number of restoration actions have been implemented in the past in the effort to achieve improvements in fish populations and their habitat. Information is provided by numerous studies referenced in the proposal. Some examples include a detailed report for the Two-Mile Meadow Restoration project on the East Fork Potlatch River (2020 Two-mile annual report). In addition, the Corral Creek monitoring summary report (Dansart 2020) and the Vegetation monitoring summary (Erhardt 2021) provide details on monitoring efforts showing site-specific responses to meadow restoration efforts.

The project has a number of other important results. Fish passage actions have provided immediate positive responses of steelhead moving into newly opened habitat. Pilot water releases from a local reservoir to augment stream flows have been shown to maintain perennial flow in Spring Valley and Little Bear Creeks, which were previously intermittent for an 11-mile reach, and provided fish passage through the entire reach (IDFG study 2015 and 2016). Meadow restoration treatments in Corral Creek (5 sites) have shown to have positive, but variable, impacts on meadow and stream conditions. Steelhead growth and survival have improved in treated areas with shifts towards higher proportions of older (age 2 and 3 fish) and larger steelhead juvenile emigrants leaving the East Fork Potlatch River, along with a corresponding increase in survival to Lower Granite Dam (PRSME Project).

It seems likely that that the restoration strategy described in the 2019 Potlatch River Management Plan has played a major role in providing these results and is related to focusing restoration into three priority watersheds. It also reflects consistent use of a project adjustment

process that helps to improve the efficiency and effectiveness of restoration efforts in the subbasin.

200206100 - Potlatch River Watershed Restoration – Latah SWCD Project Development

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Latah Soil and Water Conservation District

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comment:

The revised proposal and point-by-point responses provide useful additional detail and significantly improve the proposal as well as our understanding of the project. Additional coordination with the sister project 200860400 and work to revise the proposal and prepare the response is very much appreciated. The ISRP recommends the proponents to address the following condition under the item **1. SMART Objectives** in the next annual report and future work plans. Additionally, we encourage the proponents to revise their proposal to include the additional information provided for Proposal Objectives 2 and 3 as a valuable record for the project and future reviews of the project.

1. SMART objectives

Condition - Develop a suite of SMART objectives (see proposal instructions) to describe desired outcomes for Proposal Objective 2 (increase amounts of suitable steelhead spawning and rearing habitat) and Objective 3 (improve instream water flows to support spawning and rearing habitat). If these objectives are not feasible at a program or reach scale, please provide objectives and supporting metrics for use at the project level. Include these SMART objectives in the next annual project workplan.

Comment – The ISRP asked for the SMART objectives in the Response Request, but we found only objectives to track accomplishments tied to project implementation. No new information was found to describe desired ecological outcomes (habitat/biological objectives) in the revised proposal. Although information is provided in the original

discussion of project monitoring, which describes changes in various habitat metrics tied to past restoration work, the current objectives address only measures to track project implementation. For example, it is noted that additions of LWD have increased habitat complexity and the quality of juvenile steelhead rearing habitat. Metrics can be developed to describe desired outcomes for these habitat factors and potentially could be used to serve as the basis for habitat/biological objectives describing expected future outcomes from channel and riparian/floodplain restoration work. Examples of potential metrics include pieces of large wood per XX length of stream channel (within the highwater channel) or primary pool frequency (primary pools per XX length of channel). These are examples of objectives to describe desired ecological outcomes for restoration actions intended to improve juvenile steelhead rearing habitat. There are similar examples for meadow and riparian restoration, such as increases in percent stream surface shading and/or percent vegetative ground cover. We encourage the proponents to coordinate with the partner project for the Potlatch (200860400) to develop these objectives for aquatic and riparian/floodplain restoration activities.

Additional objectives addressing coordination, outreach, M&E, and adaptive management are useful and important additions to the proposal. Additional detail is needed, especially for objective 4.3 Evaluation and adaptive management. Objective 4.3 notes that planned M&E actions will address whether project “functionality as designed” will occur. This will be accomplished for at least 3 projects per year. The response does not explain how project functionality will be measured and what metrics will be used. We appreciate the proposal’s thorough discussion of past lessons learned and how they have been used to modify management and restoration procedures and designs, and we encourage them to describe how and when results and lessons learned from the project’s evaluation process will be reported.

2. **Methods descriptions.** The proposal discusses monitoring activities and agency responsibilities at a range of scales (watershed, reach, and site scale). Specific methods are noted and links are provided for additional detail on individual procedures. Monitoring efforts by other projects are discussed and focus mainly on biological monitoring at reach and watershed scales. It is noted that the focus for Latah SWCD will be project level monitoring (at least 2 projects per year) to “identify adaptive management strategies.” This planned monitoring underscores the need to have objectives that quantitatively describe expected ecological outcomes for planned protection and restoration actions. The objectives will serve as benchmarks for monitoring the effectiveness of various project level activities. Additionally, the proponents do not explain in detail how projects will be selected for monitoring, the

specific focus of the monitoring, or the metrics that will be assessed for each monitored project. It will be important to provide this information in annual work plans.

The response includes a detailed discussion of methods for sediment reduction, including detailed assessments of road segments to determine the highest risk areas and treatments primarily involving decommissioning and storm proofing. These approaches to reduce sediment delivery have promise for use in other projects. It is noted that “Future rural road assessments will follow a similar strategy to address fine sediment reductions in priority watersheds.” It would be a useful to provide more detail on the timing and location of future road assessments.

3. **M&E matrix – support.** We support the project’s commitment to participate in the development of the M&E matrix summarizing linkages between implementation and monitoring projects when the effort is undertaken. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. The proponents are encouraged to follow future Council decisions about the development of M&E summaries for subbasins and geographic areas.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

This is a comprehensive, well-organized proposal that describes a strategically focused restoration program for improving steelhead habitat conditions. Steelhead in the Potlatch River are ESA listed as threatened and represent an important production contributor in the Lower Mainstem Clearwater River population. Habitat restoration is an important component of the overall recovery efforts. The project is well integrated with other restoration and monitoring programs in the subbasin.

Numerous accomplishments are described and many examples of utilizing an adjustment process for management to improve results and increase efficiency. The program involves numerous Federal and State agencies, landowners, Tribal governments, and individuals. It appears to be well coordinated and has impressive examples of cooperation, cost sharing and watershed scale, innovative restoration.

The ISRP requests the proponents to participate in the development of the M&E matrix and to address the following points in a revised proposal and provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **SMART objectives.** Develop a suite of SMART objectives (see proposal instructions) to describe desired outcomes for the Proposal Objectives #2. (Increase amounts of suitable steelhead spawning and rearing habitat) and #3. (Improve instream water flows to support spawning and rearing habitat). If these are not possible at a program scale, please provide metrics for use at the project or reach level.

Develop implementation and effectiveness objectives for Latah Soil and Water Conservation District (LSWCD) coordination, monitoring and evaluation, adaptive management, project maintenance, and public outreach and involvement. These objectives should meet SMART criteria.

The objectives need to include expected accomplishments and outcomes for the five-year project time frame (2023-2027). It is important that the objectives provide clear descriptions of the quantitative expected accomplishments and desired outcomes for the project proposal time period so that there is clear understanding of the rate of progress on the path to the 2042 desired outcomes. Also, more specific milestones for key project elements during the full twenty years would be useful.

2. **Methods descriptions.** Include methods for the monitoring and evaluation activities. Provide enough detail for reviewers to clearly understand the scientific validity of the methods. There were no methods provided for project implementation and compliance monitoring.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

The requested responses are similar to the two Response items for the companion Lower Clearwater Potlatch River Restoration project. Coordination between the two projects in providing this information is anticipated.

Q1: Clearly defined objectives and outcomes

The LSWCD's Potlatch River Habitat Restoration Project is a companion project with the Idaho Office of Species Conservation's (IOSC) Potlatch River Project. This proposal contains identical text for many sections, as does the IOSC's project. As a result, the review's highlight similar strengths and weaknesses.

Restoring steelhead natural production in the Potlatch River is important as the watershed is the largest tributary to the lower Clearwater River and supports a substantial proportion of the Lower Mainstem Clearwater River population production. Steelhead are ESA listed as threatened and improving abundance and productivity are essential for the population to reach delisting viability status.

A very detailed description of the many problems and challenges in the Potlatch River watershed is provided. A number of assessments and watershed scale analyses have been completed and an amended River Management Plan (2019) produced to replace one created in 2007. There is a complete discussion explaining the strategic and biological importance of the Potlatch River, especially its importance as related to the recovery of wild summer steelhead in the Clearwater River. Also, there is a comprehensive discussion, including references, regarding restoration philosophy, identification of priority sub watersheds for restoration and procedures, including criteria, for prioritizing and selecting out year restoration projects.

A number of maps are provided that display sub-watershed boundaries, land ownership and land use patterns within the main river basin. These provide context for better understanding the proposal. One area needing further attention is the discussion of upslope factors, most notably the road system, that likely have an influence on meeting project objectives. It was noted that roads, particularly inadequate drainage, are a major contributor to increased sediment inputs to streams and accelerated routing of run off causing reduced infiltration. A more detailed summary of work completed to date to reduce accelerated sediment delivery from roads and what the findings have been regarding the effectiveness of the treatments would be useful.

The proposal provides three program-scale goals and associated implementation objectives that are quantitative and time bound. They address the projected accomplishments for major restoration treatment categories: fish passage, habitat improvement, and improved

groundwater levels and summer stream flows. However, there are no objectives describing desired outcomes for restoration activities other than for fish passage. For example, for habitat restoration, it is merely stated that treatments will improve spawning and rearing habitat. For example, Objective 2 states, “Provide an additional 35 miles of suitable habitat for steelhead spawning and/or rearing by 2042.” The suitable habitat outcome is not described. There are no metrics to describe desired improvement in rearing/spawning habitat such as primary pools per mile, frequency of in channel, large wood, etc. If such objectives are developed on an individual project basis, it is not apparent. Also, there are no objectives addressing desired increases in fish numbers such as smolt outputs or adult returns.

There are no objectives provided for some major work categories mentioned in the proposal. Of particular importance are the LSWCD monitoring and evaluation, program coordination, project maintenance and public outreach and involvement. Although there is a good deal of discussion for these items, there are no objectives to describe planned implementation accomplishments or effectiveness for these activities.

Finally, the timelines provided for the objectives were two decades out (2042), and it was unclear if the quantitative accomplishments (miles, number of barriers, number of log structures) represented the proposal’s five-year period or the full, twenty-year period. It is important that the objectives provide clear descriptions of the quantitative desired outcomes for the project proposal time period (2023-2027) so that there is clear understanding of the rate of progress on the path to the 2042 desired outcomes.

Q2: Methods

The proposal provides a good deal of information on methods for planning, implementing, and monitoring projects at multiple scales. The project operates primarily under the guidance of the NMFS Snake River Steelhead Recovery Plan and the 2019 Potlatch River Watershed Plan. These two plans provide sound guidance, both emphasizing the importance of restoring normative hydrologic and channel forming processes. The Potlatch River Management Plan (2019) offers detail on the overall strategy for restoration and substantial information on most aspects of the restoration program.

Five-year implementation plans are developed for each high priority sub-watershed. These implementation plans build from the 2019 Plan guidance and appropriately target key limiting factors in the most important steelhead production areas of the watershed. The proposal states, “Contracts associated with Project 2008-604-00 (Idaho Accord) are coordinated with contracts associated with Latah SWCD's Project 2002-061-00.” Although there is a lengthy discussion on coordinating groups and schedules, there is not much discussion on the strategic

linkage between the SWCD program and the Accord program. Clear and scientifically sound methods generally are provided for the objectives that are included. However, additional detail for certain actions would be useful. For example, methods for meadow restoration are vague and no BMPs are listed. Also, there are no methods listed for flow augmentation actions. Even if overarching methods are guided by other plans, it would be helpful to sketch out general approaches or clearly state the sections of the plan that the methods will follow. In addition, there are no methods described for coordination, outreach, implementation and compliance monitoring, evaluation, and adaptive management.

Finally, “the Clearwater Focus Program facilitates coordination between BPA funded watershed projects and Accord agreement projects through the Clearwater Technical Group and the Core Review Team, both developed to foster communication between watershed groups and provide objective technical assessment of project proposals.” Methods need to be added to cover these important work elements. The project shares data and metadata through numerous publicly accessible databases.

Although general linkages and methods for coordination are discussed, including a description of the Potlatch Implementation Group, details remain somewhat confusing. Given the complexity of multiple projects for the area and the numerous players involved and their respective roles, a more complete description of roles and responsibilities would be useful. Perhaps use of a diagram to summarize all of the players, their roles and specific methods for coordination and cooperation could be considered.

Q3: Provisions for M&E

The proposal provides a detailed description of monitoring and evaluation activities and provides a number of examples addressing how well the program is meeting its implementation and effectiveness objectives (although most of these are qualitative and do not describe desired outcomes consistent with SMART objective criteria). A wide range of monitoring and evaluation activities, being conducted as part of the Potlatch River restoration program, are described in the proposal. Biological effectiveness monitoring is primarily conducted by the IDFG Potlatch River Steelhead Monitoring and Evaluation project. Biological monitoring and evaluation are conducted at multiple geographic scales from reach to watershed levels. The sampling designs, metrics, and analytical methods are scientifically sound.

It is noted that a good share of the monitoring is guided by the Potlatch River Watershed Management Plan 2019 Amendment. Other support is provided by the project’s integration into the National Marine Fisheries Service’s Intensively Monitored Watershed program (started in 2007). There is also water quality monitoring being done as part of Idaho’s Potlatch River

Subbasin Assessment and TMDLs (Potlatch TMDL; IDEQ 2008). One of the identified beneficial uses within the Potlatch TMDL is salmonid spawning. Finally, an ongoing project-specific, monitoring evaluation program is being conducted by the LSWCD. It focuses mainly on specific physical responses to restoration activities using vegetation monitoring in conjunction with aerial and ground surveys (photo points, aerial photography, vegetation surveys, post-treatment high flow assessments). Methods for this work were not discussed in the proposal and providing additional detail or references would be useful.

The project adjustment process is directed and facilitated by the Potlatch Implementation Group (PIG) and the Clearwater Focus Coordinator. Participation in the PIG is extensive with representatives from many disciplines and entities. The group meets multiple times each year to review progress, assess monitoring results, approve projects, and adapt strategies and actions.

There are numerous examples, both in the proposal and contained in other reports (linked to the proposal) of evaluation of monitoring data and use findings to link project evaluation to decision making. A major example of this was completion of the revised Potlatch River Management Plan (2019). This effort relied heavily on past monitoring to make a wide range of adjustments to many program components. In addition, as part of an annual meeting of the PIG, program accomplishments and M&E results are reviewed and discussed, and changes are made as necessary. Another excellent example is the proponent's response to Qualification 2 of the 2014 ISRP review, the issue of summer streamflow response to meadow restoration activities. The proposal provided a link to a very detailed and comprehensive synthesis report evaluating responses to meadow restoration on five individual meadows in Corral Creek (Latah Soil and Water Conservation District Corral Creek Monitoring Summary B. Dansart 2020). There is a detailed discussion of results and a number of recommendations made regarding future work. Additional discussion on whether there are any formal thresholds for adjusting strategies and actions would be useful.

Q4: Results – benefits to fish and wildlife

It is clear that this is a sophisticated and well-managed restoration program. The accomplishments were well characterized including a synthesis of important lessons learned. Current and past restoration work has had and will likely continue to have substantial benefits to fish and other aquatic species. The proponents have consistently planned and completed a wide range of strategically selected restoration projects with many impressive results. These results are documented in annual and synthesis reports and through photos and a range of monitoring efforts. Numerous benefits to fish and wildlife are apparent.

There is a complete listing of program accomplishments for the three major restoration objectives and some discussion as to how well they delivered expected outcomes. Maps are provided showing location of individual treatments and there are summaries of accomplishments (number sites and miles for fish passage, miles of habitat treated to improve spawning and rearing, and miles of stream treated to maintain and improve stream flows). As noted earlier, the proposal describes only general outcomes (except of fish passage where miles of stream with improved access and actual steelhead use is reported) and not as quantitative SMART objectives. A report is also provided, detailing evaluation of monitoring results of meadow restoration outcomes for increased ground water levels and improved summer stream flows. It acknowledges generally positive, but somewhat inconsistent, results from this work. It suggests a number of reasons for this variability but does not provide detail on any planned adjustments to restoration procedures to improve or accelerate positive results.

The proposal would be improved with a more thorough discussion of potential water sources for flow enhancement. Flow enhancement is an important element for achievement of multiple objectives, but it is unclear what the potential quantity and quality of water is that may be available for future flow enhancement actions.

Also, a number of activities are not listed as objectives and not detailed in the accomplishment reporting. Specifically, they include program coordination, SWCD monitoring, public outreach and involvement, and project maintenance.

200207000 - Restoring Anadromous Fish Habitat in the Lapwai Creek Watershed

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Soil and Water Conservation District

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria

Final review comment:

We thank the proponents for submitting a revised proposal as well as a point-by-point response addressing all of the topics identified in our preliminary comments. In combination, the two

documents address all of the major topics requested. In our preliminary review, we requested a response on the topics listed below, and we provide our comments after each topic:

1. **Monitoring methods.** The revised proposal provides much more detail and incorporates new information on implementation and compliance monitoring, post treatment implementation monitoring, and additional monitoring that is site specific as requested. These implementation evaluations are not intended to measure effectiveness in fish response.

The revised proposal states that data collection during site visits may include, but are not limited to, photo documentation, stream flow documentation, in-stream wood structure assessment, stream temperature, vegetation survival assessment, floodplain reconnection assessment, grass seeding assessment, fence assessment, water facility assessment, and road treatment assessment. Post treatment implementation monitoring provides information to evaluate project function over time and to provide feedback to engineers and planners on potential improvements in design and installation techniques. References to guide these assessments are provided. Additionally, each action ("Strategy") includes brief statements about planning, design, implementation, expected benefits, and types of project monitoring, including references to the proposed monitoring methods.

The revised proposal describes the evaluation and adjustment process used by the NPSWCD to incorporate information gathered from eight activities: public input, landowner meetings, the annual watershed coordination meeting, administrative review, project rankings, restoration projects in other watersheds, site inspections, and annual project reviews. The proponents note that they utilize monitoring data from adjacent projects, such as Asotin Creek or the Potlatch River, to adjust the types of restoration activities to best address juvenile or adult habitat needs in Lapwai Creek. A major example is the use of large wood, which has been shown by these nearby projects to improve rearing habitat for juvenile steelhead, as measured by increased juvenile density.

2. **Coordinated low-cost monitoring.** The proponents stated that they will provide information to and participate in any regional effort to coordinate low-cost monitoring approaches, including the NPT DFRM Focus Watershed Restoration Program (199706000) and the Clearwater Focus Program (199608600). We appreciate the willingness to participate in these efforts.
3. **M&E matrix – support.** The NPSWCD participates in regional meetings to be informed of monitoring efforts in adjacent watersheds. The project stated that it will provide

information for future summaries of M&E. We encourage the proponents to follow future Council processes to develop M&E summaries for subbasins and geographic areas. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The Nez Perce Soil and Water Conservation District's (NPSWCD) Lapwai Creek Restoration Project has been underway for nearly two decades. The project is focused on improving habitat conditions for ESA listed summer steelhead. Habitat conditions are severely degraded throughout the watershed because of human induced habitat changes. The watershed has numerous habitat limiting factors influencing all life stages of steelhead, and the project is addressing many of the important ones. The project is strongly supported by numerous plans and documents including the Subbasin Plan, ESA Recovery Plan and the Council's Fish and Wildlife Program. Overall, this is a well-written proposal that addresses most of the essential proposal elements effectively.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal and to participate in the development of the M&E matrix:

1. **Monitoring methods.** Please expand the implementation and compliance monitoring methods to describe metrics, sampling protocols, analytical approaches, sampling timelines, and criteria to assess success in implementation and compliance. Describe how this information is used for adapting project approaches. For example, proponents state "The NPSWCD utilizes monitoring data from adjacent projects (such as Asotin Creek or the Potlatch River) to adjust the types of restoration activities that best address juvenile or adult habitat needs." What data are used from adjacent watersheds and how are inferences made for the focal area under this project? Where in the project adjustment process are these data and evaluations applied?
2. **Coordinated low-cost monitoring.** Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated

by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We encourage proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (for example, eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents also could explore whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data.

3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal includes goals that are mostly clearly stated, and objectives contain the essential SMART elements. Generally, the objectives are comprehensive and include outreach, coordination, and adaptive management.

Goals and objectives for the five-year period 2023-2027 include:

Goal 1: Restore the Lapwai Creek aquatic ecosystem, so that the physical habitat no longer limits recovery of the ESA threatened Lower Clearwater steelhead population

- Objective A: Improve aquatic habitat diversity and complexity on 1.8 stream miles by 2027
- Objective B: Reduce maximum summer water temperature on 4.5 stream miles to tolerance limits identified for steelhead spawning and rearing by 2027
- Objective C: Reduce instream sediment from 4 road miles and 200 acres of uplands in order to improve spawning, juvenile incubation, and invertebrate habitat by 2027
- Objective D: Remove or retrofit barriers to provide 3 miles of access to stream habitat for all life stages of steelhead by 2027

Goal 2: Improve long-term effectiveness of the restoration program within the Lapwai Creek watershed

- Objective E: Improve the long-term effectiveness and participation in the steelhead habitat improvement efforts through education and public engagement to 900 people by 2027
- Objective F: Increase project effectiveness, administrative efficiencies, and transfer project results in the Lapwai Creek watershed from 2023 to 2027

Both goals have multiple supporting objectives that link with specific strategies, prioritized actions, and timelines. The goals and objectives appropriately focus on restoring natural processes in key steelhead production areas. The tabular presentation of goals, objectives, and strategies with direct linkage to the limiting factors was effective. The clear organization and presentation of the goals and objectives was appreciated and would serve well as a template for other habitat restoration proposals.

Improvements to consider include making the objectives under Goal 1 to restore habitat more ambitious in terms of the amount of habitat restoration to be achieved by 2027. It would be useful to place this effort in perspective by indicating the percentage of habitat requiring restoration that this effort represents.

For Goal 2, it is unclear that the objectives will increase “effectiveness” of the project; they are more likely to increase participation and breadth, or scale, of the efforts. Consider rewording in future proposals. It is appreciated that the proponents have sought to address a prior ISRP concern regarding participation among private landholders with this goal.

Q2: Methods

The proponents provided an extensive description of general and specific methods that address the planning, design, implementation, monitoring and evaluation, coordination, outreach, and maintenance objectives.

Site-specific project development and implementation is a multi-year phased approach. Project ranking and selection are clearly described and rely on sound strategic guidance focused on addressing key limiting factors in critical production areas. The overall process is logical and appears to be effective.

The proponents provided a detailed and comprehensive list of the proposed work through 2027, with specific linkage to strategies and objectives. The map displaying the locations of each restoration site was informative. There were more than 25 restoration projects described. Each restoration project included an overall strategy, planning timelines, design, implementation, benefits, monitoring, and funding sources. The methods were generally complete, detailed, and provide a solid roadmap for the restoration efforts. There was clear connectivity and continuity from the problem statement through the goals, objectives, and methods. The one area of improvement needed is better articulation of the linked best practices to be followed for different types of activities.

Q3: Provisions for M&E

The proponents generally described the implementation and compliance monitoring that is planned for each restoration strategy. However, the proposal lacks detail on the methods, and a response is requested for more detail in this regard. The proposal would be much improved with a clear description of the specific metrics that will be measured for each strategy as well as criteria for assessing success. Further, annual reports should provide a more comprehensive overview of progress to date on monitoring efforts (e.g., stream temperature monitoring). Finally, for several strategies, the monitoring does not assess the actual objective, only whether the strategy was undertaken. The M&E approach would be improved by clarifying which efforts are implementation effectiveness evaluation vs. those that are intended to measure fish responses to restoration.

Project evaluation and adjustment occurs through a seven-step process. This process includes landowner meetings, annual watershed coordination meetings including stakeholders, outside project expert input, and the SWCD Board reviews. The summary of lessons learned illustrates that the project uses monitoring information to make adaptive changes. However, the proposal does not clearly describe how the implementation and compliance monitoring data are used in

the adaptive management process. Where in the process are these data considered in the development and implementation of restoration projects?

There is also no stated monitoring of outreach efforts. Given the importance of these efforts and that this is a new approach, consider some form of “monitoring” or reflection to identify which outreach vehicle was most successful in engaging with private landowners.

Q4: Results – benefits to fish and wildlife

The proponents provided comprehensive descriptions of the accomplishments for all past objectives. The descriptions highlighted key outcomes and lessons learned for each completed project. The proposal provided quantitative results showing the amount of habitat improved in relation to the amount planned. Additional summaries of outreach, coordination, and temperature monitoring were provided. We compliment the project for their outreach efforts, which included newsletters, videos, community events, site tours, and social medial posts for communicating project results.

Overall, the project has exceeded many of the desired outcomes and has a strong record of accomplishments.

199706000 - NPT DFRM Focus Watershed Restoration Program

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe Department of Fisheries Resources Management – Watershed Division

Province/Subbasin: Basinwide

Recommendation: Not Applicable

Overall comment:

The proposal provides substantial information and detail on this important project whose overarching goal is to “facilitate and coordinate an organized and efficient watershed/aquatic ecosystem restoration program throughout the Nez Perce Tribe's Treaty Territory.” This project functions at the program, policy, and administrative levels, performing essential coordination efforts to facilitate on-the-ground restoration actions over a wide area. Little scientific foundation is required for these administrative and coordination activities, and none are

provided in the proposal. The ISRP recommends that this project is Not Applicable for scientific review. However, we believe it is important for the project to participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that this project (NPT DFRM Focus Watershed Restoration Program 199706000) and the Clearwater Focus Program (199608600) will assist the lead project in developing the summary and provide information to them about what is being monitored for implementation projects and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

In addition to participation in the M&E matrix development, several areas in this proposal require improvement. The ISRP encourages the proponents to address the following issues in future work plans, annual reports, and proposals.

- 1. Goals and SMART Objectives.** Additional detail to better describe expected accomplishments and desired outcomes (“what success would look like”) of key activities, tied to the five objectives, is needed and would greatly benefit the project. This should be done using SMART implementation objectives. The current set of objectives provides an excellent foundation, but greater detail and clarity is needed.
- 2. Methods.** Describe what prioritization methods are used to meet project goals and objectives. Consider broad-scale approaches for coordinating/prioritizing and evaluating actions across subbasins and projects. Some areas rely on ATLAS, others apply different approaches for prioritization, and most are thoughtfully considered. However, project-by-project activity prioritization, without semi-regular efforts to “zoom out” and consider the basin as a whole, may miss important opportunities for leveraged actions and shared learning. At a minimum, annual discussions amongst project leads within the basin could identify 1-3 top, basin-wide priority activities for the coming year.

Provide detail on how coordination activities are considered/chosen/prioritized to maximize likelihood that they are “compatible with needs that integrate watershed, restoration, and management objectives and activities.”

- 3. Project Adjustment.** There is little indication that this project reports on overall effectiveness of alternative habitat restoration planning and implementation strategies or other broadly relevant topics. It would be beneficial if the project produced reports that have broader science applicability and shared important major lessons learned with a wider audience.

Q1: Clearly defined objectives and outcomes

Five objectives and outcomes are presented. They are goal level statements and provide a qualitative description of actions and desired outcomes. In the current form, they provide an excellent foundation for future objectives revision to better meet SMART criteria (they are currently not measurable, nor timebound). These can be difficult for coordination or administrative projects, but a number of improvements could be made. For example, under Objective 1, given the primary objective is to develop proposals, there could be an objective developed for number of new contracts developed (e.g., Table 4 in Progress to Date). Meeting and agency coordination with Watershed Division staff assignments are appreciated, and both provide a useful list of possible metrics for more specific outcomes and a source list for planned accomplishments (e.g., Table 7). For Objective 3, more specific outcome targets could include number of outreach and engagement events and number of people reached. Included is a listing of potential outreach opportunities and outcomes linked to public meetings that provide potential areas for development of quantitative metrics. For Objective 4, SMART outcomes could include number of new jobs attributable to habitat improvement projects and perhaps dollars brought into the local economy.

The proposal does not adequately discuss monitoring and evaluation objectives. We recognize that monitoring and evaluation implementation are outside the scope of the project; however, coordination and seeking of funding are well within the scope. As described above, the ISRP is asking this project and the IOSC's Clearwater Focus Coordinator, as well as other implementation projects, to assist the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) in summarizing monitoring between all the restoration and monitoring projects in this geographic area.

Q2: Methods

This project does not have scientific principles and therefore does not require rigorous methods, yet the methods for coordination (Objectives 1 and 5) are unduly vague. Although the organization of meeting attendance by staff (Table 7) and the listing of specific actions for each of the six major upcoming efforts are appreciated, this would benefit from more thorough detail given that most of other funding goes toward these efforts. Important questions include:

What is the system to ensure coordination amongst different staff? Is there a rubric to determine what suffices as “compatible with needs that integrate watershed, restoration, and management objectives and activities”? Are there timelines and best practices associated with these efforts? Without some pre-planning and careful prioritization of activities, there are likely to be non-strategic efforts and missed opportunities.

Similarly, for Objective 2, there is no description of how methods for prioritization are being chosen and cross-walked with project goals and objectives. Also, it is not mentioned if there is any intent to develop an overarching foundation for priority setting, across the entire project area that would be used by all participants. The proposal would be much improved if there was a plan to address the substantial deficiencies in the overall and project specific monitoring and evaluation efforts of the restoration implementation projects.

Q3: Provisions for M&E

There is no real project evaluation and adjustment process provided. It is clear that discontinuation of CHaMP and ISEMP has impacted the evaluation efforts; however, the vague outcome goals and limited discussion listed in Section 5 do not provide rigorous opportunities for evaluating project success or for effectively achieving the adaptive management that the project needs. Although funds or data may not be available to provide high resolution monitoring and evaluation of responses to specific actions, some measures of success could be articulated, reported, and reflected upon to guide program efforts. Some potential examples include:

Objective 1: Estimated redd count or fish abundance estimates vs. types of project action completed (habitat restoration, invasive species removal, roads removed, etc.), number of completed restoration projects and/or miles of stream to be treated by completed projects.

Objective 3: Website hits vs. types of outreach, number of people reached, numbers of information products, etc.

Objective 4: Estimated jobs created vs. funding mechanism or project type, dollars brought into the local economy, number and total dollars of projects awarded to local contractors.

Objective 5: Number of new external-projects initiated vs. type and quality of participation in local watershed groups

These types of metrics are imperfect and can be difficult to interpret. However, variable estimates – or even conceptualization and logic modeling of how this might be achieved – is necessary to ensure that there is some form of adaptive management over the course of the project.

Q4: Results – benefits to fish and wildlife

The narrative of results suggests substantial accomplishments from past restoration actions. Coordination is critical to on-the-ground action, and the proponents’ efforts are impressive and much appreciated. However, in most cases, summaries of results are qualitative and often not directly tied to the appropriate project objectives. Reporting in the future could be streamlined and made clearer with a few changes. Under Objective 1, many of the summaries of coordination activities list that meetings are attended regularly, but better summaries of what was achieved from coordination would be useful. Under Objective 2, providing timelines for when prioritization efforts will be achieved would be useful. This section for Objective 4 could be made clearer with tables of number of people reached and engagements held; consider moving the education piece for Table 4 into a separate table for this objective. Also, there is a Data Management element included, “An important goal of the Watershed Division is the timely reporting of science-based data. The Watershed Division employs a Database/GIS Administrator to lead these efforts.” It is unclear how this relates to this objective and there was little documentation of past timely reporting of data.

199607702 - Lolo/Selway Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe DFRM Watershed

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The Lolo/Selway Watershed Restoration Project has been underway since 1996. The project is implementing restoration actions to address key salmonid limiting factors including excess sediment, impaired riparian function, passage barriers, and high summer water temperatures. The overarching goal of the project is to restore fisheries resources in the Lolo Creek and

Selway River watersheds. The project implements restoration strategies that address key limiting factors for salmon, steelhead, and bull trout. Addressing these habitat limiting factors is a key component in the recovery efforts for the Clearwater River Steelhead Major Population Group. The project has an impressive list of accomplishments for the last project period 2013-2020. The proposal addresses many of the past issues and recommendations identified in previous ISRP Reviews.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** Revise implementation and compliance monitoring and evaluation objectives with full consideration of SMART objective guidance (see proposal instructions). Provide a specific timeline for the Lolo Atlas Monitoring Plan. Revise objective 4 to provide desired outcomes for the upcoming five-year time period.
2. **M&E.** As applicable, in the Methods or Relationship to Other Projects section, include a more detailed description of how this project relates to, participates in, informs, and uses information from the Lolo Atlas Monitoring Plan and the Clearwater Parr Distribution and Habitat Assessment Project. Focus the description on the metrics and criteria the project will use for restoration evaluation.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data.

Q1: Clearly defined objectives and outcomes

The proponents provided two specific goals for the project: 1) increase carrying capacity by providing access to blocked habitat and increasing habitat quality, and 2) improve monitoring and evaluation, data sharing, and adaptive management. Clear objectives with quantitative desired outcomes and timelines, essential elements of SMART objectives, were provided under goal 1, and partially under goal 2. Quantitative implementation objectives were specified for most of the biological objectives.

The ISRP has a few concerns with the objectives. The project is proposing to complete and implement the Lolo Atlas Monitoring Plan to fill data gaps. It is unclear exactly if this monitoring plan will address essential implementation, compliance, and effectiveness monitoring needs of the project. There were no timelines provided for completion and implementation of the Atlas Monitoring Plan. The proposal also states that the Clearwater River Distribution and Habitat

Assessment Project will be used to fill data gaps, but no details were provided to clearly understand how the project will support habitat restoration monitoring.

The timeline for objective 4, road decommissioning is year 2035, thus it is unclear what the desired outcomes are for the next five-year proposal time period.

We appreciate inclusion of the education and outreach objectives, which are an important component of the project.

Q2: Methods

General methods and processes were provided that clearly described the steps used for prioritization, identification, design, implementation, monitoring, and adaptive management. The project development and planning process is guided by multiple planning documents including the Lapwai Creek Watershed Ecological Restoration Strategy, NOAA ESA Snake River Recovery Plan, Clearwater Subbasin Plan, and the Nez Perce Tribe Fisheries Resources Management Plan. The Lapwai Creek Restoration Strategy provided prioritization of restoration reaches, and the project focuses on restoration in the three highest priority reaches. It appears that the overall process for planning and implementing actions is sound.

In addition to the general methods, the proponents provided detailed methods for each specific restoration action planned for the proposal time period. The specific limiting factors being addressed with each reach were clearly described. No monitoring is identified for most of the restoration projects.

Project prioritization and selection is determined using two separate methods. Projects in the Lolo watershed rely on the Lolo Creek Atlas, whereas in the Selway, projects relies on past management documents. The project needs to develop a simple but formal process describing prioritization and selection of restoration areas and actions for the Selway River. We encourage the proponents to formalize the process for the Selway River restoration to provide better decision transparency and documentation. Most actions focus on sediment reduction and barrier removal. The proposal indicates that the project uses criteria for barrier removal as well as road decommissioning projects. Developing a simple transparent ranking process utilizing the barrier and road criteria described in the proposal would be beneficial.

Q3: Provisions for M&E

The proponents describe two separate project adjustment approaches for Lolo Creek and Selway River restoration efforts. The general framework is identical, but details for each step

are quite different. The general framework is sound; however, there appears to be inadequate implementation, compliance, and effectiveness monitoring and evaluation for each subbasin.

The proposal indicates that the Clearwater Parr Distribution and Habitat Assessment Project will be used to address Lolo Creek Atlas data gaps. Additional detail is needed to clearly understand how these assessments will address the lack of adequate project implementation and compliance monitoring and evaluation. In addition, the proponents need to describe in more detail what the Lolo Creek Atlas Monitoring and Evaluation Plan will contain, how it links with the Parr Distribution and Habitat Assessment Project, and what evaluation information these efforts will provide for use in the project's adaptive management process.

A timeline for when different strategies would be evaluated and adjusted would help the planning process.

Q4: Results – benefits to fish and wildlife

The project implemented eight objectives during the last proposal period (2013-2020). Restoration efforts were focused on reducing sedimentation, reducing temperature, eliminating barriers, restoring riparian vegetation, livestock grazing control, and improving channel complexity. The proponents describe previous work, outcomes, and lessons learned and illustrate the restoration efforts with photos.

The project achieved far less than their intended outcomes for road decommissioning (target 193 miles, achieved 20.2 miles) and road improvement (target 144 miles, achieved 6 miles). It was not completely clear why accomplishment of these objectives was so limited, but it appears that it may be related to USFS management priorities. In response, the project has reduced priority of addressing road impacts and increased emphasis on floodplain restoration. The proposal would be improved if a better description of why there is difficulty in addressing roading impacts when road produced sedimentation is described as a key limiting factor.

199901700 - Protect and Restore Lapwai Creek Watershed

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria

Final review comment:

We thank the proponents for providing a revised proposal and a point-by-point response. The two documents address all of the major items requested. In our preliminary review, we requested a response on the topics listed below. Our final comments, based on the response, are provided below:

1. **Monitoring and project evaluation**
2. **Implementation monitoring**

The revised proposal provides much more detail related to monitoring and project evaluation. The proposal now states that a Monitoring and Adaptive Management Plan will be completed for all projects and that habitat project actions will be assessed via implementation and compliance monitoring to ascertain whether the projects are effective in meeting stated goals and objectives. The methods section was enhanced to include more details for metrics, sampling protocols, analytical approaches, sampling timelines, and criteria to evaluate success. Monitoring results will be uploaded to BPA's web-interface software tool CBFish. The proponents emphasize that monitoring will be low cost and is not intended to track watershed conditions over time as in status and trend monitoring.

The project will not evaluate relationships between management actions and fish productivity and survival or aquatic habitat conditions that could be assessed with action effectiveness monitoring. Examples of proposed monitoring include, but are not limited to, photopoints, longitudinal profiles, fish snorkeling, general observations of conditions, vegetation counts, and growth measurements. The proponents presented adult steelhead abundances and juvenile steelhead densities in Lapwai Creek over the past 10 years. These data are valuable for tracking the status and trends of salmonids in the creek, especially if density effects are taken into account ([ISAB 2015-1](#)). Tracking of steelhead data, which are collected by other projects, should continue into the future. No monitoring was identified for maintenance projects (monitoring considered not

applicable by the proponents), but we encourage the proponents to track and report their maintenance efforts in annual reports to document what they have accomplished.

The revised proposal adequately describes the adaptive management process, which involves a cycle of project assessment, planning, implementation, monitoring, analysis, and adjustment to meet project objectives. The ISRP appreciates that Monitoring and Adaptive Management Plans will be developed for each relevant project reach and assumes it will be delivered to BPA as part of the project's annual reporting requirements. We encourage the proponents to share results with a broader audience through publications and public and professional presentations.

3. **M&E matrix – support.** The Lapwai Creek project proponents recognized and expressed concern in their proposal that the regional monitoring programs have not incorporated their projects, as initially anticipated. The ISRP notes that projects must have provisions for monitoring and evaluation of results in order to meet scientific criteria. The collection and evaluation of juvenile and adult steelhead in Lapwai Creek by other projects is an important component of M&E. We encourage project staff to assist in any future efforts to develop an M&E matrix that links implementation and monitoring projects as time and resources allow. Please see the ISRP programmatic comment on habitat restoration M&E.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The Lapwai Creek Watershed Protection and Restoration has been underway for over a decade. The project is clearly addressing an important need to improve habitat limiting factors and enhance abundance and productivity of ESA listed steelhead. The project has a solid history of accomplishments including lessons learned. Coordination with other restoration projects is extensive and occurs regularly through a variety of approaches. Methods for planning and implementing projects, coordination, and outreach are adequately described. Overall, the proposal is much improved from the previous proposal and did address many of the recommendations from past ISRP reviews. The proposal was detailed but long and sometimes redundant. The use of tables or charts could greatly help to reduce the length of the proposal.

Many of the proposal elements meet scientific criteria, but a lack of description of monitoring and evaluation methods along with an incomplete description of the project adjustment process need to be addressed for the proposal to meet scientific criteria.

The proponents are requested to address the following in a revised proposal and include a brief point-by-point response to the ISRP referencing where and summarizing how the issues were addressed in the revised proposal and to participate in the development of the M&E matrix as described below:

- 1. Monitoring and project evaluation.** Little detail is provided covering what the plans are for project monitoring, evaluation, and project adjustment. Specifically, please describe in more detail the purpose, scope, content, and intended use of the plans. Clearly articulate if these plans will provide implementation and compliance monitoring for the project.
- 2. Implementation monitoring.** Please expand the implementation and compliance monitoring methods to describe metrics, sampling protocols, analytical approaches, sampling timelines, and criteria to assess success in implementation and compliance. Describe how this information is used for adapting project approaches.
- 3. M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Willowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. If you have a map or maps of locations of monitoring actions, please provide it to the lead project.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E

approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data.

Q1: Clearly defined objectives and outcomes

This project, in concert with other restoration projects, is working toward restoring the Lapwai Creek aquatic ecosystem by addressing key habitat limiting factors impacting recovery of steelhead. The watershed has many habitat limiting factors including elevated water temperatures, increased sediment, poor floodplain connectivity, altered hydrology, impaired riparian habitat, and reduced complexity.

The proponents provided two specific goals that support the broader goal of restoring the aquatic ecosystem: 1) increase carrying capacity and 2) increase long-term project effectiveness through coordination, adaptive management, and education. The goals provide high level desired qualitative outcomes that clearly address the overarching habitat problems. There are five objectives provided associated with Goal 1. Objectives contain measurable outcomes and timelines for accomplishment, both essential elements of SMART objectives. Goal 2 has two supporting objectives that describe the coordination, adaptive management, and educational components of the project. These objectives also include quantitative outcomes and timelines.

Q2: Methods

General methods and processes were provided that clearly described the steps used for reach prioritization, action identification, design, implementation, monitoring, and adaptive management. The project development and planning process is guided by multiple planning documents including the Lapwai Creek Watershed Ecological Restoration Strategy, NOAA ESA Snake River Recovery Plan, Clearwater Subbasin Plan, and the Nez Perce Tribe Fisheries

Resources Management Plan. The Lapwai Creek restoration strategy provided prioritization of restoration reaches and the project focuses on restoration in the three highest priority reaches. It appears that the overall process for planning and implementing actions is sound.

In addition to the general methods, the proponents provided very detailed methods for each specific restoration action planned for the proposal time period. The specific limiting factors being addressed with each reach were clearly described.

The methods for goal 2 could be improved with descriptions of the coordination and adaptive management approaches.

Q3: Provisions for M&E

The proponents describe a project adjustment process; however, the process lacks details regarding monitoring needed for implementation, compliance, or effectiveness assessments. The only information that appears to feedback into decision processes is pre- and post-restoration observations (evidence-based practice), and there are no descriptions of what metrics or attributes are measured or observed or for the sampling protocols. Some projects will rely on monitoring and adaptive management plans that are not yet developed, and the proposal provides no details to understand what information will be collected to assess results at any level. The project does use monitoring results from other projects in nearby watersheds, and the proposal highlights the need for improved information sharing to this project from others that have adequate research, monitoring, and evaluation. Although the NPT is proposing assessments of carrying capacity and fish-habitat relationships in this proposal, it is unclear how these assessments will contribute to monitoring and evaluation of habitat restoration efforts in Lapwai Creek.

Q4: Results – benefits to fish and wildlife

The objectives from past proposals (restore wetlands, reduce stream temperatures, and improve habitat diversity and complexity) are worthy goals that will provide benefits to native fish stocks. A comprehensive list of completed projects was provided for each objective. In addition to summary of restoration actions, there were extensive lessons learned for each major restoration effort. This summary is sometimes redundant; multiple projects are listed multiple times as results, and the lessons learned were copied and pasted for the first two objectives. Some edits would benefit the proposal in these regards. The proponents do present important lessons learned for the third objective.

The project coordinates broadly with other restoration projects conducted by NPT, state, and county agencies.

200739500 - Protect & Restore Lochsa Watershed

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe Department of Fisheries Resources Management: Watershed Division

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This is an impressive project and a well-written (if overly-long) proposal that sets a very good example for others in demonstrating a landscape-scale, whole watershed approach to protect and restore riparian and aquatic habitats in the Lochsa River. The project represents the combining of three separate past projects and demonstrates very consistent and effective use of partnerships and coordination, all focused on the accomplishment of mutually developed goals and objectives. Recent development of a revised restoration plan for the watershed (Atlas project), which incorporates new science along with past lessons learned, indicates the strong likelihood of continuing success for the project.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** Develop a set of quantitative, time bound SMART objectives (see proposal instructions) that describe desired outcomes for various protection and restoration treatments. Given the past experience, lessons learned and existing qualitative descriptions of desired future conditions, this should not require too much additional effort. Doing this will provide a solid foundation for tracking success and continuing to improve approaches for protection and restoration. Please also add numbers missing in Table 4.

2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data. As currently designed, the primary goal of the Parr

project is to inform Atlas prioritization; however, there are likely opportunities to use these data for M&E.

Q1: Clearly defined objectives and outcomes

The proposal does a very complete job of providing context for the ongoing restoration program. It is a good example of a coordinated, landscape scale / whole watershed approach for protection and restoration of aquatic habitat. Not only does it provide solid assessment to support floodplain and in-stream restoration, but it also does an excellent job of addressing upslope issues, most notably a range of negative effects, especially accelerated sediment input, tied to the transportation system and continuing residential development of 39,000 acres of private timberland which has “perhaps the highest restoration potential of any land in the Clearwater Subbasin” (Ecovista 2003).

The proposal provides a comprehensive description of coordination with the U.S. Forest Service (managing more than 90% of the lands in the sub basin) and priority setting, for protection and restoration at the sub watershed and reach scales. This is accomplished primarily using the ‘Lochsa Atlas Restoration Prioritization Framework’ (Lochsa Atlas) and the draft Nez Perce-Clearwater National Forest Land Management Plan 2021.

The proposal provides a well-developed, quantitative set of implementation objectives but provides only qualitative descriptions of desired outcomes. Project objectives are contained in Table 4. *Proposed Goals and Objectives for Restoration Actions Between 2023-2027*. The combination of information provided for implementation objectives linked to details included in the timelines section describes expected accomplishments. The biological objectives that are provided describe expected outcomes but do not meet *SMART criteria*. For example, for the goal to “Restore habitat complexity” the associated Biological Objective is, “Improve rearing success (parr to smolt) by improving quality and availability of habitat.” It appears that modifying the proposal’s biological objectives to be specific, quantitative and time bound statements should not be difficult as most of the information is provided. For example, to describe improved rearing habitat quality, a potential outcome objective could be “By 2027, increase the frequency of primary pools in treated reaches by at least ___%” or “By 2027, in treated reaches, increase the stored volume of water at base flows by at least ___%.” This type of objective could be adjusted to match implementation monitoring plans.

Finally, no objectives are included for activities including public involvement and outreach, coordination, partnerships management, project maintenance, and monitoring and evaluation.

Q2: Methods

A detailed description of methods for all aspects of the program is provided. Activities and methods for basic project components (planning and coordination, implementation, and monitoring) for each restoration treatment type are addressed. The proposal clearly describes priority setting used in the Atlas process and also methods for prioritizing and treating (storm proofing and decommissioning) roads. Although some excellent before and after photo sequences were provided in the proposal and reports, there is no discussion of their use as a monitoring tool or if there are formalized photo point methods used. Additionally, it sounds like there is some monitoring being done by Forest Service personnel but there is little detail provided on these activities nor is there any description of specific methods noted. Inclusion of a bit more detail on current M&E activities and methods would be useful.

Q3: Provisions for M&E

Currently the monitoring component of the program is largely limited to implementation monitoring. There is little detail provided on the process used to accomplish this but the amount of information and discussion on accomplishments makes it clear there is substantial tracking of project accomplishments. For effectiveness monitoring, the proposal states that between the project years 1998 and 2013, the Partnership (NPC and NPT-DFRM) maintained a formalized adaptive monitoring program. As noted above, no current monitoring objectives are provided because BPA no longer funds monitoring activities associated with tributary habitat restoration actions. Despite this, it is noted that the project proponents meet annually for a “lessons learned” meeting where project staff share experiences and make recommendations for adjustments to projects or contracts in the upcoming years. Several lessons learned and changes in management activities, resulting from this process, are incorporated throughout the proposal.

Q4: Results – benefits to fish and wildlife

The proposal provides a very detailed discussion of project results, tied to various protection and restoration activities in the Lochsa River watershed. It is clear that this project is well organized and productive and is demonstrating effective approaches for process-based, whole watershed restoration. Results of accomplishments prior to 2013 are summarized and tied to past, qualitative objectives, and Table 3 is an effective summary of past work. The proponents should consider including a direct comparison of the amount of restoration completed compared with what was proposed five years earlier in previous proposals. The lessons learned were both informative and succinct. Perhaps the most major of these is the decision to use the Lochsa River watershed as a demonstration area for early application of the Atlas process. This

process drew heavily on past experience and learning, in developing a sophisticated restoration strategy for the watershed. The proponents have done a good job of responding to previous Council and ISRP comments.

200207200 - Red River & Newsome Creek Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The proposal does a good job of describing the productive and well-organized program for the landscape scale restoration of Red River and Newsome Creeks. It provides solid descriptions of assessment and planning that went into development and implementation of a wide range of protection and restoration actions. The proposal provides sufficient information describing results of many of the treatments. The clear articulation of results and priorities is a product of monitoring and evaluation completed before BPA significantly reduced support for these activities. The proposal underscores the importance of cooperation and partnerships in the delivery of the program. The document is well organized and generally clear in responding to the various sections of the review template.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **Metrics for measuring objectives.** Clearly describe how and at what scale objectives will be measured. There has been clear progress since the last review on establishing implementation and effectiveness objectives. It is anticipated that addressing this condition will be an exercise in fine tuning rather than a major overhaul.

2. **Monitoring methods.** Provide a description of the current monitoring and evaluation program. This should include details regarding a more formal approach to making and documenting field observations and metrics for measuring watershed health and functionality. The ISRP understands that the current approach is generally low cost and broad-scale, but a more complete description is needed.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for assessing effectiveness of projects at meeting

desired outcomes. Due to the relatively high costs of fish population monitoring, riparian and aquatic habitat metrics could be used for “low cost” effectiveness monitoring and evaluation. This project is exemplary in the application of some of these techniques, and we encourage additional consideration of the use of photo-points, quantitative observations, aquatic habitat assessments of physical habitat metrics (primary pool and large wood frequency, stream shading, vegetation counts, remotely-sensed riparian vegetation changes). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data. As currently designed, the primary goal of the Parr project is to inform Atlas prioritization; however, there are likely opportunities to use these data for M&E.

Q1: Clearly defined objectives and outcomes

A number of SMART objectives were provided as a means to achieve Goal I: Increase instream carrying capacity for native anadromous salmonids in Newsome Creek & Red River through habitat improvement. Goal II involved outreach and coordination, and the objectives were reasonably consistent with suggested SMART criteria.

For objectives under Goal I, additional detail on metrics to be measured would be helpful. For example, Objective A states: Increase abundance & variety of fish habitat features by a minimum of 25% as measured against current baseline condition in 15 miles of mainstem channels by 2027 (there is no description of what features will be measured or how averages will be developed for multiple reaches). Objective C states, Restore riparian corridors to provide streambank stability, detritus inputs for instream food web, and mainstem channel shading/overhead cover by 75% of natural composition by 2028 (no description of what metrics will be used to measure natural composition and the scale for which averages will be developed).

In the Progress to Date section, the format and content for describing objectives is different from the Goals and Objectives section. Each objective (written as a goal statement) includes a discussion of accomplishments, success criteria (outcomes/effectiveness objectives), monitoring and lessons learned. Examples of objectives include: Reduce number of artificially blocked streams, Reduce stream temperatures, Reduce instream sedimentation, Protect and restore riparian habitats. The proponents might consider establishing a consistent format for articulating and describing objectives and associated actions to help with future reviews.

Q2: Methods

The proposal provides a comprehensive description of methods used to assess, plan, implement, and monitor project activities. Numerous references are provided. Given reductions in M&E funding, monitoring focus is now intended to be low cost, low intensity monitoring, and may require observations to be made over the course of several years. The proposal notes the use of monitoring techniques such as photo-points, longitudinal profiles, fish snorkeling, general observations of conditions, vegetation counts and growth measurements. However, limited detail on the specific methods for each technique is provided, and more information is needed.

It is noted that there have been some changes in organization that may influence some of the methods and approaches currently being used. This includes establishment of a Tributary Habitat Steering Committee (THSC), development of a Tributary Technical Team (TTT) to support the THSC, and the CRS tributary habitat program. The TTT is to be selected on background and experience, and the Team will deal with prioritization of projects, oversight of implementation, quality assurance and input to the THSC on needed implementation reviews. It is scheduled to convene in 2021. The proponents note, that from a project implementation perspective, working with the THSC and more predominantly the TTT will be an efficient and welcomed way to get other professional input and expertise. Documentation of increased efficiency will be beneficial.

Q3: Provisions for M&E

The proposal notes that Implementation and Compliance monitoring will be performed for all restoration projects implemented by the NPT Watershed Division. Post-treatment implementation monitoring will be conducted on all restoration activities to assess project function over time and provide adaptive management feedback loops to project implementers.

The proposal clearly illustrates the impacts of limited funding for M&E. The proposal notes that current monitoring activities are intended to be low cost, low intensity monitoring, and may require measurements/observations to be made over the course of several years to determine effectiveness of various treatments. This approach is not intended to track watershed conditions over time as in status and trend monitoring, nor establish inferential relationships between management actions and fish productivity and survival or aquatic habitat conditions. Examples of monitoring include, but are not limited to, photo-points, longitudinal profiles, fish snorkeling, general observations of conditions, vegetation counts, and growth measurements.

However, several of the planned actions presented rely on monitoring and adaptive management plans that are not yet developed, making evaluation difficult. The proposal would greatly benefit from a rough plan and timeline for when and how projects will be observed, evaluated (even qualitatively), and then adjusted as necessary, as well as specifics on how data collected will be used in the adjustment process. For example, the proposal mentions temperature loggers, but there is no description how those are part of program feedback.

The proposal does provide a lengthy description of approaches to identify lessons learned and to modify/adjust treatments and management approaches. The proposal does provide several examples for the use of this approach.

Q4: Results – benefits to fish and wildlife

The project appears to have provided substantial benefits to fish and wildlife. The proposal provides a detailed discussion of restoration project accomplishments and linkage to implementation objectives. Effectiveness monitoring information, a product of past programs, is provided for many of these activities. It is apparent that this project uses a whole watershed approach in addressing limiting factors. Quantitative data on treatment outcomes is generally provided for specific projects and treatment types but is more limited for reach and watershed scale results. Results include descriptions and photographs of upslope treatments, especially road decommissioning, which were targeted to address accelerated sediment delivery to streams, and also include descriptions of land acquisition and conservation easements to provide improved protection of key areas in the watersheds. Although a reduction in stream temperature in relation of habitat restoration is typically difficult to document, the proponents describe a declining trend in water temperature for McComas Meadows since 1999. There is a substantial discussion on linkages to other programs and benefits to fish species, in addition to steelhead (primary target species) including spring Chinook salmon, bull trout, westslope cutthroat trout and lamprey.

The results provided in the proposal are more detailed than those provided in the 11-page annual report released in 2020. We encourage the proponents to prepare more comprehensive annual reports and proposals that are more succinct.

201000300 - Lower South Fork Clearwater/ Slate Creek Watershed Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria

Overall comment:

This is a well-written and clear proposal founded in sound science. It provides documentation of a variety of factors that have resulted in loss and degradation of habitat, especially for steelhead and Chinook salmon. The proposal describes a whole watershed approach for protection and restoration of aquatic habitat and includes a clear discussion of the general restoration philosophy being used to guide this work. The proposal, despite being a bit long, provides a large amount of very useful information on all aspects of the project. Narrative descriptions were often supported by maps, tables, and photographs to improve understanding of the proposal and its many different aspects. The work to organize and prepare the proposal is very much appreciated. The project meets scientific review criteria, but the ISRP makes the following suggestions for project improvement. Actions toward addressing these suggestions can be described in future work plans, annual reports, and proposals. In addition, we encourage the project to participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data. As currently designed, the primary goal of the Parr project is to inform Atlas prioritization; however, there are likely opportunities to use these data for M&E.

Q1: Clearly defined objectives and outcomes

The two goals and seven objectives are clearly defined, SMART, and have specific associated actions. There is also a description of how various treatment types and projects are prioritized for inclusion in the program of work. An area that would improve the proposal is an overarching, strategic plan to focus work in the watershed. This would include a prioritization of sub watersheds and major stream/floodplain reaches which would improve the focus of work and hopefully the results. Although a qualitative process for assigning and overall risk ranking each of the sub watersheds is described for prioritizing work (higher risk-higher priority), a more quantitative and data driven approach would be an improvement. It is noted that the proponents have considered utilizing the Atlas process, described for other projects in the Clearwater, as a means for developing such a strategic approach. Given the description of the

overall project area as having a “very high priority for restoration within the Lower Salmon subbasin because of its high potential aquatic productivity, intact aquatic assemblages, and current conditions and processes affected by past management activities” investment in a plan that provides a more strategic foundation seems timely.

A well-organized set of objectives is provided for the 2023-2027 period. They replace a set of objectives (2013) derived from a matrix of pathways and indicators that were used to describe properly functioning watersheds. The proponents note, however, that the project was not funded to monitor these parameters and therefore they could not accurately define baselines or monitor to measure success of projects based on these criteria. The current set of objectives were adapted from the NOAA Recovery Plan (2017a) and have replaced the instream physical and biological criteria mentioned above for 2013. These objectives provide clear quantitative statements of planned work and accomplishments and provide a narrative description of desired outcomes.

Outcome statements are qualitative because of lack of funding for effectiveness monitoring. The proponents do acknowledge that they continue low intensity and low-cost effectiveness monitoring that includes actions such as stream temperature and riparian vegetation monitoring and use of photo point networks. There is an opportunity to develop quantitative outcome objectives that link to the current monitoring efforts. This does not replace the need for more robust monitoring but does allow for some tracking of general project effectiveness.

There are a number of activity areas that are missing from the current set of objectives. They include partnership development and management; project maintenance, particularly for fencing; public outreach and involvement; and data storage and management. It would be useful to provide at least a core set of objectives that cover these activity types in the future. Doing so would provide a more complete coverage of the full suite of program activities.

One additional improvement that could be made in the future would be to include an approximation of the additional amount of work on each objective needed to achieve a qualitative level of “success.”

Q2: Methods

Overarching prioritization and planning methods are well described. Project specific methods are also well described, and timelines are provided.

The proposal provides a great deal of information and detail into the methods that are used to develop and implement a range of activities and treatment types to meet project objectives. It

is noted that a comprehensive watershed or Atlas assessment does not yet exist for the project areas, and that a number of techniques are currently used to prioritize various treatment types. For example, Fish Passage Priorities are based on target fish species blocked and the life stage type (spawning, rearing, or both) and the amount and quality of habitat above the barrier; while instream restoration to improve complexity of aquatic habitat is based on watershed condition, and the desired future conditions are prioritized.

Specific methods and procedures are provided for the full range of project activities and a number of detailed project specific examples are provided. One area where additional information or references would be useful is additional detail on methods being used for current low-cost, low-resolution effectiveness monitoring and evaluation activities. For example: for effectiveness monitoring of Beaver Dam Analogs, “Water temperature loggers will be deployed above and below where BDAs are installed at one or more sites to measure changes in water temperature” and for Riparian planting, it noted that project areas “will be visually monitored such that riparian density is commensurate with the assumed natural condition.”

Q3: Provisions for M&E

The proposal does a very complete job of tracking program and project accomplishments. Although there is no formal process described for this implementation monitoring, a detailed listing of accomplishments including summary tables and project specific information is provided. This includes some very compelling photo point sequences for the full range of restoration treatment types. However, effectiveness monitoring and evaluation, especially at the programmatic scale, have been significantly reduced or eliminated by funding reductions in 2013. The proposal notes that the “project proposes only limited monitoring that is feasible and cost effective while also relying on partnerships to aid in supplementing monitoring data when possible.” As noted in the Methods section, there are a variety of ongoing effectiveness monitoring activities that are continuing and provide general feedback on project effectiveness.

A general adaptive management process, for all Nez Perce Tribe projects is described. It includes an annual “lessons learned” meeting with the USFS Nez Perce-Clearwater National Forest which is held before launching into the next field season. Shortly thereafter, another pre-season meeting is scheduled to begin the process over and plan for the upcoming field season. There is a more limited discussion of a specific process for project adjustment for this project, but it is clear that the proponents are very active and consistent in conducting post project evaluation of general project outcomes, identifying lessons learned, and adjusting project management and approaches for the wide range of protection and restoration treatments being employed. Numerous, detailed examples of lessons learned and follow up

adjustments to planning, implementation, and monitoring are provided. The proponents do an excellent job of illustrating how previous lessons learned are incorporated into this proposal.

Given the amount of work and potential impacts to fish from the rock blasting at Milepost 28 on Highway 14, the ISRP hopes that hydraulic velocities are remeasured post-work to determine if expected results were achieved. The Monitoring section under this activity states that the “developed model” will be used.

Q4: Results – benefits to fish and wildlife

The proposal clearly lays out past work and lessons learned. Table 1, connecting limiting factors to management objectives, is also helpful. A very detailed accounting of project accomplishments is provided. This includes a series of maps showing project locations and narratives detailing specific details of completed projects, including design, implementation, monitoring, and lessons learned. It is clear that this is a project focused on effective planning and implementation of a comprehensive, whole watershed program of protection and restoration. Although the proponents make it clear that reductions in effectiveness monitoring have significantly reduced the ability to quantitatively discuss results of past treatments, some excellent quantitative examples of successful, project outcomes are provided. A good example of this is evaluation and reporting of reductions in maximum summer stream temperature as a result of a variety of meadow restoration treatments on McComas Meadows (Meadow Creek). Other excellent examples are provided for a number of fish passage projects, riparian planting, and installation of Beaver Dam Analogs.

201008600 - Protect and Restore Crooked and American River Watersheds

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe Department of Fisheries Resources Management Watershed Division

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This is a well-organized and very complete proposal. It provides a solid context for this “ridge-top to ridge-top approach to improve aquatic and terrestrial habitat conditions.” The proposal

clearly describes conditions and associated factors reducing watershed function and limiting anadromous fish production. This information is the product of numerous assessments, recovery plans and subbasin documents. It is noted that much of the land in the two watersheds, especially in the Crooked River, is on USFS lands (Nez Perce – Clearwater National Forest). A strong working partnership exists between the proponents and the USFS, and assessment and planning information from the USFS has been important in restoration planning. Other major partners are the BLM and NRCS.

The project provides some excellent examples of outcome objectives that meet SMART criteria (although see condition, below), as well as monitoring methods that are generally low cost but still allow a base level for tracking project outcomes and trends over time. The extra time and effort to provide comprehensive information in a format that is generally easy to read is appreciated. Clearly, this project continues to provide habitat benefits to both target species (steelhead and spring Chinook) as well as other fish and aquatic species and general watershed health.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22, 2021) and to provide information to address the other Condition in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** Please revise Objectives 1 and 2 to meet SMART criteria (see proposal instructions).
2. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basinwide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). The proponents should consider whether coordination with the Clearwater and Wallowa Parr Distribution and Habitat Assessment project (200206800) or other fish assessment efforts could provide baseline or low-intensity M&E data. As currently designed, the primary goal of the Parr project is to inform Atlas prioritization; however, there are likely opportunities to use these data for M&E.

Q1: Clearly defined objectives and outcomes

The proposal did a commendable job providing objectives for past work and for the upcoming 2023-2027 work period. Past objectives were developed using the pathways and indicators process and proved difficult to measure the project level outcomes. The current set of objectives is intended to be easier to measure treatment outcomes. Six of the eight total objectives provide quantitative time bound descriptions of planned accomplishments and desired future conditions.

Objectives 1 and 2 provide measurable implementation objectives but do not provide SMART objectives describing desired outcomes. The proposal does provide a narrative description of desired outcomes, and it appears that quantitative measures could be developed. For example,

the desired outcome for O-1 is *“Increase summer rearing habitat and spawning areas by improving channel function (sediment routing) and increasing stream length and in-channel habitat.”* It would be possible to develop metrics tied to over bank flow frequency tied to stream stage, increase in primary pools per mile, and/or percent increase in stream channel length at base flow.

Additionally, the proponents identify which of these projects are unlikely to be completed in the coming five years without additional funding. The transparency and requested flexibility is appreciated, yet there is lack of clarity of what will happen with the funding and budgeting depending on which projects are implemented.

Q2: Methods

General planning and project specific methods are described adequately. BMPs are provided or referred to for all projects. Several examples are provided and include lessons learned from past observations and monitoring/evaluation. Details are provided for methods that support each major restoration treatment type (fish passage, riparian planting, treatment of dredge spoils, etc.).

Project prioritization in the American and Crooked River watersheds relies on direction from past management plans (USDA 1998), regional plans (NMFS 2011), and localized monitoring data since a comprehensive watershed assessment or Atlas does not exist for these project areas. Prioritization considers project location, (i.e., how much of the watershed is impacted by the activity), potential rehabilitation actions, focal fish species and their life stage affected, existing condition metrics, and limiting factors addressed. It is noted that the proponents desire an overall strategic plan with a more data-based, formalized process for prioritization. It would be a useful addition and would likely address both sub-watershed and reach/project scale priorities. Its ultimate development appears contingent on additional funding.

Q3: Provisions for M&E

The proposal addresses a full range of issues for monitoring and evaluation, particularly those tied to the measurement of effectiveness of individual and combinations of restoration treatments. The negative impacts of much reduced monitoring funding and cancellation of programmatic efforts like CHaMP and ISEMP on the proponent’s ability to address outcomes of past work is described. However, the current use of a variety of low intensity and lower cost approaches for measuring outcomes is noted. Although these techniques do not provide detailed and statistically based assessments of effectiveness, they do provide general feedback on riparian and aquatic habitat responses and trends following restoration work. The

proponents state that adaptive management is applied, in a passive manner, to all implemented projects.

As part of their M&E efforts, the proponents suggest numerous ideas. For example, water temperature loggers will be deployed above and below BDAs, which is an excellent first step. However, there is very limited discussion of specific methods and how they will be implemented. A summary of current effectiveness and trend monitoring techniques and a general documentation of associated methods would be useful. This is particularly true for providing future practitioners with an understanding of techniques being used during the period of reduced funding. A roughed-out plan for ongoing monitoring, and how any collected or available data would be incorporated into a project adjustment process would greatly improve future proposals, although the ISRP recognizes the limited funding for monitoring efforts.

Q4: Results – benefits to fish and wildlife

The proposal describes a range of impressive accomplishments. Accomplishments are summarized and linked to each past objective. Objectives for both habitat protection/restoration treatments and for partnerships/coordination and outreach are provided. The two sets of objectives are complimentary and provide the foundation for a balanced, whole watershed approach to restoration. The proponents have sought to respond to previous ISRP review comments through better success criteria.

Some objectives were not met because of cost and timing constraints or inability to purchase property. The proposal is candid regarding the very low escapements of steelhead and spring Chinook salmon into these river systems but does provide a solid case regarding the full range of protection and restoration benefits, not only to other aquatic species (bull trout, westslope cutthroat trout and lamprey) but to overall watershed health and function.

Maps and diagrams, summarizing project types and locations, and before and after photo sequences are used to better display past results in the proposal. There is ample discussion of past monitoring and descriptions of several lessons learned and associated management adjustments. The proponents rightly acknowledge that many benefits will not accrue for 30 years or more. One example is a discussion of results for Objective 3 Reduce stream temperatures. It is noted, “The Tribe installed temperature loggers along the stream corridor from 1999 to the present. Instantaneous maximum stream temperatures through the planted area declined significantly, but it has taken nearly 30 years for significant temperatures changes to occur.” Changes in species and stock size for planting and follow up re-planting following

survival surveys are some of the responses being used to try and reduce the response time for reducing summer stream temperatures.

200206800 - Clearwater and Wallowa Parr Distribution and Habitat Assessment

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Final review comments:

We appreciate the proponent's efforts to clarify their proposal; however, there are a substantial number of issues that are not addressed adequately in the response. We have identified three conditions for the project to provide a revised proposal for ISRP review, preferably by September 30, 2022, addressing the following issues before this project moves to full implementation. The ISRP offers to discuss our review with the project proponents to clarify the conditions.

The conditions are listed below with more detailed information in comments that follow:

1. **Link goals, objectives, and methods.** Rewrite to provide greater clarity, conciseness, and structure, provide a broader context for the work, and more clearly link project purpose, goals and objectives to the methods.
2. **Revise the Purpose Statement.** Describe the purpose of the Atlas planning framework. Explain the need for this project to accomplish that purpose and how the proposed approach for data collection is necessary to guide better decision making for future projects.
3. **Revise the Methods section.** Clearly and concisely link methods to goals and objectives and include information on QA/QC approaches for data collected.

In our preliminary review, we requested responses on the following topics:

1. **Goals and SMART objectives.** The ISRP remains concerned about the clarity of the overarching goals of the project and whether the proposed actions will provide useful

information for habitat improvements to benefit fish. A foundational issue with the proposal is that it is not well structured and overly long, making it difficult to understand how the direct linkage between the overarching Purpose, the proposed Goals and Objectives, and how the specific Methods directly respond to the above.

In the revised proposal, the proponents should better organize the proposal structure to make the document easier to follow. The proponents should start with the broader context within each section and then provide more detailed information to make it easier for the ISRP to understand the proposal.

The Purpose section should be clarified in the revised proposal. Although the proponents discuss the Atlas framework generally under the Problem Statement, the revised proposal should be rewritten to a) state foremost that the purpose is to guide better prioritization of future efforts in the watershed, b) to achieve this Atlas processes are proposed to be completed, and c) the project will focus on collecting data and metrics to fulfill Atlas needs.

The proponents should then justify how the proposed project will respond to the Problem Statement in a clearer, more concise way. At a minimum, the proponents should justify why the extensive proposed data collection is necessary, given that Atlas process is designed to use existing data. The proposal does indicate that there are existing data gaps and discuss these, but the proponents should explain more clearly how a one-time snapshot of conditions at this level of detail is the “minimum set” or “appropriate set” required for Atlas planning, and how an Atlas built from these data will directly and appropriately inform management and restoration prioritization resulting in improved fish and habitat conditions better than an Atlas created using fewer metrics. The proponents do not need to justify the use of the Atlas framework, but the proponents should explain how this project – and its proposed data collection efforts beyond the use of existing data – provides information needed to create a useful, strategic Atlas. This would include a discussion about tradeoffs between the amount of data that exists, data that need to be collected, and the quality of prioritization resulting from use of the model based on the data collected. Importantly, implementation objectives that support the needed data collection should then be developed. For example, there are currently no implementation objectives for QA/QC activities for gathering of habitat metrics data; data summarization and initial analysis; and periodic results reporting. Without these details, it is difficult to review whether this proposal meets scientific standards or would result in a useful Atlas product.

The proponents’ revision of the objectives to tie them directly to Atlas restoration strategies begins to provide more clarity. The ISRP’s original comment was meant to

suggest identifying the two types of objectives by location (e.g., biological, physical, social objectives followed by the implementation objectives for Lolo Creek, and then the same for Wallowa, South Fork) might have been clearer versus grouping locations within the two types of objectives “bin.” The revised objectives are now easier to understand, but the links between the two types of objectives and how they tie back directly to the Purpose remain murky.

We appreciate the confirmation that these will be one-time surveys, conducted between 2023 and 2027, to inform Atlas prioritization matrices for the Lolo Creek watershed and Wallowa River subbasin, as well as eventual planned development of an Atlas prioritization matrix for the South Fork Clearwater River. As described above, the proponents should state that purpose in the first paragraph of the revised proposal and then explain the need for these one-time data collection efforts in light of the program purpose and goals.

- 2. Detailed methods.** The ISRP also requests a revised methods section, improving clarity and linking the methods to the goals and objectives. The Proponent’s responses to the specific questions posed by the ISRP are helpful in beginning to understand the overall context for this proposal. Further, revised Tables 1, 2, and 5 more clearly link activities to Atlas applications and objectives.

An *example* structure could be as follows. This is not intended to be a complete example, nor the only or best approach, but it provides a general example of how tables or other structures in the document can greatly clarify what is being done and how and allow the ISRP to review for scientific adequacy and likelihood that the work will benefit the overarching stated purpose. The additional description of the methods provides more than sufficient detail, but the ISRP struggles to understand links between the detailed methods and the broader context.

Atlas Process 1:

Objective 1 : Generate spatially referenced and probabilistically balanced site-scale presence, relative abundance, and length distribution metrics in all priority areas of perennial flow and with existing data gaps in x watersheds by x date			
<i>Partial Objective</i>	Spatially referenced and Balanced	Relative Abundance	Length distribution
<i>Approach</i>	GRTS approach	Snorkeling Electrofishing	Snorkeling Electrofishing
<i>Metrics</i>		Total species captured Site density Percent species composition	Average fork-length

Such overview tables could be provided for each Atlas Process and each objective followed by detailed methods. The detailed methods would then only be provided a single time, relevant to each table, demarcated by subheaders, such as:

Data collection Methods

Site identification

- Locations: Criteria or list of locations that are priority areas with data gaps
- Sampling Plan: GRTS and other sampling protocols

Field sampling

- Snorkeling: fill in detailed methods
- Electrofishing: fill in detailed methods

Metrics calculation methods

- Total species captured: fill in detailed calculation methods
- Site density: fill in detailed calculation methods

For example, the methods in the current proposal begin with a detailed description of GRTS without first describing the broader purpose of the approach and how it is linked to the goals and objectives. In general, the proposal somewhat haphazardly combined locations of three different Atlas processes, objectives, and methods. Reviewers initially had difficulty tracking what was being done for what purpose and where.

Methods should also include descriptions of approaches that ensure the data collected are more than individual data points (e.g., see the comment in the section on Goals and SMART Objectives about need for data collection QA/QC and analysis).

The ISRP agrees that the previously submitted timeline is sufficient for the work proposed. The ISRP's question was about the timeline for using the new data to complete the various Atlas prioritization matrices and eventual restoration strategies. The revised proposal now touches on these planned timelines, although some planned Atlas processes still do not have time frames for completion. Without a general plan for implementing the various phases of Atlas efforts at different locations, the ISRP is concerned that there is no guarantee that these extensive lists of metrics to be collected will be useful or will contribute to a higher-quality decision from the Atlas process. The revised proposal should also include an estimated timeline, even if rough, for all Atlas processes, and how those Atlas processes and timelines might interact with other planning efforts in the basin.

The ISRP encourages the proponents to consider two additional items related to methods and objectives prior to implementation of this project. Both would expand the range of potential benefits from the data gathering.

First, the methods section describes that any potential or historical steelhead habitat blocked by manmade barriers will not be included in fish or habitat sampling. Unless the proponents have already done a full analysis of fish passage needs and priorities, this project has an opportunity to gather data that will support a comprehensive and prioritized program of fish passage restoration for each target watershed.

Second, there appears to be excellent potential to use the data being gathered to identify and prioritize areas of high quality/fully functioning habitat (aquatic as well as floodplain/riparian) for special protection measures. Maintenance of high-quality habitat provides immediate benefits and is an essential foundation on which to add restoration actions. This issue/opportunity was discussed in the programmatic section of the Category Review of Resident Fish and Sturgeon, [ISRP 2020-8](#) (pp 16-17): "The ISRP recommends the development of strategic approaches for prioritizing or weighting protection of high-quality habitats versus restoration of degraded habitats." In past reports, the ISRP and ISAB have strongly endorsed the importance of protecting high quality habitat rather than only restoring degraded habitats.

- 3. Potential Improvements for M&E.** The ISRP appreciates the proponents' willingness to explore and consider opportunities to leverage this work for eventual evaluation of watershed trends. The ISRP is also hopeful that activities could include post-

implementation control-impact or reference-impact monitoring within the proposed budget. The proponents also revised the proposal to include a more structured annual review and adjustment process for the project. This will be important to ensure that data collected are useful, fill data gaps, and provide the baseline Atlas data for effective prioritization and restoration decision making.

- 4. M&E matrix – lead.** The Nez Perce Tribe declined to provide a matrix summary of M&E projects for the Clearwater and lower Snake River subbasins. They acknowledged the importance of understanding linkages between monitoring and implementation but felt that the variation in ten summaries across the Columbia River Basin would be of limited value and not the best use of their limited resources at this time.

The ISRP reviewed the M&E components of the different projects in the Clearwater and lower Snake River subbasins based solely on the information provided in their original proposals, associated documents, and any information provided as part of the response loop. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. We encourage project staff to participate in future efforts to develop the M&E matrix as this project will have important data to contribute to habitat effectiveness assessment.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

The project described by the original title has been cancelled, and this project proposal is a replacement. Its primary goal is to provide data for a new Atlas prioritization effort, specifically to guide project selection and prioritization efforts in the Clearwater River basin and Wallowa River subbasin. It provides a detailed and complete listing of sampling and inventory activities but provides little detail regarding how the data will be used in the Atlas and what products will ultimately result. The project does provide excellent opportunities to provide basin-wide M&E baseline, and potentially ongoing, evaluation data.

The proponents are requested to address the following in a revised proposal and include a brief point-by-point response to the ISRP while also referencing where and how the issues were addressed in the revised proposal. In addition, we are requesting that this project lead the effort to develop an M&E matrix as described below:

1. **Goals and SMART objectives.** Please revise the goals and objectives to be clearer while maintaining quantitative and timebound objectives (see proposal instructions for SMART objectives). Clarify if the work is to be a one-time effort or whether it will be multi-year and intended to cover other drainages over time.
2. **Detailed methods.** Provide more specific connection between how the collected data will be used to inform the Atlas, and explain why and how the proposed metrics are the best for meeting project objectives. A number of questions need to be addressed. They include the following: What are the minimum needs for the Atlas, and how does the proposal go beyond that? To what end? How do these metrics directly inform issues related to limiting factors for fish in the basin? Clarify what products are expected. This should include a description of basic activities and timelines associated with development of the products. Also, please identify who will use the data for the Wallowa River and what will be its intended use. Although the group who will be using the data was named for Lolo Creek (Lolo Atlas data-gap monitoring workgroup), none was listed for the Wallowa River.
3. **Potential Improvements for M&E.** It is the understanding of reviewers that the data to be collected under this proposal are primarily intended to inform Atlas prioritization efforts. However, given the low to non-existent funding for M&E throughout the basin and the need for M&E to help adjust project actions and meet habitat restoration goals, the proponents need to consider and articulate how currently planned efforts could be altered to better meet some basic M&E needs in the basin. Approaches might include adding metrics, collecting finer-scale data, and/or spreading lower-intensity collection efforts across a larger region or larger time frame. These efforts can provide not only base-line prioritization data but also data for feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of, fish. Further, consider how currently proposed, or a modified suite of metrics, could be combined with existing datasets and compared against “fish-in, fish-out” number trends. This would provide a simple, but coordinated, evaluative approach. Lastly, articulate the plan for sharing data across the basin once collected.
4. **M&E matrix – lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns

for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring projects conduct for each implementation project.

Given the regional scope of this monitoring project, the ISRP is requesting the Clearwater and Willowa Parr Distribution and Habitat Assessment Project to summarize the linkages between implementation and monitoring projects in the basins. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist this project in producing this summary. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We have asked other projects to assist in creating the summary and to provide information about what is being monitored and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Additional Comments

Throughout the Clearwater Basin, ISRP members identify a need for improved development, coordination, and sharing of monitoring and evaluation (M&E) plans and data to feed back into a project adjustment cycle to inform future project prioritization that takes a broader, basin-wide, focus. Habitat restoration projects throughout the Columbia River Basin planned to use evaluation data generated by the ISEMP, CHaMP, and AEM monitoring initiatives. However, ISEMP and CHaMP initiatives were terminated, and AEM studies were reduced. BPA has further cut funding for M&E, and the ISRP recognizes that these actions have left restoration projects with little to no funding for these activities. Regardless, M&E remains critical for effective restoration, and we encourage project proponents to consider low-cost and coordinated M&E approaches that can provide feedback about implementation success and longer-term evaluation of restoration efficacy toward the goal of improving habitat for, and numbers of,

fish. For example, “fish-in, fish-out” number trends from across the basin can assist in data for stock recruitment and density dependence assessments, and a coordinated approach would, at a minimum, provide some guiding information and increase individual project efficiency.

We urge proponents to consider what data already exist and how they could be used for long-term monitoring and low-cost approaches for collecting new data (e.g., eDNA, photo-points, general observations, vegetation counts, remotely-sensed riparian vegetation changes – see Red River & Newsome Creek Watershed Restoration project, 200207200, for examples). As currently designed, the primary goal of the Parr project is to inform Atlas prioritization; however, there are likely opportunities to use these data for M&E.

Q1: Clearly defined objectives and outcomes

The proponents briefly describe the problem(s) that this proposal is to address, “*broad concerns regarding the extent of anadromous salmonid distribution and habitat data available for future development of Atlas implementation strategies.*” These concerns are for Lolo Creek and about 55 miles of the Wallowa River, and the data gaps will be addressed through fish and habitat data and metrics generated from probabilistically located habitat and backpack electrofishing.” The current proposal will provide this updated data to the multi-agency Lolo Atlas data-gap monitoring workgroup and presumably a similar group for the Wallowa River, although not stated in the proposal.

Objective A is to “*Generate maps and spatially referenced tables depicting site-scale numbers and areal densities of spring/summer Chinook salmon, bull trout and year 0, 1, 2 and 2+ age-length classes of O. mykiss captured or observed through electrofishing and snorkeling surveys of at least 150 sites.*” Objective B seems to be nearly identical to Objective A. Objective C involves characterization of habitat associated with fish surveys. Multiple implementation objectives were also provided. These goals read as overly broad for the work. Please consider restating them as filling data gaps for the Atlas and habitat restoration activity prioritization, if that is, ultimately, the goal (although, please see request to consider additional/revised activities to meet M&E needs in the basin).

Although the objectives tended to be quantitative and include a time frame, it was difficult to clearly see how the objectives would be used to achieve the goals. Further, dividing the objectives into two bins was confusing (vs. lists of specific activities in specific locations to achieve the objectives), and some of the objectives blurred into activities.

The proposal does not elaborate on the details of the concerns driving this project, nor does it discuss any potential alternatives to the current set of activities. Of greatest concern, although

there is a very complete listing of project activities and associated objectives for the data gathering, there is no mention (or reference) of the activities tied to the use or application of the data in development/revision of Atlas strategies. Although the proposal states, *“The Atlas framework has been identified as a prioritization tool that is to be applied to all NPT implementation areas in the interest of developing structured prioritization strategies utilizing data and input from all regional natural resource agencies,”* there is no mention if this is a one-time effort limited to these two watersheds or if it will be an ongoing activity applied to more watersheds in the future. Some description of how the data will be used and what products will be created (if beyond the Atlas) is needed. It appears that this proposal for a monitoring and evaluation plan is limited to being solely a data gathering exercise, but with modifications could potentially meet a broader set of M&E needs.

Q2: Methods

The proposal provides very specific and detailed descriptions for the scientific biological sampling and habitat inventory methods that will be used in the proposed data gathering. However, there is no discussion of why these metrics are the most useful/most efficient metrics to inform the Atlas process, nor how the metrics will be incorporated into creating or updating Atlas products. Proponents should provide broader context of how the data will be used and how uncertainty comes into play when adding data to the Atlas from this proposed work as compared to other previous survey and assessment work. Some vexing questions include how the methods proposed here mesh or do not mesh with other data in the Atlas. Also, how do proposed surveys compare spatially and temporally to other information in the Atlas? How will that impact prioritization efforts? What approaches will be applied to mitigate for differences in resolution and extent?

The ISRP hopes that the proponents will consider additional efforts, such as simple fish presence monitoring, to validate presence of various life history stages of the target fish species after removal of a fish migration barrier. Another potential approach could include using eDNA for this validation. If funds are insufficient to monitor fish responses to specific restoration actions, can basin-wide monitoring of spawners, smolts (perhaps at Lower Granite Dam at a minimum), and adult returns be used to evaluate progress? This type of analysis must be conducted within a density dependence framework, as noted in ISAB 2015-1 while also considering environmental variables in both freshwater and the ocean. The proponents should also consider how useful one-time looks at distribution would be given potential poor river conditions and generally depressed escapement numbers for most species. It is worth considering whether it is better to collect less data across a broader geographic area and on an ongoing basis.

Q3: Provisions for M&E

The proposed work is for baseline monitoring of habitat conditions and species presence for application of the Atlas prioritization framework in two river basins. In and of itself, the work does not lend itself to additional M&E, but there is no discussion of an adjustment process that might increase overall data gathering efficiency and/or value in meeting broader M/E needs. As described by the proponents, the project is purely a data gathering exercise involving biological sampling and habitat inventory. It appears that oversight of progress in completing these activities, within the stated time frames (implementation monitoring), is all that will occur. The proposal would benefit from a thoughtful consideration an annual review and adjustment processes. This could serve to increase efficiency of data gathering and effectiveness of the metrics being assessed in meeting project objectives. The proponents do provide thoughtful explanation of how past work has informed current methods. Further, the proponents should provide information and support toward a basinwide summary of M&E data being collected and available.

Q4: Results – benefits to fish and wildlife

This proposal does not appear to build off of previous funded projects, per se, but the proponents have clearly done substantial work with partners to identify data gaps and needs and will continue to work to identify highest priority reaches for snorkeling and other surveys. There are no results to report since this is a new set of activities that include biological sampling and habitat inventory. Also, there is no discussion of the benefits of this work, once completed, analyzed, and reported.

It would be nice to have the proposal zoom out and provide a broader context for the project that would help to understand the bigger picture for the work. This could help answer several questions that remain: How will this data/information be added to the Atlas? What then are plans to work with partners to use the Atlas to identify priority areas? Why is this work critical at this time of reduced funding? Without additional information (and comments under Methods, above), it is difficult to evaluate the relative importance of currently doing this baseline work. The proponents do make a convincing case that this work will be useful in filling data gaps for prioritization of future restoration efforts. However, it is less clear how the additional effort will support long-term project adjustment and adaptive management in the Clearwater.

201005700 - Snake Basin Anadromous Assessments

Links to: [Original proposal](#) and [Response \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Basinwide

Recommendation: Meets Scientific Review Criteria

Final review comment:

In our initial review, we requested a response on the topics listed below. Our final comments based on the response are provided after each topic:

1. **Consistency of results with other estimates.** The proponents responded by documenting the results of a workgroup that compared IPTDS abundance estimates with other methods for estimating abundance and concluded comparisons were difficult and that the IPTDS method was good for intensive steelhead monitoring. The proponents indicate they will continue to compare IPTDS, redd counts, and weir counting methods as part of their project to ensure estimates remain comparable to historical values. Specifically, they state they will use Joseph Creek and Clearwater tributaries as a basis to make comparisons every 5 years.
2. **Clarification of methods.** The proponents refer to a website link for details of estimating recruits per spawner and to their participation in the Ad-Hoc Supplementation Workgroup (AHSWG) that advanced standardization of regional fisheries data for use in estimating productivity. They document their calculations of recruits per spawner. They further described the approach for steelhead as well. They explain that they do not use a Bayesian method for estimating emigrant run size and will investigate the use of a P-spline model. They also further document what sizes of juveniles they use from screw traps and that they use that size range to be consistent with the FPC. Finally, the proponents state they will use several approaches to estimate survival and abundance of kelts and repeat spawners to examine iteroparity, and then will relate this to biological and environmental conditions.
3. **M&E matrix – support.** The ISRP acknowledges the proponents' willingness to cooperate in general with M&E matrix development efforts. This project has accumulated very useful information on status and trends of populations and performance of hatcheries and could be used to inform evaluations of habitat effectiveness as part of data synthesis efforts. The ISRP addresses the issue more broadly in our programmatic comment on the M&E matrices.

Preliminary ISRP report comments: response requested (Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)

Response request comment:

This recently developed *Snake Basin Anadromous Assessments* project combines the effort from previous projects and reportedly retains all essential elements of the *B-Run Steelhead Supplementation*, *Chinook Salmon Adult Monitoring*, and the *Integrated Status and Effectiveness Monitoring* projects. This unified project seeks to describe and evaluate the status and trends of Snake Basin steelhead and Chinook salmon populations utilizing a consistent and standard approach across the basin. In addition, the project proposes to implement estimation of hatchery fish, both adipose-clipped conventional and adipose-intact supplemental fish, through the run decomposition methodology, enabling a standardized calculation of hatchery fractions and enabling performance evaluations of steelhead hatchery programs, with additional focus on the Clearwater Basin. This is a well written proposal (albeit somewhat confusing because of the merger) to continue this important ongoing monitoring and analyses. The methods are well established. The project uses lessons learned to improve, and it generates information that is fundamental to effective management.

The ISRP requests the proponents to address the following in a point-by-point response to assist our review of the proposal. In addition, we request this project participate in the development of the M&E matrix as described below:

1. **Consistency of results with other estimates.** Please describe of a plan for the analysis that ensures that project-generated estimates of escapement and other metrics are consistent with historical analyses and would yield results consistent with ISEMP goals. (see Methods section of this review for more details)
2. **Clarification of methods.** The proponents need to also provide information on the following issues: (a) spawner-recruit modeling to estimate productivity, (b) Bayesian estimation of emigrant run size, (c) confirmation of limited migration of smaller juveniles, and (d) their definition of iteroparity. These issues are detailed in the Methods section of this review. The ISRP understands addressing some of these may take longer than the two months available in response loop, but the ISRP looks forward to the proponents' feedback in their response.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or

geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. We ask this project to assist them in creating the summary and provide information to them about what is being monitored and shared by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The description of objectives/goals is clear in the proposal. However, the objectives and goals seem to be used interchangeably in the proposal. In addition, this project is a merger of three projects, and this seems to be reflected in the attempt to map the objective/goals of the earlier projects into a single set for the new project. The information could be made easier for readers to see how the objectives of the earlier projects are reflected in the new objectives.

The outcomes are well described and how they will be made available to the usual users of project results is clear. Adding descriptions (maybe a table) of how each management/monitoring question will be addressed would further clarify and make tracking of the project easier. Table 10 is quite useful, and similar tables that directly show how each question will be addressed would add to the clarity of the proposal. For example, which measured variables are used for multiple questions? How are the measured variables analyzed or processed to get to the response variables that are then used? It is relatively straightforward to construct the trail for the Monitoring questions but quite challenging for the Management questions. This information may be elsewhere in a succinct presentation; with the long-history of the project as separate projects, it would be helpful to include this in the proposal as foundation for this project going forward.

Evaluation of trends is a major focus of the proposal. The ISRP encourages the proponents to also use their data to investigate 1) the probable causes of the trends and 2) how their results can be related to Viable Salmon Population criteria. To illustrate the further analysis of trends, analyses could be done that explore the possible causes (e.g., SAR values, conditions in the basin, juvenile production) of the adult steelhead escapement by tributary (Fig. A-1) that began in 2016-2017.

Q2: Methods

The system of tagging and tracking the fish is impressive. A standard approach to evaluate adult Snake River steelhead and Chinook salmon status and trends is well described, including the use of adult sampling at Lower Granite Dam, operations of basin-wide Instream PIT Tag Detection Systems (IPTDS), the State Space Adult Dam Escapement Model (STADEM), and the Lower Granite Dam Adult Branch Occupancy Model (DABOM). Output from this large collaborative effort provides high-level indicators and metrics for 22 populations of Snake River summer steelhead and 28 populations of spring/summer Chinook salmon. Metrics include, but are not limited to abundance, proportion of females, returning age-class structure, productivity, and survival from Lower Granite Dam to spawning areas. Reasonably detailed methodologies and links to additional methodologies were described. The methods appear scientifically sound and have been vetted over time through the earlier projects.

Issues related to methods that should be considered are:

- Methods and plans for ensuring new analyses can include historical data on populations collected from weirs and other methods, and would yield results consistent with ISEMP goals. The ISRP is still uncertain about the relationship between escapement estimates from PIT tag arrays vs historical methods used to develop ISEMP goals. The response of proponents to this question raised in an earlier ISRP review (see 1. at the top of p. 43 of the proposal) was not adequate. The response listed the large number of groups included in decisions of where to put the PIT tag arrays but did not specify whether these arrays would provide estimates that can be directly compared with historical estimates. For example, weirs located further upstream on some tributaries estimate escapement just prior to spawning, while PIT tag arrays may measure escapement months before spawning when some populations move into the lower portions of tributaries to hold. These fish may experience substantial pre-spawn mortality, making it difficult to compare historical vs. newer PIT tag array-based estimates.
- Evaluate productivity and abundance within a stock-recruit model to account for density effects.
- Consider using Bonner and Schwarz's (2011) hierarchical Bayesian model for estimating emigrant run size at locations where capture probability of traps or abundance is low (e.g., Lolo Creek summer steelhead). This model avoids the need for pooling strata that can lead to biases in run size estimates and underestimation of uncertainty.

- Confirm that the assumption that smaller juvenile steelhead passing Lolo Creek RST (<120 mm) are not marked because they are not migrating. It appears these fish are moving downstream given their capture in the RST. The current approach can therefore underestimate total juvenile emigrant production. Do these smaller fish constitute a substantive portion of the catch? Fall migrants are marked and enumerated in RST programs in other parts of the Columbia Basin (e.g., Umatilla River natural summer steelhead 198902401).
- Clarify the definition of iteroparity being used. Measurement of kelt rate at Lower Granite Dam may not be a good measure of iteroparity because those fish have a long distance still to travel to the ocean and then return to their stream. How do results compare to the more traditional way of measuring repeat spawning based on scales?

Q3: Provisions for M&E

The proposal clearly documents learned lessons and describes adjustments either made or to be considered. The ISRP supports the process being successfully implemented to date by the project team.

The proposal described a key deficiency in the effort to estimate productivity of natural origin steelhead spawners. This problem stems from the inability to estimate pHOS (hatchery-origin fish spawning naturally) within steelhead populations via the IPTDS method. In other words, natural origin steelhead returning to the spawning grounds are estimated but numbers of hatchery steelhead spawning in streams are not estimated. This is a critical uncertainty for population status assessments and hatchery evaluations. The project proposes to address this using adipose-clipped conventional and adipose-intact supplemental fish with a run decomposition methodology. Such effort is critically important to ensuring project success.

Q4: Results – benefits to fish and wildlife

The data and reported derived variables and metrics are fundamental to effective management. In 2020, the Nez Perce Tribe and the Idaho Department of Fish and Game completed a 10-year summary report to facilitate the Status Assessment of the steelhead DPS and spring/summer Chinook Salmon ESU in the Snake River basin. The report summarized 1) wild adult escapement at LGD, 2) wild adult escapement at the population-level, 3) population-level estimates of life history characteristics (sex and age), 4) estimates of population genetic diversity and differentiation, 5) effective number of breeders, and 6) genetic origin of detected and non-detected fish. The ISRP commends the project team for this informative report.

Analysis results can further inform benefits to fish by factoring in the effects of density dependence, ensuring results continue the historical record while also being expressed in units consistent with NOAA's analyses, and accounting for hatchery fish. Estimates of steelhead spawners and productivity are critically needed.

200206000 - Nez Perce Harvest Monitoring on Snake and Clearwater Rivers

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater, Upper Snake/Snake Upper

Recommendation: Meets Scientific Review Criteria

Overall comment:

Salmon and steelhead historically played an essential spiritual, cultural, and economic role for the Nez Perce Tribe. Dramatic declines in abundance coupled with numerous population extinctions in the Snake River basin have severely impacted the Tribes ability to conduct traditional ceremonial and subsistence fishing. Large-scale hatchery programs have been implemented for Chinook salmon, coho salmon, and steelhead to enhance natural production and restore tribal and recreational fisheries. These efforts have provided expanded harvest opportunities for the Nez Perce Tribe. As opportunities increased, the need for the Tribe to monitor their fisheries became a priority. The project is supported by the Snake River Recovery Plan as well as numerous other plans and documents.

The project is responsible for monitoring select area Nez Perce Tribal fisheries on the Snake, Salmon, and Clearwater rivers and tributaries as well as the lower Columbia River Zone 6 spring Chinook salmon ceremonial permit fishery.

The three goals are well stated and specify qualitative desired outcomes. Clear biological and implementation objectives are provided that include appropriate SMART objective elements. The proposed project provides a very important role in estimating harvest and assessing success in meeting harvest and mitigation goals, restoring abundant harvest opportunities, expanding tribal fisheries, and monitoring treaty harvest impacts to natural populations.

The project monitors a diverse set of fisheries that target hatchery and natural origin salmon and steelhead, are widely dispersed geographically, and utilize a diversity of gear types. Four

survey methods were developed to accommodate the complexity of the fisheries and the challenges of monitoring. The methods are well described and include valid sample designs, field sampling techniques, and analytical approaches, including estimates of parameter variance for each fishery. There is a limited formal adaptive management process; however, the project has made some important adjustments that have improved effectiveness over time.

The proponents have demonstrated success by providing annual harvest estimates with CVs since 2010 for the major fisheries. Annual estimates have met the variation target (≤ 0.3) for most years in all fisheries. Harvest information has been shared with other projects and entities that use the data for hatchery evaluations, status and trends monitoring of natural populations, and assessment of success in restoring fisheries.

Although the project has documented increases in tribal harvest opportunities, tribal fishing opportunities remain very limited and have declined in the most recent years due to poor returns of salmon and steelhead to the Snake River basin.

Although the proposal meets scientific criteria it would be improved if additional information was collected and analyzed on sampled fish including coded-wire-tag recovery, PIT tag scanning, and tissue sample collection for GSI analysis. This information would improve the relevance and applicability of the estimates by providing group specific estimates of harvest. We suggest that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Wallowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored and shared by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Declines in abundance and productivity of natural populations of Snake River Chinook salmon and steelhead have severely impacted the Nez Perce Tribe's ability to conduct traditional ceremonial and subsistence fishing in the Snake River basin. Extensive hatchery supplementation and mitigation have been implemented to enhance natural production and restore tribal and recreational fisheries for Chinook salmon and steelhead. Hatchery programs have provided increased treaty harvest opportunities throughout the 13 million acres where the Nez Perce Tribe has usual and accustomed fishing locations. The Nez Perce Harvest Monitoring on Snake and Clearwater Rivers Project is responsible for monitoring Nez Perce Tribal fisheries to estimate annual catch for select area fisheries in the Snake, Salmon, and Clearwater rivers, and tributaries, as well as the Lower Columbia River Zone 6 spring Chinook salmon ceremonial fishery. This project does not duplicate nor is it redundant to other monitoring and evaluation programs that exist for the combination of tribal and state salmon and steelhead fisheries in the Snake River basin.

The project has three stated goals that include implementing harvest surveys to estimate total harvest, accounting for harvest of BPA hatchery produced fish and listed natural fish, and contributing harvest data for incorporation into status and trends assessments. The goal statements are clear and describe the qualitative desired outcomes for the project that are needed to address the overarching problem of accurately documenting tribal harvest.

Clearly articulated biological and implementation objectives were provided for each of the three goals. For the most part, the biological objectives were specific and measurable, essential elements for SMART objectives. The project has established statistical confidence targets for harvest estimates ($CV \leq 0.3$ and sample rate $\geq 20\%$). These targets are an important addition to the projects methodology as they guide the sampling design and analytical algorithms. The implementation objectives describe the actions needed to achieve the biological objectives.

The project is addressing some key information uncertainties and gaps related to meeting harvest mitigation goals, restoring abundant harvest opportunities, expanding tribal fisheries to new locations, and treaty harvest impacts on natural population status. The harvest data are essential for assessing total returns of hatchery and natural fish as well as for estimating abundance and productivity for natural populations. The timeline provides specific dates for the monitoring activities.

Q2: Methods

The project monitors five fishing seasons in most years including four on the Snake River and tributaries (spring/summer Chinook salmon fall Chinook salmon, coho salmon, and summer steelhead) and one on the Lower Columbia River (spring Chinook salmon ceremonial permit fishery).

The methods incorporate four different types of survey approaches, each with unique sampling protocols. In some cases, multiple survey types are used to provide total harvest estimates for an individual fishery. Fisheries occur in three different types of systems, mainly hatchery origin fish, hatchery, and natural origin mix, and in natural production priority areas. The Nez Perce Tribe fisheries have some unique characteristics relative to non-tribal commercial and recreational fisheries. The seasons, gear diversity, and broad geographic scope of the fisheries provide unique challenges for monitoring. The four different survey approaches were developed to accommodate the characteristics and challenges associated with each fishery type. Survey methodologies include on the ground creel surveys, on the ground in-season interviews, post-season interviews and, on the ground gillnet harvest surveys.

The project methods are guided by specific sampling plans for each fishery that include sampling design, strategy, and survey methodologies. The specific survey methods applied to each fishery mentioned are clearly articulated in the methods narrative and Table 12. Methods for the measured and derived variables are described for each survey type. Appropriate sampling designs, survey methods, and analytical formulae, including variance estimates, were provided in the narrative.

The project is working with the Columbia River Inter-Tribal Fish Commission to develop and maintain a database to improve data security and access. In addition, the proposal includes expansion of sampling for steelhead, fall Chinook, and coho salmon gillnet fisheries in the Snake and Clearwater rivers using current methods for monitoring the gillnet fishery. In future proposals the proponents should provide references for the calculations.

Q3: Provisions for M&E

This is a monitoring project that provides harvest estimates for integration with other data to support mitigation, status and trends, and fisheries restoration assessments conducted by other projects or entities. The project is evaluated by the Deputy Program Manager and the Project Leader. The proponents are not contemplating any future adjustments to the sampling plans or survey methods, the harvest estimation, or statistical analysis procedures. If information or additional review identifies an adjustment need for the goals, objectives,

actions, and/or monitoring, the lead staff for this project will consult a biometrician before making any changes. The project has adjusted in the past including incorporation of analytical methods that provide variance for harvest estimates and expansion of surveys to monitor new developing fisheries.

Q4: Results – benefits to fish and wildlife

The proposal provides harvest data for a variety of the sampled fisheries, including the estimated numbers of hatchery (clipped) and unclipped (wild) fish. The data appear to be shared with harvest survey efforts in other areas and contribute to the overall estimates of fish harvests in the Columbia River Basin.

The project has demonstrated success in achieving objectives of providing harvest estimates for the high priority fisheries. Results from 2010 to present were illustrated effectively in the Progress section for each fishery and for combined harvest for all Nez Perce Tribal fisheries. The CV target (≤ 0.3) was met in most years for all fisheries.

Harvest has been highly variable in all fisheries, which is not unexpected given the large annual variability in steelhead and salmon returns. Recent years harvest estimates have generally declined in response to low run sizes and limited harvestable surpluses of natural and hatchery fish. Data are provided to other projects for the purpose of inclusion in hatchery evaluations, natural population status and trends monitoring, and assessment of tribal fisheries restoration success. Although there has been progress toward expanding and restoring Nez Perce Tribal fisheries in the Snake River basin, overall tribal harvest opportunities remain severely limited.

198335003 - Nez Perce Tribal Hatchery – Monitoring and Evaluation (M&E)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria

Overall comment:

We compliment the proponents for providing a comprehensive and content filled proposal that addresses almost all of the requested elements. This proposal is well written and demonstrated

strong connectivity and continuity from the problem statement through the goals and objectives.

The Nez Perce Tribe Hatchery Monitoring and Evaluation (NPTHME) project is responsible for conducting evaluations of the Nez Perce Tribal Hatchery (NPTH) and the Fall Chinook Acclimation Project. The project is evaluating hatchery supplementation to assess success in restoring Tribal fisheries and enhancing natural production of fall Chinook salmon in the Clearwater and Snake rivers and for spring Chinook salmon in the Clearwater River. The project also monitors natural populations to collect viable salmonid population parameter data for ESA listed Snake River fall Chinook salmon. The effort has been underway for many years.

The project is supported in the subbasin plans, NOAA's Recovery Plan, the FCRP's Hydrosystem BiOp, and is consistent with the Council's Fish and Wildlife Program in many ways. It is integrated with the Idaho Power Company and Lower Snake River Compensation Plan Snake River fall Chinook hatchery programs, as well as basinwide supplementation studies and ESA population status assessments. The project has undergone numerous reviews by the ISRP, NOAA, and in public and science review forums.

The goals are well stated and clearly articulate the desired qualitative social and biological outcomes. The goals focus appropriately on the most important benefits and risks associated with hatchery supplementation efforts.

An extensive set of biological and implementation objectives were provided for each goal. The objectives were specific, measurable and timebound, representing effective SMART objectives. Specific monitoring questions were provided for each objective. The monitoring questions provided a sound framework to identify indicators and criteria for assessment. We support the projects transition to smolt releases for spring Chinook salmon along with the shift in evaluation emphasis to the smolt strategy.

The project collects, analyzes, interprets, and shares a vast amount of data for numerous metrics and indicators. Methods are well documented in finalized protocols cited in [MonitoringResources.Org](https://www.monitoringresources.org) and in Kinzer et al. (2021). The narrative and referenced material could have been more complete, but the methods are scientifically sound.

The project coordinates extensively with the Lower Snake River Compensation Plan and Idaho Power Company's hatchery mitigation efforts. It is integrated with the complex interagency management and evaluation efforts underway in the Snake River Basin. The project has a clearly defined and established project adjustment process and participates in broader level

adaptive management processes. Numerous adaptive changes to project operations and management approaches have resulted from project results and evaluation.

The project has produced many important results. Long-term datasets for a comprehensive list of metrics and indicators have been generated and evaluated. The proposal provided presentations of many important natural production and hatchery performance indicators. These data have been critical for identifying areas of poor performance that need improvement. Datasets are kept current and shared on public databases. The project has many lessons learned that have been used to improve management and project effectiveness.

The proposal meets scientific criteria, but the ISRP makes the following suggestions for project improvements. Actions toward addressing these suggestions can be described in future work plans, annual reports, and proposals. In addition, we are suggesting that this project participate in the development of the M&E matrix as described below:

1. **Spring Chinook salmon weir operations and data collection impacts.** We are concerned with the following statement as it indicates a high degree of uncertainty for availability of critical data needed for spring Chinook salmon evaluations, *"Population abundances and fish metrics previously obtained by weirs, may or may not be replaced by other methods (spawning ground surveys and PIT tag array abundance methods)."* When and how will decisions be made regarding future weir management and/or alternative methods for data collection to replace the weir collected information? Will alternative methods provide data that will be compatible with previous methods? If no alternative methods are developed and implemented, there is an immediate need to describe the impacts that these missing data will have on the project's ability to assess the spring Chinook salmon supplementation efforts and status and trends of natural populations in the Clearwater River subbasin. A table in the report showing proposed changes in each watershed would facilitate this suggested evaluation.
2. **Declines for both fall and spring Chinook salmon.** The recent declines in productivity and abundance for Clearwater River spring Chinook salmon and Snake River fall Chinook salmon are somewhat alarming. If abundance remains depressed or continues to decline, what additional actions might the project take to help facilitate improvement in natural production and reverse the declines?
3. **Density dependence.** Fish density was rarely incorporated into the analyses even though density dependence has been reported as strong for some Snake River basin spring-summer Chinook salmon populations. We encourage the proponents to incorporate stock recruitment and fish density in analyses when possible.

4. **Habitat restoration response.** Examine possibilities for the project to provide data to assist in the assessment of salmon population responses to habitat restoration actions.
5. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Clearwater and Willowa Parr Distribution and Habitat Assessment Project (200206800) to summarize the linkages between implementation and monitoring projects in the Lower Snake and Clearwater geographic area. We expect that Clearwater Focus Program (199608600) and the NPT DFRM Focus Watershed Restoration Program (199706000) will assist the lead project in developing the summary. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored and shared by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The Nez Perce Tribal Hatchery Monitoring and Evaluation Project (NPTME) is responsible for conducting evaluations of the benefits and risks associated with NPTH and the Fall Chinook Acclimation Project. The overarching goal of these hatchery programs is to monitor and evaluate results of the Nez Perce Tribal Hatchery so that operations can be adaptively managed to optimize hatchery and natural production, sustain harvest, and minimize ecological impacts. Fall Chinook salmon are ESA listed; however, spring Chinook salmon in the Clearwater are not listed as they were extirpated and reintroduced with non-local origin hatchery stocks.

There are well stated goals that clearly articulate the desired qualitative social and biological outcomes. The goals focus on the most important benefits and risks associated with hatchery supplementation programs including enhance natural production, mimic life history of natural fish, keep impacts to non-target populations at acceptable levels, maintain life history and genetic characteristics, optimize hatchery performance while considering other goals and coordinate and share results.

The table presentation of the goals, objectives, and monitoring questions was very effective and informative. Biological and implementation objectives were provided for each goal. The objectives were specific, measurable and timebound – essential elements for effective SMART objectives. In addition to the extensive number of biological and implementation objectives provided, there were specific monitoring questions linked to each objective, which was

appreciated. The monitoring questions provide a solid framework for the specific metrics and indicators, as well as criteria and scale for each objective assessment. We compliment the proponents for a clear and informative set of goals and objectives.

Q2: Methods

The proponents provide a comprehensive and detailed methods description with extensive supporting documentation. There are clear established workflow and protocols for all data collection activities that ensure standardization and quality control. The protocols along with the established infrastructure effectively support all aspects of data management from data collection to results display and sharing. The project collects, analyzes, interprets, and shares a vast amount of data that is quite diverse. Standards have been adopted to ensure consistency in metric and indicator definitions and analytical approaches (Ad Hoc Supplementation Workgroup) allowing for comparisons with similar studies across the Columbia Basin. Methods are provided in Kinzer et.al. (2021) and are linked to detailed finalized protocols in MonitoringResources.org.

The methods are clearly linked with the objectives. We appreciate the effort to finalize MonitoringResources.org methods and protocols and the clear alignment illustrated between biological and implementation objectives, monitoring questions, and metrics and indicators.

The project uses the Coordinated Assessment's data exchange standards for natural population and hatchery performance parameters, calculations, and methods. Data are shared in many ways including StreamNet's Coordinated Assessment Database, hatchery supplementation five-year reviews, reports, and participation in numerous management forums.

The comprehensive marking plan presented, with description of changes and rationale, was informative and appears to meet the marking needs for evaluation purposes. The process for updating and documenting method changes provides an up-to-date understanding of the most current approaches.

Q3: Provisions for M&E

The proponents provide an extensive description of monitoring and evaluation results for both NPTH and FCAP. There is clear connectivity provided between the objectives and the indicators analyzed to assess outcomes. The project is highly coordinated with Lyons Ferry Hatchery and the Idaho Power Company mitigation efforts as well as numerous other basin wide monitoring projects.

The project has a clearly defined and established project adjustment process and participates in broader level adaptive management processes. The proponents provided quality examples of using evaluation results and new knowledge to adapt project approaches and to modify management approaches for both spring and fall Chinook salmon. Some highlight examples for spring Chinook salmon include replacing pre-smolt releases with smolt releases to improve survival and adult returns, shifting release times later to improve smolt migration success, and changing weir management to address operational issues. Examples for fall Chinook salmon include plans for developing local broodstocks with implementation criteria for the South Fork Clearwater and Selway Rivers, changing marking strategies and implementation parental based tagging into the marking plans, and improving redd count accuracy by utilizing unmanned aerial vehicles for surveys.

The project provides valuable information for a number of important decision processes. It supports NPT's formal informed decision processes for management of natural populations and artificial propagation programs. The proponents share information and participate in important basinwide management and evaluation processes. Project results and support are provided for in-season run forecasting, post-season run reconstruction, multiple hatchery operational plans and procedures, U.S. v. Oregon Technical Advisory Committee analyses, and USACOE spill/transport studies. The project is thoroughly reviewed in a public forum on a five-year cycle to characterize project accomplishments and to develop adaptive management changes. The review results are published and provide a sound process to develop project improvements and informed management decisions.

Q4: Results – benefits to fish and wildlife

The proposal provides a synthesis of past results for a comprehensive list of metrics and indicators related to benefits and risks of hatchery operations as well as status and trends of natural populations. The metrics and indicators provide an extensive time-series of performance tracking. The proposal included presentation of many important hatchery and natural production performance indicators. Out of basin stray rates appear to be low (3%), but what is the level of pHOS in the watershed? Many hatchery salmon spawn in streams, but apparently many also suffer from pre-spawning mortality, leading to an over-estimate of spawning escapement and possibly a biased recruit-per-spawner value if not accounted for. Can the program estimate pre-spawning mortality of hatchery Chinook salmon in spawning streams? We encourage the proponents to install a new weir on Lolo Creek to accurately count escapement and provide valuable fish metrics.

Datasets are kept current and maintained on appropriate private and public databases. The project has many lessons learned that have been used to effectively to improve the project and inform local scale and basin wide decisions.

198335000 - Nez Perce Tribal Hatchery Operations and Maintenance (O&M)

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Clearwater

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

The Nez Perce Tribal Hatchery (NPTH) began operation in 2003 to partially mitigate for Chinook salmon losses that resulted from construction and operation of the Columbia River Federal Hydropower System. Chinook salmon runs in the Clearwater River subbasin, which were once abundant and supported extensive and important Tribal ceremonial and subsistence fisheries, were extirpated due to dams that blocked migration in the Clearwater River. Fall and spring Chinook salmon runs remain severely depressed.

The project addresses key biological and cultural problems that have resulted from Chinook salmon extirpations and severely depressed runs. The hatchery program seeks to enhance fall and spring Chinook salmon runs to restore natural production and Tribal ceremonial and subsistence fishing. Salmon hold important historic, economic, social, and religious significance for the Nez Perce Tribe, and this project is key for restoring this role.

This project is a component of a much larger artificial propagation effort for fall and spring Chinook salmon in the Clearwater River subbasin. It is integrated and coordinates extensively with the Lower Snake River Compensation Plan Program, Idaho Power Mitigation Program, USFWS Clearwater River Hatchery programs and the Fall Chinook Acclimation Project. The effort is supported by the Council's Fish and Wildlife Program, Subbasin Plan, and the Snake River Salmon Recovery Plan. Production goals are specified under the U.S. v. Oregon Management agreement. Integrated long-term plans and procedures guide the overall hatchery efforts and the Nez Perce Tribal Hatchery (NPTH) operations. Extensive coordination is required for broodstock collection, incubation, rearing, transport, and juvenile acclimation and release.

The goals and objectives provided in section 3 do not adequately cover the full scope of the project and underrepresent the contributions and value. This section needs to be revised to address deficiencies (see recommendations below for details).

Methods are well described in the narrative, the supporting annual operational and procedural plans, and the HGMP. The production procedures and protocols used are standard and include some Natures rearing elements for spring Chinook salmon. The coordination and collaboration approaches appear to guide the project well.

Monitoring and evaluation of project results are conducted by the sister project NPTH Monitoring and Evaluation. The project has a well-established adaptive management process that incorporates evaluation information to make adaptive changes and numerous effective project modifications have been implemented.

The project has made significant progress and has many accomplishments. After some initial challenges, goals have generally been met for broodstock collection, juvenile releases, and within-hatchery survival performance. The proposal lacks information related to post-release performance and adult return success related to the mitigation goals. Although the project has many strengths and most proposal sections meet scientific criteria, the goals and objectives need to be enhanced and improved.

In the next annual report and future work plans, the proponents need to provide information to address the following Conditions. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **Goals.** Only one goal related to natural production is provided for fall and spring Chinook salmon in Section 3. In the problem and progress sections, additional goals are described including social, economic, and cultural needs to restore runs, restore traditional Tribal fisheries, and achieve adult mitigation goals. In addition, the project should state goals for education and outreach as well as information sharing and adaptive management, if appropriate. The general fishery management principles governing NPTH that are provided on page 4 contain much of the information needed to develop appropriate additional goals and objectives that provide a full picture of the ultimate desired outcomes for the project.
2. **Objectives.** The objectives only address broodstock management and within-hatchery production performance and are not well aligned with the one goal. Many other stated objectives for the project need to be included. The past project objectives in the progress section that are still relevant to the future operations should be added, as most

are not included in the current set of objectives. Specific objectives for fishery restoration, smolt-to-adult survival, achievement of adult mitigation return goals, disease management and control, potential impacts to non-target populations, information sharing, adaptive management, coordination, and education and outreach may all be appropriate for the project. The proponents should develop biological and implementation objectives using SMART format guidance and link objectives directly to the goals they support so that there is clear continuity and connectivity of the goals with the objectives.

3. **Timeline.** The timeline will likely need to be updated to cover added objectives.

Q1: Clearly defined objectives and outcomes

Spring, summer and fall Chinook salmon runs were historically abundant in the Clearwater River subbasin and supported extensive Tribal ceremonial and subsistence fishing. Construction and operation of dams within the Clearwater River subbasin resulted in extirpation of all three races of Chinook salmon. Salmon hold important historic, economic, social, and religious significance for the Nez Perce Tribe. The Nez Perce Tribal Hatchery was constructed to mitigate the losses of Chinook salmon in the Clearwater River subbasin that have resulted from construction and operation of the Federal Columbia River Hydropower System.

The primary goals are to produce hatchery Chinook salmon that return to the Clearwater River subbasin to restore and enhance Tribal Fisheries and support future natural production. The project was designed for two-phase implementation with near-term annual production goals of 1.4M fall Chinook salmon and 625K spring Chinook salmon and long-term goals of 2.8M fall Chinook and 768K spring Chinook salmon. The program has operated under the near-term goals up to this time.

The goals and objectives do not adequately cover the full scope of the project. The project goals and objectives described in the Problem Statement and Progress to Date sections are much more complete. The table presenting goals and objectives in section 3 only addresses biological and implementation objectives for within hatchery propagation performance from broodstock trapping through juvenile release. In addition, only one goal is specified, the reintroduction of natural populations. The few objectives that are provided are clear. Additional goals and objectives need to be added to fully represent the project's complete scope of work.

Q2: Methods

The proposal narrative in combination with the Hatchery Genetic Management Plan (HGMP) and 2021 Annual Operating Plan and Procedures for Fish Production Programs provide comprehensive methods descriptions for the project. Detailed physical descriptions along with the operational procedures for each facility and life stage are well described in the narrative. The project uses standard fish culture protocols and practices. The project is an essential component of a much larger overall artificial production program for fall Chinook and spring Chinook salmon in the Clearwater River.

Extensive coordination and cooperation are required for broodstock collection, incubation, rearing, transport, and acclimation and release. The project plays a key role in coordinating project operations and contributing to development of long-term as well as annual production and operational plans. The coordination and collaboration methods are well described and appear to guide the project well.

Q3: Provisions for M&E

Monitoring and evaluation of project performance and results are conducted by the sister project, Nez Perce Tribal Hatchery Monitoring and Evaluation, which is also being reviewed by the ISRP.

The project evaluation and adjustment process are thoroughly described. In the progress section, the proponents provide a comprehensive summary of specific lessons learned for each past objective and described important adaptive management actions that have been implemented. Some key adaptive changes include reduction of release goals from 500K to 200K at North Lapwai Valley Facility, flexible broodstock collection strategies that incorporate the ability to meet goals from different trapping locations annually, shifting production away from parr and pre-smolts to smolts to improve survival rate and adult returns and modifying release numbers at specific release locations to maximize adult returns.

Q4: Results – benefits to fish and wildlife

NPTH was constructed in 2002 and began operations in 2003. Numerous satellite facilities were also constructed to support the project operations. The project has strong justification and is supported by the Council's Fish and Wildlife Program, Snake River Fall and Spring Chinook Salmon Recovery Plan, and serves an essential role in the broader Chinook salmon artificial propagation program in the Clearwater River subbasin. The project is well integrated with the

Lower Snake River Comprehensive Plan, Idaho Power mitigation, and the USFWS Clearwater River hatchery programs.

Good progress has been made with many accomplishments. The proposal provides a comprehensive list with graphic representations of the achievements to date. After initial start-up challenges, the project has met fall Chinook salmon goals for broodstock numbers and natural origin proportions (pNOB), egg-to-release survival, and annual release targets for most of the recent years. Similarly, for spring Chinook salmon, broodstock objectives, egg-to-release survival, and annual production targets have been met for most recent years.

The proponents have implemented many effective adaptive changes based on evaluation of project outcomes and desired improvements. A number of evaluation results that are not provided, including assessment of success in restoring Tribal fisheries, post-release smolt-to-smolt and smolt-to-adult survival, and adult return numbers relative to the hatchery mitigation goal. These results would have been informative as they address very important outcomes of the project.

Salmon River

199401500 - Idaho Fish Screening Improvement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Department of Fish and Game

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

This exemplary proposal and project should serve as a model for other screening projects funded through BPA. The proposal compellingly demonstrates the widespread and critical threats to salmonids in the basin and how the project is addressing some of them, notably screening projects. It is a highly productive project. The proponents effectively use the literature and biological data to demonstrate the critical need of this project and to demonstrate its effectiveness using metrics that are meaningful and relatable. By coupling those data with managing a large and expanding portfolio of screens and passage projects, this project has clear and demonstrated benefits to fish. The proposal is well written, and the team is experienced and qualified. We are suggesting that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

This proposal provides an excellent history of both the project and the development in the region that necessitated it. The water diversions have been and continue to be a major source of mortality and a restriction on the movements of salmonids. In the proposal, the proponents

list five clear, quantitative objectives: 1) improve fish passage to tributary habitat at 15 projects in 5 years, 2) support 22 screen replacements and 15 passage projects, 3) conduct stream investigations and habitat evaluations, 4) evaluate 125 screens and structures for compliance in 5 years, and 5) evaluate entrainment rates and movement timing of salmonids. Both the objectives and outcomes, and their assessment, are well explained and justified.

Q2: Methods

Methods are described in detail and give a clear sense of the vast scope of the work. The list of methods is long but roughly organized around two key themes: 1) tasks involved with prioritizing and designing of new screens and passage structures and 2) the O&M of existing screens and passage projects. Across all of the activities, the methods appear to be appropriate, directly link to the project objectives, are based on cited literature, and apply modern instruments and techniques. Methods on how a project is identified, designed, and implemented are excellent and nicely described. The summary is among the best of all proposals reviewed by the ISRP.

Q3: Provisions for M&E

The proposal includes a robust but efficient strategy for using fish data to evaluate the effectiveness of individual screening efforts. Another strength of the project is the active participation and leadership of the proponents in the regional Fish Screen Oversight Committee, which enables exchange of technical information (i.e., “design criteria and guidelines, biological study results, testing and assessment of experimental technology, and improvements in manufacturing and construction techniques.”). The proposal also articulates how their analysis (e.g., Copeland et al. 2021) is used to direct the work into priority basins, indicating that their data and analyses are used in project evaluation and adjustment.

It would be helpful to see details on how monitored projects are selected. For example, the proponent are monitoring a part of the Pahsimeroi Watershed, but it is unclear why they selected this particular area to monitor (or why the limited number of monitored projects are selected).

The proposal does not provide an articulated plan for how they evaluate the success of the project as a whole and adjust if data indicate they are not meeting objectives, or as confounding factors exert important influences on the success of the project. The reliance on data and analysis for evaluating the individual projects, and the impressive progress to date, are strengths and suggest that such an evaluation process exists. The ISRP encourages the

proponents to articulate how they are using the information they have to make decisions about the priorities and direction of the project broadly.

Q4: Results – benefits to fish and wildlife

The benefits of the project to fish are well documented by the focused datasets proponents are collecting, as well as modeling conducted in partnership with NOAA’s Fisheries Science Center. The results are reported in two peer-reviewed publications, providing both data and a model for other screening projects in evaluating their programs. The results are impressive, including an estimated 50-90% reduction in mortality associated with screening. In addition, in the Pahsimeroi study (Copeland et al. 2021), the proponents documented a fish response that broadened the distribution of spawning adult and rearing juvenile salmon and reduced the effects of density dependent survival, a great example of restoration response (though likely more than just screening was providing beneficial effects).

The proponents also recognize the interactions between their activities and confounding factors, notably processes beyond the geographical and life history scope of the small streams (survival during mainstem passage, feeding at sea, and through fisheries). In addition, they indicate that the kinds of habitats that are needed to resist climate change effects (e.g., small, cool streams) are the very ones that their activities will keep accessible and safe for salmonids, including bull trout, steelhead trout, sockeye salmon, and Chinook salmon.

200739900 - Upper Salmon Screening Tributary Passage

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Department of Fish and Game

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

This proposal effectively describes a project that is well run, connected with the landowner community, works well with partners, and is driven by a thorough process for designing and implementing projects. The program has undergone many transitions over time as administrative decisions have refocused resources and activities. It currently operates and maintains 281 fish screens, in addition to conducting design, outreach, and implementation of screening and passage projects.

It is clear why proponents are shifting towards screening in tributaries, but some of these tributaries support few fish and are subject to dewatering. The proposal and presentation could have been clearer on how decisions were made regarding which tributary (or mainstem replacements) diversions are prioritized. We are suggesting that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proponents make a clear and compelling case that the continuing support for adequate screening of water diversions is needed. The history and justification of the project is explained, including progress to date. The proposal identified one biological goal of increasing fry to smolt survival, which is unsupported by any monitoring data but is executed through three implementation objectives that are SMART and represent a realistic scope for the next five years (daily maintenance and inspection, replacing 22 older screens, 15 passage projects).

Q2: Methods

The proposal clearly describes the processes for implementation tasks, including design, permitting and oversight of new projects and for maintaining the screens. The proponents have provided a very clear explanation of the process by which the engineer approaches task planning, the design and bidding processes, and IDFG oversight of projects. There is also good justification for the ongoing monitoring and assessment of projects to extend their useful lives and maintain good relations with landowners. These processes appear to vary greatly among sites, with seasonal flow patterns, landowners, and other factors and so having consistent methods is highly valuable. There is also a good explanation for the seasonal patterns of activity, in the field and the fabrication shop.

However, there is no summary of the prioritization process for projects, which seems to occur under other BPA funded projects (199401500, Salmon Subbasin Plan from 2004). Page 23 identifies a prioritized approach for replacing older structures, but it is not clear what that approach is. The proposal appears to prioritize work in tributaries where the majority of

unscreened diversions remain. The proponents contributed to an analysis (Walters et al. 2012) a decade ago that indicates entrainment is as high as 88% in the Lemhi during low flow but also indicates that the channel can become dewatered during low flow. Thus, future annual reports, work plans, and proposals should provide more information on how the proponents selected the projects identified for the next phase because the prioritization approach was not summarized in the proposal or in the supporting documents.

Q3: Provisions for M&E

The program is strengthened by the annual installation and operation of four PIT-tag reading stations to monitor fish passage through bypass pipes on four fish screens (L-03, L-06, L-30, and S-32) for the irrigation season from April to October every year. These are installed on three Lemhi River fish screen bypass pipes and on one Salmon River fish screen bypass pipe at the beginning of the irrigation season each year. We recommend that the project proponents describe who funds this work and how the four sites were selected and clearly explain how the results inform the project.

Q4: Results – benefits to fish and wildlife

The proponents provide evidence that the survival of juvenile salmonids is improved by properly functioning screens and have directly contributed to peer-reviewed efforts to evaluate the reduction in mortality associated with their screening efforts. It is essential that such analyses be conducted, since the overall, large-scale effectiveness of screening diversions remains an “untested assumption,” as described by Moyle and Israel (2005).

Reference

Moyle, P. and J. Israel. 2005. Untested assumptions: Effectiveness of screening diversions for conservation of fish populations. *Fisheries* 30: 20-28.

200739400 - Upper Salmon Basin Habitat Restoration

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Governor's Office of Species Conservation

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Final review comment:

Although the proponents suggested their proposal should have been treated in the category of Not Applicable, we found that the science elements in the proposal (e.g., use of Integrated Rehabilitation Assessment [IRA] and the inclusion of groundwater and grazing studies) would benefit from scientific review. In our preliminary review, we requested responses on a number of topics (see below). We provide our final comments on the proponents' response under each topic. Overall, we commend the Idaho Governor's Office of Species Conservation for making appropriate changes to the proposal, improving the proposal by simplifying and condensing it, and providing a summary of their responses in a cover letter. As a result, the ISRP concludes that this is a strong proposal that meets scientific review criteria.

1. **M&E matrix – lead.** The ISRP appreciates that project proponents felt that an M&E summary and matrix would be a valuable exercise to complete and welcomes the proponents' commitment to help develop an M&E summary and matrix at a later date. The ISRP has provided additional information on the summary of monitoring and evaluation for geographic areas in the Programmatic Comments of this report. The ISRP reviewed the M&E components of the different projects in the Upper Salmon River subbasin based solely on the information provided in their original proposals, associated documents, and any information provided as part of the response loop.
2. **Groundwater and grazing studies.** The ISRP appreciates the proponent's response to this issue in their revised proposal. It clarifies who was doing this work, what the purpose was, where data were housed, and how the information is being used.
3. **Restoration scale and context.** The ISRP appreciates the proponents' response to this issue (Appendix E in the revised proposal was especially helpful). We concur with the proponents that land values can change depending on ownership and that opportunities for restoration can shift with ownership. Further, we understand that a major part of restoration is opportunistic based on ownership and that social issues are a major factor in guiding restoration actions. We appreciate the habitat assessment strategies that are being used in the Upper Salmon, such as the IRA and the drone-based habitat

assessment, to help guide restoration.

4. **Temperature monitoring.** Based on the response, the ISRP understands that many entities monitor temperature and that the proponents have focused on temperature monitoring that comes from efforts under the umbrella of this project.
5. **Fish density monitoring.** The ISRP appreciates the clarification of the density monitoring and that it is not funded through this project. Appropriately, the proponents have placed the information on fish density monitoring within the “Relationship to Other Projects” section as recommended by the ISRP.
6. **Project adjustments.** We thank the proponents for rewriting the section on project adjustments. It is an improvement from the original proposal, and the process that is described seems to be working. We commend the recognition of the need to integrate climate effects on flow and temperature with restoration. The response is not as specific as we would have hoped but still helps to clarify how project adjustments are being made. The section would have benefited from some specific examples of how adjustments occur. We encourage proponents to add more specific information on how project adjustments are made in future annual reports and proposals.
7. **Justification for use of Habitat Quality Index (HQI).** We appreciate the proponents’ clarification that the HQI is not being used in this project and for removing information dealing with this Index to avoid future confusion.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP’s questions; see response link and final review above.)*

Response request comment:

The project appears to be primarily a coordination, facilitation, and collaboration project that works extensively with about six other Upper Salmon projects but especially with 201007200. The sociopolitical aspects of this project, which aims to develop and foster habitat restoration writ large on private lands, are critical, as most Chinook spawning occurs on private lands. The complex array of planning, permits, and coordination needed to implement habitat restoration on private ranch lands are critical and its value should not be underestimated.

The project focuses on coordinating 21 partner organizations and their interactions with landowners to ensure a consistent message and fair and equal treatment. This project has had significant successes as it has contributed to an impressive 429 habitat rehabilitation actions,

257 fish screening actions, 22 tributaries reconnected, and 25 flow agreements throughout the Upper Salmon River Basin since inception of the project. This impressive body of work has likely produced clear benefits for salmon.

The ISRP requests the proponents to address the following in a revised proposal and to provide a brief point-by-point response to the ISRP referencing where and summarizing how the issues were addressed in the revised proposal. In addition, we are requesting this project lead the development of the M&E matrix as described below:

1. **M&E matrix - lead.** One of the challenges for ISRP reviewers is understanding the specific monitoring that is being conducted for multiple implementation projects. Habitat restoration projects or hatchery projects implement actions that are intended to address limiting factors and benefit fish and wildlife. Most of these projects do not directly monitor habitat conditions or biological outcomes, but most identify other projects in the basin that monitor aspects of physical habitat or focal fish species. The monitoring project(s) in the basin provides essential monitoring data for habitat, juvenile salmonid abundance and distribution, outmigration, survival, and adult returns for salmon and steelhead. Some monitoring projects focus on status and trends in basins, while others focus on habitat relationships and responses to local actions. It is unclear what monitoring the monitoring project(s) conducts for each implementation project.

Given the regional leadership responsibilities of this project, the ISRP is requesting the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the USB. The summary should provide a table or matrix to identify what is being monitored for each implementation project and where and when the monitoring occurs. The summary also should explain how the projects are working together to evaluate progress toward addressing limiting factors and identify future actions. A map or maps could help identify the locations of monitoring actions. The monitoring information should clearly explain whether the biological monitoring is local information for the specific implementation site or basin scale monitoring of status and trends or fish in/fish out. We are asking implementation and other monitoring projects to assist your project in producing this summary.

2. **Groundwater and grazing studies.** The proposal mentions that there were long-term groundwater monitoring and grazing studies. The ISRP was unclear who was doing these projects, what questions were being addressed, where data was deposited, and who/what the results were going to inform.

3. **Restoration scale and context.** The ISRP strongly supports the restoration of habitat in the upper Salmon River. The proponents seek to support the rehabilitation of 1.25 stream miles a year for the next 15 years. To fully rehabilitate the USRB, the ISRP would like to understand how many stream miles would need to be restored, how much can be restored, how much has been accomplished to date, how much degradation of habitat is continuing, and what is the projected fish response to this work. In short, the ISRP would like to understand how much remains to be accomplished.
4. **Temperature monitoring.** The proposal describes temperature data generated by the project, but the Methods section does not indicate that temperatures are measured, nor by whom, contributing to confusion about objectives. Please provide details on this temperature monitoring, including who is doing the work, any reports, and data disposition.
5. **Fish density monitoring.** In the Methods section, the proponents describe methods of collecting monitoring data and improving models of fish density, but the ISRP was unclear as to whether this monitoring is funded by this project, or if it is only coordinated. The description of this aspect of the project is also not clearly linked to the main objective of coordinating habitat restoration. Although the technical improvements planned in the model are impressive, it is unclear whether this project will actually accomplish them. If not, then the description belongs in Relationships to Other Projects.
6. **Project adjustments.** The proponents claim that results and lessons learned from past projects implemented by the two BPA projects in the Lemhi and Pahsimeroi basins have been used to adjust ongoing work. The ISRP requests details on these adjustments and some specific examples.
7. **Justification for use of Habitat Quality Index.** The ISRP is concerned about using Binns' (1982) Habitat Quality Index to rate limiting factors and asks proponents to defend its use. This model was developed for small streams that support resident trout (brook, brown, rainbow, cutthroat) in Wyoming. Though useful at the time, it is now outdated and may not be as useful as more current and focused methods for identifying limiting factors for juveniles of anadromous Chinook and steelhead in Idaho. In contrast, the results described for a current study of barrier removal by Copeland et al. (2021) are highly relevant to the restoration work described in this proposal.

The ISRP encourages the proponents to take this opportunity to improve the organization and details of planned activities in the revised proposal. Overall, the proposal could be simplified and condensed, which will allow the ISRP to understand the planning and coordination more

clearly. Please clarify what specific activities were being planned and completed by this project and which are being conducted by other projects. More detail and greater clarity on goals and objectives, extent of restoration and future needs, certain methods, and project evaluation and adjustment would strengthen the proposal and make the ISRP's review more accurate.

Q1: Clearly defined objectives and outcomes

The two main objectives of the project are clear: 1) collaboratively identify, select, and develop projects for implementation to increase survival and abundance of anadromous salmonids in the Upper Salmon River basin, 2) coordinate and respond to watershed efforts among local entities to facilitate adaptive management. The proponents state that "The primary goal of project 2007-394-00 is to develop on-the-ground habitat projects aimed at increasing smolt-to-adult return numbers that work toward meeting or exceeding (+25%) the MAT, part of NOAA's criteria for delisting Snake River spring/summer Chinook salmon and summer steelhead (NOAA 2017)." Thus, the ultimate goal is delisting the ESUs, though achievement of that goal may depend on processes out of the control of people working in the basin itself.

The original emphasis of this project was to reconnect tributaries and increase instream flow. The team is now addressing instream habitat quality with an emphasis on juvenile rearing. As a result, the quantitative objective is to coordinate proponents to conduct habitat projects that restore about 1.25 miles of Chinook salmon and steelhead rearing habitat per year (19 miles in total) during the next 15 years, at a cost of about \$500,000 per year. Other projects provide the funding to implement these habitat restoration projects. A minimum of developing two projects a year are planned. Overall, if this coordination is the focus and goal, this objective is Specific, Measurable, apparently Achievable, Relevant, and Time Bound.

A key objective of the project is to continue the trust established between the proponents and private landowners, which fosters voluntary participation on projects conducted on their private lands. This social objective is fundamental to the success of habitat restoration in the Upper Salmon River Basin.

Q2: Methods

Methods for this project are partly sociopolitical and partly technical and scientific, and are described in some detail. Landowner trust and participation is crucial because about 90% of spawning habitat for Chinook salmon is on private lands. Technical/scientific expertise is needed to plan projects, ensure regulatory compliance, and complete engineering designs, budgets, and reporting. The basic methods are planning and prioritizing projects to advance toward the overall goal of delisting at-risk salmonids. This is being approached with increasingly

sophisticated, technologically advanced tools, and should improve efficiency and precision of habitat quality and quantity estimates.

The proponents outline steps in planning, from identifying a project proponent to communication with landowners, and five phases of engineering plans. Planning proceeds through cultural resource surveys, identifying funding sources, permitting (including ESA, NEPA, and CWA 404 permits), soliciting contractor bids, and eventually completion reports and post-construction compliance monitoring. An Advisory Committee serves to provide feedback from local landowners and resource users to the Technical Committee.

Q3: Provisions for M&E

The proponents do a thorough job (pages 13-14) describing the sequence of a how a project is developed.

The proponents use the term “structured decision making” to describe the process of project adjustment, but no formal structured decision-making process or model is described. The ISRP recommends that proponents describe this process.

With regard to the studies on cattle grazing, the proponents may also be interested in studies by Saunders and Fausch (2007, 2012, 2018) regarding the increase in terrestrial invertebrates supplied to salmonids under progressive grazing regimes and the resultant increase in fish biomass. Although this work was also done in streams with resident trout in Colorado and Wyoming, the implications for increasing fish biomass via improved range management should be transferable to habitats supporting juvenile anadromous salmonids.

Q4: Results – benefits to fish and wildlife

The ISRP compliments the proponents on contributing to 429 habitat rehabilitation actions, 257 fish screening actions, 22 tributaries reconnected, and 25 flow agreements throughout the Upper Salmon River Basin (USRB) since inception of the project.

One original goal was to identify and develop projects to increase survival and abundance of anadromous salmonids in the USRB, based on the Integrated Rehabilitation Assessment, which itself is based on a quantile regression random forest model of capacity (density of redds and rearing habitat in tributaries). In total, 97 projects were ranked by biological merit during 2013-2020. The goal was smooth dialog among partners about actions, lessons learned, and adjustments to projects.

One outcome of their early work was the realization that habitat was insufficient to support juvenile life stages, shifting focus to larger mainstem river segments and enhancing floodplain function and diverse riparian zones.

Another lesson learned was that securing voluntary participation of private landowners because most projects are on private land. Further, the proponents identified the need for a central coordinating approach, especially because all the “low hanging fruit” of simple and straightforward projects have been completed, leaving those that are more difficult, higher risk, multi-faceted, and include multiple partners. The project works to leverage the multiple funding sources that are now needed to complete projects.

References

Saunders, W.C., and K.D. Fausch. 2007. Improved grazing management increases terrestrial invertebrate inputs that feed trout in Wyoming rangeland streams. *Transactions of the American Fisheries Society* 136:1216-1230.

Saunders, W.C., and K.D. Fausch. 2012. Grazing management influences the subsidy of terrestrial prey to trout in central Rocky Mountain streams (USA). *Freshwater Biology* 57: 1512-1529.

Saunders, W C., and K.D. Fausch. 2018. Conserving fluxes of terrestrial invertebrates to trout in streams: A first field experiment on the effects of cattle grazing. *Aquatic Conservation: Marine and Freshwater Ecosystems* 28:910-922.

200860300 - Pahsimeroi River Habitat

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Governor’s Office of Species Conservation

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proponents have assembled a well-crafted proposal that shows work that generally meets scientific criteria. This is primarily a project to distribute funds for restoration design, planning, implementation, and monitoring. In fact, the project does not provide any direct salary support

and is solely about distributing funds for contracting, design etc. The overarching goal is clearly stated, to improve and expand summer and winter rearing habitat capacity for juvenile salmonids.

The project has a strong record of success. Nine habitat restoration projects during 2013-2020 restored about 6 miles of river habitat and 8.5 acres of floodplains and side channels. In total, 58 projects were completed, including these, since 2013. In addition, diversions that were closed before 2013 saved about 73 cfs of flow and reconnected 12 miles of mainstem and tributary habitat critical for anadromous Chinook and steelhead. Since 2013, more than 18.5 miles of mainstem and tributaries have been reconnected and 17 fish barriers were removed. Invasive weeds were treated on 480 acres.

The ISRP found that the proposal meets scientific review criteria, and no conditions are placed on the project nor is a response to the ISRP requested on any issue. The ISRP has identified a number of issues discussed below that the proponents are encouraged to consider and address as appropriate in subsequent reports or proposals. In addition, we are suggesting that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The overarching goal of the project is clearly stated, to improve and expand summer and winter rearing habitat capacity for juvenile salmonids. There are six biological objectives that are largely written in the SMART format, being Specific, Measurable, Relevant, and Time Bound. Many appear ambitious, although similar goals have been achieved during the previous period so perhaps most are Achievable. Objective 6 is not written in this format and appears to be an aspirational objective. Objective 10 appears partly redundant with Objective 9. It is unclear in Objective 12 how much the density of native riparian plants are expected to increase on the 2 miles of riparian habitat restored per year.

The ISRP recommends that the proponents consider their objectives within the time scale of 5 years (this funding cycle) as opposed to 15 years, as presented in the proposal.

The ISRP recommends that the proponents consider how projects can benefit species other than Chinook and steelhead. For example, despite the indication that ESA-listed bull trout are present in this basin, the species is mentioned only four times. Moreover, while there is a wide recognition that the anadromous (steelhead) and non-anadromous (rainbow trout) forms of *O. mykiss* often interbreed, produce the alternate form, and can thus exist as a blended population complex, neither "rainbow" or "rainbow trout" were mentioned in the proposal. In fact, "Objective 3 [increase survival and abundance of resident salmonids] was dropped from the project's primary consideration for restoration actions." Why?

Q2: Methods

Methods involve process-based restoration to improve channel morphology, substrate, and cover for fish created by large wood and undercut banks. A broad suite of monitoring occurs before and after construction of each project, including aerial imagery and photographic monitoring, site assessments of stream morphology and riparian health, flow measurements, electrofishing in summer and fall, and "fish in, fish out" monitoring at the downstream end using a weir and rotary screw trap. This allows the measurement of biological responses such as density of juveniles, habitat units used, and smolts/redd (productivity). However, the proposal is lacking in specifics about who will do the work and how it will be accomplished. The ISRP recommends including these types of details here.

The meaning of the following statement presented in the monitoring section is not clear, "The MRA ... but did not evaluate Pahsimeroi snow- or spring-fed tributaries, the social dynamics that may influence the extent to which recommendations could/should be implemented, or the continued effort to reconnect reaches and tributaries through barrier removal and water savings." In this context, what do the proponents mean by the phrase "social dynamics"?

Q3: Provisions for M&E

The proponents rely on IDFG and the Pahsimeroi Fish Hatchery to monitor adult spawning females and outmigrating smolts, from which estimates of productivity (smolts/redd) can be calculated. The proponents acknowledge that fish responses are variable owing to many out-of-basin factors such as hydropower facilities operations and ocean conditions, and are difficult to measure accurately. However, past work has shown that these data can be used successfully to evaluate habitat restoration in the basin. For example, the results reported by Copeland et al. (2021) suggest that productivity is expected to increase as habitat complexity is restored.

Individual restoration actions are monitored and evaluated by the Technical Team through the USBWP, including a biological and geomorphic evaluation. Results and lessons learned are shared with this group, and its Advisory Committee, providing a feedback loop for adjustments to meet biological, physical, and stakeholder goals.

The ISRP appreciates the frank discussion of some confounding factors, including local ones such as browsing by elk and deer, and out of basin processes too. One confounding factor that the ISRP believes needs more consideration is the integrated broodstock program for summer Chinook conducted by the Pahsimeroi Fish Hatchery, explained only briefly in the proposal. If the limiting factor for Chinook salmon and steelhead is density-dependence among rearing juveniles, as often is the case ([ISAB 2015-1](#)), then how could supplementation with reduced productivity of hatchery females relative to wild females improve viability of the targeted natural salmon population?

Q4: Results – benefits to fish and wildlife

The project appears to have strong benefits to fish. The project describes nine habitat restoration projects during 2013-2020 that restored about 6 miles of river habitat and 8.5 acres of floodplains and side channels. In total, 58 projects were completed, including these, since 2013. In addition, diversions that were closed before 2013 saved about 73 cfs of flow and reconnected 12 miles of mainstem and tributary habitat critical for anadromous Chinook and steelhead. Since 2013, more than 18.5 miles of mainstem and tributaries have been reconnected and 17 fish barriers were removed. Invasive weeds were treated on 480 acres.

Copeland et al. (2021) reported that removing the largest barrier in 2009 nearly doubled the number of redds and increased the number of smolts/female spawner by more than half. This provides quantitative evidence of the success of past objectives. Lessons learned are also described for other projects that are more recent, including the need to maximize habitat complexity and connections to floodplains, and the importance of process restoration that focus on ecosystem processes, now that the simpler projects that reconnected habitat are largely completed.

The proponents are open in acknowledging the fact that ecological restoration work does not always produce immediate positive results in terms of number of fish or other metrics of success. Nevertheless, the ISRP encourages the proponents to continue their work to improve capacity and productivity, which will most likely eventually produce benefits in the long run.

Reference

ISAB (Independent Scientific Advisory Board). 2015-1. Density dependence and its implications for fish management and restoration programs in the Columbia River. Northwest Power and Conservation Council, Portland, Oregon. ISAB Report 2015-1. 246pp. Available at www.nwcouncil.org/fw/isab/isab2015-1.

201007200 - Lemhi River Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Office of Species Conservation (OSC)

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

This project primarily involves identifying, planning, coordinating, designing, and funding habitat restoration projects in the Lemhi River Basin. Implementation is done by other projects. The proposal is generally well written. The proponents work with many cooperators, and they have a strong track record of completing projects. Appendix A is a list of projects that have been accomplished.

The proponents collaborate extensively with the USBWP (Project 200739400) to identify, prioritize, select, design, plan, fund, select contractors, and implement habitat restoration projects in the Lemhi River watershed. They have identified major limiting factors in the subbasin through a model that then leads to the identification of projects to address these factors. Their work is organized around two major tasks: improving the quality of instream habitat and instream flows (with some riparian restoration) and reconnecting tributaries to the mainstem Lemhi. This project has been especially successful in reconnecting tributaries along the Lemhi River and restoring complex habitats that are critical for summer and winter rearing of juvenile Chinook and steelhead.

The ISRP is not asking for a response or placing conditions on the project as we determined it meets standards for scientific merit. No further review of the proposal by the ISRP will be conducted. Below in the individual sections are recommendations for improving the project that the ISRP encourages the proponents to consider and address in subsequent proposals and

reports. In addition, we are suggesting that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Essentially, the Lemhi River is not meeting its minimum abundance thresholds (MATs) for Chinook salmon and steelhead. Bull trout are also ESA-listed, and the basin has native westslope cutthroat trout as well. The project objectives are primarily to enhance habitat and flow, and to re-establish connections between tributaries and the Lemhi River. While the Goals or Objectives are generally appropriate for the proposed work to address these issues, they are not framed as SMART objectives in a coordinated fashion. For example, Implementation Objectives 1A through 1D need to be more specific and address the timeline for this proposal (to 2027?). What form/type of habitat restoration is planned, for example?

Q2: Methods

The Integrated Rehabilitation Assessments and Multiple Reach Assessments guide restoration efforts in the basin. While this appears to be a reasonable framework, the ISRP was unclear about several strategic issues relevant to selecting and implementing restoration:

- Restoration is planned in the Lemhi River mainstem both upstream and downstream of Hayden Creek as well as in Hayden Creek where a third of the spawning occurs. The relative effects of different ecological processes on fish productivity and habitat are not clearly explained. For example, if flow is the fundamental limiting factor, are efforts to remediate other effects going to be effective? Can the core problem be identified and addressed first? What are the core problems?
- The project focuses on the mainstem Lemhi River and large tributary segments, where much of the current spawning and rearing takes place. While in some ways this is sound,

it leaves open the question of how much scope for gain there may be, if other parts of the basin do not get attention. Are they too degraded at this time to be priorities?

Although developed for bull trout, Tyre et al. (2012) provide an adaptive management framework for selecting tributary streams that the proponents might find informative for selecting tributaries for restoration.

Q3: Provisions for M&E

The proponents coordinate with other projects conducting ongoing effectiveness monitoring and evaluation studies, including the Intensively Monitored Watershed study in the Lemhi watershed (Uthe et al. 2017). However, details on several of these M&E efforts and the relationships to this proposal are lacking:

- The proposal mentions some M&E work associated with the Eagle Valley Project, yet few details are provided on what this effort entails, why this project is being monitored, and any important results. The ISRP encourages the proponents to provide additional details on this work.
- The proponents report that a BACI-designed study is being conducted of several large floodplain rehabilitation projects but do not report what agency or group is doing this work, nor the methods.
- Another study of Beaver Dam Analogs is reported, but no specifics are given.
- Effects of restoration in tributaries will also be monitored and compared to Hayden Creek, a control tributary, using PIT-tagging and reach-scale electrofishing. The proposal does not indicate what group will do this work or what exact methods will be used, such as electrofishing estimates. The ISRP recommends that the proponents add these details future reports and proposals.
- Figure 5 seems to show a decline in annual smolt counts from 2016 - 2019, and also some decline in pre-smolt counts. What is the best explanation for these trends? Are any other records available? The parr and pre-smolt counts are, respectively, much lower and higher than the smolt counts, suggesting complex movements and a larger population unit.

Q4: Results – benefits to fish and wildlife

Since 2013, collaboration and well-established landowner relationships have led to 49 individual projects comprised of multiple restoration actions in the Lemhi watershed. During this period, this project has reconnected 41 miles of habitat, removed 21 fish passage barriers,

constructed 11.28 miles of in-stream habitat complexity, and rehabilitated 115 acres of floodplain and riparian areas to improve fish habitat. Work has focused on restoring overwinter habitat for Chinook and steelhead pre-smolts, which is determined to be a key limiting factor for both species. Process-based restoration is now a focus to increase habitat complexity across multi-thread channels and floodplain habitats.

The proponents provide an excellent list of four main lessons learned about limiting factors for anadromous salmonids in the basin and the importance of hyporheic flow for buffering stream temperatures summer and winter. The report on the Lemhi IMW (Uthe et al. 2017) indicated that restoration actions have benefited fish populations in the basin:

“Our results demonstrate that restoration efforts in the Lemhi River basin have been substantial enough to elicit local responses of multiple species and life stages of salmonids but have not resulted in a basin-scale response. The results suggest that restoration has caused an increase in summer rearing capacity of Chinook Salmon (USSIRA 2017). This effort has also highlighted the need for large-scale projects in the lower Lemhi River that incorporate specific restoration actions designed to increase winter survival.... The initial responses to restoration that we documented are encouraging, but full understanding of fish population and habitat responses in the Lemhi River will require monitoring for an additional 10 to 15 years.”

The project focus seems to be almost entirely on Chinook, even though there are two other ESA listed species (bull trout and steelhead). In addition, there are non-listed resident species such as westslope cutthroat that occupy the system. Are there additional fish data being collected to assess benefits of restoration work to these other species?

It is hard to argue that fish and wildlife will not benefit from flow and habitat improvements in a basin such as this with clear problems. It will be important to continue trying to identify and prioritize the most pressing and limiting factors, and to continue to report the successes in terms of fish responses as well as quantified habitat changes (important though they are). The Proponents are encouraged to reassess limiting factors at intervals because conditions, such as due to climate change, can change and hence change the restoration framework.

The proponents acknowledge that invasive brook trout (shown prominently in several streams in Figure 8) are a consideration as a confounding factor but perhaps more concerning are the rapid influx of humans to the state, with associated demands for water and land. These interior populations are likely to be under great pressure in the future from these local factors as well as climate-driven processes affecting weather and ocean conditions.

200860800 - Idaho MOA/Fish Accord Water Transactions

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Governor's Office of Species Conservation

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

Generally, this project has demonstrated success in navigating the complex and challenging issues associated with securing instream flows. While the objectives for the project are not SMART, the proposal provides an adequate indication of the scope of the work. Strengths include thorough prioritization and review of the transactions, collaboration among diverse stakeholders and peers, and a thoughtful monitoring framework. In addition, this program is working through many legal and other barriers to improve flows, which are a key limiting factor on production or mere persistence. The negotiations of transactions and the subsequent monitoring are very complicated, but there is every indication that this program is functioning well, given the challenges inherent in the goals. Prioritization of permanent protections is a strength of the program, as is the awareness of and response to the rising frequency and severity of droughts.

As with other water transactions projects, streamflow monitoring is a financial and logistical challenge that the proponents continue to try to address, in part through partnerships with other agencies conducting monitoring. This perennial issue will challenge compliance monitoring for the program and may require exploring some emerging streamflow measurement strategies, expanding collaborations, and/or increasing funding from BPA or other sources.

Although the proposal meets scientific criteria and no response is requested, we encourage the proponents to support the effort to develop an M&E matrix for the Upper Salmon River basin.

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is

being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The objectives themselves are not SMART, but the content in Table 1 and the supporting text gets close to quantitative objectives. For example, the first objective is to “Improve the instantaneous rate of flow through a defined stream reach,” which is not a SMART objective. However, the text sets a target of 25 additional cfs by 2025, as well as defines additional tasks to be completed under this general objective. However, some of the tasks are quite general “Determine possible transactions...” A similar blend of measurable and unmeasurable targets are present under all objectives.

Given the uncertainty of new minimum streamflow rights in the Lemhi basin and the outcomes of the Managed Recharge study, it is understandable that the scope is not fixed. In addition, Table 1 provides a reasonable set of actions for the next project period in a format with that is easy to understand, detailing goals, objectives, provides definitions, and an indication of the quantification process (e.g., redd counts, fry surveys, subsurface data loggers to measure flow, etc.).

Furthermore, it was not clear to the ISRP if the project objectives need to match the broader CBWTP objectives. These objectives were critiqued for not being measurable or time bound in the 2013 Geographic Review. In addition, Objective 2 (“Improve the total volume of water restored to a defined stream reach over a period of time”) is problematic as a metric due to the variation in flows over the irrigation season and the difficulty in estimating total volume based on individual measurements, etc. The ISRP questions the value of this objective if it cannot be defined quantitatively or measured.

In summary, while the scope is generally clear in the proposal, the project would benefit from crafting measurable and time bound objectives that allow for assessment of project success and impact and inform project adjustments, but a response is not requested because the proposal scope was clear enough based on the materials provided (particularly Table 1).

Q2: Methods

The methods clearly describe the steps involved with securing instream flows, and Table 2 provides a clear overview of the transactions tools that are used and what is involved with implementing them. Details of how prioritization and ranking of transactions are conducted were not presented in the proposal. It would have helped to have a summary in the proposal

rather than referencing related proposals. The Flow Restoration Accounting Framework (FRAF) has been implemented since 2015 to provide simple (i.e., compliance) to more complex (i.e., biological) monitoring of transactions. Some of the results of the monitoring were presented in the Progress to Date, which were very helpful, though details on how proponents plan the higher tier, more detailed monitoring for the next project period was not provided.

Of note, all transactions are extensively reviewed, both by CBWTP and by the Idaho Water Resource Board, which occurs as a public process. This section provided clear indication of the amount of work involved with securing these instream flows, and the ISRP was surprised to learn that some of the MSFs currently being negotiated in the Lemhi will require approval of the Idaho state legislature. The proponents are clearly operating in a complex space, and success with water transactions demonstrates careful attention to diverse stakeholder concerns.

The proponents note that funding and logistics of streamflow monitoring are challenges for the project, despite the important role of stream flows in compliance monitoring, hydraulic modeling, etc. The proponents may investigate some of the emerging technologies for streamflow monitoring, such as radar gauges on bridges or the use of NASA's new SWOT dataset for wider sections of the river. For smaller channels, crowdhydrology.com or similar tools can be a useful tool where landowners are willing to read staff gauges. While these specific technologies will not solve this critical issue for all rivers, expanding beyond the traditional tools for streamflow monitoring may ultimately benefit the project.

In summary, the methods appear to be appropriate for this challenging but important project. While some details were not included in the proposal for review, those methods are well established at this point, and the ISRP has confidence in the application of science based on the strong track record and collaborative processes in place.

Q3: Provisions for M&E

The proposal provided a detailed description of the activities that contribute to project evaluation and adjustment. A key feature of this process is collaboration with other groups, ranging from monthly, quarterly, and annual meetings with a variety of technical partners and proponents. In addition, the proponents are using new science and collaboration with partners to innovate, such as the potential for transactions based on managed recharge for restoring instream flows. The ISRP also appreciated how, in the Potential Confounding Factors section, the proponents described how they were identifying actions that could mitigate the factors most likely to frustrate their efforts to improve flow (i.e., non-participation by senior water right holders, non-tolerance of beaver activity, and inadequate management of groundwater in

headwaters). This narrative is indicative of broader thinking about project constraints and direction that is a key component of project adaptation and adjustment. Notwithstanding the stated concerns regarding the growing challenges of streamflow monitoring, data were presented indicating the success of the proponents in getting at least some water in much-needed place and time combinations.

Q4: Results – benefits to fish and wildlife

The section on Progress to Date is very thorough, summarizes important lessons learned, and includes biological and streamflow data to support findings. It summarizes the amount of instream flows that have been protected, and includes some biological data (e.g., red counts, PIT tag data) to attempt to relate results to biological outcomes. Given that relating cfs to numbers of fish is not realistic, the proponents have demonstrated a reasonable attempt to show benefits where monitoring data can support it. In a minor point for interpreting benefits, the ISRP questioned the value of Figure 4, as it is not clear how the PIT-tag data supports the claim of fish seeking thermal refuge.

200726800 - Expense Idaho Watershed Habitat Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Custer Soil and Water Conservation District

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

The Expense Idaho Watershed Habitat Restoration Project is part of a larger collaborative habitat restoration program in the upper Salmon River watershed. The project has many partners in the effort to develop and implement restoration projects on public and private lands to address key factors limiting the recovery of ESA-listed Chinook salmon, steelhead, and bull trout. The project area resides within the entire Custer Soil and Water Conservation District's borders in the upper Salmon River watershed representing over 3 million acres. The challenges in this part of the upper Snake River basin are great, from natural conditions that may limit salmon and steelhead, the long history of impact by multiple human activities, and recent climate changes. Nevertheless, this project and ones like it are needed if we are to

maintain, much less improve, the populations of native fishes in the region. This project appears to be on track and continuing to produce benefits.

A demonstrated strength of the project is the proponents' ability to negotiate and work with private landowners, water users, and other partners. The project also has a well-established formal adjustment process that utilizes multiple agencies and experts. Regular meetings and annual and five-year plans serve the projects adjustment process effectively.

The overall goal of the project is to expand and improve habitat quantity and complexity to support recovery and long-term sustainability. The multiple objectives support the goals well and meet SMART criteria, with specific desired outcomes that are time bound. The methods are well established and support sound selection, planning, and implementation. There is a strong history of achieving past objectives and milestones.

Future proposals would be improved by including more extensive discussion of details for monitoring and evaluation, including specific methods. Even though monitoring is conducted outside the project, the direct connection to restoration action assessment should be more fully described. The proponents should also consider adding objectives for coordination, education and outreach, reporting, and adaptive management. We suggest that the project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Habitat conditions in the upper Salmon River subbasin have been degraded by a variety of land use activities. Spring-summer Chinook salmon and steelhead are listed as threatened under the ESA. Improving habitat conditions in the upper Salmon River watershed has been identified as critical to recovery of salmonids in the Salmon River subbasin.

The projects focus on increasing capacity for juvenile Chinook salmon, and it is assumed that these measures will also increase the capacity for juvenile steelhead rearing during summer and winter months. The plan identifies the need to increase hydraulic and structural diversity and complexity of the watersheds (Upper Salmon MRA 2021).

The Problem Statement could be improved by specifying how much the viability status of ESA-listed steelhead and spring Chinook populations could improve after successful implementation of proposed actions in the target reaches and streams. As it stands, the ISRP finds it difficult to judge how significant the target streams are to the viability of the threatened populations.

In addition to the overarching goal, to expand and improve habitat and habitat complexity to assist in recovery and achievement of long-term sustainability, the project has four additional sub-goals. The goals directly address the need for improvement in habitat quantity and quality to enhance salmonid capacity and productivity. Each goal is supported by biological and implementation objectives. For the most part, the objectives are SMART with clearly defined quantitative outcomes and specific timelines, though some objectives are difficult to quantify, given uncertainty about actual opportunities with landowners. The objectives are clear and provide a well-articulated pathway for goal achievement. However, the proposal would benefit from clear objectives related to coordination, education, and outreach, reporting and adaptive management that are important project elements.

Q2: Methods

The project has a well-established process for identifying, selecting, planning, implementing, and evaluating restoration projects. The District uses the USBWP Technical Team to rank and prioritize projects. The efforts are guided by habitat assessments and limiting factors analyses. A well-described multi-step process is followed for coordination/collaboration, planning, monitoring, evaluation, and adaptive management. A recently completed watershed evaluation, Integrated Rehabilitation Assessment (IRA), developed by an interdisciplinary team provides guidance for priorities and strategies. An expanded multiple data assessment is currently underway by the Idaho Office of Species Conservation. There is extensive outside project technical support provided by federal and state agency staff. Monitoring and evaluation are provided primarily by IDFG and IDWR.

The USBWP coordinates a Technical Team comprising local resource management personnel representing multiple federal, state, local, tribal, and non-governmental organizations that helps develop and prioritize habitat restoration projects at monthly meetings. Detailed evaluation and ranking of each project includes benefits at the watershed, project, and species scale to understand projected benefits and discuss modifications where needed to get the

maximum benefit while including the needs of the local landowner, legal requirements, and timelines. The proponents rely on the IRA to evaluate available habitat capacity and potential limitations on habitat capacity relative to current conditions for different life stages of salmon and steelhead; and the Multiple Reach Assessment (MRA) to identify appropriate habitat conditions at the reach, sub-reach, and channel unit scale. Monitoring of completed work is done through the IDFG, and collaborators will continue to adjust monitoring methods as necessary. In the case of irrigation modifications that require flow monitoring, this work is completed by the IDWR Water Transaction program.

Overall, the methods for selection of project sites, planning of restoration actions, implementation, and monitoring and evaluation are sound, and guide the project effectively. However, in the high-level overview of strategies, partnerships are overly general in nature and are not amenable to scientific review. Future proposals and reports would benefit from links to methods that are more detailed. The proponents have attempted to address the ISRP's 2013 Geographic Review requests for additional clarification of the problem statement, the objectives and criteria for success, observed benefits to fish populations, and provisions for monitoring of benefits in the longer term. However, we are still unable to judge how much this project could contribute to recovery of ESA-listed Chinook and steelhead populations in the Snake River. Aspects of the proposal are vague and could better demonstrate the regional significance of the proposed projects. What is the current status and limiting factors for the viability of anadromous salmonid populations in the Upper Salmon Watershed? How would restoration at sites including Pole Creek and Garden Creek contribute to the Viable Salmon Population parameters of abundance, productivity, diversity, and spatial structure, for spring Chinook and steelhead? Future reports should demonstrate how the tributaries to be restored would contribute to ESA viability and restoration of fisheries.

Q3: Provisions for M&E

Monthly Tech Team meetings occur with participation from more than 30 staff specialists from 14 organizations, who discuss the current issues, share detailed information on project planning and funding, and evaluate and rank proposed projects. This is, therefore, a well-organized and formal process to plan projects and quantify results.

The formal planning, implementation, and evaluation process has multiple places where information feeds back into decision processes. The USBWP Technical Team meets regularly to evaluate projects, provide guidance, and adapt plans. Regularly scheduled meetings, that include up to 14 organizations and multiple staff, are held to implement the project adjustment process. The SWCD board also meets regularly to discuss and improve proposed and completed

projects. The detailed timeline provides a solid roadmap to track milestones and identify needs for project adjustments.

Monitoring and evaluation occur at the restoration project and watershed scales, with funding outside of the project. Project level assessments are based on pre- and post-project level conditions and changes. Although the proposal identifies monitoring of pre- and post-project conditions, little detail was provided regarding metrics and indicators assessed or the specific field methods and analytical approaches being used.

Q4: Results – benefits to fish and wildlife

The benefits to fish and specifically ESA-listed Chinook salmon and steelhead will arise from increasing the quantity (via improved access) and quality (via restoration activities) of habitat. There is evidence of strong density-dependence, so the goals are to increase capacity and productivity. The challenges seem considerable, but this is the most sensible approach under the circumstances.

The proposal includes an extensive and comprehensive list of results covering the period 2013-2021. The list of accomplishments is impressive and project objectives appear to be met consistently. The tabular presentation in conjunction with the summary of accomplishments for each past objective was clear and informative. Good examples are provided of lessons learned and project adjustments through time. The project has facilitated numerous improvements in barriers, screens, instream flow as well as floodplain, riparian vegetation, and stream complexity conditions.

Work during the past 7 years has focused primarily on installing infrastructure to increase flow in the tributaries and fencing to protect the riparian areas. Major accomplishments include:

- Activities from 2014-2016 have ensured that at least 15 cfs will remain in Pole Creek, one of the major tributaries to the Salmon River, during a typical summer day.
- The removal of two passage barriers and retirement of water rights of 12 cfs from 2017-2018 has improved the year-round flow in Meadow Creek for Chinook salmon and steelhead. Electrofishing and snorkeling surveys by IDFG confirmed the presence of Chinook all sites in both sampling years.
- Restoration activities in Garden Creek met objectives through enhanced stream flows, improved connectivity, reduced sediment, reduced temperatures in approximately 9 miles of stream, and reduced entrainment in irrigation systems.

- In 2016, the NOAA tributary habitat expert panel judged that limiting factor status had improved related to project actions (Table 4).

Future restoration projects in the subbasin will focus on riparian revegetation and restoration to address increased stream temperature, reduced stream flows, and increase fish population resilience.

200712700 - East Fork of South Fork Salmon River Passage Restoration

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

This is a collaborative effort of the Nez Perce Tribe and the U.S. Forest Service in the South Fork Salmon River watershed. Degraded habitat conditions resulting from past and current land use activities have been identified as key limiting factors for all life stages of salmonids. The overall goal is to restore the aquatic ecosystems of Big Creek, South Fork Salmon River, and Little Salmon River watersheds by addressing key limiting factors to enable the recovery of salmonids. Despite the funding constraints on direct monitoring of fish responses to restoration, this project is making excellent progress in restoring habitat in a huge basin, not only for Chinook salmon and steelhead but also for bull trout, a species sometimes neglected in projects. This project has an excellent track record of progress in the South Fork Salmon River (SFSR) and Big Creek (BC), and is now expanding to include the Little Salmon River (LSR).

Goals and objectives are well stated and provide sound qualitative and quantitative desired outcomes. The project planning and implementation processes guide the project effectively. Although there is somewhat limited monitoring and evaluation, the base level assessments are providing valuable data for adaptive management. The project has been especially effective in road decommissioning, road improvements, barrier removal, and passage improvements. Future proposals should be improved by expanding the objectives to include monitoring and evaluation, reporting, and data sharing, but in general, this is a very strong proposal. We suggest that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proposal states that, "The overall goal of this project is to restore the aquatic ecosystems of the South Fork Salmon River (SFSR), Big Creek, and Little Salmon River (LSR) watersheds, addressing all limiting factors, so the physical habitat within these watersheds no longer limits recovery of Endangered Species Act (ESA)-listed [salmonids]." The specific limiting factors are indicated to be fine sediment that reduces egg-to-fry survival, passage barriers, riparian degradation including non-native plants, and poor water quality.

This ongoing project addresses critical needs to improve habitat conditions in the South Fork Salmon River watershed. The South Fork and tributaries support important populations of ESA-listed Chinook salmon, steelhead, and bull trout. The overall goals of the project are to restore aquatic ecosystems in Big Creek, South Fork Salmon River, and the Little Salmon River by addressing all limiting factors so that habitat no longer limits recovery of these listed salmonids. The overarching goals provide clear long-term qualitative desired outcomes for the project.

The proponents provide three specific goals for the project funding period: improving habitat quality, increasing habitat quantity, and improving project effectiveness through education and outreach. Each goal is supported by biological or social objectives and qualitative implementation objectives. The objectives are directly linked to key limiting factors including sediment, barriers, riparian condition, and water quality. No objectives are provided for monitoring and evaluation, reporting, or data sharing, all important elements of the project.

The organization and articulation of goals and objectives is exemplary. All objectives meet SMART criteria and are well suited to evaluating progress during the next review phase. The Problem Statement clearly explains the project's focus on increasing habitat quality to increase the natural productivity (hence viability) of ESA-listed salmonids. It also clearly describes how the target restoration sites relate to the population structure of each species and to previous studies of limiting factors and critical habitat (in appendices).

Q2: Methods

A wide variety of specific approaches are described, many with helpful photos to illustrate the "before and after" conditions, including culvert replacement, decommissioning roads, streambank stabilization, and riparian plantings.

The proposal includes extensive descriptions of methods for each restoration action category. The methods are clearly described and cover all steps of the restoration process including assessment, site selection, restoration planning, prioritization, implementation, and monitoring. Detailed approaches are described for all major implementation activities. The methods are scientifically sound and provide effective approaches in high priority locations that address important limiting factors. The effectiveness monitoring does not seem to involve salmonid surveys, but the habitat improvements are very much in line with current concepts in restoration. Specifically, the rivers are being allowed to make their own courses, and the human interventions are largely to fix an underlying problem and then let the streams take over.

Q3: Provisions for M&E

The Project Evaluation and Adjustment Process section clearly describes the process by which potential projects are identified, prioritized, and implemented. Watershed planning on USFS land in the SFSR and Big Creek watersheds involves biannual (spring and fall) meetings with partners from the Boise and Payette national forests to review outcomes and discuss effectiveness. For restoration work not on Forest Service land, the proponents follow an iterative approach involving landowners of conservation easements to create a restoration plan. The restoration plan is updated every 5 years and reviewed by the landowner for final approval.

For newly proposed restoration work in the LSR, where more of the watershed is located on private land, the proponents plan to emphasize public outreach by convening an LSR Watershed Collaborative that includes all interested parties. This collaborative group will meet monthly to discuss critical watershed issues and participate in decision-making steps for gathering relevant information, identifying opportunities, weighing alternatives, and prioritizing actions, and produce a watershed restoration plan by 2023.

The Potential Confounding Factors section includes an excellent, pragmatic discussion of factors that threaten the success of the project. These factors include expected changes in temperature and precipitation within the watersheds, proposed mining in the East Fork of the South Fork Salmon River, non-native brook trout interactions with Chinook salmon parr, and effects of warming conditions at sea on survival of Chinook and steelhead smolts.

The proponents have adequately addressed all ISRP recommendations from the 2013 Geographic Review. Because the Integrated Status and Effectiveness Monitoring Project (ISEMP) and the Columbia Habitat and Monitoring Program (CHaMP) are no longer funded, the proponents are now participating in and relying on the Action Effectiveness Monitoring (AEM) Program conducted throughout the Columbia River Basin. They agree with the ISRP about the need for habitat monitoring relating to fish response but lack the requisite funding. They also point out that recent results and recommendations from AEM (Roni et al. 2021) demonstrate physical and biological benefits from large wood placement, barrier removal, and riparian planting projects (but mostly in other parts of the Columbia River Basin).

The proposal has explicit sections on "Lessons Learned" that describe how the program has adapted to information gathered, effectiveness monitoring, and in general the benefit of experience. It is also good to see goals and metrics of success that are related to public education and outreach. The land in the basin is largely USFS and the proposal does a good job of indicating the kinds of partnerships and collaboration that are involved (and needed) for the work to occur on USFS land, and similarly for state and private land activities.

Q4: Results – benefits to fish and wildlife

The proponents continue to demonstrate the capability and expertise to manage restoration projects and achieve desired results. The proposal included a comprehensive summary of results achieved since the project was initiated in 2007. The detailed presentation of work completed from 2013-2020, in conjunction with the comparisons to the quantitative objectives, was highly informative. In most cases, the project exceeded the planned outcomes considerably. The photo point examples illustrating responses for barrier and road improvements were valuable, as were the detailed descriptions of lessons learned for each type of restoration strategy.

The project is notably strong in implementation of road obliteration and road improvements as well as passage replacements. Major project accomplishments in the SFSR and Big Creek watersheds include addressing fish passage concerns by reconnecting 46 miles of stream habitat through replacing 17 passage barriers with AOP alternatives (i.e., bottomless culverts or bridges); addressing sediment conditions through survey and inventory of 854 miles of roads—obliterating 225 miles of those roads, rehabilitating 300 perennial stream crossings, improving 27 miles of roads, resurfacing 21 miles of road, adding/maintaining 519 drainage structures, and armoring 47 stream crossings; addressing degraded habitat conditions by planting 8,524 riparian and upland plants, seeding 126 acres of disturbed habitat, and treating 56 acres of invasive plants.

The quantitative tracking of outreach accomplishments is also appreciated. The project has provided education and outreach to an estimated 1,849 people, including students, teachers, and chaperones, collaborative planning groups, state and regional foresters and millworkers, logging and mining company staff, Idaho Senatorial and Congressional office staff, local media, Nez Perce youth and adults, youth from other area tribes, non-government organizations, and the general public.

The results of this work are not quantified in terms of fish survival and other metrics directly related to fish and wildlife. However, a large body of scientific evidence, spanning several decades, indicates the value of the kinds of work that is being planned and conducted here on sediment transport, water quality, temperature, shade, stream morphology, and so forth. The proponents indicate that a previous ISRP review asked for more monitoring of the fish response but without the additional funding needed the proponents have not been able to do so, noting "there remains a chasm in which BPA is primarily funding implementation and ISRP is requesting more monitoring." The ISRP is aware of this issue and continues to work on potential solutions.

199604300 - Johnson Creek Artificial Propagation Enhancement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Nez Perce Tribe

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Overall comment:

The proponents have implemented a highly productive project and provided an exemplary proposal whose elements clearly meet scientific criteria. This project directly addresses the need to prevent extirpation of Johnson Creek Chinook salmon and also assesses the benefits and risks of supplementation in general. The goals are clear and directly address critical uncertainties for salmon supplementation and recovery. The project is guided by a comprehensive set of biological and implementation objectives as well as associated monitoring questions. The objectives are SMART, and the monitoring questions provide a sound framework to assess project performance as well as benefits and risks. The goals and objectives

section would serve well as an excellent example for other projects, and the project has many accomplishments to its credit.

Extensive methods, provided for both the O&M and M&E components of the project, are scientifically sound and are well connected to the objectives. The project has an impressive set of accomplishments and scientific publications, and has a high degree of success achieving objectives. The results are encouraging, showing many benefits and few negative outcomes. Monitoring and evaluation is integral to the success and provides critical information for adaptive management.

The project has generated a wealth of data and insights which could provide a foundation for developing a full Life Cycle Model (LCM) for an integrated (hatchery and natural) population to more rigorously evaluate the risks and benefits of supplementation. This may be the only spring-summer Chinook salmon spawning aggregate for which there are adequate hatchery and natural production performance data, including estimates of relative reproductive success, to develop such an integrated life cycle model. Indeed, the ISRP suggests that the proponents consider integrating their information in an LCM. We suggest that this project participate in the development of the M&E matrix as described below:

M&E matrix - support. As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop (September 24 to November 22, 2021), we ask this project to assist them in creating the summary and provide information to them about what is being monitored by this project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

Snake River basin spring-summer Chinook salmon declined precipitously following the closure of Lower Granite Dam in 1974. Abundance in most populations reached extreme low levels that were considered at high risk of extinction. Spring-summer Chinook salmon were listed as threatened under the ESA in 1992. The Johnson Creek Artificial Propagation Enhancement program (JCAPE) was initiated in 1998 to prevent extirpation of this important Salmon River basin spawning aggregate.

The proponents state that "The primary goal of the Johnson Creek Artificial Propagation Enhancement (JCAPE) program is to use indigenous stock to provide for the restoration of summer Chinook salmon in Johnson Creek and to mitigate for fish losses occurring as a result of the construction and operation of the four Lower Snake River Dams."

This clear goal statement, combined with the well-described history of the project, alignment with NOAA ESA listing and other programs in the basin, supports the seven Management Objectives. These objectives reflect the need to balance demands for artificial production with persistence of the naturally reproducing population (e.g., by marking hatchery fish and using only wild fish as broodstock). The objectives also show strong links to research and monitoring goals (e.g., status and trends monitoring) that are relevant to management elsewhere in the Columbia River Basin and demonstrate the need to coordinate and communicate findings to resource managers.

The Goals and Objectives sections provide broad and clear qualitative desired outcomes for the project. Separate specific goals, biological objectives, implementation objectives, and monitoring questions were provided for operations and maintenance and monitoring and evaluation. The goals, biological objectives, implementation objectives, and monitoring questions show strong connectivity and continuity. The objectives are specific, measurable, and time-bound, all essential elements of SMART objectives. The monitoring questions provide a framework to address critical uncertainties as well as benefits and risks of the project. However, the biological objectives are stated as assumptions or hypotheses to be tested. These assumptions are implicitly quantitative (i.e., involve numerical comparisons such as "do not differ," "are similar," "exceed") but quantitative thresholds for rejecting them are not specified. Likewise, the implementation objectives are qualitative statements about actions. The associated monitoring questions specify metrics and tests (i.e., are also implicitly quantitative), but they do not specify thresholds for rejecting the assumptions. The ISRP recommends that the objectives be augmented to include quantitative thresholds in the next project review period.

Q2: Methods

Extensive methods are provided for both the O&M and M&E project components. Standard O&M operating protocols and annual operating procedures are used and are described in multiple documents. The proponents provide standalone summaries of methods for weir operations/broodstock management, adult holding and spawning, incubation, and rearing, tagging, and smolt releases. The methods are clear, represent best management practices, and guide the production elements effectively.

Similar to O&M methods, the M&E methods are well documented in numerous publications and also finalized in MonitoringResources.org. The M&E methods integrate a diverse set of sampling and analytical approaches from low tech to highly advanced. An integration that is essential for addressing the broad set of complex questions. Sound methods were provided for all M&E activities from data collection to data sharing. The project assesses an extensive list of performance measures that serve numerous purposes including high level indicators, viable salmonid population parameters, and specific hatchery and natural production performance. The methods are scientifically sound and clearly connected to the objectives. We appreciate the linkage provided between implementation objectives, indicators and metrics, and the detailed methods. The approach to documenting changes and updating methods via dynamic web page updates is highly beneficial, and we applaud the effort.

The methods are generally well referenced, clearly described, and appear to be scientifically sound. Table 10 provides commendable detail about the calculation of metrics used to evaluate progress toward objectives.

Presumably, the estimates of relative reproductive success used to generate Figures 2 and 3 are based on the decision to include only successful spawners. Would the conclusions about demographic boost and relative reproductive success be affected by including all potential spawners? (Also note an apparent copy-paste typo in the legends on the right-hand side of Figure 3; presumably, the second lines of HxH should read HxN).

In Figure 18 (left plot), might the “unlikely finding” of greater broodstock relatedness in years of larger returns be a statistical anomaly due to high leverage of a couple of extreme points, especially the lowest run size/percent relatedness? In other words, is this relationship statistically significant, robust, or biologically significant?

Q3: Provisions for M&E

The Progress to Date section of the proposal is exemplary, albeit long (30 pages). It provides a systematic evaluation of progress for each objective, in considerable detail, complete with lessons learned and helpful tables and figures. However, readability of the proposal could have been improved by including most of the details in a separate appendix.

The proponents mention a formal five-year review cycle to test and re-evaluate assumptions, as well as a regularly scheduled “Supplementation Symposia” performance review process. They do not describe details of the review process, but they provide a list of management activities that have been changed or are currently under consideration.

This proposal includes well-written self-evaluations under the heading of "Lessons Learned" for each component, in each of the Management Objectives, along with an assessment of whether the goals are being met or not. This section includes many tables of data and graphs, indicating that the proponents have a strong grasp of the link between what they propose, the data they collect, and reassessment of the project after examining the findings. Indeed, the studies comparing reproductive success of natural origin and hatchery origin fish spawning in the river are a model of such work. As reported by Hess et al. (2012), the relative reproductive success of hatchery origin fish was not distinguishable from that of natural origin spawners. This result, in contrast to the results of some other investigations in this field, is important because it indicates that a progressive loss of fitness in naturally spawning hatchery fish is not the inevitable outcome, as others have concluded. This is but one example from the impressively systematic way in which the proposal follows statements of goals with a clear link to the research and monitoring data being collected. Other examples include the comparison of spatial distributions of hatchery and natural origin carcasses in the river, and metrics of production such as SAR and smolt production per redd.

No description of a formal adaptive management approach is provided in the proposal. However, it seems clear that an effective process is being implemented based on the number and significance of management actions that have been modified within the project over time. The project undergoes a five-year review to specifically assess performance, identify high priority uncertainties, and make modifications. The M&E provides extensive information for adaptive decision processes.

Q4: Results – benefits to fish and wildlife

The project has been guided by seven management objectives and associated assumptions. Comprehensive results, including lessons learned, were presented for each objective and management action, demonstrating consistent success in achieving objectives. The project has generated valuable datasets and results for an extensive set of critical hatchery and natural production performance metrics and indicators. These results have provided the basis for assessment of hatchery performance, productivity, relative reproductive success, life history, survival, genetic variation, and straying. Overall, the results are highly encouraging with demonstration of numerous benefits and a limited number of negative or unintended outcomes. However, the ISRP suggests that the proponents refrain from comparing aggregate hatchery and natural origin abundance and productivity estimates with ICTRT minimum viability criteria levels, as the currency of VSP abundance and productivity parameters are based only on natural origin recruits and only include low abundance spawner years for productivity. Adding hatchery fish in the assessments provides positive bias in viability comparisons and overall assessments. As we have stated in a number of reviews of Snake River spring-summer Chinook

salmon projects, the severe downward trends in productivity and abundance are very concerning. The number of populations predicted to fall below a quasi-extinction threshold of 50 within the near future is of great concern.

This project benefits anadromous fish populations, and especially Chinook salmon, in four ways. First, there is production of salmon at the facility in a manner that is designed (and documented) to be compatible with the goals of integrated population management. The admonition to "first, do no harm" has been heeded and the population persists without apparent adverse effects on the wild population, so in this way it is successful. Second, data are being gathered (tagging, redd surveys, carcasses, etc.) that provide broad scientific benefit to other projects in the Columbia River Basin, and beyond. Third, the practical lessons learned, including problems encountered, are helpful to others as well. Fourth, the scientific discoveries and publications move the entire discipline forward and are a model of relevant, careful work.

Notwithstanding the many exemplary aspects of this project and proposal, and the welcome evidence that a demographic boost was provided to the natural spring/summer Chinook without any detected reduction in reproductive success or productivity, the ISRP cautions that the project's power to detect such effects may be low. Specifically, the proponents measured relative reproductive success (RRS) over two generations and found no statistically significant difference between hatchery origin and natural origin Chinook spawning in the natural environment. However, most of the point estimates of RRS are less than one, and statistical power is likely insufficient to detect small but potentially biologically meaningful differences in reproductive success that might accumulate or accelerate in the future. More research, including comparisons to unsupplemented control populations, is needed to determine the potential long-term genetic and hatchery operational impacts on the natural population fitness. Assessment of potential continuing small reductions in reproductive success from continued supplementation of a (hypothetical) natural population that is no longer increasing despite the initial demographic boost from supplementation is a significant risk. For example, how many generations would it take to erode the initial demographic boost from supplementation in a model population based on the statistical distribution of RRS observations to date (with mean <1), if RRS were attributed entirely to genetic mechanisms (i.e., loss of fitness)? The ISRP suggests that the proponents might consider some form of life cycle modeling to assess the sensitivity of this system to detect small changes.

199405000 - Salmon River Habitat Enhancement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Shoshone-Bannock Tribes

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

Since its inception, this project has undertaken a variety of habitat evaluation and restoration projects, including remediating dredge-mined sites on Bear Valley Creek and fencing livestock from riparian zones in Panther Creek. The most recent proposal for the 2013 Geographic Review was apparently focused on coordination with the CHaMP program (now discontinued) to monitor habitat in the Yankee Fork using CHaMP protocols.

In 2018, this program hired a consultant team to develop two documents focusing on habitat restoration in Panther Creek, a Riverscape Assessment (Hill et al. 2019a) and a Conceptual Restoration Plan (Hill et al. 2019b). Members of the ISRP review team read these documents and found them to provide excellent guidance. The Panther Creek Riverscapes Assessment (Hill et al. 2019a) provided a comprehensive assessment of the landscape setting, reach types, geomorphic condition, recovery potential, and limiting factors for aquatic species of each reach of the mainstem and tributaries throughout the basin. It used an assessment framework based on River Styles (Brierly and Fryirs 2005) to evaluate reaches.

The Panther Creek Riverscapes Conceptual Restoration Plan (Hill et al. 2019b) provides a process-based restoration framework adapted from Roni et al. (2002). The document developed a clear logic for planning restoration of every reach throughout the basin, including evaluation of the recovery potential, factors limiting fish habitat, and cost-effective methods for restoring habitat, as well as a realistic vision for the time course of restoration. These two documents satisfy one part of ISRP's main qualification from the 2013 Geographic Review.

The proponents are commended for commissioning consultants to complete the Riverscape Assessment and the Conceptual Restoration Plan. This has allowed a watershed-scale approach to habitat restoration based on geomorphic assessments and strategic planning of the highest-priority actions.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22,

2021) and to provide information to address the other following Conditions in future annual reports and work plans. Because of the importance of the proposal as a guiding document for the project, we encourage the proponents to revise their proposal to reflect these additions, but the ISRP does not need to review the revised proposal.

1. **SMART objectives.** Present goals and objectives and methods in the appropriate sections, and frame implementation objectives in the SMART format (see proposal instructions).
2. **MBACI design.** Provide details on the multiple-before-after-control-impact (MBACI) monitoring study design.
3. **Reaches chosen for restoration.** Provide details on the reaches chosen for habitat restoration during this study phase (FY2023 to FY2027), based on the Panther Creek Conceptual Restoration Plan (Hill et al. 2019b).
4. **Monitoring collective performance of instream structures.** Explain how the collective performance of instream structures will be monitored, and how this strategy for initiating desired geomorphic processes that improve fish habitat will be evaluated.
5. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.
6. **Resilience to confounding factors.** Explain how the project will be designed to make the habitat restoration more resilient to potential confounding factors, especially the projected increase in water temperature resulting from climate change.
7. **Respond to previous ISRP qualifications.** Respond to the ISRP qualifications from the 2013 Geographic Review by describing how fish monitoring will be accomplished, and by whom, and how this information will be integrated with evaluations of the effectiveness of hatchery production or outplanting of steelhead and Chinook.

Q1: Clearly defined objectives and outcomes

The proposal was difficult for the ISRP to understand because it is not structured clearly. All the material in the Goals and Objectives section should be condensed and moved to the Progress to Date section, because it is a lengthy summary of findings and recommendations copied from the Panther Creek Conceptual Restoration Plan (Hill et al. 2019b). Some material is redundant.

The highest priority for restoration identified in the Conceptual Restoration Plan is removal of six barriers to fish movement, which is being undertaken by the U.S. Forest Service personnel from the Salmon-Challis National Forest. This information should be presented in the Progress to Date section.

The Goals and Objectives are currently presented in the Methods section and should be returned to the correct section. The objectives presented are actually qualitative goals rather than quantitative objectives and should be incorporated into the Goal statements. As such, they are not framed in SMART format, as outlined in the Proposal Guidelines, but should be. For example, a Specific, Measurable, Achievable, Relevant, and Time Bound implementation objective might be:

Objective 1-1: Increase fish habitat quantity and quality by installing X Post-assisted log structures (PALS) and Y Beaver Dam Analogs in Z reaches of Panther Creek and its tributaries by 2027. [Note: insert specific numbers for X, Y, and Z, based on feasibility and logistics]

Goal 2 is focused on the performance of the Post-Assisted Log Structures (PALS) and Beaver Dam Analogs (BDAs) and should be moved to the section on Project Evaluation and Adjustment Process.

Q2: Methods

The proponents describe two Low-Tech Process-Based Restoration methods that will be used, BDAs and PALS, but do not describe how decisions will be made as to where the PALS will be constructed. The diagram implies that PALS will be constructed on the insides of meander bends to direct flow toward the opposite bank to scour a pool. Many habitat structures installed by inexperienced crews are placed in locations where they work against the stream (e.g., on the outsides of meander bends) rather than with it, so basic characteristics like this for siting structures should be described.

In the Proposal Short Description, the proponents report they will use a multiple-before-after-control-impact (MBACI) monitoring study design, but no such design is provided in the proposal. Details are needed for this design, including information about the randomization and replication of treatments and control reaches that will be laid out.

It is unclear where the habitat restoration work will be done, and what reaches identified in Conceptual Restoration Plan will be treated during the proposed work. The Timeline shows work to be done at two sites/reaches/segments during 2023 to 2026, but none of the maps show the locations of these. All maps should be labeled with figure numbers and captions.

It is unclear in what reaches the CHaMP Rapid Habitat Assessment will be conducted to measure the effects of the restoration treatments, and how these reaches will be chosen. Will the assessment be done along the entire riverscape or in treatment reaches that contain habitat restoration structures and compared to control reaches that were not treated? Will visual estimates of energy refugia, predator refugia, and substrate composition be validated to ensure accuracy and acceptable precision among different observers? Without this validation, these data may not be scientifically valid, and therefore not usable.

The proponents plan to use repeated photo points to record changes to stream and riparian morphology. Please provide information on what features of these photos will be analyzed to measure these changes, in addition to those measured by aerial survey images.

Regarding the imagery analysis of riverscape dynamics, it was unclear at what intervals the imagery will be collected, before and after habitat restoration, and when the imagery analysis will take place. The proponents' reference use of drones, but it was unclear who will fly these, who will process the data, and what permits are required to use them.

No mention was made of measuring fish responses to the structures, except the statements "Assist AFP with e-fishing" for each year in the Timeline. A second component of the main qualification set by the ISRP in the 2013 Geographic Review was to describe how fish monitoring will be accomplished and integrated with evaluations of the effectiveness of hatchery production or outplanting of steelhead and Chinook. The ISRP requests information on these evaluations of the fish response and who will conduct them.

Q3: Provisions for M&E

The flow chart on page 22 nicely illustrates how the performance of individual structures will be monitored and decisions made about maintaining them. The accompanying text emphasizes that these individual structures do not represent the solution but rather function as tools to

initiate specific geomorphic processes, so the fate of any one specific structure will have negligible impact on the overall project. However, the proposal does not describe how the collective performance of the structures will be monitored or how this strategy for initiating desired processes will be evaluated. The ISRP requests that the proponents provide details on what will be measured to assess whether the complex of habitat restoration treatments in each reach was successful.

The Potential Confounding Factors section lists future threats to fish habitat and factors limiting population viability, primarily from climate change that is causing high maximum summer temperatures and episodes of heavy metals during spring runoff. However, the proposal does not include any discussion of how or whether this project is being designed to make it more resilient to the impacts of these confounding factors. For example, the proponents could report that the habitat restoration is likely to increase shading from riparian vegetation and hyporheic flows owing to logjams, BDAs, and overbank flows, and is expected to lead to cooler water temperatures as a result. Given this, monitoring temperatures before and after habitat restoration should also be included.

Q4: Results – benefits to fish and wildlife

Previous projects conducted under this program focused on dealing with overburden from mining in Bear Valley Creek in the 1980s and fencing riparian zones from livestock grazing in Panther Creek and several other watersheds in the 1990s, but results from these projects are not specified.

The proposal submitted for the 2013 Geographic Review apparently focused on coordination with the CHaMP program (now discontinued) to monitor habitat in the Yankee Fork using CHaMP protocols. Any such monitoring was not reported in this proposal.

Apparently in response to the ISRP main qualification in the 2013 Geographic Review, in 2018 this program hired a consultant team to help develop two documents focusing on habitat restoration in Panther Creek, a Riverscape Assessment and a Conceptual Restoration Plan (Hill et al. 2019a, 2019b). Members of this ISRP review team read these documents and found them to provide excellent guidance, which satisfies one part of ISRP's main qualification from the 2013 Geographic Review: *"in any future proposal ... develop clear links with a watershed assessment, well developed restoration alternatives, and specific strategies."*

References

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Roni, P., T. Beechie, R. Bilby, F. Leonetti, M. Pollock, and G. Pess. 2002. A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in Pacific Northwest watersheds. *North American Journal of Fisheries Management* 22:1-20.

200205900 - Yankee Fork Salmon River Restoration Project

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Shoshone Bannock Tribes

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Response requested - pending

Overall comment:

The proponents agreed to address the ISRP's response request from the preliminary review by May 2022. The Council granted a time extension to provide adequate time for the proponents to work with third parties and seek expert assistance to complete their revised proposal.

The ISRP appreciates how much the Shoshone Bannock Tribe (SBT) values the Chinook salmon and steelhead in the Yankee Fork, and the role of harvest opportunities for these fish in reviving SBT salmon-based cultures. The ISRP is offering advice based on western science for improving efforts to restore fish habitat and monitoring the results, which can be integrated with SBT Traditional Ecological Knowledge in hopes of sustaining and increasing these fish populations for use by the SBT.

The proponents are commended for planning and completing eight comprehensive habitat restoration projects during 2012 to 2020. The ISRP was impressed by their timely response with partners to the emergency created by loss of surface flow after restoration in the Bonanza

reach (Gregory et al. 2021), and the project evaluation and adjustment diagram (Figure 5.1 in the proposal) of steps planned to address this problem in 2021 and 2022.

Unfortunately, the current proposal is not sufficiently organized or detailed to allow the ISRP to conduct a full evaluation. Much effort was required to review many past documents and reports, which were not adequately summarized in the proposal, and further questions arose from review of these documents. A revised proposal is necessary to allow the ISRP to understand the SBT's objectives for future work in the watershed and how the work will be evaluated. In addition, certain questions from previous reviews have not been adequately addressed.

Given the complex nature of this project and its history of reviews, the ISRP encourages the proponents to engage their full planning and restoration team, or seek other expert assistance, in revising the proposal and developing the response.

The ISRP requests the SBT to address the following in a revised proposal and include a brief point-by-point response to the ISRP referencing where and summarizing how the issues were addressed in that document. In addition, we request that this project participate in the development of the M&E matrix as described below:

1. **SMART objectives.** Provide a set of clear physical and biological objectives, and corresponding implementation objectives in SMART format (see proposal instructions) for work to be accomplished during the 2023-2027 phase.
2. **Updated objectives for disrupted surface flow.** Provide an updated set of objectives, and description of the project evaluation and adjustment process, for responding to the emergency of disrupted surface flow in the Bonanza Reach after habitat restoration.
3. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. We ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

4. **Population viability.** Provide a response to the ISRP request (ISRP 2013-9) to develop biological objectives for focal species (Chinook salmon, steelhead, and bull trout) that address Viable Salmonid Population (VSP) parameters and the NOAA Population Viability criteria for Chinook salmon.
5. **Fish population responses.** Provide a response to the ISRP request (ISRP 2013-9) to explain what fish population responses were collected under the CHaMP protocol for the 55 sites sampled during 2013-2018, and a plan for analyzing and reporting these data.
6. **Modified BACI design.** Provide a description of the modified BACI design (reported in Markham et al. 2019, p. 17) used to evaluate responses of fish habitat and fish populations to restoration.
7. **Water quality parameters measured.** Provide an explanation of what water quality parameters (e.g., water temperature, river discharge) will be measured and at what intervals, to evaluate the ongoing changes owing to climate change.
8. **Nutrient restoration priority.** Provide an explanation of the priority placed on nutrient restoration, a key future strategy presented in the Yankee Fork Habitat Restoration Plan (Gregory and Galloway 2019; Table 3), and identify what partners plan to pursue this objective.
9. **Description of methods.** Provide a description of methods used to complete the planned objectives, in sufficient detail for ISRP to evaluate their scientific merit.
10. **Evidence for restoration effectiveness.** Provide an explanation of the evidence for statements about restoration causing improvements at the reach scale, and at the watershed scale by 2017, based on publications that were not available to the ISRP for review (Bouwes et al. 2016; Bouwes and Heitke 2018). The ISRP requests access to these publications.

Q1: Clearly defined objectives and outcomes

The proposal presents a primary goal of restoring harvest opportunities to revive SBT salmon-based cultures, which the SBT hopes to accomplish by restoring habitat for Chinook salmon and steelhead trout. However, no quantitative physical and biological objectives, nor implementation objectives to achieve these, were presented, nor were objectives provided in the SMART format (i.e., Specific, Measurable, Achievable, Relevant and Time Bound; see the Proposal Guidelines).

For example, the proponents present a table of prioritized future projects in the Timeline section, which is duplicated from the most recent Yankee Fork Habitat Restoration Plan (Table 3 in Gregory and Galloway 2019), but no details are presented. A timeline for the different projects and a map showing their locations is needed. Below is an example of the types of statements needed to achieve the SMART format [Note: these are only examples with placeholders (letter symbols) for the specific quantities that should be included.]

Physical objective: Increase instream complexity and opportunities for overbank flooding onto the floodplain at the Pole Flat and Upper Pole Flat sites.

Implementation objective: By 2027 install R pieces of large wood, each at least S m long and T cm diameter, in a series of U jams over the V-meter segment and remove dredge spoils from W hectares of floodplain adjacent to the reach to encourage overbank flooding and side channel formation.

The loss of surface flow through the Bonanza restoration reach in 2020 following habitat restoration efforts created an emergency requiring the SBT and its partners to trap and haul migrating fish past the barrier (Gregory et al. 2021). The proposal includes a highly useful diagram (Fig. 5.1) showing a plan for project evaluation and adjustment in 2021 and future years to address this crisis. This work should be stated as the first objective of the proposal, to continue evaluation and adjustment to address this crisis in 2023 through 2027.

Past ISRP reviews (ISRP 2013-9) requested the SBT to develop biological objectives for focal species (Chinook salmon, steelhead, and bull trout) that address Viable Salmonid Population (VSP) parameters and the NOAA Population Viability criteria for Chinook salmon, but these were not presented in the proposal. They were discussed in the Yankee Fork Habitat Restoration Plan (Gregory and Galloway 2019) and should be summarized in the proposal.

Past ISRP reviews (2013-9) also requested monitoring of the fish population response to the habitat restoration. The final report on monitoring of water quality (Markham et al. 2019) includes a section (p. 17 of the report) describing a rotating panel of 55 sites in which fish habitat was measured and snorkel surveys of fish were completed by the SBT during 2013-2018 based on a design planned by Watershed Solutions (2013) using the CHaMP protocol. In the Response to Past Council Recommendations and ISRP Reviews, the proposal reported that over 20 years of fisheries data have been collected but apparently have not been analyzed. The ISRP requests a summary of these data and a plan for analysis and reporting of them. The most recent summary of fisheries data found is reported in Gregory and Wood (2013). The ISRP understands that discontinuing CHaMP and ISEMP by BPA created problems for these efforts but needs to understand the current status of the work, data, analysis, and reporting.

In addition, the proponents reported that a modified BACI (Before-After-Control-Impact) design would be used to evaluate the responses of fish habitat and fish populations to the restoration, but the design of this study was never presented. The ISRP requests basic information on whether the design laid out in Watershed Solutions (2013) will be continued, and specifically what fish population responses will be measured.

The ISRP understands that other partners may be measuring some characteristics of habitat and fish populations. If this is the case, we request the proponents present a table or matrix identifying what partners will be measuring which characteristics, so it is clear to the ISRP review team.

Extensive sampling and analysis of water quality characteristics was conducted during 2006 to 2018, which showed that water quality in the Yankee Fork met IDEQ criteria and was excellent overall. During the presentation, Ms. Galloway reported that there were no plans to continue this work. However, ongoing climate change is likely to alter water temperature and perhaps flow and other characteristics. In addition, past ISRP reviews have requested information on toxic chemicals such as mercury (used in extracting gold) or heavy metals, but it's unclear to what extent water samples have been analyzed. The ISRP requests information on plans by SBT or a partner agency to continue monitoring temperature and flow to address future climate change and the status of measurements of chemicals potentially toxic to fish and other aquatic life.

In the Yankee Fork Habitat Restoration Plan, one long-term strategy presented is nutrient restoration (see Table 3 in Gregory and Galloway 2019). The ISRP requests information about whether this strategy is being implemented by SBT or a partner.

Q2: Methods

Detailed methods are provided in annual reports for monitoring water quality, and methods for other restoration actions are described in variable detail in some of the annual reports and in the Yankee Fork Habitat Restoration Plan (Gregory and Galloway 2019). However, the methods are not summarized in the proposal nor linked to the proposal in a way that facilitates evaluation, especially with respect to continued monitoring. Please provide these summaries and linkages.

Only a very general description of methods is included in the proposal, and because specific objectives were not provided, these methods do not follow logically from planned objectives. Please make these linkages clear in the revised proposal.

Q3: Provisions for M&E

As described above under Objectives, it is unclear what monitoring data were collected for habitat or fish populations by SBT under the CHaMP sampling protocol described in Watershed Solutions (2013). This should be explained, and a plan presented for future monitoring, analysis, and reporting of these data.

The ISRP (2013-9) requested monitoring to assess whether the overwinter cover for juvenile fish created in Pond Series 3 project, and other projects in this series, were actually used by fish. Was this monitoring completed? If so, the results should be reported in the proposal.

Q4: Results – benefits to fish and wildlife

The proponents are commended for planning and completing eight habitat restoration projects during 2012 to 2020, as described in Table 1 of the Yankee Fork Habitat Restoration Plan (Gregory and Galloway 2019). In several reports they state that these actions resulted in immediate improvements to fish habitat at the reach scale, with evidence of habitat improvement actions at the watershed scale by 2017 (Bouwes et al. 2016; Bouwes and Heitke 2018). Unfortunately, these references were not listed, nor provided. The ISRP requests links to these reports and information about the evidence used to draw these conclusions.

References

Bouwes, B., J. Heitke, and G. O'Brian. 2016. Yankee Fork River status, trend and effectiveness monitoring: 2013 – 2015 results. Report by Watershed Solutions Inc. (Boise, ID) to the Shoshone Bannock Tribes, Ft. Hall, ID.

Bouwes, B., and J. Heitke. 2018. Yankee Fork River status, trend and effectiveness monitoring 2013 – 2017 results. Report by Watershed Solutions Inc. (Boise, ID) to the Shoshone Bannock Tribes, Ft. Hall, ID.

Gregory, J.S., and E. Galloway. 2019. Yankee Fork Habitat Restoration Plan Yankee Fork Salmon River, Idaho. Report to Yankee Fork Interdisciplinary Team.

Gregory, J., M. Knutson, and E. Lyon. 2021. Bonanza City floodplain restoration project fish migration impacts mitigation plan for 2021. Report from Lost River Fish Ecology and U.S. Bureau of Reclamation.

Gregory, J.S., and C.L. Wood. 2013. Yankee Fork drainage fisheries summary and analysis. Report to U.S. Bureau of Reclamation, Boise, ID.

Markham, J., J. Gable, and E. Galloway. 2019. Yankee Fork Restoration Project: Baseline water quality data--Yankee Fork Salmon River, February 1, 2018-January 31, 2019. Report to Bonneville Power Administration from the Shoshone Bannock Tribes, Fort Hall, ID.

Watershed Solutions Inc. 2013. Fish habitat monitoring plan for the Yankee Fork watershed: status, trend and effectiveness monitoring. Report to the Shoshone Bannock Tribes.

200890400 – Salmon River Basin Nutrient Enhancement

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: The Shoshone-Bannock Tribes

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

This proposal has many strong elements, notably the scientific rigor of the approach, the credentials of the team, and their record of publishing their results in the peer-reviewed literature. However, the published literature on this subject, from studies in this basin and elsewhere, is now very extensive. Consequently, the benefits of continued studies to improve our general understanding of the effects of adult salmon on stream ecosystems and the feeding of juvenile salmonids (bioturbation, carcass decay, carcass analogs, etc.) are not clear. The practical applications may be limited if annual repetition of nutrient analogs or carcasses at each site will be needed to provide any benefits. There are also alternative factors that may determine the limits of salmonid production other than nutrients. The legacy of mining is important in this system, and many Idaho streams are heavily and adversely affected by water withdrawals leading to low flows, high water temperatures, habitat degradation, poor water quality, and many other factors unrelated to nutrients. Combined with the uncertain links between growth within and among years on survival to return, the utility of nutrient additions on a large scale (i.e., across many basins in the region) seems uncertain.

The ISRP's recommended Conditions are listed below. The proponents need to assist with development of an M&E Matrix during the response loop (September 24 to November 22,

2021) and to provide information to address the other following Conditions in future annual reports and work plans.

1. **Details on proposed future work.** Clearly explain the experiments and analyses to be conducted during the period for which funding is requested, as distinct from those studies already done or ongoing. The proponents wish to “evaluate the efficacy of marine-derived nutrient treatments designed to increase freshwater productivity and the growth and survival of stream-dwelling salmonids” [p. 12] but the methods for studying growth and survival, and integration of those data, are not evident. Specifically, the proponents need to present the sampling design and power to falsify the null hypothesis that there is no effect of treatments on growth and survival.
2. **Scaling-up project actions.** Provide a more thorough description of the framework and methods for scaling up to a whole watershed and understanding the relative effects of “food” via salmon carcass additions of various types (live, dead, and analogs) and “habitat” from various habitat restoration treatments, alone and together. The study treatments for food and habitat are apparently confounded, so that their effects cannot be separated.
3. **SMART objectives.** Provide the objectives in the SMART format (see proposal instructions).
4. **Project evaluation and adjustment.** Describe the formal process for evaluation and adjustment of the project.
5. **M&E matrix - support.** As habitat projects and monitoring projects are not presented as part of an integrated proposal or plan, the need for a crosswalk to identify the linkages between implementation and monitoring is extremely important for basins or geographic areas. The ISRP is requesting a response from the Upper Salmon Basin Habitat Restoration Project (200739400) to summarize the linkages between implementation and monitoring projects in the Salmon River basin. During the response loop, we ask this project to assist them in creating the summary and provide information to them about what is being monitored for this implementation project and where and when the monitoring occurs. A map or maps of locations of monitoring actions would be helpful in this regard.

Q1: Clearly defined objectives and outcomes

The proponents report three overarching goals of the Shoshone-Bannock tribe, and tribal objectives for adult returns to the Yankee Fork Salmon River watershed, and then present two goals to support these overarching tribal goals, and several objectives for each. The distinction

between goals 1 and 2 is not sufficiently clear. Goal 1 is essentially to increase the viability of native salmonid populations by coordinating physical habitat, hatchery supplementation and nutrient enrichment actions; the five associated objectives all involve investigating food as a limiting factor. Goal 2 is essentially to increase the viability of native salmonid populations by coordinating with collaborators to prioritize and implement habitat restoration actions; the actions considered in goal 2 would seem to address all limiting factors, not just food, but presumably still include food (e.g., density dependence is mentioned).

Most objectives for Goal 1 are specific, measurable but not explicitly quantitative, probably achievable, and relevant, but the time period over which they are to be accomplished is not detailed. The proposal suggests that many will be measured annually, but over what time period? Five years? In contrast, most objectives for Goal 2 appear aspirational rather than specific. In particular, it is uncertain how proponents will “implicitly consider density-dependent processes.” Density-dependence is not easily measured, and if it is based on counts of spawners and recruits, it will require some decades to assess using stock-recruitment relationships. These objectives, while laudable, need to be reframed in SMART format.

The proponents list a sweeping set of objectives, but the work to date is much more narrowly focused on assessing the efficacy of marine-derived nutrient treatments to increase freshwater productivity and the growth and survival of stream-dwelling salmonids in the upper Salmon River Basin. However, how do we know that nutrients are limiting in this and other systems in the region? If there are too few adults (i.e., “the paucity of returning anadromous fishes,” p. 4), then density may be low and thus food not limiting. If so few adults return from the sea that they do not even replace the nutrients lost when smolts leave, the problems in the system seem more fundamental and less tractable than can be addressed with carcass analogs.

Live salmon, dead salmon, and analogs can bring nutrients to a system, but they are no panacea. Collins et al. (2015 - cited in the proposal) stated, “we urge caution in the application of nutrient mitigation as a management tool. Although applications of nutrients and other materials intended to mitigate for lost or diminished runs of Pacific salmon may trigger ecological responses within treated ecosystems, contributions of these activities toward actual mitigation may be limited.” Given these caveats, the benefits of nutrient enrichment should be viewed as hypothesized and subject to testing rather than assumed, but in some places this distinction is not clear.

Q2: Methods

Methods for past studies are described in commendable detail in the most recent annual report (Kohler and Richardson 2019). Other sources of methodological details are cited in an extensive

list in Appendix 4. The MBACI design used to evaluate stream food web responses to salmon carcass analog (SCA) additions seems appropriate. Four treatment streams and two control streams were chosen randomly. The four treatment streams were delineated into 6-km segments, each with a 3-km upstream control/reference segment and a 3-km downstream treatment segment that received the SCA additions.

The ongoing study has a BACI design, with one upstream control segment and one downstream treatment segment, each ca 1-2 km. However, the treatment is a combination of large wood additions (habitat) and salmon carcasses (food), so any response detected will be from this combination of factors. Given this, the experiment will not answer the question of whether either factor alone would have had the same effect as the two factors together.

A factorial design with each factor alone and in combination, compared to a control, would be preferred, although twice the effort (four treatments instead of two). Or, if the effects of salmon carcasses are now known then the three treatments of Control, added Habitat, and Habitat + Salmon Carcasses would address many aspects of this key question. Finally, it is unclear whether the description of the “quasi-treatments” applied throughout the watershed (e.g., habitat restoration and salmon carcasses) are this same BACI experiment. It would be helpful if the proposal had clarified exactly what was learned from past work and distinguish that from what is ongoing and planned for this funding period.

Some methods for the ongoing work are described in only a few sentences. Consider the proposal to measure density-dependence via growth and emigration. How will this measurement actually be accomplished? Other aspects are similarly incomplete or unclear. For example, the first paragraph on page 14 is confusing and the associated reference (Peterson and Heron 2018) is missing from the References section: *“In 2015 and 2016 we collected chemical, physical, and biological measures in a spatially explicit manner across the YFSR watershed in order to parameterize a watershed-scale Aquatic Trophic Productivity (ATP) model (Whitney et al. 2020) and to fit spatial statistical stream-network models (SSNs) to 10 measures of macroinvertebrate drift, water quality, nutrients, and metabolism, using readily available covariates (i.e., predictor variables) representing topography, network topology, river flow, and climate. The fitted models were used to generate predictions at 1km intervals throughout the YFSR and the West Yankee Fork Salmon River.”*

It is not clear what variables are being predicted and what fitted models are being compared. Are different models (i.e., models with different covariates) being compared for their ability to predict each of the 10 different variables, or are there just 10 different models, each one being fitted and tested for its ability to predict a different variable of interest?

The goals of the study explicitly include collecting data to determine the effects of nutrients on “the growth and survival of stream-dwelling salmonids” and this reflects some of the Objectives listed in 1d. However, there is no adequate description of methods that would achieve these goals related to salmonid growth and survival.

In the Potential Confounding Factors section, the proponents suggest that nutrient enrichment, initiated to increase food-web productivity, might indirectly ameliorate climate change (e.g., temperature) effects on growth rate. This relationship implies that changing climate could be a confounding factor in their experimental design. Presumably, their analyses with the ATP and SSN models allow them to control for climate change effects in their evaluation of nutrient enrichment. Similarly, if nutrient enrichment can have unintended consequences in the presence of non-native brook trout, the presence of brook trout should have been considered and controlled for in analyses to date.

Finally, given the very broad overall Goal 1, “Increase carrying capacity, productivity, spatial structure, diversity, and population abundance for native salmonids in the Yankee Fork Salmon River watershed through process-based restoration principles that coordinate physical habitat, hatchery supplementation, and nutrient enrichment actions,” it seems surprising that the proponents focus on nutrient enrichment, which will require annual inputs. Alternative forms of habitat enhancement, acquisition of water rights, etc. would seem to be more consistent with the philosophy of allowing the river to mend itself without continued human intervention.

Q3: Provisions for M&E

The proponents have a good track record of refining their hypotheses based on new findings and adapting their experimental approach. They are now attempting to use a structured decision-support (i.e., Atlas) process to apply past evaluations and lessons learned to inform sound science and planning at the watershed scale. The proposal indicates that a diverse array of stakeholders will participate in the Atlas planning process via the Yankee Fork Salmon River Interdisciplinary Team, and that evaluation results and decisions will be documented during meetings and disseminated in presentations, annual reports, and in published papers. However, more details about the meeting process and schedule would have been helpful and should be included in future proposals. In addition, more information on the evaluation and adjustment process would have been helpful.

Q4: Results – benefits to fish and wildlife

The proponents have completed and published a set of eight studies addressing whether marine-derived nutrients delivered by spawning anadromous fish are important to stream food

webs leading to fish, and whether the currently depressed fish populations may be exporting more nutrients in smolts than the adults are importing. The project has provided new knowledge with practical benefits for fish and wildlife, especially if applied judiciously at a larger scale. Excerpts of key findings in the proposal include:

Benthic macroinvertebrate abundance and biomass increased after SCA treatments in 2010, 2011, and 2012, with no apparent reduction in taxonomic diversity or evenness. However, one year after SCA treatments, benthic macroinvertebrate abundance and biomass appeared to return to baseline conditions, suggesting that annual nutrient enhancement would be needed to stimulate benthic invertebrate production through time. Drift invertebrate abundance and biomass increased 2-3 fold one month after SCA additions in both 2010 and 2011 but appeared to decline toward baseline conditions 60 days after treatments. Taken together, organic material and nutrient additions (i.e., SCA) significantly increased short-term food resources for stream dwelling salmonids in upper Salmon River Basin study streams. Measures of the energetic profitability of stream habitat for salmonid fishes revealed small, yet significant increases in net energy availability in streams that received analog additions, but only after controlling for differences in physical habitat features such as temperature and stream flow.

Results suggest that density dependent processes are important. When adult abundance falls below ~500 spawners, juvenile salmonid nutrient exports are likely to exceed adult imports. This finding has important implications for managers attempting to protect, enhance, and restore ecosystem functions and natural processes in headwater streams/lakes above highly modified habitats

While the results of the previous studies were useful, the scientific literature on the ecological role of salmon digging and nutrients from their carcasses in aquatic and terrestrial ecosystems has exploded since the early 1990s. Consequently, the value of new research must be put in the broader context of what is established and what is not. Perhaps not surprisingly, the closer the trophic connection, the stronger the response, as was also seen in lake fertilization projects designed to enhance sockeye salmon populations. That is, the connection between fertilization and lake phytoplankton was strong, the connection to zooplankton evident but weaker, the connection to juvenile sockeye salmon growth weaker still but generally evident, and the connection to adult returns at best very slight. Thus, the overall benefits to adult salmon from stream nutrient additions cannot be assumed from positive responses at intermediate trophic stages. Many factors other than nutrients affect juvenile salmon growth and survival (temperature, competition, habitat, predators, human disturbances, etc.) in streams, and the return of smolts to the river as adults.

The text on hypothesized benefits of nutrients to adult salmon abundance cites Benjamin et al. (2020, CJFAS). However, that work is based on a model linking smolt size (related to enhanced food, notwithstanding possible limitations from temperature and competition) and survival at sea. The preponderance of the scientific literature on salmon indicates that there is little benefit in mean annual survival from increased average smolt size. The benefits of increased size tend to be relative, conferred to the largest individuals within a given cohort, rather than to all individuals above an absolute size, likely because other ecological processes control variation in survival among years. Consequently, even if added nutrients result in larger smolts (and this is by no means certain), the benefits for adult returns are likely to be small at best.

It is easy to model the benefits of food for growth, and growth for survival, but the effects of food on survival are seldom that simple. Indeed, larger smolts tend to produce younger and hence smaller adults. Given these considerations above, the ATP / Life Cycle Model approach is important and perhaps should have been done first, taking advantage of the abundant literature on carcasses, analogs, nutrients, and the production of salmonids in streams, and size-selective survival, growth at sea and so forth. However, the inputs and especially those related to the benefits of growth need to be done very carefully so as not to preordain the outcome.

The conceptual model presented by Benjamin et al. (2020, Figure 1) will be linked to the ATP model in the proposal here, but this seems to neglect a possible important pathway. Specifically, in the model, the flow of nutrients from carcasses is almost exclusively within the aquatic realm. Some consumption by terrestrial invertebrates is included, and some effects on riparian vegetation too, but those pathways are brought back to the aquatic community. The significant role of scavenging by terrestrial animals in carcass nutrient distribution was reported by Cederholm et al. (1999), and subsequent work in many systems has confirmed this.

For example, Kaylor et al. (2020 - Ecosphere) conducted nutrient enrichment experiments in the Upper Grande Ronde River system and reported that at one of their three sites, black bears absconded with so many of the carcasses that the study of aquatic pathways was compromised. In addition, they reported that the incorporation of nutrients by juvenile Chinook salmon and steelhead was "primarily through direct consumption of eggs and carcass tissue." Thus, the form of nutrients most likely to be beneficial (real salmon, digging, and leaving surplus eggs) are least likely to be available, and most likely to be transferred from the stream by scavengers. Such scavenging benefits the wildlife but does not advance the goals related to fishes.

Reference

Cederholm, C.J., M. Kunze, T. Murota, and A. Sibatani. 1999. Pacific salmon carcasses: essential contributions of nutrients and energy for aquatic and terrestrial ecosystems. *Fisheries* 24: 6-15.

200890500 - Supplementation Projects

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Shoshone-Bannock Tribes

Province/Subbasin: Upper Snake/Snake Upper

Recommendation: Meets Scientific Review Criteria - Conditional

Overall comment:

Declines in salmon and steelhead abundance and distribution in the Snake River basin have had dramatic effects on the Shoshone-Bannock Tribes culture, livelihoods, and sustainability. Although extensive restoration and enhancement efforts are underway to recover ESA-listed Snake River salmon and steelhead, populations remain severely depressed and have trended downward in recent years. The overarching goal to restore historically important tribal fisheries directly addresses a critical cultural need. The proponents describe their desire to advance and forward the importance of linking Shoshone-Bannock Traditional Ecological Knowledge (SBTEK) with western science and hatchery supplementation strategies. We compliment the Shoshone-Bannock Tribes for the extensive and effective presentation and integration of SBTEK throughout the proposal. It was well done and highly informative.

Overall, the objectives generally describe the desired outcomes. The methods include extensive tasks along with detailed hypotheses for each monitoring question. The objectives lack time frames, and some objectives for essential work like, coordination and education and outreach were not provided. The objectives need to be revised (see conditions below).

Extensive methods are presented in the proposal and appendices. For some objectives, they are clear; however, there are some improvements and additions needed (see conditions below).

The project has a reasonable set of accomplishments and has demonstrated high egg survival in incubation boxes for steelhead and Chinook salmon. Limited information is provided on post-release survival and adult return performance for remote site incubator releases.

The ISRP agrees with the conceptual and logical structure of the studies, and the proposal has many strengths. However, modifications and additional information are needed. Many of these

recommendations were previously identified in the 2011 ISRP review (see ISRP Memorandum 2011-16).

In the next annual report and future work plans, the proponents need to provide information to address the following Conditions:

1. **Objectives.** Provide timelines for each objective where timebound objectives are needed. Consider adding objectives for coordination, education, outreach, and participation in adaptive management processes.
2. **Methods.** Describe in more detail (than provided in Appendix A and the methods section) what experimental designs and statistical models will be used to achieve objectives 2-4. The proponents should seek statistical design support if needed.
3. **Project adjustment process.** Provide more information about the institutional procedures and schedule (i.e., meetings and reviews) that will be followed to implement the adaptive management process described in the proposal.
4. **Plans for captive broodstock and Bonneville Hatchery releases.** The proposal describes two alternative hatchery strategies to address Snake River Chinook salmon egg limitations for the incubation box supplementation strategies. It is not clear if these options are a component of this project or other projects. If this project is proposing these options, much more information is needed to assess the scientific merit. We suggest completing a planning process that examines and compares the potential benefits and risks of the proposed alternatives. A comparison is needed of the current plan for a new hatchery with supplemental breeding and smolt releases at Bonneville Hatchery (combined with transport of a conservation component of eyed-eggs for streamside incubation in treatment streams to provide for a natural life cycle).

Q1: Clearly defined objectives and outcomes

The project has multiple stated goals of which two seem to be most important: 1) restore harvest opportunities for tribal membership, essential to reviving Shoshone-Bannock salmon-based cultures and 2) increase natural production using supplementation informed by Shoshone-Bannock Traditional Ecological Knowledge (SBTEK) and the Idaho Supplementation Studies. These goals directly address the overarching problems created by severely depleted runs of salmon and steelhead returning to the traditional fishing areas of the Tribes. The proponents describe the desire to advance the importance of linking SBTEK with hatchery supplementation approaches. The proposal appropriately highlights the need for a well-designed study of the effectiveness of supplementation using remote site egg incubators.

There are six objectives presented to achieve the goals and guide the proposed hatchery egg out-planting as well as the monitoring and evaluation efforts: 1) Determine the proportions of subyearling vs yearling emigrant life-history types among adults returning to Panther Creek, 2) Evaluate and optimize methods for egg incubation, 3) Estimate the proportional contribution of egg supplementation to juvenile and adult production, 4) Evaluate the effects of egg supplementation on the productivity of natural-origin Chinook salmon, 5) Disseminate findings in technical reports, presentations, social media campaigns, and scientific manuscripts and 6) Monitor increases in tribal member harvest through creel surveys.

We greatly appreciate the integration and linkage between SBTEK and western science in the objective descriptions. Overall, the objectives generally describe the projects desired outcomes, but there are some weaknesses in the objectives. The level of detail is limited, and objectives do not meet SMART criteria as presented, but most of them describe implicitly quantitative tasks (i.e., to “determine,” “evaluate” or “optimize”). They are also supported by specific and testable (but not explicitly quantitative) hypotheses and tasks listed under each objective in the Methods section. None of the objectives includes timelines, which are essential elements for SMART objectives. It is not clear when the work on each objective will begin or end. In addition, the proponents should consider adding objectives for education and outreach, data management, web-based data sharing, coordination, and adaptive management decision making.

There are no objectives related to steelhead egg outplanting or monitoring and evaluation, which have been important elements of the project in the past. The steelhead supplementation and monitoring efforts were dropped from the project due to funding limitations. In the Confounding Factors section the proponents identify the possible need to initiate captive broodstock or begin smolt releases at Bonneville Hatchery as an egg bank strategy to address limited egg supplies available from Snake River summer Chinook hatchery programs. The proponents should develop objectives for planning and coordinating such major changes to the artificial production program.

Q2: Methods

The methods section is extensive with multiple appendices. For some elements, the description of methods is clear and scientifically sound. The project uses a diverse set of sampling and analytical protocols including remote site incubators, adult weirs, instream PIT arrays, electrofishing, eDNA surveys, PBT, otolith microchemistry, and harvest monitoring. There is creative integration of multiple methods and the proponents are taking appropriate advantage of new technologies like parentage-based tagging (PBT) to evaluate fish production from egg supplementation, otolith microchemistry to investigate rearing juvenile behavior, and e-DNA to

identify tributaries not used by Chinook salmon. Taken together, this proposal includes a variety of methods to test a series of important hypotheses in a culturally sensitive context.

Methods are described briefly in the main proposal (and appendices) and in commendable detail in the annual report for 2018. The ISRP agrees with the conceptual and logical structure of the experiments listed under objectives 2-4, but more detail is needed than is provided in Appendix A about the experimental designs, analytical approaches and statistical models that will be used. In tasks 2.2 and 2.3 in particular, variation among tributary blocks might be conflated with variation among families. For task 2.2, would it be possible to control for tributary effects across families within each incubation type, perhaps by using 2 egg boxes and 2 artificial redds per tributary? Further explanation of the statement on page 26 about pseudo-replication in South Fork Salmon is needed. For task 2.3, it is possible that there may be an interaction between the number of eggs per box (incubation density) and the number of boxes per tributary (optimal density in stream). Would it not be useful to investigate these effects separately?

For objective 4, the proposal provides little information to assess if the multiple requirements and assumptions needed to execute a BACI design can be met. No evidence is presented to demonstrate that the control site has similar habitat and fish production characteristics as the proposed treatment site. The proposed design (BACI with one treatment and one control stream) and time period (4 years?) may not have enough statistical power to detect moderate or small but biologically meaningful effects of supplementation on the productivity of naturally spawning salmon given expected variability in other factors. It is important to use *a priori* modeling to investigate the statistical power of the experimental design and statistical analyses being proposed. Some important questions to consider include: Are there enough natural origin adults returning to Musgrove Creek control to achieve adequate adult and juvenile sample sizes? How many strays return to Musgrove Creek, and how will they be dealt with in the experimental design? The proponents should examine alternative options for control population. There are numerous unsupplemented spring-summer Chinook salmon populations in the Snake River basin that may serve well as controls for the Panther Creek population supplementation.

Q3: Provisions for M&E

The project has extensive monitoring and evaluation to support the project adjustment process. The proponents understand and embrace the value of the adaptive management cycle for evaluating progress and adjusting approaches and objectives. The proposal does not describe the institutional procedures and schedule (i.e., meetings and reviews) that will be followed to implement adaptive management. The project adjustment description would be

improved with discussion of how information from this project informs higher-level management decisions. The example of how the process will be applied to the optimization of remote site incubation and artificial redd strategies is informative. Figure 5.1 provides a very clear set of decision branch-points to illustrate the different hypotheses and methods. This is a helpful way to portray the complete set of monitoring questions and the transition from results to application. We understand that the process being proposed is a simplification and that actual implementation will be complicated by policy decisions and by U.S. v Oregon agreements. Examining changes in Tribal and non-Tribal perspectives and connections is novel and should prove useful in a social and cultural context.

The proponents highlight the impact and importance of the magnitude of mortality experienced during both downstream and upstream migration under prevailing and expected future conditions. This level of mortality poses formidable risk to the availability of broodstock and eggs for their experiments and to the viability of Chinook populations in their study streams. They have given considerable thought to alternative approaches to proceeding in the face of these and other confounding factors beyond their control. The proposal describes some future hatchery production options to address potential limitations in availability of Chinook salmon eggs. These options include major program and production efforts for captive broodstock and/or release of Snake River hatchery spring Chinook salmon from Bonneville Hatchery. The proponents should complete a benefit-risk assessment to compare potential hatchery alternatives including captive broodstock, smolt releases at Bonneville Hatchery, and the current proposed approach to help inform a wise decision on the best future options.

Q4: Results – benefits to fish and wildlife

Evaluating the efficacy of different approaches to salmon and steelhead supplementation, enhancement, and natural production has obvious value. Without such evaluations, outdated methods may continue when ones that are more effective are available. Or, if the old methods are found to be optimal, then they can be used with greater confidence. Either way, the project benefits management, salmon, and people.

This project has been using streamside egg incubation techniques to supplement Chinook salmon and steelhead across a broad geographic area since 1995. The sources of Chinook salmon broodstock have changed through time with a final selection of the Pahsimeroi River summer Chinook salmon as the donor. This proposal lays the foundations for a new and potentially valuable series of experiments to test the effectiveness of remote site incubators. Results and methods for pilot studies in support of this proposal are described in commendable detail and clarity in the annual report for 2018.

The project has made substantial progress in achieving past objectives and a significant number of lessons have been documented to help guide future efforts.

200890600 - Crystal Springs Hatchery Planning, Operations, and Maintenance

Links to: [Proposal](#) | [Past reports](#) | [Past reviews](#)

Proponent: Shoshone-Bannock Tribes

Province/Subbasin: Upper Snake/Snake Upper

Recommendation: Not Applicable

Overall comment:

This is a hatchery construction and operations planning project that has been underway for over a decade. The project has been engaged in the Council's Hatchery Step Review Master Planning Process, which was initiated with a Master Plan submittal in 2011. The proposal highlights the proponents' intent to continue and complete the Step Review Process to obtain authorization for construction and operation of Yellowstone cutthroat trout and spring-summer Chinook salmon hatchery facilities and programs. The Step Review Process has been prolonged as a result of discovering that the water chemistry at Crystal Springs is inadequate (too hard) for rearing spring Chinook salmon. This finding has created the need to locate and develop an alternate site for spring Chinook salmon production. It is regrettable that time was lost, but it would have been more regrettable to build the facility only to find out it was unsuitable for Chinook salmon rearing.

The Shoshone-Bannock Tribes requested that the ISRP defer any recommendations based on the current Categorical Review of the project proposal and to allow the Step Review Process to proceed to the final determination. We acknowledge the challenges that can result from multiple review processes occurring simultaneously. We accommodated the request and did not review the proposal to assess the adequacy in meeting scientific criteria. However, we conducted a specialized tailored review because of the proponents' efforts to prepare and submit the proposal and our desire to highlight strengths and weaknesses and provide input that we hope will help inform sound development of Step 2 and Step 3 submittals. This review does not address any specific criteria identified in the Step Review requirements. There will be no responses requested or conditions identified based on this review.

Tribal ceremonial and subsistence harvest opportunities have been severely limited. Chinook salmon runs have declined precipitously throughout the Tribes' usual and accustomed fishing areas. All salmon populations in the Salmon River subbasin are part of an ESU listed as threatened under the ESA. Historically, harvest of salmon and other native species provided up to 700 pounds of fish per tribal member annually. In recent years, harvest has only provided 0.5 pounds of fish per member. The loss of available harvest has impacted Tribal culture and subsistence in a many ways. Hatchery programs are being planned and developed to restore fishing opportunities for Chinook salmon in Panther Creek and Yankee Fork. In addition, hatchery construction and operations are planned for Yellowstone cutthroat trout to provide tribal and non-tribal harvest on the reservation. The proposed hatchery programs are considered essential for restoring historically important place-based tribal harvest opportunities.

The project has made considerable progress in the Step Review Process. A Master Plan was submitted in 2011 in Step 1. Following review by ISRP and proponent responses, the project met review criteria (qualified). Designs were completed through 90% and a draft EIS was released in 2017. Unfortunately, NOAA operational plan reviews identified a critical high-risk factor for rearing Chinook salmon at Crystal Springs. Studies concluded that due to hard water, the Crystal Springs site would be unsuitable for Chinook salmon rearing. Consequently, an alternative hatchery location must be found, which has delayed the planning process. A location on the Pahsimeroi River is the preferred location currently being evaluated, but it will have major disease and operational challenges with an IDFG summer Chinook hatchery located not too far upstream. The proponents should consider other production alternatives in case a suitable location in the Salmon River subbasin cannot be identified. Early success in improving smolt outmigration survival to Lower Granite Dam using acclimation in river water prior to release has been demonstrated with hatchery reared Snake River sockeye salmon reared in similar hard water and that showed similar physiological rearing responses at Springfield Hatchery. The proponents should consider pilot experiments to evaluate the influence of acclimation in river water on smolt quality and migration performance. Such an approach may be the best overall alternative if a new hatchery site cannot be found.

The project is well guided by clear Tribal policy standards that highlight the need to restore natural conditions and ecosystem processes, revitalize traditional Tribal systems of management including tribal place-based fisheries, and protect Tribal treaty rights. We strongly support the overall desires to produce and release high quality smolts, use local broodstock, and have sufficient monitoring to allow for effective adaptive management. The proposal presents five goals (note that the goals are incorrectly numbered in the proposal with Goal 4 absent). These goals provide a mix of qualitative and quantitative outcomes. Each goal is supported by one or more objectives. Some of the objectives are well stated with quantitative

desired outcomes and timelines, and some are not. Although the goals and objectives are extensive, there is a lack of clarity for some objectives.

Objectives 1 and 2, associated with Goal 2 (rearing and release of 30,000 cutthroat trout) lack SMART objective elements of quantitative outcomes and timelines.

Objectives 1 and 2 associated with Goal 3 are confusing and there is a lack of clarity regarding production numbers of spring Chinook smolts for release in Panther Creek and Yankee Fork. Objectives 1 and 2 both include rearing 600,000 Chinook salmon smolts. Is the total production goal actually 1.2 million, or is this an unintended duplication? It is unclear if the project objective to produce 600,000 smolts is in addition to the 300,000 currently produced at Sawtooth Hatchery and released in the Yankee Fork. The table provided illustrating the Panther Creek and Yankee Fork broodstock, natural spawning, and harvest goals only presents one set of numbers, and it is not clear if these are for Panther Creek only or both rivers combined. The table needs to provide specific numbers for each program. There is need for more specificity regarding broodstock for each of these two programs.

There is also similar lack of clarity regarding treatment stream juvenile acclimation and adult recapture facilities planned for both Yankee Fork and Panther Creek. Will adult collections also occur at the new Pahsimeroi Hatchery facility?

The proposal clearly identifies the importance of monitoring and evaluating natural populations and responses of the treatment streams. It is reassuring that the project will include East Fork Salmon River and Bear Valley Creek as untreated reference populations. Additional details and analyses regarding the selection of these reference streams, including demonstration of correlations among the response variables, will be needed in the final monitoring and evaluation plan.

Methods described for completing the Step Review Process are adequate. Few details are provided about methods for achieving the remaining objectives, which is understandable given the current status of the planning efforts.

The project has a well-defined and clearly described project adjustment process that includes decision rules and quantitative criteria for the hatchery development phase. The proposal does not describe higher-level adaptive management decision processes that will be used to evaluate and adjust the program once fully implemented. This higher-level process needs to be developed and described.

The proposal presented a thorough consideration and approach for addressing climate change with specified actions and time frames.

We thank the Shoshone-Bannock Tribes for the proposal submittal. We hope this review provides useful information for the preparation of the required Step Review documents. We encourage expedited completion of the final master plan and look forward to future conversations and interactions with the project proponents.

200740200 - Snake River Sockeye Captive Propagation

Links to: [Original proposal](#) and [Response and revised proposal \(link to folder\)](#) | [Past reports](#) | [Past reviews](#)

Proponent: Idaho Department of Fish and Game

Province/Subbasin: Mountain Snake/Salmon

Recommendation: Meets Scientific Review Criteria

Final review comment:

We thank the project proponents for their point-by-point response and revised proposal which, in combination, adequately addressed three of the four issues raised in the preliminary review. The ISRP still has questions and suggestions regarding methods for estimating carrying capacity of nursery lakes that is discussed below. In our preliminary review we requested responses on the following four topics. Our final comments on the proponents' responses follow each topic:

- 1. Additional objectives.** The proponents modified the proposal to include one new goal and six implementation objectives associated with adaptive management, coordination, outreach, and publication. The additional goal and objectives create a complete and sound set of goals and objectives that will guide the project well into the future.
- 2. Methods for estimates of carrying capacity methods for nursery lakes.** The proponents revised the methods section to include a more complete description of the approach used to estimate carrying capacity of the nursery lakes. The added information does not provide the requested clarity for the methods or results. The response does not provide new data, analyses, or results to support the estimates of carrying capacity, and no additional discussion is provided of how the estimates influence selection of release strategies and production targets. Additional references provided do not appear to address density dependence or carrying capacity. We suggest the proponents provide a

more complete description of the specific methods for estimating carrying capacity of the nursery lakes.

3. **Rationale for release strategies.** The revised description of the rationale used for selecting life stage and location of release provides a much clearer justification and additional detail required for understanding the selection of specific release strategies.
4. **Integrated artificial production and natural production life cycle model.** We appreciate recognition of the importance and value that an integrated life cycle model can provide. We understand the challenges of adding new objectives given the project's limitations, and we agree that it is essential to continue to make progress on the three high priority questions that address poor performance of smolts produced at Springfield Hatchery. The foundation of the life cycle model will be enhanced with additional survival data for Springfield Hatchery smolts. In addition to pursuit of additional funding to support a graduate student, we suggest that the proponents begin participation in the AMIP Life Cycle Monitoring workgroup. There is much to be learned from the multiple models that have been developed, executed, and interpreted by members of the workgroup and there may also be support that can be provided. Given the challenges facing Snake River Sockeye Salmon recovery, we encourage initiation of model development as soon as possible. The proponents could begin laying the groundwork for model development by organizing and analyzing datasets that will be essential for the model.

Preliminary ISRP report comments: response requested *(Provided for context. The proponents responded to the ISRP's questions; see response link and final review above.)*

Response request comment:

This is a long-running project that involves multiple agencies, numerous hatchery facilities, and comprehensive research, monitoring, and evaluation efforts. Snake River sockeye salmon have been on the brink of extinction for decades and are listed as endangered under the ESA. The current status remains at high risk of extinction with very low returns of natural origin adults in recent years.

The proposal represents an integration and consolidation of multiple separate past projects, and the project is implemented cooperatively by IDFG, NOAA, and the Shoshone-Bannock Tribes. The stated goals provide clear qualitative desired outcomes that directly address the need to prevent extinction of Snake River sockeye salmon. There is an extensive set of biological and implementation objectives along with monitoring questions. The objectives generally support the goals well, and the monitoring questions provide a sound framework for

addressing uncertainties and documenting project benefits and risks. A few important objectives related to planning, coordination, outreach, publication, and data sharing are not included.

The methods for artificial propagation are sound. However, descriptions of methods for lake fertilization and monitoring and evaluation are brief, incomplete, and need to be enhanced. We appreciate the efforts to complete final methods protocols in MonitoringResources.org and the extensive publications record. The project has a sound adaptive management decision process implemented by the Stanley Basin Sockeye Technical Oversight Committee. The three-phased approach provides clear decision points and criteria for reducing reliance on hatchery propagation in favor of emphasis on natural production.

Phase 1 of recovery has been successful, but serious challenges are being encountered in phase 2 (e.g., poor Springfield Hatchery smolt SARs and high smolt and adult migration mortality). Overall, the results are well documented; however, the pace at which the project is moving through Phase 2 toward Phase 3 and the ultimate goal is not clear and appears to be lagging. The uncertainty regarding quality of smolts produced from Springfield Hatchery and the poor post-release performance is a significant problem that may or may not be solved in the future to an acceptable level of performance with the added acclimation.

The ISRP requests the proponents to address the following points in a revised proposal and to provide a brief point-by-point response to explain how and where each issue is addressed in the revised proposal:

1. **Additional objectives.** Although the list of objectives is extensive, the proposal did not explicitly include any objectives related to coordination, planning, publication and reporting, outreach, data sharing, and participation in adaptive management, despite their importance to project success. Please add objectives relative to these project elements.
2. **Carrying capacity methods.** Provide more detail to clarify the analytical methods used for estimating carrying capacity of nursery lakes (see details in methods section below).
3. **Rationale for release strategies.** Explain the rationale (or propose an experimental design) for choosing to release captive-bred sockeye at different locations and at different life history stages.
4. **Integrated artificial production and natural production life cycle model.** The project has accumulated a wealth of information on the performance of specific life-stages in relation to release strategy, life history type, habitat conditions, and other limiting factors. For example, performance data includes survival of hatchery fish in-hatchery

and after release, productivity of natural fish in natal lakes, smolt survival during downstream and ocean migration, and adult survival during upstream migration. This information is well suited for development and application of an integrated hatchery-natural production full life cycle survival model. An integrated full life cycle model would help to identify key survival bottlenecks across the entire life cycle, and to evaluate and rank alternative scenarios for future management actions and project improvements. Given that a number of critical uncertainties remain, a life cycle model would also provide a more rigorous framework for assessing benefits and risks associated with the project. We recommend that the proponents add full life cycle modeling as an objective in the revised proposal, complete the model development and assessment within the next two years and submit in a report for ISRP review.

Q1: Clearly defined objectives and outcomes

Snake River sockeye salmon have been at very high risk of extinction for many decades. They are listed as endangered under the ESA and remain at high risk of extinction. Numerous anthropogenic factors have severely impacted survival at all life stages. The project addresses the critical conservation and management needs to restore Snake River sockeye salmon. The ultimate goal is to re-establish self-sustaining populations of sockeye salmon in Sawtooth Valley lakes to levels that allow ESA delisting and provide treaty and sport harvest. In addition to the ultimate goals, five proximate goals are presented. Each proximate goal had supporting quantitative biological objectives, implementation goals, and monitoring questions or hypotheses. There is an extensive number of objectives and monitoring questions (about 40 of each). The objectives meet SMART criteria, but they are complex and not easy to map to previous (2010) objectives for the various phases of recovery or to descriptions in the Methods section.

The Problem Statement provides useful historical background for the project. However, the discussion of primary limiting factors (low spawning abundance and lack of nutrients in nursery lakes) seems shallow and at odds with more complete discussions of full life cycle limiting factors in the annual progress reports by Eaton et al. (2020) and Johnson et al. (2020).

In combination, the goals and objectives provide clear qualitative desired outcomes, quantitative outcomes, and specific implementation steps needed to achieve biological objectives. There is appropriate emphasis on the importance of research, monitoring, and evaluation.

Although the list of objectives is extensive, the proposal does not explicitly include any objectives related to coordination, planning, publication and reporting, outreach, data sharing,

and participation in adaptive management, despite their importance to project success. It would have been useful to provide some sense of priority for the extensive list of monitoring questions.

Q2: Methods

The methods are organized to present general methods for artificial production first, followed by research, monitoring, and evaluation. The production methods are complex and cover trapping, spawning, incubation, juvenile rearing, disease treatment, release strategies, and lake fertilization. The Methods section describes procedures for:

- Captive propagation, which are well documented in Appendix B and ESA Section 10 permits and follow standard practices.
- Lake fertilization, which are very brief but more fully described in the annual progress report by Eaton et al. 2020, but methods are not discussed for analytical methods to assess capacity of the nursery lakes. These capacity estimates play an important role in project operations, and clear methods are essential.
- Monitoring questions, which are also brief and difficult to review. The caption for Table 4.1 is confusing without more context (e.g., to explain “ratio of SAR”), and it would have been useful for the proposal to include a comparison of SARs by group as shown in Appendix C in Johnson et al. (2020).

Methods are linked to the monitoring questions; however, there is lack of connectivity to the biological and implementation objectives. Many of the methods have been published as final in MonitoringResources.org and peer reviewed publications.

Risk of extinction is reduced by maintaining the gene pools at Sawtooth, Eagle Creek, Burley Creek, and Manchester facilities as well as the natural environments of three lakes. Detailed pedigrees are maintained to minimize loss of genetic diversity, which is also monitored, and the return rates from different release strategies are assessed. An impressive array of data has been collected on the fish produced from the captive broodstock and natural spawning, the forage base (i.e., nutrients and zooplankton) available to them, and their growth and survival. The data collection methods are based on sound principles. Population-specific breeding programs for Petit, Alturas, and Redfish lakes are maintained by NOAA and IDFG, and the Shoshone-Bannock Tribes (SBT) leads lake fertilization and limnology monitoring, monitoring of juveniles in the lakes, and adults on spawning grounds.

The section on Potential Confounding Factors clearly describes uncertainties and implications for the project related to climate change impacts on habitat conditions in the tributaries, migratory corridors and ocean, experimental spills in the hydrosystem, the potential spread of non-native bass and lake trout, fall-back behavior at the Sawtooth weir, and logistics of transporting smolts from Springfield Fish Hatchery to acclimation/release sites in the Sawtooth Valley. However, the proposal does not include any discussion of developing an analytical framework to evaluate or rank the relative potential impacts of these confounding factors.

The proposal does not adequately explain the methods for deciding how to release captive bred fish back to the natal habitat. What is the rationale for deciding how many fish to release at various life history stages, and how to schedule releases over years among release sites? Was or is there an experimental design to help disentangle impacts of potential confounding factors?

Q3: Provisions for M&E

The project implements a comprehensive monitoring and evaluation program that addresses important critical uncertainties. Monitoring and evaluation results have been instrumental in informing the projects adaptive management process.

The recovery plan for Snake River sockeye includes three successive phases related to hatchery intervention. *"Kline and Flagg (2014) identified three triggers that would allow the project to move through the recolonization phase, and into the final (local adaptation) phase, of recovery. The first trigger begins the phasing out of the safety net program at Burley Creek Hatchery and Manchester Research Station and occurs when the 5-year geometric mean abundance exceeds 1,000 anadromous adults. The second trigger begins the phasing out of the safety net program at Eagle Fish Hatchery and occurs when the 5-year geometric mean abundance exceeds 2,150 anadromous adults. The third trigger begins the transition to the local adaptation phase of recovery and occurs when the 5-year geometric mean abundance of natural-origin anadromous adults exceeds 750 fish."*

Recovery efforts are managed collaboratively by the IDFG, NOAA Fisheries, and the SBT through the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC). The evaluation and adjustment process is a key responsibility of the SBSTOC. The SBSTOC has representatives with expertise in fish health, hatchery production, genetics, life history, monitoring, and lake ecology. The committee has members from numerous co-manager agencies, BPA, and private interests. The SBSTOC meets quarterly to review fish culture performance and monitoring and evaluation results to identify and plan critical project adjustments needed to improve performance. The project is formally reviewed every five years and provides data to NOAA

Fisheries for 5-year ESA status reviews. The five-year project review meetings give collaborators and interested parties the opportunity to evaluate progress towards meeting recovery goals.

Data collected seem to be used to regularly update reported relationships among variables such as fry density, zooplankton biomass, growth, survival in captivity and post-release and measures of genetic diversity. This population is at the brink of extinction and under ESA protection, so the level of scrutiny and pressure to respond to new information remains high.

The proponents are commended for publishing their findings in the peer-reviewed literature (at least 42 publications are now associated with the Snake River Sockeye Captive Propagation project).

An example of application of the adaptive management approach related to poor performance of smolts produced at Springfield Hatchery is provided. The proposal highlights some valuable lessons learned. The SBSTOC process in combination with the three-phased approach with specific criteria and triggers provides a solid foundation for adaptive management decisions.

Q4: Results – benefits to fish and wildlife

The project has a good record of accomplishments. Most importantly to date, this project has prevented the extinction of the Snake River sockeye ESU by maintaining captive broodstock for the past three decades. Captive breeding (phase 1) was considered experimental when the project began, but the project has succeeded in conserving the genetic lineage of the population, re-introducing captive fish back into the natural environment, and increasing population abundance, and survival at different life-stages. The monitoring and evaluation results are extensive and very informative.

The project is facing difficult challenges in Phase 2. It is disconcerting that the water chemistry issues along with the performance of smolts produced at Springfield Hatchery are so poor and that these issues were not addressed at an earlier stage in the hatchery planning and development process. The uncertainties related to future performance of Springfield Hatchery produced smolts is problematic as transition from Phase 2 to Phase 3 relies on adequate smolt-to-adult survival.

The initial problem with smolts from the Springfield Fish Hatchery (SpFH) exhibiting low survival immediately after release may or may not have been solved by acclimating smolts at Sawtooth Fish Hatchery (SFH) for 1 to 3 weeks. However, survival during downstream migration to Bonneville Dam tailrace is still lower for SpFH than SFH smolts, and overall SARs are typically highest for natural-origin smolts, lower for SFH smolts, and lowest (0 for BYs 2013-2015) for SpFH. It is noteworthy that captive-bred adults re-introduced to spawn naturally in Redfish and

Pettit lakes produce smolts that exhibit SARs comparable to those from the original population in the 1950a and 1960s (Bjornn et al. 1968).

Recent monitoring and evaluation has identified two strategies that result in the highest number of anadromous returns: 1) captive and anadromous adult releases, and 2) hatchery reared smolt releases. Releasing captive and anadromous adults to volitionally spawn produces the greatest benefits in terms of smolt-to-adult returns (SARs), and springtime releases of hatchery-reared smolts provides the greatest benefits in terms of recruits per spawner (R/S).

The ISRP finds it difficult to review progress on Phase 2 because the proposal and associated documents do not provide a full life-cycle systems analysis (i.e., modeling) perspective to identify the key survival bottlenecks across the life cycle nor a synthesis of how key bottlenecks influence viability. The case for nutrients being limiting in the nursery lakes (i.e., for lake fertilization) is inadequately explained and seems contradicted by recent results and discussion in Eaton et al. (2020). Surprisingly, no data are presented to show the size of natural-origin smolts in relation to juvenile density (as an indicator of density effects on productivity, and to estimate carrying capacity), or in comparison to hatchery-origin smolts (as a possible explanation for differences in survival during downstream migration and overall SAR). Figure 2.6 in the proposal shows that natural-origin smolts at age-1 are typically about 10-15 g, which is large in comparison to most natural sockeye populations, yet much smaller than SpFH hatchery-origin smolts which average over 30 g. Increasing natural production from these lakes to achieve population viability will be difficult without a clearer understanding (or exposition) of factors constraining smolt-per-spawner productivity. It also appears that high mortality during migration (over 70% downstream from release to the Bonneville Dam tailrace, and about 50% upstream from Bonneville Dam to Sawtooth Valley) are serious impediments to achieving viability. However, the proposal does not provide an adequate summary of data or discussion for the ISRP to review these issues. Has transportation of smolts past the dams (from Sawtooth Valley to below Bonneville Dam) been proposed, perhaps as part of an experimental design?

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