Fish and Wildlife Program Categorical Assessment, 1980-2022: Habitat Protection

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This is a staff product and has not been reviewed or approved by the Council. This working draft functions as supplementary documentation for the Categorical Assessment presentations and contains information to inform the upcoming amendment process. While elements within this document were developed in collaboration with the region's state and federal fish and wildlife agencies and tribes, the document itself has not been reviewed by anyone other than Council staff and should be considered preliminary. We welcome feedback and/or corrections for future drafts of this documentation.



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Purpose

The objective of this assessment is to describe the status of habitat protection under the Council's Fish and Wildlife Program over the last 40 years, and to describe key topics for the Council and region to consider as we approach the next Program amendment cycle.

Approach to mitigation

Habitat protection is a tool that can be used to prevent future habitat degradation or loss, or to prevent fish and wildlife mortality. This can be particularly important in a place like the Columbia Basin, where habitat conditions are not static and may continue to degrade. Although protection alone may not increase the quality of habitat to the same extent as habitat enhancement, it can preserve existing quality, in combination with continued stewardship. In the Fish and Wildlife Program, protection is implemented through (1) screening diversion ditches to prevent fish entrainment (Table 1), (2) protecting and/or enhancing lands that benefit resident and anadromous fish (Table 2), wildlife (covered in a separate chapter), or the ecosystem in general, and (3) protecting stream reaches from future hydroelectric development (Table 3). Habitat protection is guided by policy and prioritization, and that guidance has shifted over time (Table 4). This work falls under several Program strategies, including Habitat, Protected areas and hydroelectric development, and Maintenance of Fish and Wildlife Program investments (Table 5).

Program measures over time by topic

Decade	Measures associated with screens			
1980s	• Upon approval by the Council, Bonneville shall fund the design and construction of the improvements listed in Program			
1990s	• Fish Screen Oversight Committee (FSOC) was established by the 1987 Fish and Wildlife Program to develop criteria for the implementation of BPA-funded fish passage and screening activities.			
	• Develop a prioritized list of tributary screening and passage facility improvements for stream diversions in the Columbia River Basin affecting salmon and steelhead. Improvement can include new facilities and the upgrading and maintenance of existing facilities. The program should also include Columbia River and Snake River mainstem pump diversions. Priority			

Table 1. Program measures associated with screens

initially should be given to weak stocks, with emphasis on stocks petitioned under the Endangered Species Act in the Snake River Basin. It is essential that this process be completed not later than December 15, 1991, so that the prioritized list can be used to implement projects in 1992.

- Criteria for design, construction, operation and maintenance of facilities should be based on standards and criteria developed by the National Marine Fisheries Service (NMFS) in concert with other agencies with expertise in the areas of screening and fish protective facilities in the region. In addition, conduct statistically valid evaluations of screening facilities as necessary, to assure fish are adequately protected and the number of adult fish returning to the Columbia River, as a result of this program, are assessed.
- Require in issuing or renewing authorizations, as a condition of the authorization, that diversion structures have functional fish screens and other passage facilities for man-made barriers to salmon and steelhead that meet the criteria referenced above. For existing authorizations, wherever practical, and especially on high-priority diversions, the three agencies should proceed to design and install screens on an agency- or shared-cost basis, with authorization renewals contingent on reimbursement to the agency, or other arrangements satisfactory to the agency. By March 1, 1992, the three federal agencies should report on their progress, including the number of such permits, estimated screening costs, resources needed to implement and monitor the program, and a time frame for compliance.
- Identify resources that will be needed to accomplish screening and passage work, and prepare a general operational plan, including a schedule, budget, proposed cost sharing and incentive programs. The presumption is that diversion owners will contribute a significant amount of funding for installation and maintenance of screens. Under current federal law, some federal funds may be available to assist in diversion screening. The plan will also address how ongoing screening and passage programs funded by the Mitchell Act and the states will be comprehensively integrated basinwide. The National Marine Fisheries Service, the oversight committee, and Bonneville should review this plan with the Council by February 1, 1992. The goal is to complete the installation of all needed screens and passage facilities by the end of 1995.
- Require as a condition of both existing and new water use authorizations, that diversion structures have functional fish screens and other passage facilities for man-made barriers to salmon and steelhead that meet the criteria referenced above. For existing authorizations, wherever practical, and especially on high priority diversions, the three agencies should proceed to design and install screens on a multiagency or shared-cost basis, with authorization renewals contingent on reimbursement to the agency, or other arrangements satisfactory to the agency. By March 1, 1992, the three federal agencies should report on their progress, including the number of such permits,

estimated screening costs, resources needed to implement and monitor the program, and a time frame for compliance.

- By January 1993, resume the program to inspect all underwater diversions in the mainstem Columbia and Snake rivers to determine whether screens that prevent losses of juvenile and adult salmon are installed and operating. Repair, update and, where necessary, install screens on all diversions by December 31,1995. The presumption is that diversion owners will fund installation and maintenance of screens. The Corps of Engineers, National Marine Fisheries Service and other appropriate sources might also be considered as potential funding sources. Work under this measure should be coordinated with all other measures under this section.
- Maintain a prioritized list of tributary screening and passage facility improvements for stream diversions in the Columbia River Basin affecting salmon and steelhead.
- Require as a condition of both existing and new water use authorizations, that diversion structures have functional fish screens and other passage facilities for manmade barriers to salmon and steelhead that meet the criteria referenced above.
- Fund periodic inspections of all underwater diversions in the mainstem Columbia and Snake rivers to determine whether screens that prevent losses of juvenile and adult salmon are installed and operating. Repair, update and, where necessary, install screens on all diversions by December 31, 1995.
- Fund installation and maintenance of the barrier net system at the outlet from Banks Lake into the main irrigation canal to conserve the spawning population of kokanee in the lake.
- Annually, in January, provide the Council with a prioritized list of tributary screening and passage facility improvements for stream diversions in the Columbia River Basin affecting resident fish. Improvements can include new facilities and the upgrading and maintenance of existing facilities. The list should include gravity and pump diversions. Priority initially should be given to naturally producing weak stocks. Additionally, provide the Council by November 1995 with a list of diversions where fish screening is a secondary problem compared to impaired instream flows. Identify resources that will be needed to accomplish screening and passage work, and prepare a general operation and maintenance budget, including a schedule, budget, proposed cost sharing incentive programs, and monitoring and evaluation plans. To accelerate this effort, immediately identify and allocate a budget from all available sources for implementation of the plan.
- Based on the priorities indicated in Section 10.2C.1, provide funding for state and tribal fish screen programs to implement all priority screening projects. Innovative solutions that accomplish the same purpose as fish screening, i.e.,

	conversion to electric pumping, conversions from surface to ground water, consolidations of diversions, etc., shall be encouraged. Funding shall be sufficient to:		
	 develop preliminary designs; 		
	 see that necessary permit processes are carried out; 		
	 make certain private landowner and public concerns are addressed; 		
	 review detailed designs to ensure that biological and engineering criteria are met; 		
	 monitor construction phases; 		
	 establish written operating criteria; 		
	 monitor operation and maintenance phases in compliance with criteria and recommend corrective actions if necessary; and 		
	 conduct project evaluations. 		
	 Require as a condition of both existing and new water use authorizations that diversion structures have functional fish screens and other passage facilities for man-made barriers to resident fish that meet the criteria developed by the Fish Screening Oversight Committee (see Section 7.10). For existing authorizations, wherever practical, and especially on high-priority diversions, the three agencies should coordinate with the state fish screen programs and proceed to design and install screens that meet Oversight Committee criteria on a multiagency or shared-cost basis, with authorization renewals contingent on reimbursement to the agency or other arrangements satisfactory to the agency. By March 1 of each year, the three federal agencies should report on their progress, including the number of such permits, estimated screening costs, resources needed to implement and monitor the program, and a time frame for compliance. 		
2000s	Specific projects listed in Subbasin Plans		
2010s	Install appropriate and effective juvenile lamprey screening for tributary water diversions		
	Screen water diversions		
	 Maintenance of Fish and Wildlife Program investments (FSOC; O&M) 2018 Asset Management Strategic Plan 		

Decade	Measures associated with Fish Lands			
1990s	 Develop programs for land exchanges to protect high quality riparian habitat 			
	 Provide funding for the acquisition and management of permanent conservation easements for rebuilding and maintaining Columbia Basin salmon and steelhead populations. 			
	 Implement land exchanges, purchases or easements of a sufficient width to improve and maintain salmon and steelhead production in privately owned riparian areas and adjacent lands, with full compensation of landowners. 			
	• Immediately develop programs for and implement further exchanges of public lands for high quality riparian lands to promote management of riparian habitat for salmon and steelhead production.			
2000s	Specific projects listed in Subbasin Plans			
2010s	Maintenance of Fish and Wildlife Program investments (O&M)			
	 Acquiring and protecting lands adjacent to the mainstem critical to protecting habitat areas and local water quality 			
	• In areas of the basin where quantitative assessments of native resident fish losses have been completed, and mitigation based on native resident fish is not feasible, perpetual land acquisitions should be used, at a minimum ratio of 1:1 mitigation to lost distance or area, to benefit fish habitat as a primary tool for mitigation and settlement.			
	• Whenever possible, resident fish mitigation through habitat acquisitions should take place through settlement agreements that have clear objectives, a plan for action over time, a committed level of funding that provides a substantial likelihood of achieving and sustaining the stated mitigation objectives, and provisions to ensure effective implementation with periodic monitoring and evaluation. Resident fish mitigation agreements should be permanent or span multiple years and be long-term in duration. These agreements should include:			
	 Measurable objectives, including the estimated resident fish habitat losses addressed by acquisitions 			
	 Demonstration of consistency with the policies, objectives, and strategies in the Council's program 			
	 Adherence to the open and public process language found in the Northwest Power Act, including measures to address concerns 			

Table 2. Program measures associated with Fish Lands

over additions to public land ownership and impacts on local communities, such as a reduction or loss of local government tax base or the local economic base, and consistency with local governments' comprehensive plans

- When possible, provide protection for riparian habitat that can benefit both fish and wildlife, and protection for high-quality native habitat and species of special concern, including endangered, threatened, or sensitive species
- Assurance for effective implementation of the agreement, with periodic monitoring and evaluation (including a periodic audit) and reporting of results; at a minimum, annual reports to Bonneville must continue in order for the Council to evaluate the mitigation benefits
- Assurance of long-term maintenance of the habitat adequate to sustain the habitat values stated in the agreement for the life of the project (this is a requirement), along with a committed level of funding that provides a substantial likelihood of achieving and sustaining the resident fish mitigation objectives
- Adequate funding for operation and maintenance
- Resident fish mitigation agreements may include the protection of undegraded or less degraded habitat or, in appropriate circumstances may include protection and improvement of degraded habitat when necessary for effective mitigation. In the latter case, any mitigation agreements with Bonneville should include sufficient funding to enhance, restore, and create habitat functions and values for the target species of resident fish on acquired lands that are degraded.
- Resident fish mitigation agreements may represent incremental mitigation based on individual habitat acquisitions. However, where a resident fish loss assessment has been developed for a particular hydropower facility or for an entire subbasin using the best available scientific methods and the loss assessment has been accepted as part of the program, the Council encourages mitigation settlement agreements.
- The Bonneville Power Administration will require, wherever possible, that resident fish mitigation agreements through habitat acquisitions include a management plan with clear objectives; a plan for action over time; a committed level of funding that ensures long term maintenance to sustain the stated mitigation objectives; and provisions to ensure effective implementation with periodic monitoring and evaluation.
- Resident fish mitigation agreements shall include a management plan agreed to by Bonneville and the management entity adequate to sustain the minimum credited habitat values for the life of the project. Agreements shall include sufficient funding for operation and

	maintenance over the long term to demonstrate a substantial likelihood of
	achieving and sustaining the mitigation objectives.

Table 3. Program measures associated with Protected Areas

Decade	Measures associated with Protected Areas
1980s	 The Council will designate stream reaches and wildlife habitat areas which shall be protected from further hydroelectric development. Protected Areas rules in 1988 amendment
1990s	 BPA: Do not acquire power from hydroelectric projects located in protected areas. Federal Energy Regulatory Commission (FERC), and all other federal agencies responsible for managing, operating, or regulating federal or non-federal hydroelectric facilities located on the Columbia River or its tributaries are required to take protected area designations into account to the fullest extent practicable at all relevant stages of decision-making processes.
2000s	Same
2010s	Same

Table 4. Program measures associated with policy

Decade	Measures associated with Policy		
1980s and 1990s	Early Programs emphasize protecting weak stocks		
2000s and 2010s	 Subsequent Programs emphasize building from strength Efforts to improve the status of fish and wildlife populations in the basin should protect habitat that supports existing populations that are relatively healthy and productive. 		
	 Strongholds: A salmon, steelhead, or resident fish stronghold refers to a subbasin, watershed or other defined spatial area where populations are stronger and genetically more diverse than other areas. The Council will work with regional entities to establish criteria for identification of stronghold areas within the Columbia River Basin. The Council may consider additional 		

funding in these areas to provide further protection and to reduce impacts limiting factors. Strongholds will emphasize the preservation and restorate of habitat for wild fish.		
 Request states to identify stronghold areas 		
 Consider stronghold recognition areas designated by states and tribes in accordance with state law 		
 Work with fish and wildlife agencies and tribes and others to keep up- to-date maps available for strongholds and other areas in the basin that are managed for wild fish stocks 		
 Inventory existing actions that have occurred and are occurring within identified stronghold areas as identified by the respective states of the Council 		
 Support fish habitat improvement actions implemented within strongholds 		

2014/2020 Fish and Wildlife Program strategies associated with assessment

Table 5. Fish and Wildlife Program strategy and strategy performance indicators (SPIs; NPCC2020) associated with the protection portion of the Habitat Assessment

Strategy SPI	Description	
Ecosystem function	Protect and restore natural ecosystem functions, habitats, and biological diversity wherever feasible consistent with biological objectives in the program.	
	No specific SPIs	
Habitat	Protect, enhance, restore and connect aquatic and terrestrial habitat. Protecting existing quality habitat is as important as enhancing degraded habitats.	
E1-1	• Acres protected by purchase or conservation easement.	
E1-2	• Miles of stream protected by purchasing or leasing land.	
E1-6	• Number of new fish screens installed, or number of screens improved.	
Protected areas and	Protect fish and wildlife from the adverse effects of future hydroelectric project construction and operations. As part of this strategy, the Council supports	

hydroelectric development	protecting streams and wildlife habitats from any hydroelectric development where the Council believes such development would have unacceptable risks to fish and wildlife.
C4-3	• Licenses granted by FERC in protected areas since 1988.
Resident fish mitigation	For resident fish and other aquatic species impacted by the hydrosystem, protect and mitigate freshwater and associated terrestrial habitat, and native fish populations.
R5-1	• Hungry Horse Dam mitigation for inundated lost habitat.
R6-1	• Number of acres of suitable stream or reservoir habitat in the Kootenai River Basin (in development)
R6-2	• Number of accessible miles of previously blocked suitable streams in the Kootenai River Basin (in development)
Strongholds	Acknowledge and encourage efforts to designate and conserve stronghold habitats and their populations of native, wild, and natural-origin fish, as well as areas managed for wild fish.
	No specific SPIs
Maintenance of Fish and Wildlife Program investments	The Council has determined adequate and dependable operation and maintenance support is needed to ensure ongoing proper functioning of past infrastructure investments by Bonneville and the action agencies intended to benefit fish and wildlife in the Columbia River Basin.

• No specific SPIs

Summary of implementation

Screens

Background

A substantial amount of <u>irrigation</u> occurs in the Columbia Basin using water withdrawn from the Columbia River and its tributaries. Water withdrawals can entrain fish into irrigation canals/ ditches. The fate of fish migrating past water diversions depends on whether the diversions are

screened. A properly screened diversion should keep fish in their natural environment or return them to the stream through a bypass system. Unscreened diversion ditches are a mortality source for both hatchery and wild fish, listed and not listed stocks.

Screening diversions is a way to help with fish passage and address entrainment issues. In essence, screens allow water to be diverted into irrigation ditches while fish are protected from entrainment and are passed above or below the diversion to continue their migration. The Council developed a <u>story map</u> about screening efforts that occur in the Columbia Basin under the Fish and Wildlife Program. Screening is a very effective (and cost-effective) tool to prevent the mortality of wild and hatchery fish.

As irrigated acreage peaked in the 1980s, Mitchell Act funding supported early screening programs. By the late 1980s and early 1990s, that funding was insufficient to cover ongoing operation and maintenance (O&M) of those screens, along with the additional screening needs that emerged following ESA-listings in the 1990s.

Implementation

Fish screening has built up to a basinwide effort, and associated technology has advanced to meet the varied design needs throughout the Columbia Basin. Following ESA listings in the 1990s, BPA began funding screen shop construction. Over this same period of time, there were advancements in technology and design around screens.

Today, there are 16 projects that operate screens and 5 screen shops that fabricate screens in association with the Fish and Wildlife Program. These projects are responsible for 1,864 screens associated with the Program. Information on individual screens can be found on the Council's website.

Screens require maintenance to remain effective. This is done through a combination of screen tenders and private property owners. Screen maintenance programs keep screens running longer and functioning as designed. On the financial side, this means project annual budgets must be adequate to cover this recurring maintenance.

In 2014, the Program identified the need for a long-term plan for protecting fish and wildlife investments. Toward this end, the Council convened the Asset Management subcommittee in late 2014 and early 2015. In 2018, The Council released an <u>Asset Management Strategic Plan</u> (NPCC 2018). The plan was developed in collaboration with the Council, Bonneville, sponsors, and managers. The Council's Plan specifically called out the need for sufficient O&M of past Council investments, including screens. It also identified a forward-looking approach to ensuring sufficient funding is planned in anticipation of future maintenance needs. To develop a list of screens in need of maintenance, it was first necessary to have a full inventory of screens in the basin. The Council's Asset Management Program has four phases:

- Phase I: Asset Inventory
 - Shared understanding of definitions (O&M, non-recurring maintenance, etc.)
 - Standardized data
 - Clarity on roles and responsibilities
- Phase II: Condition Assessment
 - Safety compliance condition
- Phase III: Prioritization
 - Program criticality and condition
- Phase IV: Strategic Planning
 - Planning funding transition

The Fish Screens Oversight Committee (FSOC), established in the 1987 Fish and Wildlife Program, was instrumental in producing the Phase I inventory and Phase II condition assessment for the asset management strategic plan (NPCC 2018).

From The Council's Asset Management Strategic Plan (NPCC 2018):

Annual O&M budget

To capture all needs for the Program's past investments it is important to ensure that the projects associated with the three categories (hatcheries, screens and lands) continue to receive adequate annual budgets to cover annual O&M costs. These O&M budgets need to be protected and remain a Council Program priority. Annual maintenance is important to avoid emergency needs in the future.

Fish Screens

To better understand non-recurring screen maintenance needs, roles and responsibilities, and possible future impacts associated with new screen criteria, staff developed a Fish Screen Asset Management and Strategic Planning template to solicit additional feedback and detail regarding the priorities of the fish screen managers. Currently, Bonneville is using these templates to create MOAs with the larger screen-operating entities to help plan for the asset management strategy for the Program's fish screens. These MOAs will specifically address needs as identified and confirmed through the Plan. Phase III work to date relating to screens ... will be updated annually in accordance with the timelines and processes outlined in this Plan.

5-year Assessments (Fish Screens)

At five-year intervals the Council and Bonneville staff, with the sponsors and managers, will re-assess and update their fish screen inventories to ensure the lists are up-to-date (e.g., add or remove screens, and re-prioritize needs). This assessment will be coordinated through FSOC and guided by the appropriate MOA and project reviews.

Sponsors and managers continue to make use of the prioritized list of screen maintenance developed by FSOC. Full correspondence is available on the Council's <u>website</u> for the Asset Management Strategic Plan. For example, the 2024 decision letter to the Council on asset management of screens noted:

In February and March, Bonneville and Council staff requested maintenance priorities from sponsors and managers for fish screens. Fish screen managers continued to use their existing priority list of Program fish screens. In March and April, Council and Bonneville staff reviewed the fish screen priorities received and prepared a presentation for the Subcommittee. Based on the discussion at the meeting, the Subcommittee supported bringing the priorities received to the Fish and Wildlife Committee ... the Subcommittee will investigate the potential to fund a 3rd party assessment of the Program's screen fabrication facilities in FY25.

Discussion

Are O&M budgets adequate for current maintenance?

- Since screens require maintenance to remain effective, a stable and adequate annual budget for O&M funding is essential.
- Although some inflation adjustments have occurred to address prior flat funding, there is an ongoing need to ensure budgets are sufficient to cover recurring maintenance so that the goals and objectives of the investments are accomplished.
- Non-recurring maintenance needs require additional funding in perpetuity to ensure protection of these long-term and successful Program investments outside of O&M budgets

How is climate change affecting operation and maintenance of screens?

- Climate change causing increased costs for O&M
- Planning for increased flows at screens (e.g., more random or unexpected events, increased debris loads- especially post-fire)
- Drier conditions with more fluctuating water levels requires additional maintenance to keep fish passage going when water levels are low

Are there opportunities for increased efficiencies?

• Opportunities for coordination in implementing screening/ passage/ and water conservation, habitat restoration, and protection?

References

Anadromous Fish Habitat and Hatchery Review. 2022. Council recommendation and decision letter (includes information on project adaptation for Climate Change): https://www.nwcouncil.org/fs/17709/2022_04_4.pdf

Columbia River Basin Fish Screen Programs story map: https://storymaps.arcgis.com/stories/efc90cbc92b44c00b4fc13c0d8fe1f7d

NPCC Program Tracker Fish Screens mapper:

https://projects.nwcouncil.org/programtracker/modules/data/screens/dashboardmap?Spon sorGroup=All&Sponsor=-1&Project=-1&Screen=2

NPCC. 2018. Asset management strategic plan:

https://nwcouncil.app.box.com/s/tv8ct47vzz58v8smuuzi53z7u5fanx9l

Asset management strategy website with related information: <u>https://www.nwcouncil.org/fish-and-wildlife/forums-and-workgroups/om-strategic-plan/</u>

Fish Lands

Background

Habitat protection – through acquisition – is a tool to prevent degradation of habitats occupied by resident fish, anadromous fish, or wildlife (reviewed separately). For fish, habitat protection often goes hand in hand with habitat restoration. Any lands protected for fish require development of land management plans that specify how the conservation values will be maintained over time. If protection occurs through settlement agreements, there are further requirements related to long-term funding for stewardship and demonstrated ability to maintain mitigation objectives.

Implementation

Habitat protection for the benefit of fish and wildlife occurred prior to the Northwest Power Act and the first Fish and Wildlife Program (Figure 1). Early mitigation – termed 'pre-Act' – was entirely for the benefit of wildlife. Protection of habitat for fish specifically accelerated in the mid-2000s. This included both resident and anadromous fish. In more recent years, there has also been effort to restore habitats that benefit both fish and wildlife.



Figure 1. Number of parcels purchased for the benefit of wildlife (blue), fish and wildlife (green), fish (yellow), or unknown but potentially wildlife (purple) under the NPCC Fish and Wildlife Program, 1979 – 2023

When considering only habitat protected for fish or fish/wildlife together, a total of 44,168 acres have been protected, according to data available in CBFish (Table 6). This mitigation has occurred throughout the Columbia Basin, in 22 subbasins. The largest share of acreage protected has occurred in the Flathead River subbasin, the Salmon River subbasin, the Walla Walla River subbasin, and the Willamette River subbasin. Additional habitat protection for fish has occurred outside of what is recorded in CBFish when protection occurred under a settlement agreement or prior to tracking in CBFish.

Subbasin	Fish and Wildlife	Fish only	Total acreage
Clearwater		245.7	245.7
Columbia Estuary		1279.1	1279.1
Columbia Lower	100.0	963.7	1063.7
Columbia Upper Middle		16.2	16.2
Elochoman		383.5	383.5
Flathead		16496.7	16496.7

Table 6. Total acres protected for fish and wildlife together, or just fish by subbasin, within the Columbia River Basin, 1978 to 2023. Data on acreage are reported in CBFish.

Grande Ronde	1211.1	4.3	1215.4
Grays		1047.0	1047.0
Hood			
John Day		1200.0	1200.0
Methow		921.9	921.9
Okanogan		1123.9	1123.9
Owyhee	1660.0		1660.0
Pend Oreille	40.0		40.0
Puget Sound		8.1	8.1
Salmon		9551.5	9551.5
Snake Upper		73.0	73.0
Umatilla		76.9	76.9
Walla Walla	2337.0	134.2	2471.2
Wenatchee		150.0	150.0
Willamette	3557.9	609.1	4167.0
Yakima		978.1	978.1
Grand Total	8906.0	35262.9	44168.9

Construction and operation of Libby and Hungry Horse Dams caused losses of multiple resident fish species. Loss assessments were completed in 1991 and were approved by the Council and adopted into the Program. Fish losses upstream of Libby dam included rainbow trout, Westslope Cutthroat Trout and mountain whitefish (FWP, CSKT, and KTOI 1998). Downstream losses included Westslope Cutthroat Trout, ~ 90% of burbot, and effectively all Kootenai River white sturgeon (FWP, CSKT, and KTOI 1998). Fish losses at Hungry Horse Dam were assessed both due to habitat inundation and loss of connectivity to the Flathead Lake ecosystem and included juvenile and adult cutthroat trout, adult bull trout, and adult kokanee salmon (Fraley et al. 2003 and references contained within).

Mitigation for resident fish losses occurs through habitat restoration and protection, reducing non-native species interactions, and more. The Council tracks three SPIs related to resident fish mitigation at Hungry Horse (SPI R5-1) and Libby Dams (SPIs R6-1 and R6-2). Currently, data are available to characterize mitigation at Hungry Horse Dam. Since 2004, a total of 14,097 acres have been protected or restored as mitigation for resident fish losses at Hungry Horse Dam (Figure 2, left). This corresponds to 67.67 stream kilometers protected (Figure 2, right).



Figure 2. Hungry Horse Dam mitigation for inundated lost habitat reported in acres (left) and kilometers (right), for 2004-2011 (blue) and 2012-2022 (red) through implementing the NPCC Fish and Wildlife Program. Data reported on Program Tracker as SPI R5-1

At Libby Dam, substantial restoration has occurred in Kootenai River above and below Libby Dam through the efforts of multiple partners. This restoration benefits resident fish and wildlife. Data on total acreage or stream kilometers protected for resident fish is not currently summarized because it has not been determined how to credit this mitigation against the loss assessment.

- R6-1 Number of acres of suitable stream or reservoir habitat in the Kootenai River Basin. (in development)
- R6-2 Number of accessible miles of previously blocked suitable streams in the Kootenai River Basin (in development)

Discussion

Settlement agreements exist for Libby and Hungry Horse Dams – are there opportunities to settle remaining resident fish losses?

- Land acquisition costs in Montana are substantially higher now than they were in the 1990s. Is funding sufficient to continue making progress toward mitigation targets?
- What process is used to prioritize which fish lands are protected?

- Some of the issues identified for wildlife lands are also relevant for fish lands:
 - Are data on all purchased lands available in CBFish?
 - $\circ~$ Are land management plans approved and implemented?
 - Have any conservation issues been reported?
 - Is funding sufficient to maintain conservation values?

References

- Fraley, J., B. Marotz, and J. DosSantos. 2003. Hungry Horse Mitigation Plan: Mitigation Plan for Losses Attributable to the Construction and Operation of Hungry Horse Dam. 1990-2003 Technical Report, Project number 199301904, 74 electronic pages, (BPA report DOE/BP-00004100-1). Available online at: <u>https://www.osti.gov/biblio/901082</u>
- Montana Department of Fish, Wildlife, and Parks, Confederated Salish and Kootenai Tribes, Kootenai Tribe of Idaho (FWP, CSKT, KTOI). 1998. Fisheries Mitigation and Implementation Plan for Losses Attributable to the Construction and Operation of Libby Dam. Project number 1995-00400, 63 electronic pages, (BPA Report DOE/ BP-00006294-4). Available online at: https://www.osti.gov/servlets/purl/834380

Protected Areas

Background

In 1978, Congress passed the Public Utilities Regulatory Policies Act (PURPA) to increase development of renewable energy, including hydroelectric. To incentivize this development, PURPA mandated that utilities would have to buy any developed electricity. While it was meant to address potential electricity shortages in the region, it resulted in a rapid increase in development of *small* hydroelectric facilities (red line in Figure 3).



Figure 3. Cumulative development of all hydroelectric facilities (red) and hydroelectric facilities with a nameplate capacity > 5MW (blue) in the Columbia Basin, 1890-2020

As these hydroelectric facilities were developed, the utilities became concerned about how to tie this geographically dispersed hydroelectricity into the existing transmission infrastructure. Fish and wildlife managers were concerned about increasing negative effects on fish and wildlife. As a result, both utilities and fish managers supported an effort to identify areas that would not be open to hydroelectric development.

Implementation

In support of this effort, the Council led the Pacific Northwest Rivers Survey to identify a list of river reaches that were appropriate for protection. These river reaches occurred throughout the area serviced by Bonneville, not just the Columbia Basin, to ensure that negative effects would not just be moved from one location to another. In 1988, approximately 44,000 miles of stream were designated as protected areas. These included habitats used by anadromous fish, resident fish, and wildlife (Figure 4).

Along with these protected areas, the Council requested that FERC take the Council's hydroelectric development standards into consideration when developing or licensing hydroelectric facilities. To date, no licenses have ever been issued by FERC within these protected areas.



Figure 4. Reaches designated as protected from future hydroelectric development in 1988 within the area serviced by Bonneville Power Administration

Discussion

Protected Areas are a significant accomplishment of the Program. The areas that were protected are very important habitats for fish and wildlife. The success of this effort reflects that it is more effective and less expensive to protect habitats (i.e., prevent habitat degradation) than to try and develop a mitigation program to restore degraded habitat, particularly in areas where habitats have significant value and the cost of that mitigation would be substantial.

The only challenge surrounding protected areas relates to tracking when potential project proponents are investigating new hydro projects, when they apply for preliminary permits, or when they advance to later steps of the application process. Often, it is through direct contact with agency personnel that the Council is alerted to interest in developing a hydroelectric project within a stream reach that is designated as protected. Other tracking occurs through periodic review of data on the FERC website, which is not particularly user friendly.

• Bonneville historically funded a position focused on FERC licensing, but no longer funds that position. Is there an easier way to track applications for hydroelectric development licenses in relation to the Protected Areas?

References

FERC site for tracking permits: <u>https://www.ferc.gov/licensing</u>

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Policy guidance for protection

Background

Policy issues related to habitat protection are essentially about how to take existing funding and apply it to protection efforts in a way that maximizes benefit. In early years of the Program, the emphasis was on protecting weak stocks. This was the period of time leading up to ESA listings and numerous stocks were extremely vulnerable to extirpation. Post 2000, and as ESA-listings proceeded, the Program embraced the concept of building from strength. This is similar to how strongholds are designed. By protecting the best habitats and largest, most-diverse populations, the long-term capacity is preserved for these fish to respond to and persist through changing environmental conditions. They may also serve as a source for reintroduction into restored habitats. As with any policy issue, there are trade-offs.

Examples of implementation

- Protect weak stock emphasis on efforts in ESA listed populations
- Build from strength measures regarding Hanford Reach Fall Chinook, Upper Columbia Sockeye
- Strongholds No progress made to designated stronghold habitats

Discussion

There is a lot to be considered by the region on this topic. The policy framework used to prioritize investments has big implications.

- Does building from strength increase vulnerability for listed stocks?
 - Are there other venues to address that vulnerability?
- If weak stocks are protected, is there a risk of failing to protect stocks that are currently doing well, but may be vulnerable to ongoing or increasing degradation in the basin?
- How does climate change or climate adaptation factor into prioritization? Invasive species?
- How does the idea of building from strength relate to preserving genetic diversity and rebuilding the full complement of stocks that historically existed?