

Staff summary of Issues & Recommendations Mainstem

*Preliminary draft, please refer to full recommendations for complete review

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2009 Fish and Wildlife Program Section Section VI Mainstem (page 34)

I. Summary

With regard to the Fish and Wildlife Program's Mainstem Plan, a number of federal agencies, tribes, and the Bonneville customers recommend that the Council continue to recognize the reservoir management, spill and passage measures and performance standards in the FCRPS Biological Opinions as the Program's baseline mainstem measures and objectives. Montana and the Kootenai Tribe of Idaho do recommend adjustments in operations at Libby Dam, and Montana also at Hungry Horse, to improve conditions for sturgeon and other fish in and below the reservoirs, adjustments they believe are consistent with the flexibility in the bull trout, Libby Dam and salmon and steelhead BiOps. The Spokane Tribe recommends that the Council continue to include in the Program the altered operations at Grand Coulee that the Tribe considers important to improve conditions for fish in Lake Roosevelt and then work for their implementation. Washington recommends continued adherence to the Vernita Bar operations that benefit fall chinook in the Hanford Reach. Oregon, the Nez Perce Tribe, the Pacific Fishery Management Council and environmental and fishing groups and individuals recommend implementation of increased spill as an experiment (the proposal out of the CSS studies) if the dissolved gas waivers can be revised. A recommendation the Bonneville customers anticipated and adamantly oppose. A number of the environmental groups recommend the Council completely de-link its Fish and Wildlife Program from the Biological Opinion measures and pursue additional flow and passage actions, including operating John Day and other lower Columbia reservoirs at minimum operating pool. A set of these groups along with the Nez Perce Tribe support a serious evaluation of the removal of the four dams in the lower Snake River.

More broadly, a number of the agencies, tribes, environmental and fishing groups, and individuals recommend, in part out of the Columbia River Treaty review, that the Council's mainstem plan incorporate an explicit ecosystem function focus and assist in restoring more natural floodplain functions, hydrograph and habitat all along the mainstem through the estuary and plume, taking advantage of any potential for improved fish habitat that may come from a modernized Treaty. These recommendations are led by the Columbia River Inter-Tribal Fish Commission with an extensive recommendation for revisiting flood risk management, including reduced reliance on reservoir operations allowing for different management of peak flows, with increased flood risk management options such as moving structures out of the floodplains, reclaiming lost floodplains and, where locally necessary, constructing and/or modifying levees. The USGS added a recommendation to develop a sediment budget for the lower river.

Many of the state and federal agencies and tribes included in their recommendations a set of broad topics relevant to many parts of the Program but each with a distinct mainstem element. These include recommendations regarding:

- lamprey (mainstem passage, operations, hydrosystem performance standards)
- sturgeon (passage and hydrosystem operations effects)
- eulachon (assessing hydrosystem impacts and potential improvements)
- expanded and updated bird/fish/mammal predation provisions
- increased regard for the plume/estuary/near-shore environment and flow effects
- toxic contaminants (recognize connection to hydrosystem and assess problems and potential improvements in the mainstem, led by an extensive recommendation from CRITFC and NOAA Fisheries, and also recommended by the environmental and fishing groups and individuals)
- climate change (review and adapt hydrosystem operations to flow changes)
- passage of anadromous fish above blockages (Grand Coulee and Chief Joseph in the mainstem, with quite specific provisions from the Spokane Tribe and the Coeur d'Alene Tribe; and environmental and fishing groups and individuals particularly echo this recommendation)

Among the many miscellaneous recommendations for the mainstem are:

- a number of recommendations from NOAA Fisheries to update the language of the Program's mainstem provisions
- recommendations from the Yakama Nation for best practices to prevent or reduce biological harm from PCB leaks at mainstem dams and from lower river dredging
- continued recognition and updating of the performance standards and mainstem spill and bypass provisions of the Mid-Columbia HCPs, from Chelan PUD
- recommendations from the U.S. Fish and Wildlife Service to benefit mainstem habitat for fall chinook in the Snake River and for the use of drones for monitoring in big river habitat such as in the Snake
- recommendation for bull trout passage at Albeni Falls Dam from the Kalispel Tribe, as well as set of recommendations on improving mainstem conditions for bull trout from the Fish and Wildlife Service
- recommendation from Kintama to question and clarify the underpinnings of certain hydrosystem operations given their understanding of the information on ocean survival
- recommendation from the Native Fish Society and Wild Steelhead Coalition to identify and protect thermal refuge areas in the main stem Columbia and tributaries

State Fish and Wildlife Agencies and Other State and State-Supported Agencies

Montana Department of Fish, Wildlife and Parks (2)

Operational changes at Libby and Hungry Horse:

Systemwide analyses of Columbia River dam operations conducted for the Columbia River treaty review revealed opportunities to improve operations at Hungry Horse and Libby dams. Recommend specific adjustments to how various components of the annual operation are modeled and coordinated. Most recommended changes pertain to Libby operations that can be modified to achieve mutual benefits to Canada and US in an attached **Appendix A**. These recommended operations can be achieved within flexibility afforded by VARQ and Biological Opinions by the US Fish and Wildlife Service (USFWS) and NOAA-Fisheries, and are consistent with the Montana Fish Accord.

In that appendix, recommended modifications to Libby Dam operations, designed to be mutually beneficial to Canada and US, and represent an opportunity for negotiations with Canadian stakeholders:

Reports on Libby Dam operation from BC Hydro and the Province of British Columbia, indicate that the white sturgeon tiered flows, VARQ (or variable flow) flood control, and summertime reservoir drawdown for anadromous fish flow augmentation, are being collectively lumped under the term “VARQ.” Clarify.

Recommend retaining the “sliding refill date” to adjust refill earlier in dry years and later in wet years. This is common practice by dam operators under the current operating strategy; however, the sliding refill date based on inflow forecasts should be formalized.

Variable end of December draft point at Libby Dam should be further relaxed in less than average water years. As currently implemented, when Libby is drafted before Jan. 1, and the inflows are less than predicted, the reservoir remains below the draft targets, just to maintain the established minimum flows downstream. Conversely, if inflows exceed predictions, operators have over three months to compensate (release more water) before spring runoff commences. The tribal CRT alternative E3 adjusted the variable end of December draft point at Libby. The current operation adjusts linearly from elevation 2426 in dry years to 2411 in wet years. E3 was designed to reduce drawdown to 2430 in dry years (and adjust to the original 2411 in wet years). Analysis showed that reservoir elevations could be safely increased by up to 4 ft (elevation 2430) in dry water years (driest 20th percentile).

System modeling revealed that the current VARQ operation can be improved in slightly above average and below average water years by further reducing reservoir draft and by using improved coordination among headwater projects. Similar “sliding-scale” rule curves should be applied to other reservoirs throughout the Columbia Basin so that dry subbasins are drafted less to preserve local ecosystem functions, and wet subbasins are drafted deeper for local and system flood control.

Sturgeon tiered flows and the VARQ discharge protocol should be modeled as one volume, as VARQ was originally designed.

Sturgeon tiered flows changed before the USFWS BiOp was finalized.. As currently implemented, the larger volume in the highest tier increases the chance that an unpredicted precipitation event will result in spill (and potential for flooding at Bonners Ferry). Secondly, lowering the thresholds separating the tiers, results in higher discharge volumes at lower water supplies, which further impacts reservoir refill. Since there is little interest in reopening the USFWS BiOp to adjust the tiered volumes, recommend adjustments that are within the flexibility of the sturgeon BiOp. Specifically, half of the sturgeon tiered flow volume should be released before the end of May (during high water years, tiers 4 and 5). This strategy would reduce the potential for premature reservoir refill, spill and possible flooding downstream (a problem for BC stakeholders on the shoreline of Kootenay Lake).

At Libby and Hungry Horse, the trigger for summertime flow augmentation for anadromous fish recovery (10 or 20 ft from full pool depending on water supply) should be based on site-specific reservoir inflows (as originally designed), not flows at The Dalles.

Continue to implement stable or gradually declining Kootenai River flow after spring runoff. This operation is beneficial to fish and their habitat, and facilitates limited regeneration of riparian vegetation. Maintaining lowered winter flows in years following high spring runoff would aid in the establishment of riparian vegetation with positive benefits to both aquatic and terrestrial communities.

Recommended modifications to Hungry Horse Dam operations:

System modeling revealed that the current VARQ operations at Hungry Horse Dam can be improved in slightly above average and below average water years by further reducing reservoir draft and by using improved coordination among headwater storage projects. Improving reservoir refill probability during dry years will improve reservoir productivity and help meet reservoir storage criteria and biological constraints in the proposed CSKT Water Compact.

Downstream of Hungry Horse Dam, implement a sliding-scale, stable flow (minimum) during summer and fall to benefit bull trout and other native fish species. We recommend a linear adjustment of the minimum flow in the Flathead River at Columbia Falls during summer and fall (mid-June through September). The existing minimum flow at Columbia Falls adjusts from 3,200 cfs to 3,500 cfs based on water availability. During summer and fall, when reservoir storage is drafted for anadromous flow augmentation (10 to 20 ft from full pool depending on water supply), river flows should remain stable or gradually declining after the spring runoff and stabilize at a minimum of 5,000 cfs during above average water years and adjust linearly down to 3,500 cfs in the driest water years.

At Libby and Hungry Horse, the trigger for summertime flow augmentation for anadromous fish recovery (10 or 20 ft from full pool depending on water supply) should be based on site-specific reservoir inflows (as originally designed), not flows at The Dalles.

Oregon Department of Fish and Wildlife (3)

Implement experimental spill management (from the CSS studies), the centerpiece of which is to increase spill to 125% of total dissolved gas level or biological constraints, and then monitor survival effects compared to current spill effort. As 125% total dissolved gas exceeds Clean Water Act water quality standards, modifications through that regulatory processes are required.

Recommended much of collaborative managers' draft recommendation package that have a tie to the mainstem, including: continue and extend fish/bird predator control in mainstem; lamprey (passage; hydrosystem performance standards; operational assessment, mainstem habitat); sturgeon, including upper-Columbia sturgeon (operations and passage; assessment of impacts); eulachon (assessment of hydrosystem and hydrograph impacts); bull trout (passage); plume/estuary/near-shore (importance of hydrosystem impacts; monitor and assess); toxics (hydrosystem connection; assess and address); climate change (assess hydrograph changes and mainstem ops implications); passage at anadromous fish blockages

Washington Department of Fish and Wildlife (4)

Recommended a portion of collaborative managers' package: extend fish predator control; lamprey (passage and hydrosystem performance standards, operational assessment, habitat); sturgeon, including upper-Columbia sturgeon (operations and passage; assessment of impacts); eulachon (assessment of hydrosystem and hydrograph impacts); plume/estuary/near-shore (importance of hydrosystem impacts; monitor and assess)

Hanford Reach/mainstem and estuary, spawning, rearing, and resting habitat.

Recommendation 1: Change title to Columbia River mainstem and estuary, spawning, rearing, and resting habitat.

Recommendation 2. Maintain the language regarding the Vernita Bar agreement to protect the spawning and rearing habitat for Hanford Reach fall Chinook salmon and extend the language to include protection of chum salmon spawning in the mainstem Columbia River below Bonneville Dam.

Washington Governor's Salmon Recovery Office (5)

Estuary/plume -- importance of recognizing, assessing hydrosystem's impact

Lower Columbia Fish Recovery Board (6)

Eulachon assessment, including flow and hydrosystem effects

Sturgeon: reduce pinniped predation on sturgeon; assess effects of altered hydrograph

Estuary/plume/near-shore -- importance to assess, including effects of altered flows

Continue and extend mainstem bird, mammal and fish predation control

Lower Columbia Estuary Partnership (11)

Estuary/plume: Recommend the Council include strategies specific to this region that provide normative hydrologic or environmental flows to the estuary and plume, allowing overbank flows, similar to hydro management in other highly controlled systems (e.g., Colorado River).

Recommended that the program address both toxic contamination in the mainstem and the possible effects of climate change on hydrology and flows in the mainstem

Indian Tribes and Tribal Organizations

Confederated Salish and Kootenai Tribes (16)

Predator control: recommend to develop and implement strategies systemwide to manage and reduce non-native fish that compete and feed on native fish, in mainstem and elsewhere

Kootenai Tribe of Idaho (24)

Operational changes at Libby Dam (same as from Montana FWP, *see* above)

Measure 1:

BPA and the action agencies shall adjust operations at Libby Dam per recommendations provided in Appendix A to achieve mutual benefits to Canada and US.

Measure 2:

BPA and the action agencies shall in good faith consider the potential impacts of winter operations at Libby Dam (e.g., winter peaking) on the recovery of native fish species, the food web, and habitat restoration efforts, and mitigate for those impacts if necessary.

The Tribe recognizes the challenge of balancing the provision of an adequate, efficient, economical and reliable power supply, with protection, mitigation and enhancement of fish and wildlife affected by the development and operation of hydroelectric facilities. However, some winter power operations, including power peaking, are known to have detrimental effects to native plants such as cottonwoods, may negatively impact the food web and some native fish species, and also contribute to accelerated bank erosion and land loss. Winter operations, including power peaking, may undermine some of the goals and objectives of BPA funded projects.

Colville Confederated Tribes (15)

Recommended the water and flow management actions, hydro spill and dam passage strategies, performance standards, and inriver survival targets reflected in the 2008/2010 FCRPS biological opinion and the 2008 Colville Accord

Habitat and ecosystem function:

Continue to identify, protect and restore habitat areas and ecological functions that are associated with productive spawning, resting, rearing, and migrating salmon and steelhead, white sturgeon, and other native fish in the Columbia River mainstem (and tributaries), as supported by the existing Accord.

Continue to protect, enhance, and connect freshwater habitat in the mainstem Columbia River for the life history stages of anadromous and resident fishes.

Continue to provide conditions that support the needs of resident fish species in the mainstem Columbia River and its tributaries.

Sturgeon: Continue to enhance the abundance and productivity of white sturgeon in the mainstem in order to rebuild self sustaining populations able to support harvest. Continue to operate the hydropower system in a manner consistent with FCRPS biological opinion that balances needs of anadromous fish, white sturgeon, and other native fish species in the Columbia River.

Kalispel Tribe (23)

Recommended BiOp/Accord implementation

Recommend bull trout passage at Albeni Falls per Corps of Engineers assessment

Coeur d'Alene Tribe (13)

Recommend anadromous fish passage at Grand Coulee and Chief Joseph -- specifics:

Anadromous Fish Passage

The Coeur d'Alene Tribe recommends the following phased approach to begin reintroduction of anadromous fish into their historic range:

Phase I - Immediately fund studies in the period covered by this Program to investigate scientific-based feasibility of upstream and downstream passage options for salmon and steelhead, investigations to determine project timelines, appropriate potential donor stocks, evaluation of existing quantity, quality and capacity of salmon habitat in the upper basin, simulate hydro operations, and assess socio-economic implications of different hydrograph scenarios. Develop stakeholder and regulatory support for passage and associated communication plans.

Phase II - Utilizing information gained through Phase I, test salmon reintroduction and interim fish passage facilities at Chief Joseph and Grand Coulee Dams or identify additional studies and/or alternatives that are necessary to advance the fish passage planning process.

Phase III - Construct permanent juvenile and adult passage facilities and propagation facilities necessary to reintroduce salmon and steelhead above the dams. Continue to inventory, record, implement, and maintain priority habitat improvements and habitats above Chief Joseph and Grand Coulee dams for the reintroduction of anadromous fish.

Phase IV - Monitor, evaluate, and adaptively manage the reintroduction efforts. Implement additional habitat and hydro-related infrastructure improvements as necessary.

Spokane Tribe of Indians (26)

Recommend specifics of anadromous passage at Grand Coulee and Chief Joseph -- *see* Coeur d'Alene Tribe

Recommendations for predator management in Lake Roosevelt

Recommendations for Grand Coulee operations different from FCRPS BiOp -- drafting and water retention and priority provisions [need to compare to current Program; at the least it is similar]

Recommendations to assess hydrosystem effects on upper Columbia sturgeon

Upper Columbia United Tribes (27) (minus Colville; w/ Kalispel caveats)

Recommend anadromous fish passage specifics

Recommend assessment of toxic contaminant effects; hydrosystem connection

Recommend Columbia River Treaty-derived “ecosystem function” principles for mainstem hydro operations:

- Improve normative spring, summer and winter flows resulting in a more natural hydrograph;
- Higher and more stable headwater reservoir levels;
- Restoring and maintaining fish passage to historical habitats.
- Higher river flows during dry years;
- Lower late summer water temperature;
- Reconnected floodplains throughout the river including a reconnected lower river estuary ecosystem as well as reduced salt water intrusion during summer and fall;
- Columbia River plume and near shore ocean enhanced through higher spring and summer flows and lessened duration of hypoxia;
- An adaptive and flexible suite of river operations responsive to a great variety of changing environmental conditions, such as climate change;

...plus some specific provisions related to these principles

Upper Snake River Tribes (28)

Recommend some of the collaborative managers’ draft package of recommendations (*see* above, at Oregon) -- those with partial mainstem focus including recommendations relating to lamprey, sturgeon, eulachon, anadromous fish passage

Nez Perce Tribe (25)

Implement experimental spill management

Lamprey -- passage/hydrosystem performance standards/operational assessment, habitat

Support for breaching the lower Snake dams

Yakama Nation (17)

Recommend support for both Bonneville and CRITFC recommendations (which means support for BiOp/accord implementation in mainstem, plus additional material in CRITFC recommendation, below)

PCBs from dams: recommend the Corps of Engineers develop best practices to reduce and contain spills and leakage of PCB-laden fluids from FCRPS dams

Mainstem habitat and dredging: establish a technical working group to develop best practices for dredging mainstem shipping channel to be compatible with, if not complementary to, shallow water habitat formation and reduction in wake stranding.

Lamprey recommendations with the others, including mainstem passage/performance standards/habitat

Confederated Tribes of the Umatilla Indian Reservation (19)

Support Bonneville and CRITFC recommendations, except Bonneville view on toxics)

Lamprey recommendations -- same

Confederated Tribes of the Warm Springs Reservation (21)

Support Bonneville and CRITFC recommendations

Columbia River Inter-Tribal Fish Commission (14)

Lamprey recommendations: passage, performance standards, mainstem habitat

Toxics and hydropower system:

Recommendation: Insert the following language into the Fish and Wildlife Program that recognizes fishery resources are clearly affected by toxics that have accumulated due to the development and operation of the federal hydropower system:

“Fishery resources are clearly affected by the development and operation of the federal hydropower system. Dam presence is associated with the accumulation of contaminated sediment (Colas et al., 2013) and the presence of reservoirs and their operations are a controlling factor on the chemical conditions such as anoxia, which impact the distribution and bioavailability of toxics in the system. An example of a specific impact caused by the dams is to sturgeon; once anadromous, sturgeon are now blocked in reservoirs and subjected to contaminants year-around at contaminant levels exacerbated by the reservoirs.”

Measure 1: The U.S. Army Corps of Engineers, in coordination with BPA, should fund and implement a programmatic review and assessment of how hydropower projects affect problems associated with the effects of toxic substances in the mainstem Snake and Columbia Rivers and opportunities for operational changes or other actions to help mitigate these impacts and reduce toxic contamination. Determine how seasonal anoxia in dam reservoirs controls the release of toxics and other pollutants from the sediments to the water column and how the uptake and transfer of these toxics and pollutants transfer up the food web and negatively impact fish. Evaluate how environmental toxicants impact the reproductive fitness of fish that are impounded behind dams. [more in recommendation]

Avian and pinniped predator control -- continue and update

Revisit flood risk management:

Recommendation 1: Adopt a Flood Risk Management Appendix for Fish and Wildlife program that follows the outline below. Specific reservoir elevations and flow targets to be provided pending modeling and analysis from Columbia River Treaty Review Iteration #3 alternative model runs.

Recommendation 2: Add to Basinwide Strategies - Flood Risk Management pursuant to Columbia River Treaty Review

- U.S. Columbia River Basin Flood Risk Policy Review: The Tribal, Federal, and State Sovereigns will conduct a region-wide public process to review the current level of flood risk management in the Columbia River basin to enhance ecosystem-based function. This will begin in 2013. The Treaty (post-2024 and before 2024 if feasible) should be designed to adapt to any such changes.
- U.S. Flood Plain Reconnection: Reconnect floodplains and wetlands throughout the basin to take advantage of spring peaking flows and as mitigation for damages caused by the implementation of the Treaty. The Tribal, Federal, and State Sovereigns will work with the Northwest Power & Conservation Council Fish and Wildlife Program and NOAA/NMFS Recovery Planning process (particularly estuary actions) to implement flood plain reconnection for the purpose of achieving additional benefits from modernized CRT operations.
- Water Supply Allocation: Once ecosystem-based functions have been achieved (including the achievement of the NPCC goals to double salmon runs and meet resident fish and wildlife objectives) and tribal reserved water rights have been addressed, the Pacific Northwest States and Tribes will design and initiate a process for the allocation of unallocated stored water. The Treaty (post-2024 and before 2024 if feasible) should be designed to adapt to any such changes.
- Flood risk management procedures should be modernized to incorporate a coordinated operation plan based on power production, flood risk management, and ecosystem-based function as equal primary drivers under the Columbia River Treaty (Treaty). Flood risk management pursuant to the Treaty should reflect a comprehensive approach that addresses all opportunities to manage high flow events, including floodplain management, additional levees, and strategic levee improvements. If Canada is not willing to amend the Treaty to provide continued coordinated operations, then the post-2024 Treaty flood risk management "called upon" provisions should be structured to provide adequate protection, avoid adverse effects on reservoir and river ecosystem based function, and reasonably compensate Canada for their flood risk support.
- The Department of State should obtain long-term, coordinated, and assured Canadian storage that provides an adequate level of system flood risk management. Assured Canadian storage operations should be implemented prior to using U.S. "effective use" and "called upon" from Canadian storage.
- Flood risk management pursuant to the Columbia River Treaty should reduce reliance on reservoir storage, address management of peak flows, and increase flood risk management options by moving structures out of the flood plains (e.g. by incorporating

conservation easements or by fee acquisition after thorough study and feasibility assessment), reclaiming lost flood plains to enhance ecosystem-based function and flood risk management, and, where necessary, constructing and/or modifying levees.

U.S. reservoirs/projects should meet their authorized uses consistent with ecosystem based function, treaties and trust responsibilities to Columbia Basin tribes and their applicable legislation and other U.S. laws such as the Clean Water Act, and Endangered Species Act.

- Flexibility is needed for adapting to changing objectives in the U.S. and Canada and to climate change to avoid additional risks to authorized purposes.
- Develop new storage reservation diagrams (SRDs) for eight system storage reservoirs.
- Reduce flood risk reservoir drafts in all but the highest water years.
- Local flood protection should be the highest priority.
- If the Department of State is not able to negotiate amendments to the CRT to provide continued coordinated operations, then the flood risk management program under the Treaty would need to:

Establish a common understanding of methods and procedures for post-2024 “called upon” flood risk management implementation and for reasonable compensation to Canada for economic losses and operating costs associated with that operation.

Develop Post-2024 “called upon” operations.

Consider “called upon” storage only if Canadian power drafts do not provide sufficient storage in conjunction with use of U.S. system flood storage.

Create storage reservation diagrams to incorporate ecosystem-based function.

Draft projects according to their future, modified storage reservation diagram (SRDs) consistent with integration of ecosystem-based function.

Operate both Canadian and U.S. projects to their expected power objectives and other project purposes, including Canadian local flood control, before making a “called upon” request.

Coupled with continued coordinated flood storage in Canada, limit “effective use” flood risk management operation after 2024 to the eight U.S. reservoirs authorized for system flood control – consistent with their meeting authorized purposes.

For implementation of the Treaty, the U.S. and Canada should develop and implement improved water forecasting procedures (i.e. establish official weekly or bi-monthly forecasts and increased monitoring capability) using the best available science and use these to coordinate U.S. and Canadian river operations.

Confederated Tribes of the Grand Ronde Community of Oregon (18)

Recommendations included significant portions of managers’ collective draft recommendations, including: lamprey; plume/estuary/near-shore; climate change and hydrosystem; toxics and assessment of connection to hydrosystem; sturgeon; expand and implement/assess pikeminnow and pinniped predation control to below Bonneville; eulachon assessment

Willamette and passage -- revise provisions in mainstem on passage to incorporate Willamette juvenile and adult passage modification and to give them same priority for funding as mainstem passage

Cowlitz Tribe (22)

As with the Grande Ronde Tribe, picked up many of the managers' collective draft recommendations, with mainstem focus: lamprey; sturgeon; eulachon; toxics; ocean/plume; climate change; predation

Federal Agencies

NOAA Fisheries (30)

Recommend the Council continue to incorporate (updated) Biological Opinion actions and performance standards as the Fish and Wildlife Program's baseline mainstem measures and objectives.

Toxics and mainstem

Both the Independent Scientific Advisory Board (2013) and the Independent Scientific Review Panel (2013) recommend that the Fish and Wildlife Program take a more active role in ensuring that toxic contamination associated with FCRPS be addressed

Insert the following language into the Fish and Wildlife Program that recognizes fishery resources are clearly affected by toxics that have accumulated due to the development and operation of the federal hydropower system:

“Fishery resources are clearly affected by the development and operation of the federal hydropower system. Dam presence can be associated with the accumulation of contaminated sediment (Colas et al., 2013) and the presence of reservoirs and their operations can be a controlling factor on the chemical conditions such as anoxia which impact the distribution and bioavailability of toxics in the system. An example of a specific impact caused by the dams is to sturgeon; once anadromous, sturgeon are now blocked in reservoirs and subjected to contaminants year-around at contaminant levels exacerbated by the reservoirs.”

Measure 1:

Coordinate with other federal agencies and co managers on a programmatic review and assessment of how hydropower projects exacerbate any problems associated with the effects of toxic substances and if any such correlation exists, the Council should identify opportunities for operational changes or other activities to help mitigate these impacts and reduce toxic contamination. Determine how seasonal anoxia in dam reservoirs controls the release of toxics and other pollutants from the sediments to the water column and how the uptake and transfer of these toxics and pollutants transfer up the food web and negatively impact fish. Evaluate how environmental toxicants impact the reproductive fitness of fish that are impounded behind dams.

Plume/estuary/near-shore ocean -- various recommendations, including continue monitoring and increase understanding of hydrosystem effects on plume/estuary and how to address adverse effects

Miscellaneous recommendations for the Program's mainstem provisions:

Revise the 2nd of the Primary mainstem strategies to: “...2) provide adequate levels of survival to support fish population [Insert] targets that at a minimum meet ESA requirements in biological opinions and recovery plans [End Insert]. ESA biological opinions on mainstem hydrosystem provide minimum survival targets through the system. Also, the recovery plans have population recovery objectives that have evolved since the subbasin plans.

Revise language about optimizing fish survival: The hydrosystem is not optimized for survival of any species, nor can it be. Replace this language with something more accurate like [insert] manage the hydrosystem to maintain or increase the survival of migrating fish” [end insert].

Add language that recognizes that Dworshak cool water summer releases should be prioritized to protect upstream migrating adults during the summer.

Revise language on p. 38, last bullet to reflect that a spill efficiency goal would provide clearer regional guidance than the current non-specific language.

Review the emphasized issues for testing on p. 41. Several of these objectives have been worked on by the action agencies for the past 5 to 10 years.

Mainstem habitat: amend language about creating islands in the bullets on page 42 under Actions to consider. Islands can provide habitat for avian predators. This mainstem action should be properly caveated, e.g. create islands without providing habitat for predatory birds, or removed.

Juvenile Fish Transportation on p. 45, the three highest priorities. The second bullet: “...Conduct a transportation study that targets Snake River fall Chinook...” has been completed in that all fish have been released and we are not just waiting for adult returns.

The word “optimal” again is used in the Juvenile Bypass Systems section on page 48. “Optimal” could mean several things. The document should more clearly articulate desired outcomes.

On page 47, replace the fourth bullet with [insert] *develop operational and configurational measures to effectively reduce impacts of adult fallback (and steelhead kelt passage) outside of the juvenile spill passage season.*

Eulachon -- among a set of eulachon recommendations, mainstem focused recommendations to assess estuary and plume survival and hydrosystem effects; adjust the timing, magnitude, and frequency of hydrosystem flows (especially spring freshets) entering the estuary and plume to better reflect the natural hydrologic cycle; improve access to habitats; and provide better transport of coarse sediments and nutrients in the estuary and plume if these are found to be limiting to eulachon life history.

Piscivorous predator control -- implement and expand (same or similar to collective managers’ draft rec):

Program should strive to measure the effects of predation and express them in common terms such as salmon adult equivalents to facilitate comparison and evaluation against other limiting factors. Predator evaluations should include salmon adult equivalent metrics in their reports.

BPA should continue to implement annually the base piscivorous predator-control program and expand northern pikeminnow removals to other mainstem dams in the lower Columbia River i.e., expand program to include northern pikeminnow removals at McNary and Bonneville dams. The action agencies should evaluate the effectiveness of focused pikeminnow removals for these expanded efforts and implement as warranted.

BPA (and action agencies) should work cooperatively with NOAA Fisheries, USFWS, states, tribes and the Council to develop and implement system wide strategies to manage and reduce non-native fishes that compete and feed on native fish in mainstem and in tributaries. This also applies to section II.D.2 Non-Native Species Strategies, page 18.

Avian predator control (same or similar to collective managers' draft recs)

The Council should adopt into the Program the management plans that have been developed through USACE and other processes for piscivorous avian species in the Columbia Basin and estuary. Incorporate any management plans that have been developed for double-crested cormorants, Caspian terns, and other avian species in the mid-Columbia River area and prioritize actions for implementation.

Reintroduction of anadromous fish into blocked areas (same or similar to collective managers' draft rec)

U.S. Fish and Wildlife Service (33)

Recommendations on lamprey (same or similar to collective managers' draft recs) -- prioritize research needs for juvenile and adult lamprey passage; hydrosystem performance standards; operational effects; mainstem habitat

Recommendations on toxics (same or similar to collective managers' draft recs) -- assess and address hydrosystem-connected toxic contaminants

Recommendations on bull trout -- evaluate how projects, reservoir conditions and operations impact connectivity among basins for bull trout; bull trout passage; operations and habitat for bull trout

Fish Passage Center -- recommend the Mainstem Monitoring and Evaluation component of the Fish and Wildlife Program continue to implement the various functions performed by the Fish Passage Center.

Snake River fall chinook:

Recommend development of a plan to use unmanned aircraft system (UAS) technology for monitoring and evaluation of fall chinook redds; key areas to target in this plan would be large mainstem rivers such as the lower Snake River and its tributaries that are too large or remote for survey on foot.

Mainstem habitat: program should continue to support the creation of shallow-water habitat in reservoirs for use by native fishes, and should provide additional support for monitoring

and evaluation of use especially by chinook salmon in the Snake River Basin. Shallow-water habitats in reservoirs are used for rearing by native fishes and can be created by disposal of dredge material. Use of such created habitat can increase as juvenile abundance in natal riverine habitat upstream of reservoirs increases. However in the case of subyearling fall Chinook salmon, the characteristics of ideal island and shallow-water habitats have not been fully identified. Plans are being made to dredge Lower Granite Reservoir and to create rearing habitat for fall Chinook salmon subyearlings with the dredge material, but there are no plans to monitor and evaluate the use of the created habitat or its influence on growth and survival.

Sturgeon -- management framework plan; mainstem passage and operational strategies

U.S. Geological Survey (38)

Lamprey; sturgeon; eulachon -- recommendations same or similar to collective managers' recommendations

Recommend sediment budget for lower Columbia:

Sediment Budget for Lower Columbia River

Recommendation: The Council should consider updating the Fish and Wildlife Plan to request that the appropriate agencies assess key components of a sediment budget for the lower Columbia River including:

- Inputs and outputs for a defined reach should be determined. A logical study reach would extend from Bonneville Dam to the mouth. This would be most complete if it included main-stem measurements of flux at or near (1) Warrendale (just downstream of Bonneville), (2) Beaver Army terminal (downstream of major tributary inputs but upstream of the bay-head depositional zone), and (3) a location near the mouth so as to understand net transport out of the lower Columbia River. Ideally, these locations should be supplemented by measurements allowing independent estimates of sediment brought in by major tributaries, particularly the Cowlitz and Willamette Rivers.
- Both bedload and suspended load measurements should be determined, and sufficient observations made so as to allow estimating total flux at each measurement location. As noted above, the management issues involving these components of the overall sediment flux are distinct.

Columbia River Treaty and flows: support habitat responses to changes in future stream flows conditions from modernized treaty: support adaptation of DELFT3d model to a hierarchical habitat classification tool to identify key recoverable habitats in lower Columbia

Fish tagging: along with recommendations of Fish Tagging Forum:

Consider less expensive deployment of JSATS or other active telemetry systems to measure compliance with BiOp performance standards.

Future studies of passage and survival in hydrosystem should focus on further efficiencies in water use.

Environmental Protection Agency (37)

Recommendation on toxics and mainstem hydrosystem connection:

A third recommendation is for the Council to provide a review and assessment of how hydroelectric projects affect toxic contaminants in the Columbia River Basin and how toxic contaminants can impact the fish that are impounded behind dams. Fish species have been affected in various ways by the development and operation of the hydropower system. Dam presence can be associated with the accumulation of toxic sediments and the presence of reservoirs and their operations can be a controlling factor on the chemical conditions, such as anoxia and mercury as previously discussed, which can impact the distribution and bioavailability of toxics in a reservoir system and in turn may impact recovery efforts.

Pacific Fishery Management Council (34)

Recommend Program test the efficacy of higher levels of spill to increase smolt-to-adult return rates.

Fully consider how changes to the Columbia River Treaty may impact salmon and habitat, and endorse full mitigation by asking the U.S. Entity representatives to place a high priority on ecosystem function

Bonneville Power Administration (35)

Incorporate once again the hydro spill and dam passage strategies, performance standards, and inriver survival targets reflected in the 2008 FCRPS BiOp, as modified by the draft 2013 Supplemental BiOp, which the Accords adopt through the term of the Accords (September 30, 2018). Based on the best available science, the federal agencies developed these provisions in coordination and consultation with the region's state and tribal natural resource agencies, the Council, and other stakeholders. The applicable standards and metrics are currently being implemented by the Action Agencies and were formally endorsed in the Accords. Through ongoing studies and evaluations, as shown in the recently released 2013 Comprehensive Evaluation, the Action Agencies are demonstrating empirically that the FCRPS is on track to meet these performance standards and metrics by 2018.

Spill regimes are designed individually for each dam based on years of study, balancing juvenile and adult passage conditions. Recent structural improvements at the dams are making spill more natural and effective, allowing fish to pass more naturally at the surface. As a result of surface passage spill, fish survivals are higher and fish now pass faster. Spill volumes are based on efficiency rather than volume.

Water and Flow management: Similarly, the Program should continue to reflect the flow management actions included in the 2008/13 BiOp and endorsed in the Accords. This should include recognition of the recent agreement with BC Hydro regarding use of Non-Treaty storage for additional flow augmentation, an action supported by the Accords and the Independent Scientific Advisory Board (ISAB) in its recent review.

Hydro results: A recent paper prepared by BPA, the Corps, and the Bureau of Reclamation, in coordination with NOAA Fisheries, titled Federal Columbia River Power System Improvements and Operations Under the Endangered Species Act – A Progress Report (to be presented to the Council in fall 2013) describes the major overhaul of the hydro system that has taken place in response to regional pressure for improved hydro survival and biological performance metrics. The Program should acknowledge and support these substantial regional accomplishments.

Lamprey passage: The Program should also reflect the lamprey passage improvements at federal dams that are occurring based on commitments in the Accords, which are now also reflected in the U.S. Fish and Wildlife Service Lamprey Conservation Plan. This is consistent with the ISAB comments on hydro strategies.

Columbia River Treaty: Within the next year the U.S. Department of State is expected to make diplomatic decisions regarding the Columbia River Treaty for the post-2024 period. BPA expects there will be robust regional discussions regarding the Treaty this year and beyond. However, the substance of Treaty negotiations for post-2024 implementation falls outside the timeframe of this Program amendment.

Bureau of Reclamation (36)

Continue to incorporate Biological Opinions measures and standards into the Fish and Wildlife Program.

Bonneville customers and customer groups, other utilities

Bonneville Customers (Public Power Council; Northwest RiverPartners; PNGC Power; Northwest Requirements Utilities) (44)

Incorporate by reference and ensure consistency with provisions of the NOAA Biological Opinion which will be completed by the end of this year.

Spill:

Proposed “Spill Experiment” is illegal, inappropriate and unnecessary -- total dissolved gas Clean Water Act violations, BiOp negative review; dam survivals currently high; and more.

Because the Draft BiOp reflects the best available science on spill and transport, the Council should adhere to spill and flow measures incorporated therein. Council should not re-adopt its prior spill regimes based on prior court orders because spill at those artificially imposed levels is not based on the best science. Prior spill regimes required spill “around the clock” for a period of four months at the Snake River projects, regardless of whether spill at that level was biologically necessitated. Rather than corresponding to the actual biological needs of migrating salmon, prior spill measures were based on calendar dates.

Chelan PUD (45)

Continue to recognize (and update) the performance standards and mainstem spill and bypass provisions of the Mid-Columbia HCPs as part of the baseline objectives and measures in the mainstem plan.

Recognize limits to survival gains that can be realized thru hydrosystem and habitat; avoid measures like SARs that are impacted by out-of-basin factors.

Grant PUD (46)

Reduce avian predation in Mid-Columbia reach.

Environmental and fishing groups -- and individuals in support (either by explicit connection or by similar recommendations)

American Rivers (49)

Mainstem dam operations and Northwest Power Act obligations -- Council and Fish and Wildlife Program should become more assertive on mainstem federal dam management and operations; current strategy of NOAA Fisheries and the Action Agencies is based on testing the minimum limits of the Endangered Species Act's jeopardy standard; Power Council's "equitable treatment" standard should be used to build on ESA actions where they may be insufficient to recover and sustain healthy wild populations of listed salmon and steelhead as well as non-listed fish populations

Undertake a "spill experiment" as recommended by federal, state, and tribal biologists through the Comparative Survival Study; raise the total dissolved gas "cap" to 125 contribute significantly toward meeting the Power Council's smolt-to-adult ratio goals of two to six percent.

Assist in restoring more natural floodplain functions on mainstem (and tributaries) to allow dam managers to operate the river to more closely mimic a natural hydrograph; floodplain restoration could help allow the hydrosystem to meet its flood management and safety obligations under a modernized Columbia River Treaty in a manner that also meets ecosystem function purpose.

Reintroduction of salmon and steelhead above Chief Joseph and Grand Coulee; other processes are working toward reintroduction above impassable dams on the Snake River, Yakima River, and elsewhere; Fish and Wildlife Program should endorse these efforts and offer expertise and funding to help speed them along and ensure their success.

also Conservation Northwest; TA Anderson; Alice Bartholomew; Kathy Bradley; kx bx; Mark Canright; Clay Colson; Jorge De Cecco; Francine Dolins; James Dunn (less specific; see below); Eric Edwards; Marilyn Evenson; Angela Fazzari; Justin Featherston; Margaret Garrity; Carol Gold; Donald Harland; Marjorie Hass; Molly Hauck; Steve Iverson; Ghazale Jamsheed; Catherine Johnston; Linda Kade; Maya Kurtz; Carolyn Massey; Margaret McGinnis; Karen Naiman; Thomas Nelson; John Nichols; Heather Payne; Christian Ritenour; Thomas Ronan; Caryn Sappelli; Marvin Scherl; Donna Selquist; William Seyfried; Jeanie Streit; Ray Swiatkowski; Brian Thompson; Ann Whittaker; Irene Willey

John Dunn

Change dam operations to improve salmon survival. Improve the passage of juvenile salmon over the dams. Allow more spillage to improve water flow for the river's natural habitat. Change the flood risk operation and garner increased water flow from Canadian reservoirs to improve water flow.

Association of Northwest Steelheaders, Idaho Rivers United, Institute for Fisheries Resources, Pacific Coast Federation of Fishermen's Associations, Save Our Wild Salmon Coalition (64)

Undertake a test of expanded spill as recommended by federal, state, and tribal biologists through the Comparative Survival Study.

Pursue specific actions to provide flows of adequate quality and quantity for anadromous fish migration, as required by the Northwest Power Act; including, but not be limited to, drawdown of John Day Reservoir to Minimum Operating Pool; operating some or all of the lower Columbia River reservoirs (as well as those on the Snake River) at MOP would increase the likelihood of meeting the velocity equivalents of the flow objectives established for the lower Columbia River in previous Council Fish and Wildlife Programs and NOAA decisions.

Endorse “Ecosystem Function” as an explicit third purpose of the Columbia River Treaty, at least co-equal with power production and flood risk management.

Conduct a comprehensive study of lower Snake River restoration via removal of the four dams on the lower Snake River

Northwest Sportfishing Industry Association (NSIA) and the Association of Northwest Steelheaders (ANWS) (62)

Recommend adaptive management project to test increased levels of spill in the spring to achieve better, more reliable survival of smolts passing through the hydro system

Long Live the Kings (57)

Plume: understand the relationship between the dams and the functionality of the Columbia River plume; plume plays a significant role in the coastal ecosystem and could affect salmon outmigrants as well as other organisms occupying the plume; not aware of work focusing on the changes to the flow regime and the impacts that may have downstream.

Native Fish Society and Wild Steelhead Coalition (60)

Identify and protect thermal refuge areas in the mainstem Columbia and tributaries. Protection would include both the refuge areas and the sources of cool water that feed them. Develop a plan for controlling fishing in refuge areas especially during periods of high water temperatures in excess of 68 degrees F

Northwest Resource Information Center, Inc. (61)

Federal Columbia River Power System must be changed to comport with the Snake River salmon and salmon fisheries restoration intent of the Power Act. Principal elements of such a plan: sequentially breach the four lower Snake River dams and operate John Day pool at design level

Formally recant Council support for the provisions of the NOAA Fisheries (Bonneville) Biological Opinion that do not comport with the salmon and fisheries restoration mandate of the NW Power Act and with federal court orders; mainstem measures in the BiOp (including the

current draft updated BiOp) cannot possibly meet the Snake River salmon and salmon fisheries restoration intent of the Northwest Power Act; salmon and salmon fisheries restoration mandate of the Northwest Power Act should be substituted as the only appropriate baseline for the Program and the Power Plan.

Darrell Johnson (472)

Removal of the four unnecessary dams from the lower Snake River; power can be substituted for by other means, and this river can be restored to a much more natural profile to the benefit of all.

James Adcock (464)

Recommends an "all out effort" be funded to make continuous measurements of the highest scientific quality during these rare periods of high spill and resulting fish trauma; serious data with which to base rational decisions on leads to parties arguing how much spill is or is not beneficial to fish, and what levels of dissolved gas should be permitted.

Miscellaneous

Kintama (43)

Groups advocating for increased spill or flow to accelerate the movements of smolts into the ocean should be required to demonstrate how these arguments can be logically correct if ocean survival rates are worse than in freshwater.

Proponents of management actions should be asked to provide data showing that early marine survival rates are better in the ocean than in freshwater, since only better marine survival rates soon after ocean entry can potentially improve SARs by manipulating the hydropower system; if marine and freshwater survival rates are approximately equal then flow manipulation will change where salmon smolts will die, but not change SARs, yet the associated hydrosystem manipulation will come at great economic cost.

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