MFWP Region 1
490 North Meridian
Kalispell, MT 59901

Bill Bradbury, Council Chair
Northwest Power Planning Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348

September 17, 2013

Re: Recommendations on the Northwest Power and Conservation Council's Columbia Basin Fish and Wildlife Program.

Dear Council,

The Montana Department of Fish Wildlife and Parks (MFWP) appreciates the opportunity to provide recommendations on the Columbia Basin Fish and Wildlife Program. As requested, our comments address hydrosystem passage and operations; fish and wildlife habitat protection and restoration; artificial fish production; non-natives species; resident fish and wildlife affected by the hydrosystem; and over-arching program efficiencies. Our comments and recommendation on pages 1 through 7 are specific and follow the structure of the 2009 Program. Pages 8 through 10 contain generalized comments regarding the overall Program, followed by an appendix.

II. BASINWIDE PROVISIONS

A. Vision for the Columbia River Basin

2. Planning Assumptions

Page 7. In Lieu Provisions

The Council should clarify BPA's "In-lieu" funding restrictions and establish a policy in the new Program. The Council should review in-lieu decisions implemented by BPA to ensure that critical mitigation efforts receive BPA funding for successful and timely implementation. Also, the in-lieu provisions should not prevent project sponsor's from establishing equitable cost-share arrangements with other entities that are responsible for similar on-the-ground actions.

Rationale: Section 4(h)(10)(A) of the Northwest Power Act requires BPA to protect, mitigate and enhance fish and wildlife to the extent affected by the development and operation of the hydropower projects of the Federal Columbia River Power System (FCRPS) in a manner consistent with Council's fish and wildlife program and the purposes of the Act. The "in Lieu" provision of section 4(h)(10)(A) states that "Expenditures of the Administrator pursuant to this paragraph shall be in addition to, not in lieu of,

other expenditures authorized or required from other entities under other agreements or provisions of Law." These vague statements should be clarified.

Page 7. Quick facts box

We recommend adding Kootenai white sturgeon and mountain whitefish, and change rainbow trout to redband trout.

Page 8. Harvest

The 2009 Program states, "Harvest can provide significant cultural and economic benefits to the region, and **the Program should seek to increase harvest opportunities consistent with sound biological management practices.** Harvest rates should be based on population-specific adult escapement objectives designed to protect and recover naturally spawning populations." We recommend that the text in bold print above be revised to read: **the Program should seek sustainable harvest opportunities consistent with sound biological management practices.**

Rationale: The revised sentence is more consistent with the long-term goals of the Fish and Wildlife Program. Montana reduces harvest if necessary to allow native fish populations to rebound, and increases harvest limits on nonnative species to reduce negative interactions with native species. These practices should be applied throughout the Columbia Basin.

C. Biological Objectives

Page 12. Resident Fish and Wildlife Losses

Our previous comments urged completing loss statements elsewhere in the basin. Loss statements provide a measure of the negative impacts at each site, so can be used as a benchmark for assessing progress toward site-specific goals. This effort began, but faded over time, perhaps because the process became more complex and expensive than intended.

Rationale: Our intent was to apply a quick and inexpensive method to examine construction and inundation losses sustained at each federal dam. The techniques used to develop loss statements for Hungry Horse and Libby reservoirs can be applied as a rapid assessment tool at other reservoirs. These loss statements can be used to measure progress toward offsetting construction and inundation losses. This is especially important now because BPA is requesting credits (i.e. credit for each kilometer of stream protected by their investments in fisheries mitigation) to provide accountability for the program.

D. Basin Wide Strategies

Page 14. Habitat strategies

Mitigating Construction and Inundation Losses

Permanent or long-term funding agreements should remain a priority for completing this work including all the key points outlined in the current program, and funding should be tied to approved loss statements or settlement agreements. The Council should maintain conservation easements and fee

title acquisitions as opportunities to protect and restore habitat for fish and wildlife. Streamline the process to expedite habitat protection goals before prices rise further, and opportunities for habitat protection and enhancement decline as human development expands. Once habitat is secured, the focus should shift to habitat restoration.

Habitat protection for fish and wildlife would benefit if Council encouraged greater emphasis on partnerships (as mentioned on p.7 of the 2009 Program) to expand conservation benefits and reduce mitigation costs to the ratepayers. Over the past 10 years, Montana has conserved more than 45 km of important native fish streams, by leveraging $32 million from the resident fish program with more than $31 million from other conservation programs. We recognize that partnership projects require more time to develop and implement. However, they also provide opportunities for creative solutions that allow sponsors to combine priorities from multiple programs resulting in landscape-level conservation benefits, reduced acquisition costs, and reduced and/or shared long-term O&M costs. Council should encourage cost-share partnerships and build flexibility into the program necessary to partner with other conservation programs that prioritize both habitat conservation and working landscapes operating under best management practices.

By the end of fiscal year 2012, approximately 51 km of mitigation credit for Hungry Horse Dam had been accumulated to offset a portion of the 125.8 kilometers of documented tributary habitat losses. Unfortunately, human population growth, subdivision, and potentially incompatible development along the major waterways in the Flathead and Kootenai Basins are continuing in spite of the past economic downturn. Development is picking up both nationally and locally and will continue to increase the costs to implement mitigation, both due to increasing land prices and increasing O&M costs. At the same time, opportunities for landscape or large-scale fisheries habitat protection are becoming fewer due to ownership changes, subdivision, fragmentation, and an improving real estate market. This combination of escalating costs and decreasing opportunities indicate that the most effective and efficient means to mitigate construction and inundation losses may lie in a long-term, predictable yet somewhat flexible "settlement" agreements, or long-term funding agreements using capital funds that utilize a number of partners and increased program flexibility. To minimize long-term ratepayer costs, the Council should strive to implement habitat measures as rapidly as possible given revenue constraints.

Only 3 kilometers have been protected in the Kootenai Subbasin. We recommend that a program similar to the "Secure and Protect" project in the Flathead Subbasin (CSKT and MFWP) be established in the Kootenai Subbasin.

Montana, CSKT and the Kootenai Tribe of Idaho (KTOI) are united as mitigation partners in the Montana portion of the Mountain Columbia Ecological Province. The state and tribal fish and wildlife authorities have the greatest interest in the success of the habitat protection program and should be empowered to use mitigation funds to implement mitigation actions based on the best available science, unfettered by costly bureaucratic processes that directly reduce available project funding.

Page 15. Protected Areas

Recommendation : Make certain that important habitat for bull trout and other species of concern are included in the protected areas. We request that "resident fish" be specifically identified as a value

where that is not already the case. For those river reaches that are not already Protected Areas, we request that the Council add them.

Rationale: Bull trout (*Salvelinus confluentus*) is an ESA listed species that depends on relatively pristine habitat in streams and lakes. Primary threats to bull trout include factors that are caused or exacerbated by hydropower development, including habitat degradation, blockage of migratory corridors, and water quality impacts.

Page 18. Non-natives Species Strategies (see also page 53)

The Council should continue to be regional leaders coordinating science, policy and outreach to control the spread of Aquatic Invasive Species (AIS) to, and within the Columbia River Basin. The NPCC's Fish and Wildlife Program should emphasize preventing the invasion and spread of AIS (e.g. quagga and zebra mussels, Eurasian milfoil, flowering rush, Didymo), especially those species that pose the greatest risk to ecosystems and industries. Bonneville Power Administration (BPA) power revenues should be used to help fund AIS prevention, and protocols for early detection and rapid response, through the Program and Operations and Maintenance budgets. Prevention activities should include inspecting and decontaminating boats from infested waters that enter the Columbia Basin. Such a large-scale problem requires a coordinated effort from all interested parties.

Projects designed to eradicate or suppress nonnative species should be prioritized based on the site-specific level of threat represented by non-native species, the likelihood of successful mitigation, cost-effectiveness, and partnership opportunity. Top priority should be given to native species strongholds where there is a reasonable chance that nonnative species can be completely eradicated, and prevented from reinvasion. Furthermore, long-term suppression projects that cannot eradicate the threat of non-native species should not displace funding for habitat restoration or other mitigation actions with defined costs and high likelihood of success.

Mitigation programs should include efforts to prevent and reduce the occurrence of non-natives. Assessment of presence and population trend for non-native species should be included within long-term monitoring efforts as well as evaluation techniques implemented for habitat restoration projects. Managers should determine when deterrent actions would be required. A predetermined threshold should be established with potential control or prevention actions identified. Literature review for new and innovative prevention and control methodologies should be conducted periodically.

Rationale: Non-native species represent a threat to native species and native ecosystems. They often have a competitive advantage because of fewer natural predators, competitors and diseases. In addition non-native species are often tolerant of human caused disturbances. They can be aggressive and exclude native species especially under limited resource situations. Prevention of AIS, and detection and rapid response to new invasions, are critical to prevent further degradation of ecosystem functions, and to protect prior investments in fish and wildlife restoration, infrastructure, and renewable energy production.

Pages 18-19. Artificial fish production

The Council should be aware that funding for the Sekokini Springs Isolation Facility for genetic conservation of native westslope cutthroat trout, has not been fully allocated to date. Funding approved for renovating the site was intended to be in addition to MFWP's base program. The Sekokini Springs Master Plan contains a 17-year experimental horizon that cannot be fully realized until the facility, including outdoor rearing habitats, is renovated. The step 3 APRE approval letter from NPCC specifically mentioned only the initial years, and the remainder of the experiment should not be allowed to fade from institutional memory.

Experience gained from the Sekokini Springs Isolation Facility, associated experiments, and field operations show great potential for genetic conservation of westslope cutthroat trout. The isolation facility can also hold wild fish while restoration projects are underway (e.g. habitat restoration or chemical rehabilitation) for restoring populations after limiting factors are eliminated. These conservation techniques can be applied to other salmonids species. The Council can help distribute information on effective techniques and research results.

Pages 22-23. Resident fish mitigation and crediting

The program should maintain the resident fish goal of mitigating construction, inundation and operational impacts to resident fish populations by "preserving, enhancing, restoring and/or creating fish and wildlife habitat equal to the quantity and quality of habitat lost . . . through the acquisition of appropriate interests in real property at a minimum ratio of 1:1 mitigation to lost distance or area". We acknowledge that the 1:1 ratio does not replace habitat that was permanently lost due to inundation as the reservoirs filled, but instead prevents the loss of additional habitat, and after the habitat is protected, investments in habitat restoration are also secured. Terrestrial wildlife losses caused by dam operation should be based on the functionality of riparian and riverine ecosystems as determined from scientifically defensible, repeatable, and comprehensive assessment tools similar to those developed by the Kootenai River Operational Loss Assessment, Protection, Mitigation, and Rehabilitation project (BPA Project 200201100).

The outcome of these efforts would be the overall protection and restoration of ecosystem integrity through coordinated implementation of BPA-sponsored projects, partnerships, and a variety of other leveraging opportunities. Projects funded by BPA would meet this purpose and outcome and need to be implemented in a clear, predictable, timely, cost-effective and efficient manner with benefits for fish and wildlife as well as credits clearly defined. Permanent or long-term funding agreements between BPA and state and federal agencies and tribes who implement mitigation should also remain a priority for completing this operational mitigation, including all the key points outlined in the current program. However, we believe that it would benefit the program and the ecological integrity of fish and wildlife habitats of the region if Council also encouraged a greater use of partnerships to expand conservation benefits and reduce mitigation and long-term management costs to the ratepayers.

Page 22. Wildlife Operational Losses

BPA should prioritize funding for agencies and tribes that are interested in completing operational impact assessments using methods that provide a systematic approach to characterize active physical

and biological processes in watersheds and describes spatial distributions, histories and linkages among important ecosystem components. BPA should then fund development and implementation of mitigation plans to offset those identified losses caused by ongoing dam operations. Alternatively, we also support the current program direction of encouraging long-term funding agreements or permanent settlements to address operational losses in lieu of precise assessments of impacts if specific regional managers prefer that option. Regardless of which approach is used, it is time to start implementing projects that offset impacts caused by ongoing operations of federal hydropower facilities.

Page 24. Part 9. Monitoring, Evaluation, Reporting, Research and Data Management.

The Council's efforts to standardize RM&E and data sharing should recognize that needs differ throughout the Columbia Basin. Whereas anadromous fish migrate through multiple states and jurisdictions, resident fish typically reside between and or above dams and management agencies are often coordinated by other existing forums. Be vigilant not to apply "one size fits all" strategies, and instead focus on specific problem areas were coordination is currently lacking or has room for improvement.

We recommend that monitoringmethods.org be discontinued. This process has not proven useful or cost-effective.

Page 25. Section b. Research

The Council should continue its commitment to research to resolve critical ecosystem or biological uncertainties. Examples of critical ecosystem or biological uncertainties we have identified include:

- The need to understand the persistence of geochemical signatures in fish scales (a non-lethal sampling technique).

- The need to understand the relation between genetic differences and fish (species) performance (e.g. survival, growth, fecundity, phenotype) in various environmental settings (elevation, aspect, gradient etc.).

- The need to understand parentage (genetic sampling of progeny to determine relative number of successful redds) in bull trout populations as a measure of population resiliency (added benefit to red counts or escapement). The long-term data base on bull trout redd counts in South Fork Flathead River tributaries upstream of Hungry Horse Dam, makes this location ideal for this research.

VI. MAINSTEM PLAN

D. Mainstem Strategies

Pages 41, 48-50. Hungry Horse and Libby dam operations

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. We therefore recommend specific adjustments to how various components of the annual operation are modeled and coordinated. Most of our recommended changes pertain to Libby operations that can be modified to achieve mutual benefits to Canada and US **(see 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.

Page 53. Mainstem Monitoring and Evaluation

Monitoring and research in the Flathead and Kootenai river systems has used several strategies to assess biological responses to dam operations in these partially impounded drainages. Ongoing investigations are attempting to relate fish growth and survival, at the population level, under various operating strategies. This requires studying fish that reside in waters influenced by dam operation, which can be problematic where fish are migratory and move into and out of the affected area. We used natural marks (signatures in fish otoliths created by changing isotopic ratios in ambient water as fish migrate), paired with genetic information, to describe the movement patterns of native westslope cutthroat trout, bull trout and mountain whitefish. We are currently expanding this method for non-lethal sampling (e.g. in fish scales) to reduce sampling mortality on sensitive fish species of concern.

Recent evaluations have begun to describe how *Didymosphenia geminata* (Didymo) responds to dam operation, discharge, water temperature, and water chemistry. Nuisance growth of Didymo downstream of Hungry Horse and Libby dams has clogged river substrate and smothered insect production since the early 2000s, which impacts fish food availability. Evidence suggests that seasonally low phosphorus and nitrate levels, and periods of lower discharge (i.e., winter and early spring) increase Didymo growth and associated problems. Expanding investigations to quantify distribution throughout the drainages while continuing to monitor dam-influenced reaches over time is important to understanding how to control nuisance blooms.

Page 58. Part D. Updating Existing Subbasin Management Plans

The management plans should be revisited when necessary to ensure that actions remain abreast of new science and results, indicating which techniques are the most effective. It is important that project proponents retain the flexibility to respond to new opportunities or scientific results as new information becomes available such as the recently completed Operational Loss Assessment for the Kootenai River (BPA Project 200201100).

Montana's subbasin plans were designed in internally-linked, electronic format to facilitate periodic updates. This electronic format makes updates easy and inexpensive.

In addition to the foregoing specific comments, the MFWP offers the following general comments to be considered when drafting a new Fish and Wildlife Program.

1. Modify operations at Libby and Hungry Horse Dams.

Our recommendations for modifications are included in **Appendix A**, attached. Our recommended changes can be achieved within flexibility afforded by VARQ and Biological Opinions by the US Fish and Wildlife Service (USFWS) and NOAA-Fisheries.

2. Enhance the effectiveness of monitoring and evaluation.

MFWP and our partner agencies have made recent advances in non-lethal sampling for genetics (e.g. parentage to assess population stability) and geochemical signatures in scales and otoliths (e.g. stock identification and natal stream of origin) to identify the contribution of fish from restored areas (accountability). New techniques are more cost-effective than traditional methodologies, because all fish are marked by their environment or parentage, so that artificial marking is not needed to identify stocks for experimental comparisons.

3. Adopt Strategic Recommendations for White Sturgeon

White sturgeon have declined in abundance throughout most of the Columbia Basin, and distinct population segments are in dire condition. Only the population downstream of Bonneville Dam continues to have substantial natural recruitment, and predation on adult sturgeon by Steller sea lions just below the Bonneville Dam may threaten that population (ISAB 2013). Reduced natural recruitment will likely be a major factor influencing sturgeon the status and sustainability of harvest fisheries. The Kootenai River population is being supported by conservation aquaculture while researchers work to restore natural reproduction. Roughly 4% ($9.5 million) of annual direct Fish and Wildlife Program expenditures of $246 million in 2012 were dedicated to white sturgeon restoration.

Recommendation: The recently completed basin-wide framework plan for white sturgeon synthesizes existing information and recommends actions to address limiting factors and information gaps. After the draft basin-wide framework incorporates the edits and comments provided by the managers, strategic recommendations should be incorporated in to the mainstem plan as a sturgeon chapter. After ISRP review, the framework should be adopted into the Program.

4. Continue to Focus on Habitat from an Ecosystem Perspective

Reconnect blocked habitat where advisable and appropriate. Promote land acquisitions and easements along with ecosystem restoration. Ensure genetic reserves and strongholds for native fish and wildlife species. Create buffers around and migration pathways between isolated areas containing high species diversity. Enhance the Columbia Basin's ability to prevent the introduction of Aquatic Invasive Species, and to prepare for early responses where AIS are detected. The Council and BPA can add value to AIS mitigation actions taken by federal, state, and tribal agencies by helping to coordinate efforts across jurisdictions. Inventories in the subbasin plans should be used to identify the remaining species

strongholds, and areas where restoration actions have the greatest likelihood of success. Protect the best and restore the rest, beginning with areas where success is most probable. Where mitigation cannot be achieved in-kind and in place, use offsite mitigation to increase biological production to further offset impacts caused by the Federal Columbia River Power System. Reserve at least 15 percent of the program funding for each of the resident fish and wildlife components of the program, over a multi-year time frame, while maintaining funding flexibility to take advantage of quickly developing opportunities, provided that those efforts are tied to completing documented losses identified in approved loss statements or negotiated settlements.

5. Anticipate and Plan for Climate Change

The region should plan to help mitigate the predicted impacts of climate change. Hungry Horse and Libby dam operations, monthly drawdown and refill targets, can be adjusted to accommodate new trends in water supply and seasonal distribution. The selective withdrawal systems on Libby and Hungry Horse dams allow operators to control water temperature in the dam discharge to more closely match natural thermal regimes necessary to support native aquatic ecosystems.

Habitat protection efforts should also be implemented to help maintain habitat corridors that will allow species to adapt to changing climatic conditions. BPA should fund perpetual land protection through conservation easements, land purchases, or other long term measures, such as water rights acquisitions, to combat climate change impacts on resident fish and wildlife populations. Targeting key habitats across the basin and linking them across the landscape is one of the most effective ways to help preserve species given the variability and uncertainty associated with future climatic conditions.

Recommendation 1: Ensure that current restoration or habitat projects are resilient to predicted future climate scenarios to ensure that investments made today are effective into the future.

Recommendation 2: Require project proposals and management plans to consider the potential impact on project outcomes of climate change and its associated variability and uncertainty.

6. Promote Genetic Diversity

Use naturalized hatcheries to conserve remaining genetic diversity to restore sensitive fish species, including the creation of failsafe replicate populations (for redundancy if a given population is lost due to disturbance).

7. Maximize policy and program benefits and minimize process costs.

Ensure that the project prioritization and rolling reviews are applied consistently to maintain legitimacy in the process. Establish relationships between similar research activities throughout the Columbia Basin to derive over-arching results to assess the relative benefits of mitigation actions and avoid actions that are duplicative or at cross-purposes. Share results with project proponents so that the most effective techniques are applied basinwide. Encourage the development of rate cases that allow the expansion of the program to include mitigation of impacts caused by dam operations, and that capture

current opportunities to protect key habitats that are being lost through time to development and other incompatible land uses. Consistently strive to reduce process and increase meaningful on-the-ground actions. Promote and encourage partnerships whenever possible to reduce both short-term and long-term costs while also achieving landscape-scale conservation benefits.

Pursue longer-term agreements and contract terms to reduce process and allow project proponents to focus their efforts more towards on-the-ground mitigation actions.

BPA's current staff resources limit our ability to implement habitat protection projects and place an unreasonable burden on their existing staff that are involved in real estate transactions. The Council should encourage BPA to hire more staff to secure important fish and wildlife habitats before opportunities to do so are lost over time. Personnel and funding should be sufficient to accomplish mitigation projects in a timely, responsive, equitable, and effective manner.

Use web meetings, conference calls and electronic mail to reduce travel and coordination costs.

8. Mainstem restoration should apply to major Columbia River tributaries also, to benefit anadromous and resident fish and wildlife.

Thank you for the opportunity to submit our recommendations.

Sincerely,

Brian Marotz, Hydropower Mitigation Coordinator

Joel Tohtz, Fisheries Program Manager

Alan Wood, Wildlife Program Manager

Appendix A

Recommended modifications to Libby Dam operations

The following recommendations were 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". Canadian complaints include 1) low Libby Reservoir elevations during summer and fall, the peak recreational season; 2) too high Kootenay Lake elevations during and after spring runoff, and 3) BC Hydro claims an impact to power revenue because of the sturgeon flows, VARQ, and summer operations resulting in lower releases during peak winter power demands.

BC Hydro modeled operating alternatives that attempt to refill Koocanusa Reservoir earlier. BC Hydro Alternatives 3a tries to refill Libby by June 1 and 3b by June 30. Refill by these dates can only happen safely in average or lower water years, because reservoir inflows exceed turbine capacity after those dates in many years. If Libby Reservoir refills prematurely, the dam must spill, resulting in dissolved gas concentrations in excess of Montana state standards (110%), and potentially causing flooding downstream. We 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.

The 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 wateryears (driest 20th percentile).

System modeling revealed that the current VARQ operation can be improved in slightly above average and below average wateryears 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. When the mandatory VARQ discharge protocol is not merged with the volume released for sturgeon tiered flows, Libby Reservoir refill is reduced to about 12 % of all years. This is a problem for BC stakeholders in the Koocanusa headwaters. This is a policy problem, not a modeling problem; the underlying cause is that the Corps has to consult with USFWS for the sturgeon operation,

but not for the VARQ flood control operation, so the two operations have been modeled separately (as a consequence the two release volumes are counted separately and additively).

The sturgeon tiered flows changed before the USFWS BiOp was finalized. The USFWS increased the volume in the highest tier, and they lowered the trigger points (inflow forecast thresholds) between the tiers. This causes two problems. First, the volume in the highest tier was originally designed to be less than the next tier down, because unregulated sideflows are high in wet years, and less storage needs to be released to meet discharge targets at Bonners Ferry. 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, we 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. We ask the Council to Work with Montana, KTOI and Canada to improve riparian regeneration by gradually reducing flows after spring runoff. Successful regeneration of riparian vegetation can be significant in years following high spring runoff. However, much of that new growth is subsequently destroyed by high winter flows. 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 wateryears 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 wateryears and adjust linearly down to 3,500 cfs in the driest wateryears.