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Dear Mr. Walker:

Thank you for providing the Native Fish Society with notice to comment on the draft fish and wildlife program. As you know I have been involved with the Council's fish and wildlife program since 1980 and participated in the development of the 1982 plan and all plans since that time.

Three factors influence the recovery, conservation and viability of native, wild salmonid populations. These factors are physical habitat and its productive capacity, biological requirements for species and populations using that habitat, and the policy context of fish and habitat management. The fish and wildlife program provides the policy framework through which funding priorities are established.

We know that salmonid habitat in Columbia River subbasins is in good and improving condition in wilderness areas and of higher quality on federal lands compared to most private lands where it is largely degraded. Obviously there are exceptions but generally over the salmonid landscape this is the case. Mainstem habitat is a limiting factor for wild, native salmonids due to the federal hydroelectric dams and reservoirs, and many miles of spawning and rearing habitats have been removed from production through inundation and blockage. Mitigation for hydro development has taken two general forms: the improvement of adult and juvenile passage at dams and reservoirs and investments in subbasins in order to increase productivity for spawning and rearing of salmonids.

The policy framework has focused on using hatcheries to boost production of salmonids in tributaries and developed measures to improve survival in the mainstem and estuary. The policy framework however, has not specifically focused on recovery of native, wild salmonids. Mitigation has failed to restore salmonid abundance and the Council's goal of doubling the runs has not been achieved. Independent scientific reviews of hatchery, harvest and habitat programs has been critical for improving the reproductive success and recovery of salmonids, but the Council's fish and wildlife program has not fully implemented the advice provided by the many scientific reviews of the fish and wildlife program. A major issue is making it possible for science to better inform policy on management and investment decisions.

The following are brief descriptions of unresolved issues that can be found in the FWP since 1982.

Lack of measures to specifically address risks to wild, native salmonids. Wild salmonids are locally adapted to their spawning and rearing streams. We have known this since 1854 and it has been confirmed many times since, but fish management institutions have resisted the science. Their interest has been in production of fish for harvest rather than in the productivity, resilience and sustainability of wild populations that are the basis of production. Hatcheries can increase production but not the productivity of salmonids. The FWP should adopt measures that create a conservation requirement framework for wild

salmonids in subbasins. Important issues such as spawner abundance, gene conservation, nutrient enrichment from spawner carcasses, life history diversity and habitat pathways to maximize this diversity are all important to a successful FWP. I recommend that the Council request of the independent scientific panels a framework for recovery of wild salmonids in the Columbia Basin.

Hatcheries cannot recover or replace wild, native salmonid populations. One unstated lesson coming out of the Hood River native broodstock studies is that hatchery fish productivity is improved by using wild brood. What was shocking by these studies is that hatchery fish productivity was lower than wild fish in the first generation and degraded rapidly in each subsequent generation. It was interesting that the scientists were not surprised by the fact that hatchery fish survival declined but by how fast it declined. The FWP has relied on hatchery supplementation to boost production of fish in the subbasins and have embraced the notion that hatchery fish can be used to recover wild fish populations. This was never true and it has now been confirmed, so the FWP should halt further hatchery supplementation investments in the Columbia River Basin until those being tested are completed.

Stray hatchery fish are a threat to wild salmonids and their recovery. There are two problems with stray hatchery fish. One is that they represent a non-native spawner that interbreeds with native spawners causing loss of fitness in the offspring and degrading survival of the wild population. The other problem is that the stray fish are not supporting the purpose they were produced to provide such as fisheries. The FWP should resolve the problem of strays, especially steelhead, invest in hatchery fish barriers on spawning streams, and mark all hatchery fish so that they can be distinguished by origin and type in rivers where they do not belong. In the 1980s researchers pointed to transportation of smolts as a cause of hatchery fish strays yet the issue has gotten worse and is being ignored.

Establish habitat carrying capacity and spawner abundance goals by watershed and manage to achieve both. Attention has to be given to habitat capacity to produce salmonids and targets should be developed. Part of that work includes maximizing the life history pathways the salmonids can utilize in order to complete their life cycle and successfully reproduce and grow their young through all life stages. We know the value of habitat and habitat rehabilitation, but we also need fish, locally adapted fish that are able to fully utilize the habitat and make the best use of it. That means each watershed would have a conservation requirement that includes spawner abundance goals tied to habitat capacity estimates.

Nutrient enrichment goals are established for each population and watershed. Nutrient enrichment of streams from salmon carcasses has long been ignored by fish management institutions, but emerging science has documented the fact that our streams are starved for nutrients and would be more productive with more spawners. The FWP would establish nutrient enrichment standards from salmonid carcasses as part of its habitat improvement program. This conservation requirement would increase the productivity of the habitat for both fish and wildlife since nutrients are utilized by wildlife and fish as well as riparian plants that provide wildlife habitat and stream structure and thermal protection.

Natural production management streams are needed. Most watersheds have wild native salmonids returning to them, but only a few streams have been designated as wild salmonid conservation areas. Each ESU and Ecoregion should have one or more watersheds dedicated to wild salmonid conservation. This would help supply the reference streams the scientists recommend. As important is the creation of a wild salmonid conservation network that provides a safety net for maintaining biological diversity and productivity throughout the Columbia Basin. Since hatchery production is dependent upon having access to wild populations for an egg supply, it is only prudent to maintain a diverse array of wild native populations in as many watersheds as possible and to designate more watersheds as wild salmonid conservation areas.

Protect and enhance thermal refuges in the mainstem and in tributaries. Even before global warming was a fashionable cause, salmonids (hatchery and wild) depended on thermal refuges during hot summer flows. These refuges are identified in the mainstem and in tributaries. They are critical to the completion of the salmonid life cycle. Researchers have recommended that the thermal areas be identified, protected and managed for salmonid protection during hot flow periods. They also recommend that the sources of those thermal refuge areas be identified and managed for protection so they remain available to salmonids.

Some spawning and rearing tributaries would not have chinook salmon if it were not for thermal refuges to carry the fish through the summer months. The FWP should recognize the value and vital importance of these refuge areas and develop a plan to maintain them in the mainstem and in the subbasins.

The conservation unit for the FWP is composed of wild native salmonids and the watersheds that sustain them. Identify the wild native populations in the Columbia River Basin and the watersheds supporting them. Establish measurable biological objectives for them in subbasins and the mainstem. Develop a monitoring and evaluation program for each to determine whether objectives are being achieved and to provide the basis for adaptive management.

Wild Salmonid Rescue. Working under permits from NMFS and WDFW a new approach to wild fish rescue has been in operation for several years. This strategy is being developed by Dave Brown of SW Washington, called the Safe Haven Project. Young of the year salmonids from streams that will dry up in early June are captured and transplanted to spring fed ponds and reared until the following year and then released back into the streams from which they were taken.

This approach is being evaluated with the help of graduate students. The juvenile salmonids are PIT tagged, and their adipose fin removed so they can be observed upon return. Evaluation is aimed at determining the survival to adult spawner. The WDFW provides pathology certification so the fish are disease free. This is an artificial rearing rather than an artificial propagation program. It is based on natural production of juveniles exposed to natural selection prior to capture. They are reared in an environment that dampens domestication selection and when released these fish exhibit wild behavior.

According to Dave Brown and WDFW biologists the project is adding adult fish to the rivers and their spawning tributaries.

This project is a significant departure from the typical hatchery program. There is no intervention into mate selection, spawning and initial stream rearing with this project like there is in the hatchery program. It is based on wild fish breeding naturally and exposed to natural selection in streams. In captivity these fish are fed in a way to purposely separate them from human contact. The result is a juvenile of natural origin that is less domesticated by the captive rearing process.

The fish are released into their tributaries of origin rather than into the mainstem river so that as adults they home back to their tributaries to reproduce. The purpose is to keep the tributaries productive.

I recommend that the Safe Haven Project be included as an option in the FWP to help expand the productivity of wild salmonids in watersheds, evaluate the results and develop another conservation opportunity for recovery of wild salmonids in the Columbia River Basin. To begin this discussion Dave Brown and the biologists working with him on this project should be invited by the Council to introduce them to the potential of this unique approach to wild salmon recovery.

Summary. Recovery of naturally produced wild salmonids is a goal of the Council's FWP. To be successful the program needs measurable fish and habitat objectives and a monitoring program to evaluate it and provide the means to successfully implement adaptive management.

In order to address major limiting factors to salmon recovery and to describe success, the following improvements to the FWP are offered.

1. Combine fish abundance goals and habitat goals into an integrated program.
2. Establish measurable biological objectives for each population
3. Establish conservation requirements for each population and watershed
4. Conduct an on-going risk analysis for each hatchery program regarding impacts on wild populations
5. Remove selective impacts of fisheries and other human caused sources of mortality affecting the life cycle reproductive success of populations
6. Optimize the life history diversity of populations
7. Maintain the genetic diversity of populations

8. Monitor and evaluate projects for contract compliance and for fish response so that success can be defined and adaptive management options can be realized.

By focusing on the health, resiliency and life history diversity of naturally produced wild salmonids the FWP will improve its success and be able to recognize and describe success in measurable terms.

Comments on objectives:

Making sure that FWP project funding actually results in effective projects depends on the application of the best available science, independent scientific and economic review, and monitoring and adaptive management. The FWP establishes goals and standards and the Council expects results that are consistent with the FWP. The following comments are directed at providing a strong and effective FWP.

Page 21, lines 18-27: **Thermal Refuges.** Include protection of thermal refuges in the mainstem Columbia and in subbasins for juvenile and adult salmonids and resident trout. This objective would identify thermal refuges, their sources, and develop a plan to maintain the sources and benefits to salmonids.

Page 26, lines 15-24: **Strongholds.** Strongholds may also be areas that provide the ecological conditions needed to support salmonids and their recovery, but have few fish. The fish may not be "stronger" or "genetically more diverse," but the ecological conditions are good. The FWP should protect such areas until limiting factors are resolved.

Strongholds need to be identified in each ecoregion. The Council would designate wild, native salmonid production areas. Some streams have been recognized as wild salmonid watersheds (e.g. John Day and M.F. Salmon) but those were being managed as such before the FWP was established. There are additional watersheds that would qualify and could be designated. Some examples are Joseph Creek, Wind River, Molalla River, White River, Minam River, Chamberlain Creek, Selway River, and Asotin Creek among others. Since most watersheds have wild native salmonids, it would be a mistake to view strongholds as the only important watersheds for wild salmonids. Maintaining natural production and wild populations in each watershed perpetuates the biological diversity of the Columbia Basin and reduces risk.

Page 32, lines 33 and 34: **Hatchery Risk Management.** The suggestion is good and essential. Each hatchery program should have a risk assessment to evaluate impacts on wild, native salmonids and ESA-listed fish. This risk assessment would look beyond the hatchery fence and evaluate risk associated with hatchery strays, related harvest in mixed stock harvest, disease transmission from hatchery fish to wild fish and from hatchery effluent among many other issues. These risk assessments would help the agencies to modify operations and reduce risk.

Page 32, lines 36-40: **Harvest and Wild Salmonid Spawner Abundance.** This guidance is excellent. To be effective conservation requirements by watershed and species should be established based on an estimate of the watershed carrying capacity. Harvests of adults and juveniles, both directed and incidental harvests, should be managed to achieve spawner abundance goals for the watershed. This would provide a sound scientific basis for management, which is measurable. Canada has established conservation requirements for Atlantic salmon recovery based on an estimate of carrying capacity, egg deposition and spawner abundance. The conservation requirement also sets limits on fishing based on ecological conditions such as water temperature.

Hatchery Evaluation: The Independent Economic Advisory Board completed Phase I review of hatchery costs, but the Council did not support the IEAB's request to complete Phase II which would have presented the Council and region an economic assessment of the salmonid hatchery program. Since there are millions of dollars in public funds going into hatchery production, the public should get an evaluation of that investment and the cost to provide salmonids for harvest from each hatchery. The IEAB provided the first cost to catch analysis for Columbia River hatchery programs and the Phase II evaluation should be authorized by the Council to provide a complete assessment.

Page 71, **Mainstem habitat.** Summer water temperatures in the Columbia River continue to increase and in some years reach lethal temperatures for migrating adult salmon and steelhead. The section on Strategies in Specific Areas should include identification of thermal refuges and a plan to maintain them and the sources of cool water for migrating fish. This should also be included in the section under Water Quality, page 73.

Page 75, **Juvenile Transportation.** A priority that should be added to the study is the relationship of transported juvenile fish and adult strays. Juvenile transportation and the straying of adult salmonids was identified in the 1980s by researchers. Strays have become a larger problem since then and the Technical Recovery Team for Oregon tributaries to the Columbia River have identified stray hatchery fish as a major limiting factor in recovery of ESA-listed steelhead in rivers such as the Deschutes and John Day. Evaluation of this problem is a high priority for unless strays can be controlled, recovery of listed salmonids cannot be accomplished.

Page 80. **Adult Passage.** U.S. Army Corps of Engineers have provided research on steelhead kelt survival and repeat spawner contribution to steelhead spawning populations. Safe kelt passage around the dams should be a priority. At this time steelhead kelt passage is not adequate as indicated by repeat spawner success in tributaries below The Dalles Dam compared to those above Lower Granite Dam. The killing of steelhead kelts could be a taking under the ESA. This life history strategy in steelhead is important to their productivity, resilience, and genetic diversity. Kelt reconditioning should not be viewed as a replacement for safe kelt passage at dams. The FWP should specifically address kelt passage survival and repeat spawners. Studies should be conducted, survival monitored and solutions for increased survival identified.

Page 81. **Lamprey.** Juvenile Pacific lamprey passage survival at the dams should be a research priority in the FWP. Improving lamprey abundance throughout the Columbia River Basin is important for cultural, social and ecosystem purposes. Identifying sources of mortality is a priority in constructing a recovery plan for lamprey and should be added to the FWP.

Page 96. **Fish Passage Center.** The Fish Passage Center provides important information. It should expand to include annual reports on status of wild salmonids in the basin. Some categories that are important include wild salmonid passage by dam; wild spawner abundance by ESU and watershed; wild smolt yield by index watershed in each ESU by species and population. At present the ability for the public to track the status and biological objectives for wild salmonids in the Columbia Basin is an issue that ought to be solved.

Monitoring and Evaluation. Mainstem and tributary monitoring and evaluation of habitat projects should be expanded to determine the fish response to the investment. Some reviewers have noted that monitoring and evaluation is often limited to compliance. For example, if the project is to place large woody structure in a stream to improve fish habitat, evaluation is based on the number of structures. The purpose of these structures is to achieve a benefit for fish, so evaluation should reach beyond compliance by including biological response to the project.

Sincerely,

Bill M. Bakke, Executive Director