LSRCP Response to ISRP
Snake River Fall Chinook Program Review

ISRP's major recommendations are copied below (**in Bold**) for clarity here. LSRCP's response is below the recommendation.

1. ***Integrate the LSRCP fall Chinook program goals, objectives, and implementation with the recovery plan for natural Snake River fall Chinook. …… The LSRCP fall Chinook program needs to be balanced with the recovery plan, which will evaluate the risks and trade-offs of alternative hatchery production and harvest levels to natural fall Chinook abundance, productivity, diversity, and special distribution.***

   To date the fall Chinook recovery plan has not been finalized. The Lower Snake River Compensation Plan (LSRCP), Washington Department of Fish and Wildlife (WDFW), the Idaho Power Company (IPC), and the Nez Perce Tribe (NPT) are all participating in the development of the fall Chinook recovery plan. In addition, LSRCP, WDFW, IPC, and NPT participated in meetings with NOAA Fisheries related to identifying and implementing M & E needs necessary to obtain an ESA section 10 permit to operate Lyons Ferry Hatchery. LSRCP assumes that the Section 10 permit will be consistent with the Snake River Fall Chinook Recovery Plan when it is finalized.

   The current fall Chinook hatchery program is the result of a Congressional mandate to mitigate for fall Chinook lost as a result of development of the hydrosystem in the Lower Snake River. Policy issues currently governing Snake River fall Chinook, in addition to ESA, will need to be considered in the discussions. Policy issues include treaties between the U.S. Government and the Nez Perce, Umatilla, Yakima, and Warm Springs tribes, Congressional mandates (Lower Snake River Compensation Plan, Northwest Power Act, Magnuson Act), Idaho Power Hells Canyon Settlement Agreement, Nez Perce Hatchery Agreement, US. V. OR 2008-2017 Management Agreement, Columbia Basin Treaty Tribes Accords, FCRPS BiOp, and the Pacific Salmon Treaty.

   The current hatchery program was put in place to replace fall Chinook lost as a result of hydrosystem development activities. Fish were to be produced to mitigate for those activities. All parties working to provide hatchery fall Chinook would prefer to not have to have hatcheries producing fish. However, until natural fish return in numbers to replace the mitigation need, hatchery mitigation will likely continue. Discussions during the coming years will describe what the program will look like in the future.

   Evaluating the full suite of limiting factors affecting Snake River fall Chinook and the potential risk and benefits of management actions is what "managers" do. The "balance" point is reflection of the individual management entities goals, values, and risk tolerances. The ISRP's comments are perceived as placing a higher priority on "self-sustainability" over harvest. LSRCP believes both are important and is working to balance self-sustainability and harvest. Other processes (US v. OR, FCRPS BiOp, Treaty Rights, ESA, etc.) are also working to establish priorities between self-sustainability and harvest.

The Lyons Ferry Hatchery, Nez Perce Tribal Hatchery, and Idaho Power Company fall Chinook production programs recently completed Hatchery Genetic Management Plans (HGMPs) and received ESA Section 10 Permit coverage.

2. ***Evaluate hatchery/wild salmon interactions and develop biologically-based spawning goals for natural fall Chinook salmon. Currently, total adult returns to the Snake River are meeting program goals but largely because harvest rates have been cut for conservation purposes, ……. leading to large numbers of spawning fish that contribute to density-dependent survival and low productivity (return per spawner).***

   When the fall Chinook hatchery program was implemented in the early 1980's, the number of natural fall Chinook crossing Lower Granite Dam was at an extremely low level. The program focused primarily on avoiding extinction. Large increases in hatchery and natural fall Chinook have only occurred relatively recently. It has only been in the last 15 years that hatchery and natural fall Chinook escapement above Lower Granite Dam began to increase, and only since 2009 that escapement has exceeded 50,000 hatchery and natural fall Chinook above Lower Granite Dam. The LSRCP cooperators working on Snake River fall Chinook are contributing to the recovery planning effort. The LSRCP program has an adult return goal for natural-origin returns (14,360). The goal was established in the LSRCP mitigation program planning. Ongoing analysis presented by Cooney and Connor described efforts to understand population productivity. Biologically-based spawning goals for natural fall Chinook are anticipated to be part of that Snake River fall Chinook Recovery Plan.

   LSRCP, WDFW, NPT, and IPC recognize the need to consider evaluation of hatchery and natural fall Chinook interactions. Collaborative efforts to develop an evaluation program and budget to support M & E activities will continue during coming years.

   Two important issues will need to be considered as efforts to develop an evaluation plan occur.

   First, budgets to conduct this work will need to be developed. Due to the size of the Snake River, work will be difficult and costly.

   Second, the quantity and quality of fall Chinook habitat remaining downstream of Hells Canyon Dam is limited. Current habitat to support fall Chinook is greatly reduced and greatly altered from what existed prior to dam construction. The spawning/rearing capacity of this altered area is unknown, but attempts will be made in coming years to quantify these factors.

   It should be noted that limitations to Zone 6 fall Chinook harvest are typically triggered by B-run steelhead harvest thresholds, not the number of natural and hatchery fall Chinook.

3. ***Apply visible marks on 100% of hatchery Chinook as a means to (a) establish the origin of fish used as broodstock, (b) refine estimates of naturally spawning hatchery fish and their spawning ground distributions, (c) improve estimates of the proportion and number of hatchery and natural origin fish returning to Lower Granite Dam, and (d) control characteristics of the spawning escapement.***

The issue of applying visible marks to 100% of hatchery Chinook is controlled by the US v. OR Management Agreement (Agreement). NOAA, USFWS, WDFW, NPT and CTUIR all signed the Agreement.

This recommendation is inconsistent with ISAB Tagging Report (ISRP/ISAB 1009-1) *"Mass Marking/Hatchery Mark Rates -- The ISAB and ISRP have supported marking all hatchery fish. This allows fish to be segregated at counting and broodstock collection weirs, so the ratio of hatchery-origin and natural-origin adults can be controlled. At the same time, the ISAB and ISRP share the concerns about using mark-selective fisheries as a conservation tool to maintain abundance of natural populations and the consequences of mass-marking and mark-selective fisheries on estimates of mortality on natural populations. Support for tagging all hatchery fish should not be confused with support for mass-marking to enable mark-selective fisheries. Applying a mark that is useful for hatchery and natural population broodstock management that is then used for mark-selective fisheries is problematic."* (page 35)

a) ***establish the origin of fish used as broodstock.*** Parental based tagging (PBT) is currently being used, and will likely continue to be used in the future, to determine origin of broodstock at Lyons Ferry and Nez Perce Tribal Hatcheries. Based on spring/summer chinook and steelhead PBT testing, LSRCP, WDFW, IPC, and NPT believe PBT will adequately identify the origin of most fall Chinook used as broodstock, and that the origin of very few spawners will not be identifiable or will be identified incorrectly using PBT. Validation of fall Chinook PBT assignments will be conducted.

b) ***refine estimates of naturally spawning hatchery fish and their spawning ground distributions.*** Estimates of the number of hatchery and natural spawning fish escaping to spawn above Lower Granite Dam are made annually. Much work has been conducted recently to improve the run reconstruction methodology. Future work will continue to refine run reconstruction methodology, as well as applying the new methodology to previous year's fall Chinook runs to Lower Granite dam.

Spawning ground distribution of spawning fall Chinook is monitored annually by counting redds in the Snake River below Hells Canyon Dam. In addition, there is currently a new BPA funded project that is documenting the homing ability through radio telemetry of sub-yearling fall Chinook released above Lower Granite Dam. This study, while focused on hatchery origin fish, may also be used to further describe the distribution of natural origin fall Chinook (by subtraction). Future work will evaluate the efficacy of determining origin of naturally spawning fall Chinook.

c) ***improve estimates of the proportion and number of hatchery and natural origin fish returning to Lower Granite Dam.*** Work will continue to make estimates of the number of hatchery and natural origin fall Chinook returning to Lower Granite Dam more accurate and precise. Great steps were taken in this direction recently with the development of new run reconstruction methodology. With the onset of the Parental Based Tagging for fall Chinook in the Snake River, random sampling of fall Chinook at Lower Granite for either broodstock collection, the radio telemetry, or fish that are trapped and passed upstream, will also help make natural and hatchery origin estimates more accurate and precise.

d) ***control characteristics of the spawning escapement.*** Controlling escapement above Lower Granite Dam would require a substantial modification and increase in the size of the current trap and holding tanks at Lower Granite Dam. Substantial increases in budget and manpower to operate the trap would be required, and NOAA would need to provide adequate take authorization to handle large numbers of natural fall Chinook and wild steelhead. Development of budgets to support trap modification and manpower for operation would require commitment from funding agencies, as current budgets are inadequate to do this.

Currently, sport fisheries in the Snake River have been mark-selective in nature and treaty fisheries are non-selective. With the current external marking program for Snake River fall Chinook, this equates to about half of the hatchery origin fall Chinook to be available for harvest. Either marking strategies or selective fisheries would have to change before fisheries can be relied upon to control characteristics of the spawning escapement.

Further, until recently, the fall Chinook fishery in the Snake River has been incidental to the summer steelhead sport fishery. Angler effort and success have increased in the last few years. Angler effort, and the number of fish allowed to be harvested will have to increase substantially for this method to be viable at controlling hatchery origin fish on the spawning grounds.

4. ***Consider development of additional standards for in-hatchery performance, including survival levels for key life stages at each hatchery and acclimation site as a means to help determine performance that may need improvement.*** Some goals could be set, but these would seem rather arbitrary goals. WDFW and NPT have been documenting egg survival, egg-fry survival and egg-to-smolt survival since program inception. Survival at the hatcheries has generally been high, and would likely exceed any goals established. In years where mortality within the hatchery was high, corrective measures have been applied over time to address the problems. The lack of established goals does not prevent our program from making adjustments to increasethe survival of fall Chinook in the hatchery environment.

5. ***Develop a monitoring program that tracks demographic (e.g., age and size at return, fecundity, egg size, maturation dates) and genetic trends (e.g., changes in effective population size) in hatchery fish as a means to evaluate modifications to the mating procedures.*** Age and size at return is currently being monitored and effective population size has been calculated each year males were used multiple times at LFH. Fecundity estimates by age and rearing class have been documented in the past (1994-2010), and will be revisited again in coming years. Once all age classes of PBT profiled returns occur we will document fecundity and egg size of hatchery and natural (not identified as progeny of PBT fish) fish. WDFW will work with the co-managers to develop a longer-term mating protocol that would balance the genetic concerns with changes in age at maturity and fish sizes over time.

6. ***Further evaluate factors affecting the survival, migration rate, and arrival timing of hatchery smolts traveling from their release locations to Lower Granite Dam. These analyses may help managers refine when fish should be released to maximize survival and minimize potential interactions with natural Chinook and other ESA-listed species.*** WDFW will release 20K PIT tagged subyearlings and 30K PIT tagged yearlings released at LFH. These have been and will

continued to be used to document relative survival, migration rate, and arrival timing to various hydrosystem projects downstream of Lyons Ferry Hatchery. Releases from FCAP and Nez Perce Tribal Hatchery have similar representative PIT tagged groups that can be utilized as well to look at survival, migration rate, etc. Managers will examine this data in coming years now that release groups/release times/release sizes have been standardized in more recent years. In addition, the results from hatchery releases can be compared to natural origin PIT tagging efforts (USFWS) to potentially better align our releases with the natural production in the river.

7. ***Continue to evaluate ecological and disease interactions of hatchery and wild juvenile salmon.*** This data gap is recognized in the draft Snake River Fall Chinook Salmon Recovery Plan, and additional funding will be required to address this need.

8. ***Continue to evaluate and document adequacy of the run reconstruction methodology, which is used to estimate abundance and composition of the Chinook run. Consider the validation approach discussed in our review.*** The co-managers continually discuss the methodology used in the run reconstruction at Lower Granite Dam. We agree that further evaluation is necessary and will incorporate evaluation of the higher percentage of wild origin fish in the new approach vs the older method. Run reconstruction estimates are bootstrapped and provide bounds around the final return estimates.

9. ***Continue to discuss and evaluate the re-introduction of fall Chinook into historical habitats, including prime spawning and rearing areas above Hells Canyon Dam. Approximately 85% of the historical spawning and rearing areas is not presently available.*** The LSRCP program is a mitigation program to provide for fall Chinook lost due to construction of the Lower Snake River Dams. Reintroduction of fall Chinook above Hells Canyon Dam is not within the purview of the LSRCP or BPA funded hatchery programs. However, reintroduction above Hells Canyon is being considered as part of the Snake River Fall Chinook Salmon Recovery Plan.

Throughout their Review, ISRP mentioned other information that needed to be collected and made available. Other information is being recorded that ISRP expressed interest in includes:

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- Brood tables for hatchery releases;
- In-Hatchery performance standards and survival levels;
- Age and size of returning fish;
- Fecundity and Egg size;
- Maturation Dates;
- Effective Population Sizes of broodstock;
- Migration timing, migration survival to Snake and Columbia River dams.

Also, LSRCP is in the process of developing a computer database capable of storing data related to trapping, holding, spawning, incubating, rearing and releasing salmon and steelhead collected at weirs and reared at hatcheries. Metrics derived from data recorded during these activities will be calculated from data contained in the database when it is complete.

Other ISRP comments (page 3). The program also needs to address two key questions. First, how effective has the hatchery program been in establishing locally adapted and self-sustaining spawning aggregations of fall Chinook? Existing data suggest that the natural spawning population is not viable

as the return-per-spawner index of productivity is typically well below replacement. The low productivity of natural fall Chinook is a critical concern in an otherwise successful program. And, second, what risks does the hatchery program pose to natural populations?"

These "questions" are NOT comprehensive and reflect a biased/assumed perspective that self-sustaining natural population is priority goal. While robust natural production is an attribute of the program's goals, other objectives exist. Furthermore, the ISRP fails to acknowledge the altered condition of contemporary ecosystem and the limits it has on achieving and maintaining a healthy, abundant, and self-sustaining population of fall Chinook in the Snake River basin. Using these two questions to set the stage for the ISRP recommendations is inconsistent from the review charge given to the ISRP.