



**Independent Scientific Review Panel**  
for the Northwest Power & Conservation Council  
851 SW 6<sup>th</sup> Avenue, Suite 1100  
Portland, Oregon 97204  
[www.nwccouncil.org/fw/isrp](http://www.nwccouncil.org/fw/isrp)

**Memorandum (ISRP 2010-17)**

**May 28, 2010**

**To:** Tony Grover, Director, Fish and Wildlife Division, Northwest Power and Conservation Council

**From:** Eric Loudenslager, ISRP Chair

**Subject:** ISRP Review of the Walla Walla Spring Chinook Master Plan, March 2010 Response (#2000-38-00)

## **Background**

Over the past eight years, the ISRP has conducted numerous reviews of the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Walla Walla Spring Chinook Master Plan (project #2000-038-00) and the related project proposals.

This Master Plan proposes to add incubation, early rearing, and final rearing facilities to the existing South Fork Walla Walla Adult Holding and Spawning Facility (i.e., Umatilla Hatchery satellite facility operating under the Council's Fish and Wildlife Program since 1997) in order to produce annually 500,000 yearling spring Chinook smolts. This production group would be reared to full term, acclimated at the new facility, and released directly into the South Fork Walla Walla River, which is identified as the primary potential spring Chinook natural production area in the upper mainstem portion of the subbasin.

On November 13, 2008, we released our latest review, a Step 1 review in the Council's Three Step Review Process. Step 1 is the feasibility stage, and all major components and elements of a project should be identified. In that review, we focused on the CTUIR's responses to the Step 1 scientific review elements specified by the Council. In addition, we evaluated the adequacy of responses to issues raised in past ISRP reviews of the proposal. Specifically, we evaluated proposals for this hatchery program in the FY 2007-09 and FY 2002 project reviews and found the proposals did not meet the ISRP's scientific review criteria. The FY 2007-09 review stated:

“The ISRP remains unconvinced of the rationale for the hatchery as the appropriate rebuilding tool for spring Chinook in the Walla Walla River, based on the material contained in the proposal. From the proposal it is confusing to determine what mix of harvest augmentation and natural production restoration is the real purpose of the hatchery production. From the proposal it is not possible for the ISRP to conclude that the habitat

conditions are actually sufficient to support the hatchery production in addition to the fish that are currently returning to the watershed, even though those numbers are only in the tens to hundreds annually.”

In our November 13, 2008 review we found that the Master Plan did not meet scientific review criteria ([ISRP 2008-14](#)). We noted that the comments from our previous 2007-2009 review (summarized above) still apply. Consequently, we asked for a revised Master Plan that focused on four specific items, summarized as follows:

1. evaluate the natural production of smolts and adults from the recent releases, and if information is lacking to conduct the evaluation, develop a proof-of-concept release program to justify the need for potential raceway construction;
2. provide evidence that the habitat in the subbasin is adequate to support a reintroduced population and link with the habitat restoration description;
3. provide a decision framework; and
4. provide an HGMP for the program.

On March 29, 2010, the Council sent us the CTUIR’s response and requested our review. The response indicated that the Master Plan would not be revised. Instead, the CTUIR’s response was embedded in our November 2008 review.

### **2010 ISRP Step-1 Overall Recommendation**

#### *Does not meet scientific review criteria*

In our last review in 2008, we recommended to the proponents (CUITR) that they revise the Walla Walla Spring Chinook Hatchery Master Plan with special focus on four topics identified above.

The treatment of these topics in the response was in places helpful but ultimately incomplete in terms of the content needed to permit the ISRP to find the Master Plan meets scientific review criteria. The response offers considerable explanatory prose and tribal perspective, but does not adequately address the underlying scientific concerns. If the ISRP concerns or interpretations, or the basis of targets or recommendations by HSRG (e.g., PNI and pHOS) are incorrect, misguided, or otherwise unsupported by scientific principles or evidence, the proponents should clearly demonstrate these rather than suggesting that they disagree that the levels are not important.

For each of the issues identified in our 2008 review (numbered and italicized), specific comments are provided below.

## **ISRP Comments on the CTUIR Response to the Initial Step-1 Review Topics**

*ISRP 2008 Review Issue 1. In Section V. A. “Existing Environmental Resources; 3. Status of Spring Chinook in the Walla Walla Subbasin” (pp. 44-46) fully evaluate the natural production of smolts and adults from the recent releases. This information is necessary in order for the sponsors to make informed decisions about the feasibility of achieving the program’s goals. If data from the recent stocking is inadequate for analysis, develop an experimental design to use the U.S. v Oregon agreement stocking of 250,000 spring Chinook smolts from Ringold Springs Hatchery through 2019 to allow evaluation of whether constructing 20 additional raceways is justified.*

ISRP 2010 Comment: The purpose of this 2008 ISRP recommendation was for the proponents to evaluate the current status of spring Chinook in the Walla Walla which would serve as a baseline for estimating whether the capacity and productivity of the habitat would facilitate achieving the proposed goals of the program. There have been smolt releases of Carson-strain spring Chinook from various sources into the subbasin. The data and results from these releases – especially in regard to characteristics of natural productivity (e.g., number of returns and SARs, number of redds, and natural smolt production) – are the kinds of information that can inform whether or not the concept is workable given current in-basin and out-of-basin conditions (including choice of founder stock). Ultimately, from such empirical assessments, the ISRP anticipates a plan with a stepwise approach towards justifying a 500,000 hatchery-origin smolt production target.

Some additional summary information on population trends and abundance was provided. The information provided was not sufficiently detailed for the ISRP to interpret the data or evaluate the adequacy for developing a hatchery program consistent with the objectives (page 15 MP) or the existing habitat conditions. However, the empirical data that demonstrates natural spawning by adult hatchery-origin fish reintroduced into the Walla Walla River, and the subsequent production of parr, is evidence that an effort to restore a self-sustaining natural population of spring Chinook salmon using a reintroduction strategy may be justifiable scientifically, depending on survivals in freshwater and marine life stages.

The program proposed – to establish a self-sustaining natural population of 1,100 individuals, with an integrated hatchery component releasing 500,000 smolts to yield a hatchery return of 2,750 individuals based on a smolt-to-adult return (SAR) of 0.55% is not supportable based on the limited empirical evidence. The SAR applied is larger than being used in the planning of spring Chinook reintroduction in the Hood River and is larger than realized in the ongoing effort to reintroduce spring Chinook in the Umatilla and in the trial efforts in the Walla Walla. There is some support to indicate that habitat exists for spawning by 1100 spring Chinook and subsequent rearing of parr. It is not established that these parr will survive in the lower Walla Walla River in sufficient numbers to achieve self-sustaining status. Based on the information provided, it is not clear to the ISRP that the biomass of returning hatchery-origin adults would exceed the biomass of the released hatchery smolt production, given current values.

*ISRP 2008 Review Issue 2. Using evaluation from (1) above, provide more thorough and convincing evidence that the habitat in the subbasin is adequate to support a reintroduced population of spring Chinook (Section V. Existing Resources; A. Existing Environmental Resources; 1. Watershed Carrying Capacity). Link this analysis with the habitat restoration description provided in Section V. B. Existing Resources; 4. Habitat and Passage Restoration and Improvement Efforts.*

ISRP 2010 Comment: For this topic information presented in the Master Plan is restated, and the CTUIR state they “will continue to gather habitat data as it changes through time and make appropriate adjustments based on monitoring and evaluation results.”

Ultimately, because the goal of the program is to re-establish a self-sustaining natural population with an integrated hatchery program (that provides harvest) the capacity for natural production is vital to understanding whether this program may or may not be successful beyond simply producing hatchery smolts, or even adult returns that inadequately yield natural production.

The purpose of requesting a more thorough presentation of AHA analyses and/or EDT was to provide some evidence that the natural productivity is sufficient to begin a reintroduction effort and with habitat and within subbasin passage and instream flow enhancement has a reasonable expectation of success. The tabular materials provided did not provide any effective support for this contention. There is some level of natural productivity that is achievable now, but it is not clear how it might grow with additional improvements or that this growth trajectory can be influenced by a hatchery smolt release program.

*ISRP 2008 Review Issue 3. Within the plan, provide a decision framework that identifies performance metrics for adult and juvenile production in both the hatchery and natural phases that would justify an integrated-harvest program. If the evaluation concludes that reintroduction of a self-sustaining spring Chinook population is unlikely, develop options for a harvest augmentation program. Include in the decision framework those circumstances that would trigger cessation of fish stocking because the program has succeeded and is no longer needed, or has been unsuccessful in providing restoration and harvest. Goals for harvest (where, when, by whom?) are not adequately articulated with development and definition of target and limit reference points for decision management.*

ISRP 2010 Comment: For this topic the CTUIR refer the ISRP to Appendix X of the Master Plan, the Monitoring and Evaluation Strategy in the Master Plan, and provide Table 3 (page 17 of the response). Table 3 is informative in that it identifies that under almost all circumstances a full production of 500,000 smolts is planned, and even under a reduced program when there are low NOR and low HOR, 450,000 smolts are planned for release.

Table 3 is easier to follow than Appendix X, and needs to be expanded into a broader decision framework. In its current form it does not conform to “best practices” for artificial production as developed by the HSRG, ISRP, and ISAB recommendations and incorporated into the Fish and Wildlife Program. For an integrated program with the objective of reestablishing a self-sustaining natural population the PNI values of 0.06, 0.31, and 0.42 for scenario 2, 3, and 4

respectively is not justifiable. The HSRG recommends a PNI of 0.67 or greater for primary populations and a PNI greater than 0.50 for contributing populations. The HSRG emphasizes these PNI recommendations represent minimum conditions.

Whether the HSRG recommendations are stringent enough, or too stringent, remains to be empirically determined. They are well supported by theory and initial observations on the relative reproductive success of hatchery-origin adult salmon (RIST 2009). The ISRP believes a supportable decision framework would have hatchery production levels driven largely by the availability of natural-origin adults to contribute to the hatchery broodstock, and be designed to limit through harvest the scale of natural spawning by hatchery-origin adults (e.g., Chief Joseph Dam Hatchery Program, Project #2003-023-00, <http://www.nwcouncil.org/library/isrp/isrp2010-1.htm>).

To meet the standards for experimental management and risk assessment developed for the Artificial Production Review (NPCC 99-15) and incorporated into the Fish and Wildlife Program, the sufficiency for a decision framework centers on whether or not there are justifiable thresholds to expand the program to full potential or discontinue because the program failed miserably or succeeded wonderfully. The ISRP recognizes that for the majority of programs, the short-term results will fall between these two extremes.

For “adaptive” decision making, the proponents will need to clearly identify the criteria and measurable metrics by which decisions will be evaluated and the program adapted.

The Master Plan states:

*Long term variations from the predicted SAR and spawner escapement or juvenile habitat capacities are examples of monitoring and evaluation results which may trigger a reprogramming of hatchery production or adult outplanting within the subbasin. It is the intent of the co-managers that in the longer term, after a self sustaining natural population has been reestablished in the upper mainstem, a portion of the hatchery releases may be shifted to Mill Creek and the Touchet River to augment reintroduction and harvest in those two areas of the subbasin. In addition, monitoring and evaluation of tributary habitat capacities may alter the number and location for adult outplants. Lastly, fundamental changes to the overall program may be implemented based on results of the comparative hatchery action analysis study when it is completed in order to more effectively reach the WWHMP goals. Any longer term changes to the program will be coordinated with the co-managers and through U.S. v. Oregon.*

This is a sound approach, but the numerical values (i.e., the reference points) that will trigger management decisions need to be included in the plan. Development is needed of life-cycle models and monitoring protocols with sufficient precision to accommodate application to the decision framework.

*ISRP 2008 Review Issue 4. Provide an HGMP for the program.*

An HGMP is required in the step one Master Plan but has not yet been provided.

## 2010 ISRP Summary Comments

In the response to the ISRP, the CTUIR emphasized their belief that the ISRP review of the Master Plan overly focused on the establishment of a “self-sustaining run” of natural spring Chinook in the Walla Walla. This emphasis by the ISRP was (is) because the first objective of the Master Plan (page 15) is “establish self-sustaining natural populations in the South Fork Walla Walla River, Mill Creek, and Touchet River.” Based on first principals, successful reintroduction requires establishing a self-sustaining natural population. This is reflected in the Fish and Wildlife Program 2009 amendments (page 19): “The purpose of such supplementation is to restore and maintain healthy fish populations with sufficient genetic and life history diversity to ensure that eventually, after appropriate habitat improvements, they will become self-sustaining.”

Successful reintroduction of Chinook salmon in the Columbia River Basin to the point of reestablishing a wild population with recruitment above replacement has not yet occurred. Positive recruitment has not occurred in the Walla Walla until 2009, or in only 1 of 6 years to date. The likelihood of success for this reintroduction is thus not promising, but several tactics are possible that improve the odds, including the selection of local naturalized broodstock, as recommended by the HSRG (2009). Such adaptation may be slow, requiring several generations. When coupled with habitat improvements and mainstem dam passage, a self-sustaining population may be attainable, particularly during periods of improved ocean conditions.

In the response to the ISRP, the proponents state that “establishment of a self-sustaining run is a long term goal of the program but it not the only goal and should not be the driving objective.” A clear statement, with numeric targets, would perhaps greatly assist program planning and the review. Harvest is clearly a goal, but the success of hatchery-origin returns and thus harvest will be a function of the development of a stock well-adapted to the Walla Walla subbasin. Furthermore, a harvest goal and a rebuilding goal may involve the development of quite distinct broodstocks. Harvest returns to a particular place or time of harvest, size, or catchability trait may be selected with broodstock development that is different from that related to establishing natural production. The November 2008 ISRP review of the Walla Walla Master Plan recommended including the option of pursuing a segregated harvest program in the decision framework as a contingency if restoration was not successful. This was rejected by the CTUIR. Modeling of reproductive success and harvest using AHA should indicate this. Such work would also be useful in providing insight to the benefit of the habitat improvements that are planned, and the levels required in productivity and capacity. For the latter, as the HSRG noted, initially, the benchmarks for PNI and PHOS are not attainable.

Determining the potential of the system is possible using the 250,000 smolts currently available through *U.S. v Oregon*. It would be consistent with the Fish and Wildlife Program and the Council’s Artificial Production Review, to use this production in a formal adaptive management experiment to better define the biological boundaries of the system and then establish the subbasin objectives and develop an appropriately scaled artificial production strategy. The ISRP believes that while this approach would require a longer development phase before design and construction, it would be better than the current Master Plan's approach, which is essentially to build it and run by trial-and-error to see the result, and then adapt.

The Master Plan included an alternative two: partial production at South Fork Facility. That alternative developed incubation and early rearing capability at the South Fork Walla Walla Brood Facility, with fry to smolt rearing at Ringold Springs Hatchery. This option, together with the 250,000 *U.S. v Oregon* smolts available through 2017 provides an opportunity to design an adaptive management experiment to establish a local broodstock, determine likely range of effective SARs for the hatchery production, and determine natural parr and adult production from natural spawning by a mixture of hatchery- and natural-origin adults. This information would provide empirical support for final scaling of artificial production and facility needs within the Walla Walla subbasin.

### **Literature Cited**

Recovery Implementation Science Team (RIST). 2009. Hatchery reform science: A review of some applications of science to hatchery reform issues.

[http://www.nwfsc.noaa.gov/trt/puget\\_docs/hatchery\\_report\\_april92009.pdf](http://www.nwfsc.noaa.gov/trt/puget_docs/hatchery_report_april92009.pdf)