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**Subject: HSRG Review of Cathlamet Channel Net Pen Spring Chinook Program HGMP**

A subcommittee of the Hatchery Scientific Review Group (HSRG) has reviewed the Cathlamet Channel Net Pen Spring Chinook Hatchery and Genetic Management Plan (HGMP), dated September 3, 2013. The principles and recommendations developed by the HSRG during their review of the Columbia River Basin hatcheries (HSRG 2009) were used as a template to organize information for review of this HGMP. The HSRG reviewers were asked to compare the consistency of the Cathlamet Channel Net Pen Spring Chinook HGMP with the principles and recommendations developed by the HSRG for hatchery operations for the Columbia River Basin. The results are as follows:

**Principles and System-Wide Recommendations**

*The HSRG's three principles for hatchery management are presented below, with each of 17 system-wide recommendations (applicable to programs across the Columbia River Basin hatchery system) listed under the principle from which it is derived. These principles and system-wide recommendations represent the key findings of the HSRG during its review of Columbia River Basin hatcheries, but are applicable to all hatchery programs. Hatchery programs that adhere to these principles and recommendations are more likely to contribute to the managers' harvest and conservation goals.*

**Principle: Develop Clear, Specific, Quantifiable Harvest and Conservation Goals for Natural and Hatchery Populations within an “All H” Context.**

*“During its reviews, the HSRG observed that goals for fish populations were not always explicitly communicated and/or fully understood by the managers and operators of hatchery programs. These goals should be quantified, where possible, and expressed in terms of values to the community (harvest, conservation, education, research, etc.). At times, goals have been expressed in terms of the numbers of smolts to be released without specifying whether or how this hatchery production contributes to harvest and/or conservation. Hatchery production numbers may be the means of contributing to harvest and/or conservation values, but they are not endpoints. When population goals are clearly defined in terms of conservation and harvest, hatcheries can be managed as tools to help meet those goals.”*

*“To be successful, hatcheries should be used as part of a comprehensive strategy where habitat, hatchery management and harvest are coordinated to best meet resource management goals that are defined for each population in the watershed. Hatcheries are by their very nature a compromise—a balancing of benefits and risks to the target population, other populations, and the natural and human environment affected by the hatchery program. Use of a hatchery program is appropriate when the benefits significantly outweigh the risks and when the benefit/risk mix from the program is more favorable than the benefits/risks associated with non-hatchery strategies for meeting the same goals.”*

**Recommendation 1:** *Express conservation goals in terms of a population’s biological significance (Primary, Contributing, Stabilizing) and viability (natural-origin spawning abundance and productivity).*

**Comment:** There is no natural population directly linked to this program; (no spring Chinook in the Elochoman River) and the natural populations potentially affected through straying have been designated (as Primary, Contributing or Stabilizing) (Table 2.2.2.1).

**Recommendation 2:** *Express harvest goals in terms of a population’s contribution to specific fisheries.*

**Comment:** HGMP lacks specific quantifiable goals for contribution to specific fisheries. Section 1.7 identifies Goal of program as: “Mitigation/Augmentation. The goal of this program is to support fisheries in the basin and lower Columbia River, while eliminating a directed harvest on wild fish. Also serves as mitigation for development (including hydro-power) and habitat degradation.”

Section 1.10 “Performance Indicators”, table 1.10.1 further identifies “This program provides mitigation for lost fish production due to development within the Columbia River Basin and contributes to a meaningful harvest in sport and commercial fisheries.

While this is a new program, managers should specify numbers of fish expected to be contributed to specific fisheries, or at a minimum total number of fish expected to be harvested, (i.e. smolt-to-adult survival x # of smolts released x terminal harvest rate).

**Recommendation 3:** *Ensure goals for individual populations are coordinated and compatible with those for other populations in the Region.*

**Comment:** The proposal appears to adhere to this Recommendation. The HGMP states in Section 3.1 “*WDFW (draft) Conservation and Sustainable Fisheries Plan (C&SFP)*. This program is identified within the WDFW draft Conservation and Sustainable Fisheries Plan. This document addresses priorities of the *LCFRB Recovery Plan (2010)* and *Fishery Management and Evaluation Plan (FMEP)*, the legal requirements of the Endangered Species Act (ESA), and recommendations of the Hatchery Scientific Review Group (HSRG). It describes the adaptation of general principles for hatchery management to the unique genetic and ecological setting of each watershed.”

**Principle: Design and Operate Hatchery Programs in a Scientifically Defensible Manner.**

*“Once a set of well-defined population goals has been identified, the scientific rationale for a hatchery program (in terms of benefits and risks) must be formulated, explaining how the program expects to achieve its goals. The purpose, operation and management of each hatchery program must be scientifically defensible. The strategy chosen must be consistent with current scientific knowledge. Where there is uncertainty, hypotheses and assumptions should be articulated.”*

*“Scientific defensibility should be a central consideration throughout all phases of a hatchery program—when determining whether a hatchery should be built or a program initiated; during the hatchery or program planning and design phase; and during the operations phase. This ensures a scientific foundation for hatchery programs, a means for addressing uncertainty, and a method for demonstrating accountability. Documentation for each program should include a description of analytical methods and should be accompanied with citations from the scientific literature.”*

**Recommendation 4:** *Identify the purpose of the hatchery program (i.e., conservation, harvest or both).*

**Comment:** Program is identified as a Harvest program (Section 1.6).

**Recommendation 5:** *Explicitly state the scientific assumptions under which a program contributes to meeting the stated goals.*

**Comment:** While the justification for a harvest program is provided in several places (Sections 1.8, 1.12, 3.3), no specific assumptions about smolt to adult survival, harvest rates or stray rates are provided. It can only be assumed that WDFW believes these fish will survive and be caught at some level. Those assumptions should have been provided in order to assess the program and its compatibility with other basin management objectives. There are several other spring Chinook net pen programs on the lower Columbia that should be used as surrogates.

**Recommendation 6:** *Select an integrated or segregated broodstock management strategy based on population goals and hatchery program purpose.*

**Comment:** Program is identified as a segregated program (Section 1.6).

**Recommendation 7:** *Size hatchery programs based on population goals and as part of an “all H” strategy.*

**Comment:** The current production goal of 250,000 smolts appears to be based on either availability of donor stock or facility capacity. Without a specific harvest goal and assumptions about SAR, stray rate or catch, it is not known if this program is appropriately sized.

**Recommendation 8:** *Manage harvest, hatchery broodstock and natural spawning escapement to meet HSRG standards appropriate to the affected natural population’s designation.*

**Comment:** This is a segregated harvest program without an associated natural population. Nonetheless, like the other Select Area Fishery Evaluation Projects (SAFE) which this program is designed to emulate, it is important to consider strays to other populations such as ESA listed spring Chinook stocks upstream of the release site. Unlike the other SAFE areas which are more off-channel sloughs and bays, the Cathlamet Channel comprises a significant portion of the main-stem flow of the Columbia River, so imprinting and straying to upriver areas is likely. Additionally, since the Cathlamet Channel is more like a mainstem flow than an off-channel slough or bay, returning adults may not hold near the release site for as long and be less vulnerable to harvest before moving upstream. Specific acceptable upriver stray rates should be established prior to adult returns followed by adequate monitoring and adaptive management. Also see comments from Recommendation 9. In the early 1990’s, ODFW and WDFW (Paul Hirose and Mark Miller) conducted a survey of all potential terminal fishery areas in the lower Columbia River. Sites were sampled and evaluated based on a number of criteria. There is likely important information on the suitability of Cathlamet Channel in the resulting report submitted to BPA.

**Recommendation 9:** *Manage the harvest to achieve full use of hatchery-origin fish.*

**Comment:** Two primary goals of SAFE areas and HSRG recommendations are to maximize harvest of returning hatchery adults while minimizing catch of non-hatchery stocks and non-target species (i.e. sturgeon). The WA/OR “Select Area Fishery Evaluation Project Report”, 2006, states that the spring Chinook SAFE areas (4 sites) had an average annual harvest rate of 91.2% of local hatchery fish and a 0.06% (26 fish) harvest rate of upriver stocks. Although section 3.3.1 of the HGMP states that no harvest data is currently available for Cathlamet Channel spring Chinook, a test fishery was executed in the spring of 2013 and preliminary data suggests 50% of the fish caught (52 of 102) were from stocks above Bonneville. This is not surprising as Cathlamet Channel has historically been an important spring Chinook fishing area. Since ESA puts a limit on the harvest of upriver stocks, a high harvest rate in an area such as

Cathlamet Channel could potentially close the entire fishery early and lose the potential of higher harvest rates of hatchery fish elsewhere along with additional straying of hatchery fish from that lost opportunity. Use of selective harvest gear in the Cathlamet Channel with very low release mortality such as beach and purse seines has the potential to resolve these issues.

***Recommendation 10:*** *Ensure all hatchery programs have self-sustaining broodstocks.*

**Comment:** While this is a new program, it appears that the donor stocks (Cowlitz and/or Lewis River) have achieved broodstock goals for at least the last 12 years (see Section 6.1).

***Recommendation 11:*** *Coordinate hatchery programs within the Regions ecosystem to account for the effects of all hatchery programs on each natural population and each hatchery program on all natural populations.*

**Comment:** Section 3 of the HGMP describes the coordination of hatchery production in the Region via WDFW (draft) Conservation and Sustainable Fisheries Plan (C&SFP) and LCFRB Recovery Plan (2010) and Fishery Management and Evaluation Plan (FMEP). These documents do take into account the impacts of hatchery production on natural populations.

The HGMP could be improved by indicating the pHOS of nearby primary and contributing populations of spring Chinook. This information would be useful in then calculating an upper limit for straying from the proposed net pen project. With an assumed SAR, terminal harvest rate, potential stray rate and pHOS of nearby populations, the HGMP could include a risk assessment that would be useful in then calculating the number of smolts that could be released in the initial years.

***Recommendation 12:*** *Assure that facilities are constructed and operated in compliance with environmental laws and regulations.*

**Comment:** It appears that NPDES guidelines with regard to effluents will be adhered to (Table 1.10.2.1).

***Recommendation 13:*** *Maximize survival of hatchery fish consistent with conservation goals.*

**Comment:** Fish appear to be released at a time and size aimed at maximizing survival for spring Chinook reared at Columbia River hatcheries (Section 10.3).

**Principle: Monitor, Evaluate and Adaptively Manage Hatchery Programs.**

*“In addition to establishing resource goals and a defensible scientific rationale for a hatchery program, the HSRG recommends that the managers’ decisions be informed and modified by continuous evaluation of existing programs, changing circumstances and new scientific information. Decisions about hatcheries must also be made in a broader, integrated context and*

*hatchery solutions must meet the test of being better, in a benefit/risk sense, than alternative available means to meet similar goals. Systems affected by hatchery programs are dynamic and complex; therefore, uncertainty is unavoidable. The only thing certain is that the unexpected will occur.”*

***Recommendation 14:*** Regularly review goals and performance of hatchery programs in a transparent, regional, “all-H” context.

**Comment:** The HGMP describes a process for updating information on survival, contribution to fisheries and contribution to natural spawning areas for this program. However, due to lack of clear harvest goals, it is unclear how these data will be used to modify the program (Section 1.10). After conducting a risk assessment (see Recommendation #11), the HGMP should include decision triggers to increase or decrease the number of smolts released based on straying, pHOS of local populations, sufficiency of harvest, and acceptable mortality to non-targeted Chinook, steelhead and sturgeon populations.

***Recommendation 15:*** Place a priority on research that develops solutions to potential problems and quantifies factors affecting relative reproductive success and long-term fitness of populations influenced by hatcheries.

**Comment:** No ongoing research was described (Section 12).

***Recommendation 16:*** Design and operate hatcheries and hatchery programs with the flexibility to respond to changing conditions.

**Comment:** In the absence of clear harvest goals, it is difficult to see how (or why) hatchery operations would change due to changing conditions (social or environmental). A section on adaptive management should be included in the document (perhaps Section 3, or Section 11) that describes a process for altering hatchery programs based on changes to goals, or hatchery performance. The HGMP could include the use of quantified decision triggers and critical assumptions within an adaptive management framework.

***Recommendation 17:*** Discontinue or modify programs if risks outweigh the benefits.

**Comment:** Various monitoring activities are described within the HGMP to measure benefits (Table 1.10.1) and risks to natural populations (Table 1.10.2). While it is assumed that results from this monitoring could be used to alter hatchery programs, no level of impacts or benefits was identified as “unacceptable” so it is unclear why much of these data are being collected: see also comments on Recommendations 11, 14 and 16.