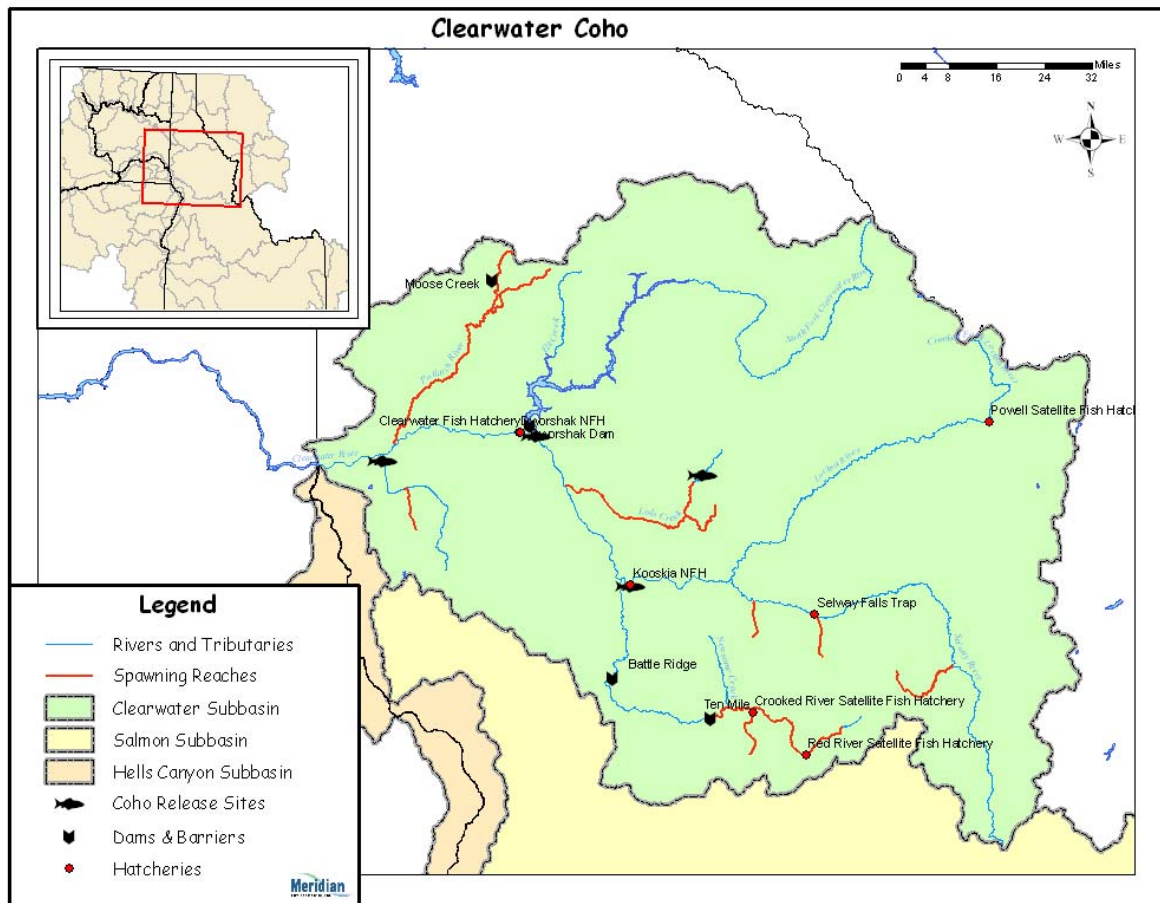


# Hatchery Scientific Review Group Review and Recommendations

## Clearwater River Coho Population and Related Hatchery Programs

January 31, 2009



## 1 Clearwater River Coho

Clearwater River coho salmon are not considered part of the Lower Columbia River ESU.

Historically, coho salmon were abundant in the lower Snake River Basin and were known to spawn in the Clearwater, North Fork Clearwater, South Fork Clearwater, Lochsa, and Selway rivers (Nez Perce Tribe and FishPro 2004). In 1910, the construction of Harpster Dam completely blocked coho salmon access into the South Fork Clearwater River. In 1927, Inland Power and Light Company completed Lewiston Dam at River Mile 4.0 on the Clearwater River. The dam included a fish ladder, but it was inadequate, virtually eliminating coho salmon runs into the Clearwater subbasin. While improvements were made to the fish ladder in subsequent years, attempts to reintroduce coho into the South Fork Clearwater River met with little success. After Harpster Dam was removed in 1963 and Lewiston dam was removed in 1973, there was no observed increase in coho salmon abundance<sup>1</sup>. The native Clearwater River coho population was never listed under the Endangered Species Act (ESA), and was considered extinct when the last coho crossed the Lower Granite Dam in 1986. Even though coho salmon are listed as threatened in the lower Columbia River, reintroduced coho in the Clearwater subbasin are considered out-of-ESU and are not listed.

In 1995, the Nez Perce Tribe began a coho reintroduction program in the Clearwater River subbasin using coho reared at Mitchell Act hatcheries in the lower Columbia River. By 1998, this agreement provided an annual transfer of 550,000 coho salmon smolts from the Eagle Creek National Fish Hatchery (NFH) for release in the Clearwater River subbasin. Eagle Creek Hatchery broodstock was initially selected because of its early run timing that is probably similar to historic runs in the Clearwater River. Consistent with the Clearwater Subbasin Plan (Nez Perce Tribe and FishPro 2004), the Nez Perce Tribe envisions developing an annual escapement of 14,000 coho salmon to the Clearwater subbasin.

## 2 Current Conditions

Coho salmon in the Clearwater River subbasin are currently maintained through an integrated reintroduction hatchery program involving the Dworshak, Kooskia and Eagle Creek NFHs. To date, the reintroduction program has been moderately successful. Over the past 5 years (2003 through 2007), adult coho counts at Lower Granite Dam have averaged over 2,100 fish<sup>2</sup>. In 2004, adult returns reached a high of 3,898 at Lower Granite Dam; 2,104 of these were trapped at Clearwater weirs with 419 females spawned to produce almost 900,000 eggs. A total of 498 adults were passed at weirs to spawn naturally and at least 35 redds were counted in tributary streams. In 2005, adult spawning was observed in the Potlatch River, Lapwai Creek, Lolo Creek, Clear Creek, and the South Fork Clearwater River (Nez Perce Tribe 2005). An important goal of this program is to develop a localized broodstock.

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 346 and 0.58, respectively.

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<sup>1</sup> <http://www.nwcouncil.org/history/Extinction.asp>

<sup>2</sup> [http://www.fpc.org/adultsalmon/adultqueries/Adult\\_Annual\\_Totals\\_Query\\_form.html](http://www.fpc.org/adultsalmon/adultqueries/Adult_Annual_Totals_Query_form.html)

## 2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the natural population.

- ESA Status: Not listed
- Population Description: For the HSRG review, the population has been classified as a Stabilizing population.
- Recovery Goal for Abundance: NA
- Productivity Improvement Expectation: NA
- Habitat Productivity and Capacity is estimated as: Productivity: 1.5; Capacity: 1,000

## 2.2 Current Hatchery Programs Affecting this Population

The integrated coho salmon program includes a smolt release sourced from the Eagle Creek NFH and a locally adapted (Clearwater stock) program that generates smolts from adults trapped at Snake and Clearwater facilities.

1) Smolts reared at the Eagle Creek NFH are transferred and released directly to Clear Creek, the Middle Fork Clearwater River, and Lapwai Creek. The current release goal for Lapwai Creek and for the Middle Fork Clearwater River/Clear Creek sites is 275,000 smolts each (550,000 total smolts). Coho smolts are not adipose fin-clipped. Depending on funding, release groups may receive evaluation tags (coded wire-tags and PIT-tags).

2) Adult broodstock collected from returns to Dworshak NFH, Kooskia NFH, the Nez Perce Tribal Hatchery, and Lyons Ferry Hatchery in Washington are transferred to the Dworshak facility for holding and spawning. Additional eyed-eggs may be transferred to the Dworshak facility from Eagle Creek NFH to better address production objectives. Fish rear through early spring at the Dworshak when they are transferred to the Kooskia NFH following the release of spring Chinook smolts from that facility. Coho acclimate for approximately 3-5 weeks before being released in Clear Creek and the Middle Fork Clearwater River. The smolt production goal for the locally adapted program is approximately 280,000. Coho smolts are not adipose fin-clipped. Depending on funding, release groups may receive evaluation tags (coded wire-tags and PIT-tags).

3) Approximately 30,000 coho salmon eggs are transferred to the Potlatch Corporation which operates an educational outreach program. Subyearlings generated by this program are planted in Orofino Creek.

Coho smolts are not adipose fin-clipped. Depending on funding, release groups may receive evaluation tags (coded wire-tags and PIT-tags).

The coho program has an R/S of 4.0.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from integrated in-basin programs: 1,192
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 0

## 3 HSRG Review

The HSRG has developed guidelines for minimal conditions that must be met for each type of program as a function of the biological significance of the natural populations they affect. For populations of the highest biological significance, referred to as Primary, the proportion of effective hatchery-origin spawners (pHOS) should be less than 5% of

the naturally spawning population, unless the hatchery population is integrated with the natural population. For integrated populations, the proportion of natural-origin adults in the broodstock should exceed pHOS by at least a factor of two, corresponding to a proportionate natural influence (PNI) value of 0.67 or greater. For Contributing populations, the corresponding guidelines are: pHOS less than 10% or PNI greater than 0.5. It is important to note that these represent minimal conditions, not targets. For example, the potential for fitness loss when effective pHOS is 5% is significantly greater than it would be at 3%. For Stabilizing populations, we assume the current pHOS or PNI would be maintained.

The HSRG analyzed the current condition and a range of hatchery management options for this population, including the effect of removing all hatchery influence, and arrived at one or more proposed solutions intended to address the manager's goals consistent with the HSRG guidelines for Primary, Contributing, and Stabilizing populations. The solution included in the cumulative analysis is the last option described in the Observations and Recommendation box below.

In order to highlight the importance of the environmental context, two habitat scenarios were considered: current conditions and a hypothetical 10% habitat quality improvement.

See HSRG Observations and Recommendations in the box below for more information.

### 3.1 Effect on Population of Removing Hatchery

The No Hatchery scenario is intended to look at the potential of the natural population absent all hatchery effects with projected improved fish passage survival in the Snake and Columbia mainstem (FCRPS Biological Opinion May 5, 2008). Our analysis estimated that Adjusted Productivity (with harvest and fitness effects from AHA) would increase from 0.6 to 1.2. Average abundance of natural-origin spawners (NOS) would decrease from approximately 346 fish to approximately 100 fish. The harvest contribution of the natural and hatchery populations would go from approximately 637 fish to approximately 27 fish.

### 3.2 HSRG Observations/Recommendations

In the Observation and Recommendation box below we describe elements of the current situation (Observations) that were important to evaluate the natural population and where applicable, the hatchery program(s) affecting that population. We also describe a solution (Recommendations) that appeared to be consistent with manager's goals; however, this is not the only solution. In some cases more than one solution is described.

Summary results of this analysis are presented in Table 1. The adjusted productivity values reported for each alternative incorporates all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

## **Observations**

Managers have identified a strategy for Clearwater River coho that emphasizes maintaining existing natural spawning populations, and using hatchery-origin coho salmon in an attempt to augment natural production.

Coho salmon were extirpated upstream of Lower Granite Dam in the mid-1980s. In 1995, in cooperation with the USFWS and the IDFG, the Nez Perce Tribe initiated a coho salmon reintroduction program in the Clearwater subbasin.

Current production plans include transferring approximately 550,000 smolts from the USFWS Eagle Creek NFH for planting in Lapwai Creek and Clear Creek. Additionally, the Nez Perce Tribe is developing a locally adapted broodstock from returning adults (both first generation returns from Eagle Creek outplants and from returning adults produced via natural spawning). Adults appear to be returning to capture sites in sufficient numbers to begin transitioning to locally adapted broodstock. The broodstock production program has begun this process with a smolt production target of about 280,000 smolts.

Eagle Creek smolts are trucked from the USFWS facility in the Clackamas River system and released directly to receiving streams. Locally produced smolts are sourced from spawning events at the Dworshak NFH. Juveniles rear at Dworshak and acclimate for 3-5 weeks at the Kooskia NFH before being released to the Middle Fork Clearwater River or Clear Creek. Broodstock for the local program could be collected at four facilities: Lyons Ferry Hatchery, Nez Perce Tribal Hatchery, Dworshak NFH, and Kooskia NFH.

A small educational program operated by the Potlatch Corporation is provided approximately 30,000 eggs. Fry produced in this program are planted in Orofino Creek.

## **Recommendations**

This is a reintroduction program to develop self-sustaining populations. The HSRG recommends that managers establish locally adapted adult returns to meet all broodstock needs for this program. This could best be accomplished by (a) emphasizing adult returns for broodstock from all adult capture facilities; and (b) releasing any additional Eagle Creek smolts exclusively at facilities where broodstock subsequently could be collected (e.g., Nez Perce Tribal Hatchery, Dworshak National Fish Hatchery, Kooskia National Fish Hatchery). Initially the primary focus of this program should be to establish a locally adapted hatchery population. As managers build returns of locally adapted hatchery-origin adults, phase out the importation of out-of-basin coho. Once adults return in excess of broodstock needs, adults could be outplanted or some of the smolt production could be allocated to tributary releases. The final step would be to transition from locally adapted segregated hatchery broodstock to a well integrated program. A PNI greater than 0.5 is necessary for the natural environment to drive adaptation and increase fitness. To be most successful, managers should reestablish their monitoring and evaluation program.

The managers should coordinate the programming of all salmon populations reared in the Clearwater Fish Hatchery, Dworshak National Fish Hatchery, Kooskia National Fish Hatchery and Nez Perce Tribal Hatchery to maximize the benefits of available water supply, appropriate water temperature, and rearing containers. Operating these four major hatcheries as a coordinated system would facilitate the movement of

programs/populations between and among the different hatcheries. This would maximize survival by producing fish in good condition for release at the appropriate life stage.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Clearwater Coho. The light green row indicates the natural population and yellow indicates the segregated hatchery population, if applicable. A 10% habitat improvement is applied to the HSRG Solution to evaluate the additional effect of improved habitat towards conservation objectives.

Alternative	Type and Purpose	Prog Size (/1000)	HOR Recapture	Additional Weir Efficiency	Effective pHOS	PNI	NOS Esc	Adj Prod	Harvest	Hatchery Surplus
Current	Int Cons	833.9	40%	0%	73%	0.0	346	0.58	637	550
No Hatchery	None None	-	0%	0%	0%	1.0	100	1.15	27	-
HSRG Solution	Int Cons	830.1	40%	0%	80%	0.0	405	0.58	1,018	589
HSRG Solution w/ Improved Habitat	Int Cons	830.1	40%	0%	78%	0.0	448	0.64	1,030	589