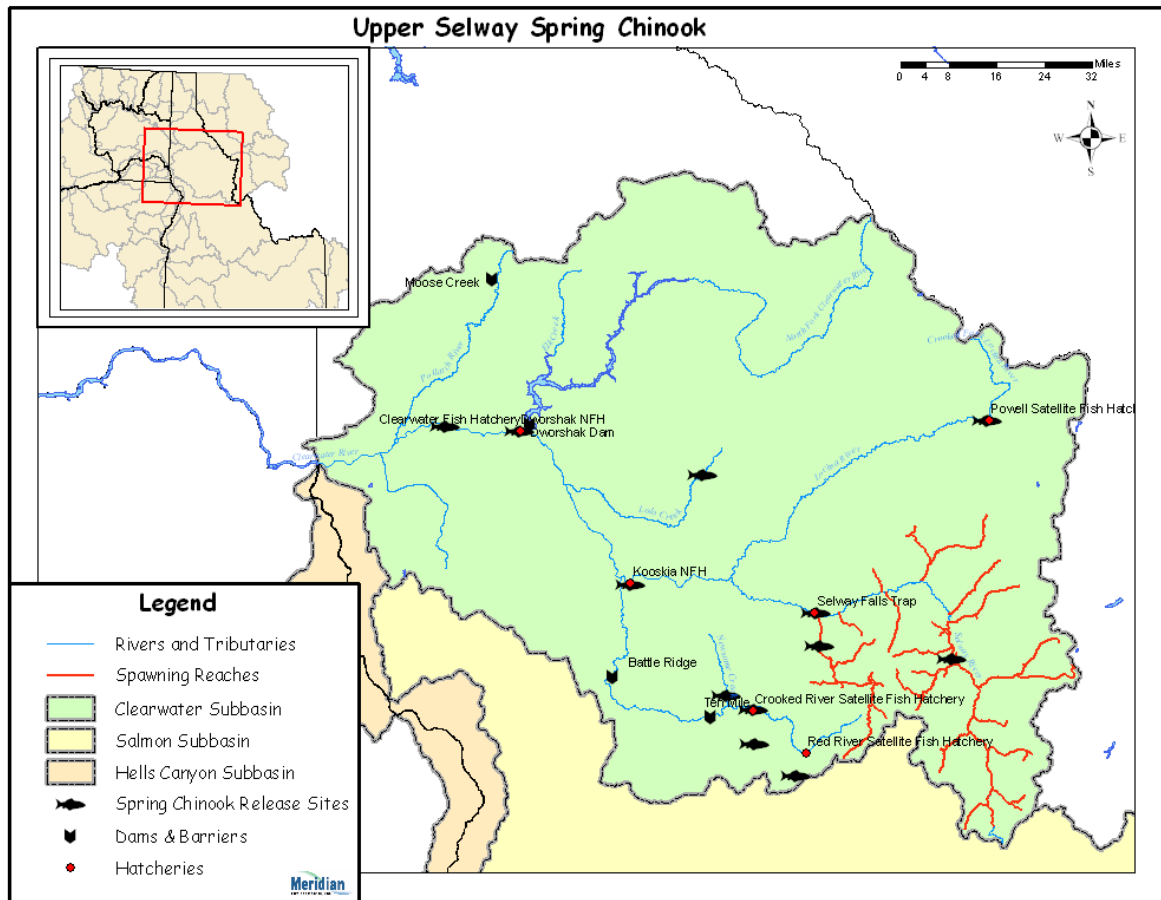


Hatchery Scientific Review Group Review and Recommendations

Upper Selway River Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Upper Selway River Spring Chinook

The Snake River Spring- and Summer-Run ESU was listed as threatened under the Endangered Species Act (ESA) on August 22, 1992 and reaffirmed on June 28, 2005. The ESU includes those fish that spawn in the Snake River drainage and its major tributaries, including the Grande Ronde and the Salmon Rivers, and that complete their adult, upstream migration (passing Bonneville Dam) between March and July. Fifteen artificial propagation programs are also included in the ESU; however, the non-indigenous hatchery spring- and summer-run Chinook stocks currently used in the Clearwater River and its tributaries, including the Selway River, are not considered part of the ESU (57 FR 14653).

Spring Chinook salmon were likely extirpated from the Clearwater River subbasin following the construction of Lewiston Dam in 1927. When the Kooskia and Dworshak National Fish Hatcheries (NFHs) were completed in 1967 and 1969, millions of spring Chinook were released into the Clearwater River and its tributaries, primarily as yearling smolts. Broodstock for these hatcheries came primarily from the Rapid River Hatchery (considered an upper Snake River stock), with significant contributions from Carson-stock hatcheries (Leavenworth, Little White Salmon, and Carson NFHs) and Willamette River hatcheries. More recently, these and other facilities in the subbasin have used adults returning to the hatcheries or satellite collection sites to supply gametes for their programs (Myers et al. 1998). The total adult return goal for Dworshak NFH and Clearwater Fish Hatchery is 21,135 spring Chinook over Lower Granite Dam. Currently Kooskia NFH and the Nez Perce Tribal Hatchery do not have established adult return goals.

Spring Chinook salmon enter the Columbia River and begin spawning migrations during April and May, reaching the Clearwater subbasin from April through July. Spawning typically occurs in tributaries and headwater streams in August and September. Eggs hatch in December with emergence complete by April. Spring Chinook salmon remain in fresh water for one year, migrating to the ocean in the spring of their second year, typically from March through June. Nearly all adult spring and summer Chinook that return to the Snake River Basin result from fish that emigrate as yearlings in April-May.

2 Current Conditions

Adult spring/summer Chinook returns to upper Selway River consist primarily of hatchery-origin fish, resulting from a hatchery program operated by the Nez Perce Tribe with cooperation from the IDFG and the Clearwater Fish Hatchery. Both natural- and hatchery-origin components of this population are not listed under the ESA. The reintroduced spring Chinook population in the upper Selway River was originally derived from the Rapid River Hatchery, with significant contributions from Carson-stock hatcheries (Leavenworth, Little White Salmon, and Carson NFHs) and Willamette River hatcheries. This composite population is now supplemented with Selway River natural returns. The upper Selway River is generally considered to extend from the confluence of Running Creek up through the McGruder section.

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 127 and 0.60, respectively. The model also estimates that 188 hatchery origin Chinook stray into this population each year.

2.1 Current Population Status and Goals

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

- **ESA Status:** The non-indigenous spring- and summer-run stocks currently used in the Clearwater River subbasin are not considered part of the Snake River Spring- and Summer-Run ESU, and not listed under the ESA (57 FR 14653).
- **Population Description:** For the purpose of this review, the HSRG assigned this population as Primary. The population currently meets the broodstock criteria for a Stabilizing population designation.
- **Recovery Goal for Abundance:** Not listed, not applicable.
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity:** Productivity: 1.3; Capacity: 600

2.2 Current Hatchery Programs Affecting this Population

The current Upper Selway hatchery program releases approximately 300,000 parr (100 fpp) directly to the upper Selway River in the McGruder Corridor in mid-July. Parr are not adipose fin-clipped but may be Oxytetracycline-marked. Broodstock adults are sourced from South Fork Clearwater hatchery-origin returns (trapped at Crooked River or Red River) or from returns to the Rapid River Fish Hatchery. Spawning, incubation, and rearing through release occur at the Clearwater Fish Hatchery. The program has an R/S value of 0.9.

In 1991, the IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the USFWS initiated a large-scale Chinook salmon supplementation study that was designed to continue through 2014. The study incorporates treatment and control streams in the Clearwater and Salmon subbasins. Within this ICTRT population zone, Whitecap Creek, a tributary to the upper Selway River, is maintained as a control stream. “Treatments” include the development and release of “supplementation” smolts (hatchery x natural parents) and the release of “supplementation” adults to treatment spawning streams (50:50 hatchery: natural-origin release design). In 2004, juvenile treatments ended in all but three study streams. In 2007, adult treatments ended. The study will conclude in 2014 following a five-year period of “no treatment” evaluation.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from integrated in-basin programs: 0
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 188

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 factor effects from AHA) would increase from 0.6 to 1.2. Average abundance of natural-origin spawners (NOS) would decrease from approximately 127 fish to approximately 117 fish. The harvest contribution of the natural and hatchery populations would go from approximately 34 fish to approximately 13 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 Upper Selway River Spring Chinook that emphasizes maintaining existing natural spawning populations, and using hatchery-origin Chinook salmon in an attempt to augment natural production. Currently this population does not meet the standards for a Primary or Contributing population (pHOS greater than 10%).

The Upper Selway River hatchery program has a release goal of 300,000 parr (100 fpp). Broodstock are sourced from South Fork Clearwater River returns or from Rapid River Fish Hatchery returns. Adults are held at the Clearwater Fish Hatchery and spawned. Incubation and rearing through release also occurs at the Clearwater Hatchery. Parr, released to the upper Selway River in mid-July, are not adipose fin-clipped but may

receive an oxytetracycline mark. Broodstock consist of 100% hatchery-origin adults. There is no ability to manage the composition of spawners in the wild.

The ongoing Idaho Supplementation Study is ending in 2014. Adult returns from this program ended in 2007. The current phase of the study monitors production and productivity in the absence of adult supplementation. Following 2014, managers will have greater flexibility to pursue other management options.

Recommendations

At the current level of juvenile production and with no capability in place to collect returning adults for broodstock or to control the composition of adults on spawning grounds, managers will not meet HSRG-defined standards for Contributing or Primary populations. While not presented, the HSRG identified that managers could meet the HSRG-defined standards for a Contributing population. One way to accomplish this would be to source 100% natural-origin adults for broodstock, reduce juvenile releases to 100,000 fish, and transition to a smolt release from a parr release. Transitioning to a release program that plants 100,000 smolts instead of 300,000 parr will increase survival back to the habitat and may reduce potential competitive concerns with naturally produced Chinook salmon juveniles in the upper Selway River system. Use of selective fishing or trapping gear could provide the means to collect natural-origin broodstock and provide additional harvest benefit as well.

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.

The HSRG recommends that managers continue to implement their apparently successful BKD strategies, which include culling.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Upper Selway Spring Chinook. 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	None None	-	0%	0%	54%	0.00	127	0.6	14	0
	Seg Harv	300.3	0%						20	0
No Hatchery	None None	-	0%	0%	0%	1.00	117	1.2	13	-
HSRG Solution	None None	-	0%	0%	53%	0.00	141	0.6	15	0
	Seg Harv	300.3	0%						21	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	50%	0.00	161	0.7	18	0
	Seg Harv	300.3	0%						21	0