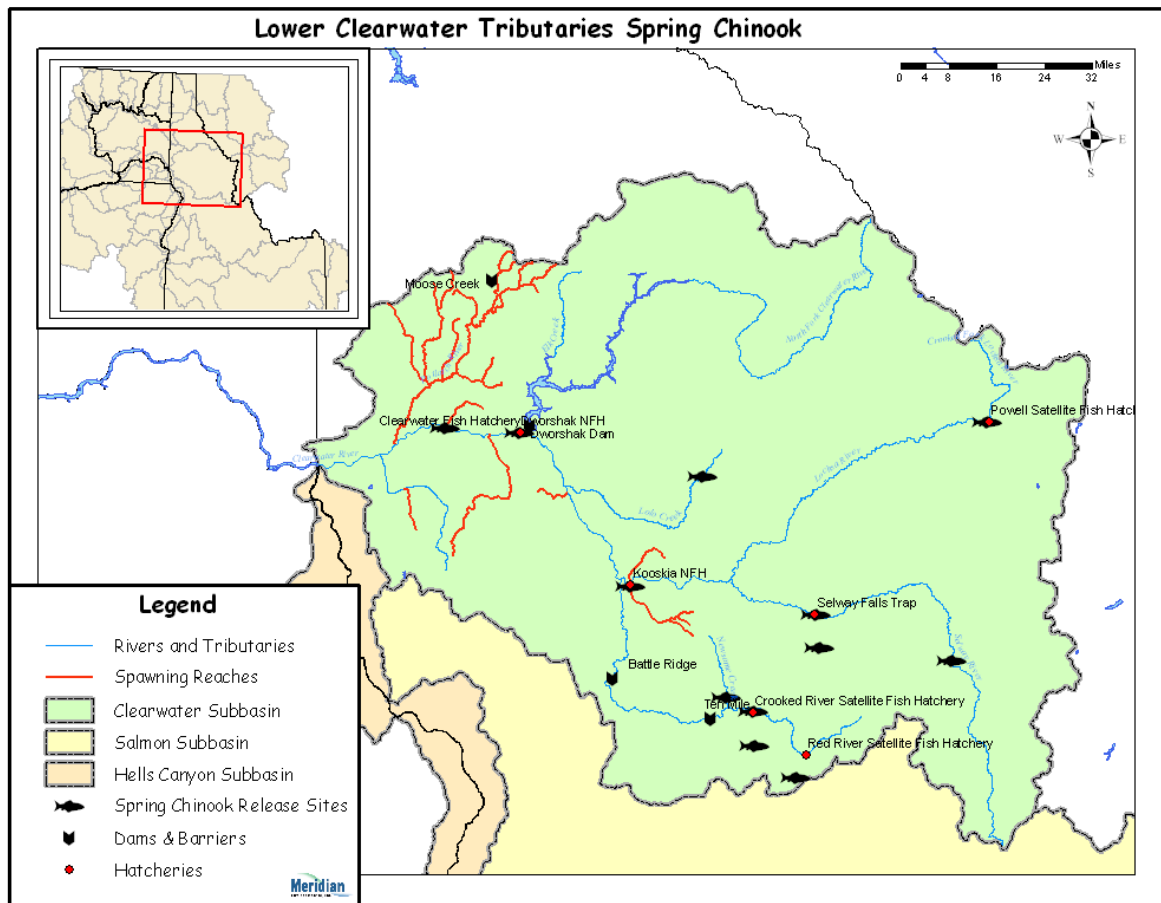


Hatchery Scientific Review Group Review and Recommendations

Lower Clearwater River Tributaries Spring Chinook and Related Hatchery Programs

January 31, 2009



1 Lower Clearwater River Tributaries 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 River and the Salmon River, 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 Lochsa 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. After construction of the Kooskia and Dworshak National Fish Hatcheries (NFHs) 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 basin 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 (Nez Perce Tribe and IDFG 1990). 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.

There are no estimates of historical spring Chinook run sizes in the Lower Clearwater River tributaries.

2 Current Conditions

This population includes all naturally spawning spring Chinook in the Middle Fork Clearwater River and tributaries, the North Fork Clearwater River downstream of Dworshak Reservoir, and the mainstem Clearwater River and tributaries downstream of the Middle Fork/South Fork confluence, with the exception of the Lolo Creek drainage. Spring Chinook of the Lower Clearwater River tributaries are not listed under the ESA. Current natural abundance (the number of adults spawning in natural production areas) is unknown.

Adult spring Chinook returning to the North Fork Clearwater River are primarily hatchery-origin fish, as Dworshak Dam blocks all passage into the North Fork watershed. There is currently a segregated spring Chinook hatchery program operated at the Dworshak NFH. The stock used in the program was originally derived from the Rapid River (considered an upper Snake River stock) and other hatchery stocks reared and

released at Dworshak NFH. Generally, since 1988 Dworshak NFH has generated its own broodstock from rack returns. Between 2002 and 2006, an average of 4,324 spring Chinook returned to Dworshak (including sport and Tribal harvest).

Adult spring Chinook returns to the Middle Fork Clearwater River consist almost exclusively of hatchery-origin fish. A segregated hatchery program operates out of the Kooskia NFH (located about 1.5 miles east of Kooskia, Idaho, near the confluence of Clear Creek and the Middle Fork Clearwater River). The Kooskia spring Chinook program was started using a wide variety of stocks from the lower Columbia River and Rapid River Hatchery; however, from 1973 through 1980, smolt releases had a very strong Carson stock influence. Egg transfers of Carson stock from Dworshak NFH in 1985 and 1986 resulted in smolt releases in 1987 and 1988 that were a mixed stock, referred to as Clearwater stock. Since the Kooskia NFH program already had stock made up primarily of Carson derivatives, the resultant program (1989 and later) still has a Carson lineage, but is referred to as Kooskia stock. The Kooskia stock is now maintained with Middle Fork Clearwater returns. Between 2002 and 2006, an average of 1,405 spring Chinook returned to the Kooskia NFH (including sport and Tribal harvest).

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 116 and 0.60, respectively. The model also estimates that 496 hatchery origin Chinook stray into this population each year. Hatchery-origin strays are generated primarily from the segregated programs operating at Clearwater and Kooskia National Fish Hatcheries.

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 Stabilizing. The population currently meets the broodstock criteria for this population designation.
- **Recovery Goal for Abundance:** Not listed, not applicable
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity:** Productivity: 1.3; Capacity: 250

2.2 Current Hatchery Programs Affecting this Population

Four hatchery programs potentially affect this population (Dworshak NFH, Kooskia NFH, Clearwater Fish Hatchery, and the Nez Perce Tribal Hatchery).

The Dworshak NFH operates a segregated harvest program in the North Fork Clearwater River. Broodstock collections occur at the hatchery rack from May to August. Returning adults swim up the fish ladder at Dworshak Dam directly into holding ponds. Spawning, incubation, and rearing all take place at Dworshak NFH. This program volitionally releases approximately 1,050,000 smolts (20 fpp) directly to the Clearwater River (on-station release). All smolts are 100% adipose fin-clipped with a portion coded wire- and PIT-tagged. The program has an R/S value of 7.0.

The Kooskia NFH segregated program releases approximately 600,000 smolts into Clear Creek (on-station release), a tributary to the Middle Fork Clearwater River. Adult

salmon are trapped at the Kooskia facility from May through August, and transported to Dworshak NFH for spawning. Rearing occurs at the Kooskia facility. All smolts released are 100% adipose fin-clipped and a portion coded wire- and PIT-tagged for evaluation purposes. The program has an R/S value of 7.0.

The Clearwater Fish Hatchery is located on the lower North Fork Clearwater River across the North Fork from the Dworshak NFH. This program produces spring Chinook salmon to meet segregated harvest mitigation as well as integrated supplementation objectives. Broodstock are collected at satellite facilities in the upper Lochsa River (Powell) and upper South Fork Clearwater (Crooked River and Red River). All spring Chinook produced at the Clearwater Fish Hatchery are released outside of this population zone. Release sites include locations in the South Fork Clearwater River, South Fork Clearwater River tributaries, and the Selway River.

The Nez Perce Tribal Hatchery releases juvenile spring Chinook salmon directly from their facility near Cherry Lane. The spring Chinook production target for the Tribal Hatchery is 124,000 smolts. All other Nez Perce Tribe Chinook salmon releases in the Clearwater occur outside this population zone. Release sites include locations in Newsome Creek, Lolo Creek, and Meadow Creek (Selway). Broodstock are collected at the Tribal Hatchery in addition to locations in Lolo Creek and Newsome Creek. The Nez Perce Tribal Hatchery program has an R/S of 4.2.

Estimated number of hatchery strays affecting the overall population:

- Hatchery strays from integrated in-basin programs: 0
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 496

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 116 fish to approximately 49 fish. The harvest contribution of the natural and hatchery populations would go from approximately 3,955 fish to approximately 5 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 Lower Clearwater River Spring Chinook that emphasizes maintaining existing natural spawning populations, maintaining existing hatchery mitigation programs, and using hatchery-origin Chinook salmon in an attempt to augment natural production. Currently this population does not meet the HSRG-defined standards for a Primary or Contributing population (pHOS exceeds 0.1).

The LSRCP mitigation goal for Dworshak National and Clearwater fish hatcheries is 9,135 and 11,915 adult spring Chinook to the project area upstream of Lower Granite Dam. Currently Kooskia NFH and the Nez Perce Tribal Hatchery do not have established adult return goals.

Four hatchery programs operate in this population zone:

The Dworshak National Fish Hatchery (NFH) operates a segregated harvest program in the North Fork Clearwater River. Broodstock collections occur at the hatchery rack from May through August. Spawning, incubation, and rearing takes place at the Dworshak facility. This program volitionally releases approximately 1,050,000 smolts directly to the Clearwater River. All smolts are 100% adipose fin-clipped with a portion coded wire- and PIT-tagged for evaluation purposes. Most of the water supply for this hatchery is pumped from the North Fork Clearwater River near the adult collection intake, causing reoccurring disease problems at the facility.

The Kooskia NFH segregated program volitionally releases approximately 600,000 smolts annually into Clear Creek, a tributary to the Middle Fork Clearwater River. Adult salmon are trapped at the Kooskia facility from May through August, and transported to Dworshak NFH for spawning. Rearing occurs at the Kooskia facility. All smolts are 100% adipose fin-clipped and a portion coded wire- and PIT-tagged for evaluation purposes. Constraints in surface water quality and groundwater quantity limit program capacity, although winter and spring flows are not limiting. This facility therefore would appear to provide a location for acclimation and release.

The Clearwater Fish Hatchery produces spring Chinook to meet segregated harvest mitigation as well as augmentation/supplementation objectives. Broodstock are collected at satellite facilities in the upper Lochsa River (Powell) and upper South Fork Clearwater (Crooked River and Red River). All spring Chinook produced at the Clearwater Fish Hatchery are released outside this population zone. Release sites include locations in the South Fork Clearwater River, South Fork Clearwater River tributaries, and the Selway River.

The Nez Perce Tribal Hatchery releases juvenile spring Chinook salmon directly from their facility near Cherry Lane. The production target for this program is 200,000 smolts. All other Nez Perce Tribe Chinook salmon releases in the Clearwater subbasin occur outside of this population zone. Release sites include Newsome Creek, Lolo Creek, and Meadow Creek (Selway). Broodstock are collected at the Tribal Hatchery in addition to locations in Lolo Creek and Newsome Creek. This facility has limited water supply and vessels for rearing of yearling fish.

The HSRG acknowledges that managing for the recommended PNI values may not be possible or appropriate when abundance levels are low and demographic risks to the population increase. To address this concern, it is the HSRG's understanding that managers have developed a variable sliding scale for managing abundance so that in low abundance years, more hatchery-origin fish of the appropriate population component are allowed to reach the spawning grounds to reduce demographic risk to the respective populations.

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

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.

Kooskia National Fish Hatchery: The HSRG recommends that managers consider modifying the program to match the existing water supply with consideration for supporting other programs within the Clearwater subbasin.

Dworshak National Fish Hatchery: The HSRG recommends that managers develop an improved water supply at this facility to address disease and temperature problems.

Nez Perce Tribal Hatchery: Facility programming should be designed to fit the limitations of the water supply and be integrated with other facilities in the basin to achieve manager's goals.

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

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Lower Clearwater Tributaries 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%	77%	0.00	116	0.6	13	0
	NPTH Seg Harv	124.6	90%						84	16
	Kooskia Seg Harv	600.7	90%						1,403	1,250
	Dworshak-Hatchery Seg Harv	1,051.1	90%						2,455	1,687
No Hatchery	None None	-	0%	0%	0%	1.00	49	1.2	5	-
HSRG Solution	None None	-	0%	0%	77%	0.00	124	0.6	14	0
	NPTH Seg Harv	124.6	90%						89	20
	Kooskia Seg Harv	600.7	90%						1,477	1,337
	Dworshak-Hatchery Seg Harv	1,051.1	90%						2,585	1,839
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	75%	0.00	138	0.7	15	0
	NPTH Seg Harv	124.6	90%						89	20
	Kooskia Seg Harv	600.7	90%						1,477	1,337
	Dworshak-Hatchery Seg Harv	1,051.1	90%						2,585	1,839