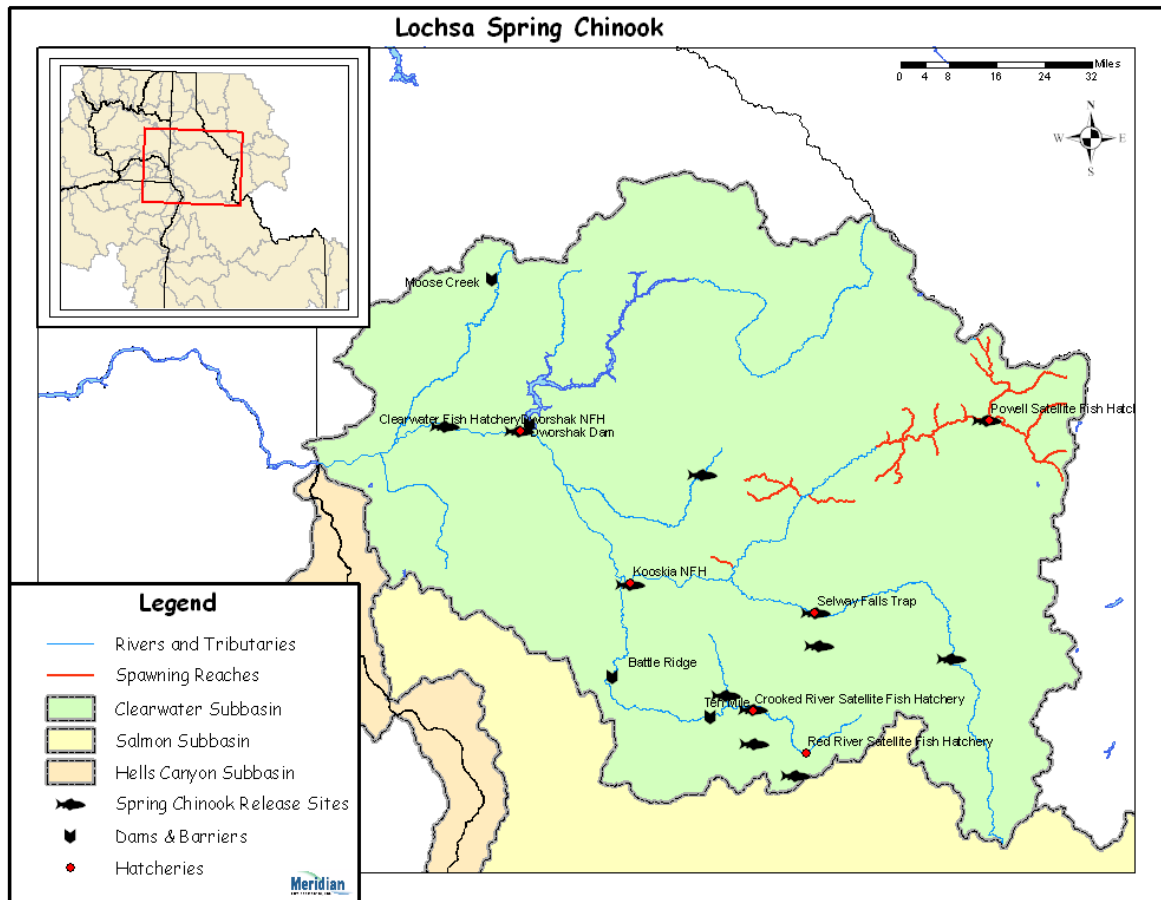


Hatchery Scientific Review Group Review and Recommendations

Lochsa River Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Lochsa 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 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. With completion of the Kooskia and Dworshak National Fish Hatcheries (NFH) 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 Lochsa River. Chapman (1981) estimated that the Lochsa River system was capable of producing 459,000 spring Chinook smolts in its pristine condition.

2 Current Conditions

Adult spring Chinook returns to the Lochsa River consist primarily of hatchery-origin fish. The Lochsa River Spring Chinook population is not listed under the ESA. A Clearwater Fish Hatchery satellite facility (Powell) is located at the headwaters of the Lochsa River at the confluence of Brushy Fork Creek and Colt Killed Creek. Reintroduction of spring Chinook salmon following removal of the Lewiston Dam in 1973 has resulted in naturally reproducing runs in mainstem and tributary reaches of the Lochsa River. Primary spawning tributaries include Bear (Papoose), Big Flat, Brushy Fork, Colt Killed, Crooked Fork, Fishing (Squaw), and Pete King creeks. The number of natural-origin adults spawning in natural production areas is unknown for this population.

The number of juvenile Chinook released at Powell has ranged from a low of 500 fish in 1991 to a high of 909,520 fish in 2000. The adult return goal for the Powell satellite is

2,553 adults to the project area upstream of Lower Granite Dam. Total adult returns to Powell (hatchery- and natural-origin combined) have ranged from a low of 14 fish in 1995 to 2,344 fish in 2001 (for the period 1995 through 2006).

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 211 and 0.60, respectively. The model also estimates that 366 hatchery origin Chinook stray into this population each year. The vast majority of strays come from the segregated program operating out of the Powell satellite facility.

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 are 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, no goal
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity:** Productivity: 1.3; Capacity: 940

2.2 Current Hatchery Programs Affecting this Population

The primary hatchery program affecting this population is the Clearwater Fish Hatchery spring Chinook segregated harvest program. The purpose of this program is harvest mitigation. Spring Chinook salmon in the Clearwater River subbasin are not ESA-listed, and the program was not intended to enhance or benefit the survival of listed spring Chinook.

Approximately 1,860 Chinook are needed for broodstock for the Clearwater Fish Hatchery spring Chinook salmon program. This number includes 1,020 for Powell, 840 for the South Fork program (Crooked and Red rivers) and also accounts for pre-spawning mortality. The adult return goal for the LSRCP-funded Clearwater Chinook program is 11,915 adult Chinook over Lower Granite Dam.

This program releases approximately 400,000 smolts to the Lochsa River from Powell Pond. In addition, the program may release approximately 300,000 acclimated pre-smolts from the same facility. Smolts and pre-smolts are 100% adipose fin-clipped and a portion coded wire and PIT-tagged. Adult collection occurs from May to August at the Powell satellite. Adults are trucked back to the Clearwater Fish Hatchery for holding. Spawning, incubation and rearing takes place at Clearwater Fish Hatchery. The R/S for the smolt program is 6.00. The R/S for the pre-smolt program is 1.25.

In 1991, the IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the USFWS initiated a large-scale Chinook salmon supplementation study. The study, designed to continue through 2014, incorporates treatment and control streams in the Clearwater and Salmon subbasins. Within this ICTRT population zone, the Chinook supplementation study maintains the following control and treatment streams: Control: Pete King Creek, Crooked Fork Creek, and Brushy Fork Creek; Treatment: Legendary Bear Creek, Fishing Creek, Colt Killed Creek, and Big Flat Creek. “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 and 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: 366

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 211 fish to approximately 139 fish. The harvest contribution of the natural and hatchery populations would go from approximately 1,041 fish to approximately 22 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 Lochsa River Spring Chinook that emphasizes maintaining existing natural spawning populations and existing hatchery mitigation programs. 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. The Powell satellite return objective is 2,553 adults to the project area (part of the Clearwater hatchery goal of 11,915). Currently Kooskia NFH and the Nez Perce Tribal Hatchery do not have established adult return goals.

A segregated harvest program operates in the Lochsa River. Approximately 400,000 smolts and 300,000 pre-smolts are released annually from the Powell satellite facility. Beginning in 2009, the 300,000 pre-smolt program will be terminated and 700,000 smolts will be released from this facility. Adults are collected at Powell for spawning at the Clearwater Fish Hatchery. When broodstock collection goals are not achieved here, broodstock is taken from the South Fork Clearwater River program and occasionally from Rapid River in the Salmon River. All fish are adipose fin-clipped and a portion coded wire- and PIT-tagged.

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 HSRG recommends that broodstock for this segregated program originate only from returns to the Lochsa River and that the importation of broodstock from other sources be terminated to promote local adaption and increase productivity of the hatchery 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.

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 Lochsa 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%	58%	0.00	211	0.6	34	0
	Seg Harv	700.8	80%						1,007	668
No Hatchery	None None	-	0%	0%	0%	1.00	139	1.2	22	-
HSRG Solution	None None	-	0%	0%	57%	0.00	232	0.6	38	0
	Seg Harv	700.8	80%						1,061	746
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	54%	0.00	264	0.7	43	0
	Seg Harv	700.8	80%						1,061	746