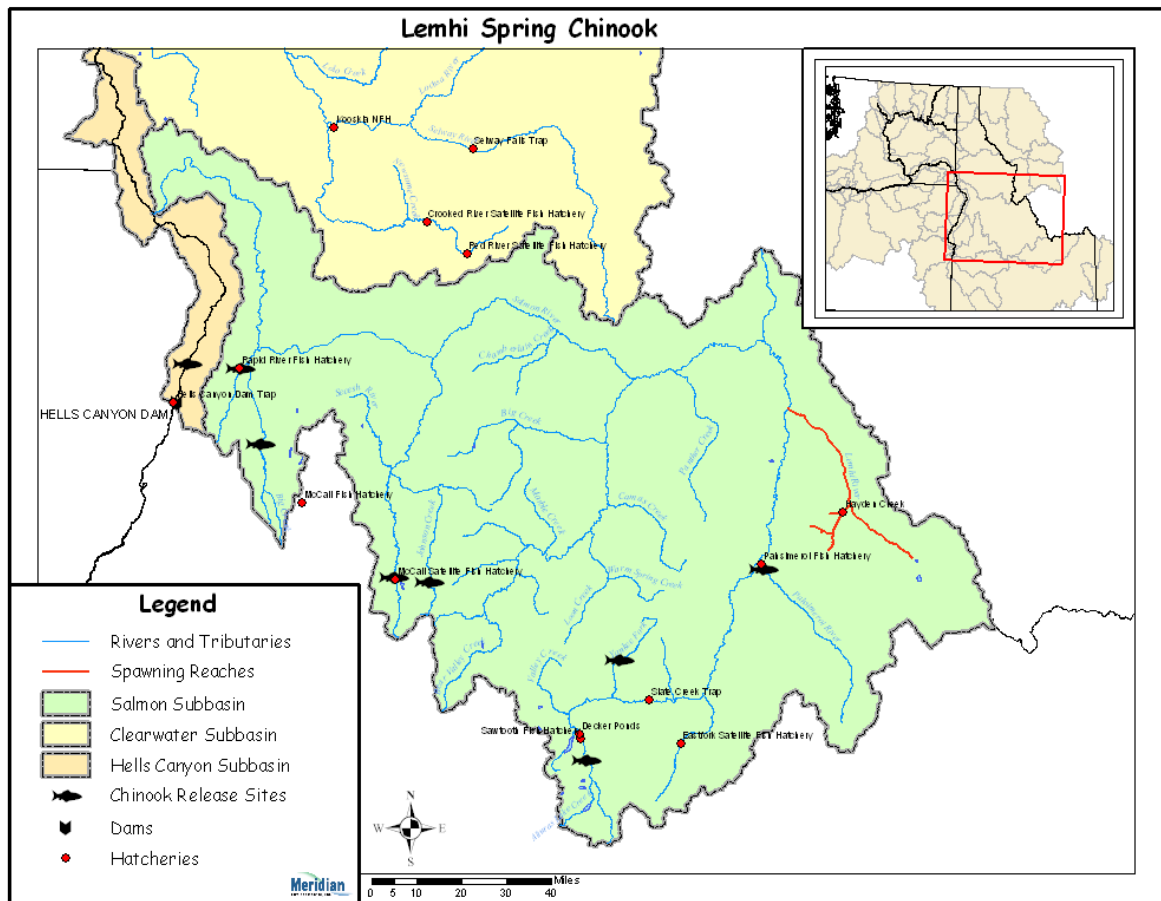


Hatchery Scientific Review Group Review and Recommendations

Salmon Lemhi River Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Salmon Lemhi River Spring Chinook

The Lemhi River Chinook population is part of the Snake River Spring/Summer Chinook ESU. This population is a spring run and is classified as threatened under the Endangered Species Act. The Interior Columbia Technical Recovery Team (ICTRT) has classified this population as “Very Large” based on its historic habitat potential. A “Very Large” population is one that requires a minimum abundance of 2,000 wild spawners and an intrinsic productivity greater than 1.34 recruits per spawner (R/S) to be viable.

Historically, it is estimated that anywhere from 2-3 million spring/summer Chinook returned to the entire Snake River each year (NPCC 2004). The portion returning to the Lemhi River is unknown but was probably in the tens of thousands.

2 Current Conditions

Adult spring Chinook returns to the subbasin consist of both natural-origin fish and a few hatchery strays from outside the population. With the exception of Rapid River stock, natural- and hatchery-origin Chinook in the Salmon River drainage are listed as Threatened. Fish spawn primarily in the Lemhi River and Hayden Creek, with the majority spawning in the Lemhi River upstream of Hayden Creek near Leadore. Spawning occurs from mid-July through late September. Juvenile emigrants exhibit both a sub-yearling and yearling life-history. A portion of the Lemhi River is currently inaccessible due to tributary dewatering. Most habitat is privately held and ranched.

Current (1957 to 2003) natural abundance (number of adult spawning in natural production areas) has ranged from 10 fish (1995) to 3,357 fish (1961). Abundance has been variable in recent years. The most recent 10-year geometric number of natural spawners was 80 fish (NOAA Draft Recovery Plan). Redd counts in the Lemhi River have generally been less than 100 from 1992-2003 (StreamNet).

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 406 and 1.13, respectively. The model also estimates that four hatchery-origin Chinook salmon stray into this population each year. There is no Chinook hatchery program operating in the Lemhi River.

2.1 Current Population Status and Goals

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

- **ESA Status:** Snake River Spring/Summer Chinook are listed as threatened under ESA.
- **Population Description:** For the purpose of this review, the HSRG assigned this population as Primary. The population currently meets the broodstock criteria for this population designation.
- **Recovery Goal for Abundance:** The ICTRT defined the Lemhi River spring Chinook population as “Very Large” and identified a minimum abundance threshold of 2,000 natural-origin adults.
- **Productivity Improvement Expectation:** The ICTRT productivity standard associated with a population defined as “Very Large” is 1.34.
- **Habitat Productivity and Capacity:** Productivity: 1.31; Capacity: 3,900

2.2 Current Hatchery Programs Affecting this Population

There is no hatchery stock associated with this Chinook population. AHA modeling indicates however that some hatchery strays from the following programs may spawn in the Lemhi River:

- Salmon/ Little Salmon Spring Chinook (Rapid River Hatchery)
- Salmon/ East Fork/South Fork Johnson Creek Summer Chinook
- Salmon/ South Fork Salmon Summer Chinook (McCall Hatchery)
- Salmon/Pahsimeroi Summer Chinook (Pahsimeroi Hatchery)

The IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the USFWS initiated a large-scale Chinook salmon supplementation study designed to continue through 2012. The study incorporates treatment and control streams in the Clearwater and Salmon subbasins. The Lemhi River is a Control stream for this program. “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 2012 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: four fish.

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 1.1 to 1.3. Average abundance of natural-origin spawners (NOS) would increase from approximately 398 fish to approximately 786 fish. The harvest contribution of the natural and hatchery populations would go from approximately 43 fish to 86 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 Lemhi River Chinook salmon that emphasizes maintaining existing natural spawning populations. Currently this population is consistent with the HSRG-defined standards of a Primary population (pHOS less than 0.05).

The ongoing Idaho Supplementation Study is ending in 2012. 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 2012, managers will have greater flexibility to pursue other management options.

Recommendations

The HSRG recommends that managers continue to monitor status and trend information for this natural population as well as the proportion of hatchery fish in natural production areas.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Lemhi River 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%	1%	0.00	398	1.1	43	0
No Hatchery	None None	-	0%	0%	0%	1.00	786	1.3	86	-
HSRG Solution	None None	-	0%	0%	1%	0.00	593	1.2	65	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	0%	0.00	1,122	1.3	122	0