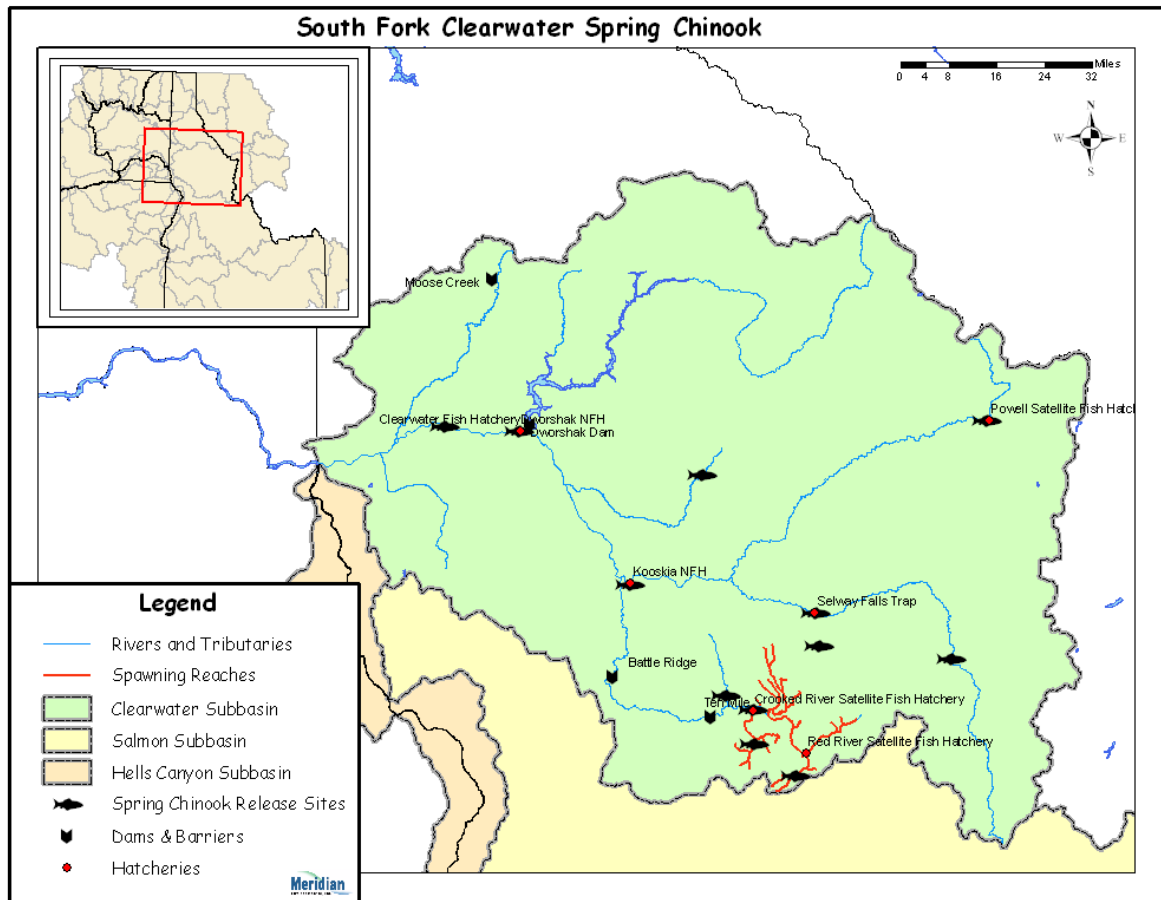


Hatchery Scientific Review Group Review and Recommendations

South Fork Clearwater River Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 South Fork Clearwater 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 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 South Fork Clearwater, 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 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. Spawning typically occurs in tributaries and headwater streams in August and September. Eggs hatch in December with emergence complete by April. Spring Chinook 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 Chinook returns to the South Fork Clearwater River consist primarily of hatchery-origin fish. Both natural- and hatchery-origin components of this population are not listed under the ESA. Hatchery programs operate out of the Clearwater Fish Hatchery and the Nez Perce Tribal Hatchery. Broodstock for both hatchery programs was founded primarily from the Rapid River Hatchery stock, with significant contributions from Carson-stock hatcheries (Leavenworth, Little White Salmon, and Carson NFHs) and Willamette River hatcheries. Augmentation or supplementation programs incorporate both hatchery- and natural-origin fish into spawning designs (e.g., collected in Newsome Creek, Red River, and Crooked River terminal areas).

The current distribution of spring Chinook salmon in the Clearwater River subbasin includes the Lolo Creek drainage and all major drainages above the confluence of the Middle and South Forks of the Clearwater River. Relatively contiguous distributions of spring/summer Chinook salmon exist in the Lolo/Middle Fork, South Fork, and Upper and Lower Selway. Spring/summer Chinook salmon are absent from many tributaries in the Lochsa River drainage, but found in Pete King Creek and Fish Creek, and most

tributaries above (and including) Warm Springs Creek. Natural abundance (number of adults spawning in natural production areas) is unknown for this population.

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for the natural-origin population at 224 and between 0.50 and 0.60, respectively. The model also estimates that 274 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 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, not applicable
- **Productivity Improvement Expectation:** NA
- **Habitat Productivity and Capacity (S.F. Clearwater):** Productivity: 1.30; Capacity: 1,875
- **Habitat Productivity and Capacity (Newsome Creek):** Productivity: 1.30; Capacity: 625.

2.2 Current Hatchery Programs Affecting this Population

The primary spring Chinook hatchery programs affecting this population are operated at the Clearwater Fish Hatchery and the Nez Perce Tribal Hatchery.

Approximately 750 spring Chinook salmon adults are needed for broodstock for the Nez Perce Tribal Hatchery spring Chinook program. This number includes jacks and accounts for pre-spawning mortality. This brood level will provide for a target release of 75,000 pre-smolts from Newsome Creek (South Fork Clearwater River) acclimation facility, 150,000 pre-smolts from Yoosa/Camp (Lolo Creek) acclimation facilities, and 400,000 parr into Meadow Creek (Selway River).

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

The Clearwater Fish Hatchery segregated spring Chinook program volitionally releases approximately 400,000 smolts (17 fpp) into the Red River at the Red River Satellite facility and approximately 700,000 smolts (17 fpp) into the Crooked River at the Crooked River Satellite Facility (upper and lower sites combined). All smolts released are 100% adipose fin-clipped and a portion coded wire and PIT-tagged. Adult collection occurs at Red River and Crooked River satellite facilities from May to August. All broodstock are held at the Red River satellite facility until transfer to the Clearwater Fish Hatchery for spawning. Incubation and initial rearing occurs at Clearwater Fish Hatchery. In late

March, smolts are moved to satellite sites for acclimation. Fish are volitionally released between April 10th and 15th. The program has an R/S value of 4.0.

The Nez Perce Tribal Hatchery spring Chinook segregated hatchery program releases approximately 75,000 pre-smolts into Newsome Creek. Adult collection occurs at the Newsome Creek adult trap. Adults are transferred to the Nez Perce Tribal Hatchery for holding and spawning (the proportion of natural- and hatchery-origin adults in the spawning design is not known). Incubation and early rearing occur at the Tribal Hatchery. Pre-smolts are transferred to the Sweetwater Spring facility, held until late August/early September (when water temperatures cool) and then transferred to the Newsome Creek acclimation facility. Prior to release, approximately 6,000 fish are PIT-tagged. Volitional release commence in early October, with all remaining fish forced out by mid-October. Target size at release is 29 fpp. The program has an R/S value of 1.00.

In 1991, 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 2014. The project incorporates treatment and control streams in the Clearwater and Salmon subbasins. Within this population zone, the Chinook Supplementation Study maintains the following control and treatment streams: Control: American River; Treatment: Newsome Creek, Crooked River, and Red River. “Treatments” include developing and releasing “supplementation” smolts (hatchery x natural parents) and releasing “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: 29
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 245

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 0.5 and 0.6 to 1.1 and 1.2. Average abundance of natural-origin spawners (NOS) would increase from approximately 234 fish to approximately 301 fish. The harvest contribution of the natural and hatchery populations would go from approximately 2,179 fish to approximately 54 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 South Fork 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 is not operating consistent with 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.

Newsome Creek: The near-term management objective for the Newsome Creek population component is to increase natural production with longer term objectives to also provide terminal harvest. Increasing natural-origin escapement is unlikely with the current pre-smolt release program given the low productivity in the system and the low recruits per spawner of the current hatchery program. Depending on the composition of adult returns, natural-origin fish may be incorporated in the broodstock. The composition of adults spawning in the habitat varies. The Newsome Creek program has a release objective of 75,000 pre-smolts. Incubation and rearing occur at the Nez Perce Tribal Hatchery.

Crooked River/Red River: This population component is being managed as a Stabilizing component to provide harvest. The current program is operated consistent with the objectives provided by the managers. Segregated programs operate out of the Clearwater Fish Hatchery

with production targets of approximately 700,000 smolts in Crooked River and 400,000 smolts in Red River.

Broodstock for all three programs is collected locally. Red River and Crooked River adults are temporarily held at the Red River satellite for transfer to the Clearwater Fish Hatchery for spawning. Newsome Creek adults are held locally until transfer to the Nez Perce Tribal Hatchery for spawning. Spawning, incubation and rearing takes place at the Tribal hatchery. Smolts are transferred back to Red River and Crooked River acclimation sites and are volitionally released. Pre-smolts are transferred to an acclimation pond in the Newsome Creek drainage in the fall where they rear until they are volitionally released in October. Pre-smolts are 100% coded wire-tagged and about 6,000 are PIT-tagged.

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.

IDFG's implementation of BKD risk management strategies, including culling, has been very successful.

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.

Newsome Creek: The HSRG recommends converting the current pre-smolt program to a smolt program of the same size (approximately 75,000 smolts, pNOB=100%, PNI=0.6) and allowing all other returning adults to spawn (excluding strays from the segregated programs). This would allow the program to operate consistent with the standards of a Contributing population and reduce the ecological impacts of parr releases on naturally rearing spring Chinook. This approach is expected to increase the total spawners as well as natural-origin spawners via reproduction by hatchery-origin recruits in Newsome Creek.

Crooked River/ Red River: The HSRG has no specific recommendations for this program.

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 South Fork Clearwater 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%	49%	0.00	191	0.5	43	0
	Newsome Creek Int Both	75.4	50%	0%	44%	0.08	43	0.6	11	10
	Seg Harv	1,100.0	90%						2,125	1,153
No Hatchery	None None	-	0%	0%	0%	1.00	179	1.1	41	-
	Newsome Creek None	-	0%	0%	0%	1.00	122	1.2	13	-
HSRG Solution	Int Both	-	0%	0%	48%	0.00	215	0.6	49	0
	Newsome Creek Int Both	75.3	0%	0%	53%	0.65	175	1.0	52	1
	Seg Harv	1,100.0	90%						2,237	1,265
HSRG Solution w/ Improved Habitat	Int Both	-	0%	0%	44%	0.00	252	0.6	57	0
	Newsome Creek Int Both	75.3	0%	0%	47%	0.68	222	1.1	57	1
	Seg Harv	1,100.0	90%						2,237	1,265