

1 East Fork/South Fork Salmon-Johnson Creek Summer Chinook

The East Fork South Fork Salmon River Chinook population is part of the Snake River Spring/Summer Chinook ESU. The East Fork South Fork population is a summer run and is classified as threatened under the Endangered Species Act. The Interior Columbia Technical Recovery Team (ICTRT) listed this population as “Large” based on its historic habitat potential. A “Large” population is one that requires a minimum abundance of 1,000 natural spawners and an intrinsic productivity greater than 1.56 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 (NPPC 2004). The portion returning to the East Fork Salmon River and Johnson Creek is unknown, but was likely in the thousands.

2 Current Conditions

The East Fork/South Fork Salmon Chinook population is primarily a summer run. Adult returns to the subbasin consist of both hatchery- and natural-origin fish, as there is an integrated hatchery program operated by the Nez Perce Tribe in Johnson Creek. The population includes Chinook from both Johnson Creek and the extirpated component from the East Fork South Fork Salmon River. Natural- and hatchery-origin components of this population are listed as Threatened. Spawning occurs from mid-August through late October. Juveniles leave the system as yearlings starting in early March and continue into the spring.

Current (1957 to 2003) natural population abundance (number of adults spawning in natural production areas) has ranged from 58 fish in 1995 to 3,260 fish in 1960.

Abundance in recent years has been highly variable. The most recent 10-year geometric mean number of natural spawners was 321 fish (NOAA Draft Recovery Plan). Redd counts in index areas from 1992-2003 generally ranged from less than 100 to 800 (StreamNet).

AHA modeling data submitted by IDFG estimates current adult escapement and adjusted productivity for this population at 562 and 1.16, respectively. The model also estimates that 3 hatchery-origin spring and summer Chinook stray into this population each year from out-of-population hatchery programs.

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 East Fork South Fork Salmon River Chinook population as “Large” and identified a minimum abundance threshold of 1,000 natural-origin adults.
- **Productivity Improvement Expectation** The ICTRT productivity standard associated with a population defined as “Large” is 1.56.
- **Habitat Productivity and Capacity:** Productivity: 1.45; Capacity: 1,700

2.2 Current Hatchery Programs Affecting this Population

The primary hatchery program affecting this population is the Johnson Creek summer Chinook integrated program. This program releases approximately 100,000 smolts to Johnson Creek each year. All juvenile fish are marked with an elastomer tag and coded wire-tags. In addition, a minimum of 5,000 smolts receive PIT-tags. Smolts are transported from McCall Hatchery at 26-28 fish per pound and released into Johnson Creek (near Wapiti Ranch). Broodstock for the program is collected at the adult weir on Johnson Creek (100% NOR goal). Adults are transferred from the weir site to the South Fork Salmon River satellite facility for holding and spawning. Egg incubation and juvenile rearing occurs at the McCall Hatchery. Natural-origin and supplementation-origin adults are passed upstream of the weir to spawn in the habitat. The estimated program R/S value is 6.0.

The IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the USFWS initiated a large-scale Chinook salmon supplementation study that will continue through 2012. The program incorporates treatment and control streams in the Clearwater and Salmon subbasins. Johnson Creek was initially a control stream for this program but due to the initiation of the integrated hatchery program, its role within the experimental design has been modified. “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: 379 fish.
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: three 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 1.2 to 1.4. Average abundance of natural-origin spawners (NOS) would decrease from approximately 561 fish to approximately 484 fish. The harvest contribution of the natural and hatchery populations would go from approximately 110 fish to approximately 53 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 East Fork South Fork Salmon River Chinook salmon that emphasizes maintaining existing natural spawning populations as well as using hatchery-origin Chinook salmon in an attempt to augment natural production. Currently this population and the integrated hatchery program are operated consistent with the HSRG-defined standards of a Primary population ($PNI > 0.67$) and appears to be providing a demographic benefit to the population.

The current integrated program collects broodstock (100% NOR goal) from rack returns at the Johnson Creek facility. Adult holding and spawning occurs at the McCall Fish Hatchery satellite facility on the South Fork of the Salmon River. Incubation and rearing occurs at the McCall Fish Hatchery. The current production target for the program is 100,000 yearling smolts. Average SAR and R/S values for hatchery-produced fish are 0.4% and 6.0, respectively.

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.

Recommendations

The HSRG has no specific recommendations for this program except 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 Johnson Creek Summer 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	Int Both	101.8	0%	0%	35%	0.74	561	1.2	110	0
No Hatchery	None None	-	0%	0%	0%	1.00	484	1.4	53	-
HSRG Solution	Int Both	101.8	0%	0%	33%	0.75	643	1.2	121	0
HSRG Solution w/ Improved Habitat	Int Both	101.8	0%	0%	29%	0.77	790	1.4	137	0