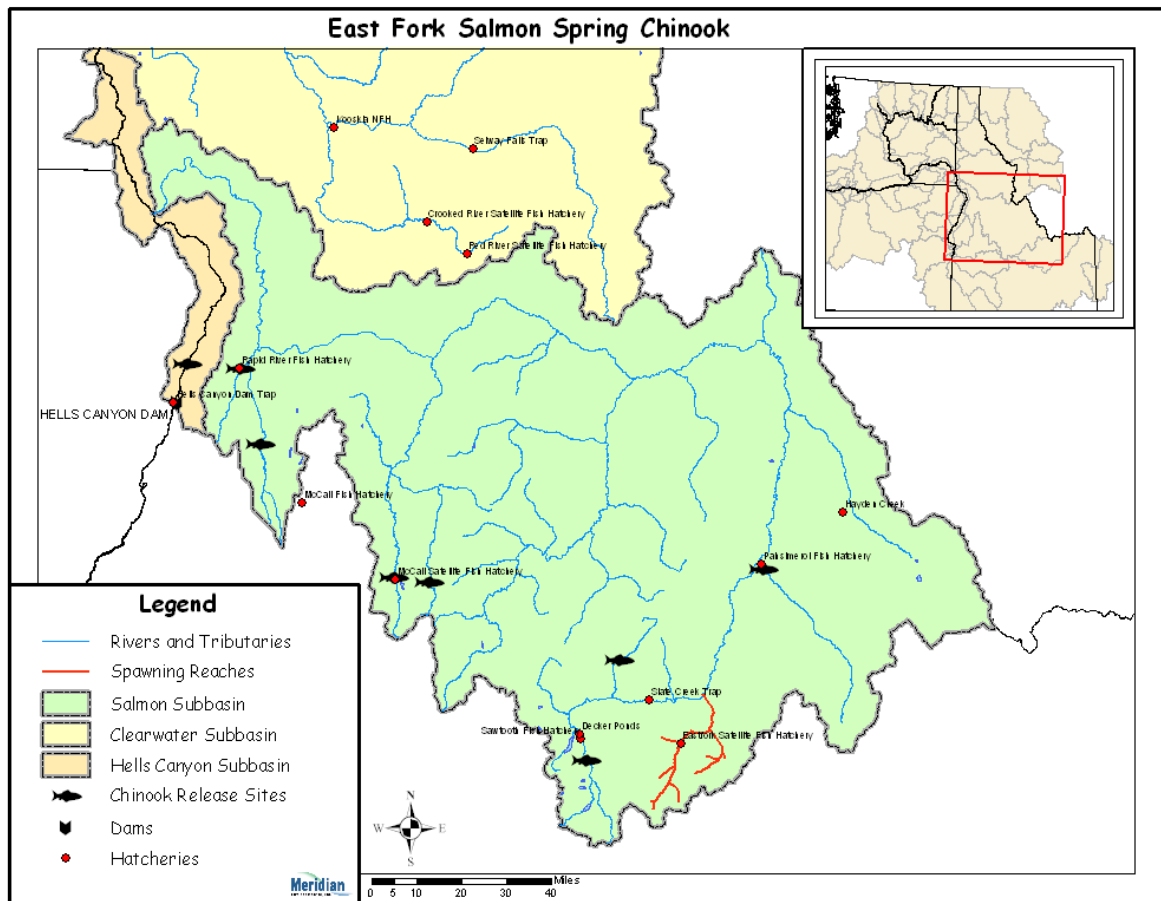


Hatchery Scientific Review Group Review and Recommendations

East Fork Salmon River Spring/Summer Chinook Population and Related Hatchery Programs

January 31, 2009



1 East Fork Salmon Spring/Summer Chinook

The East Fork Salmon River Chinook population is part of the Snake River Spring/Summer Chinook ESU. The East Fork Salmon River population is a spring/summer run and is classified as threatened under the Endangered Species Act. The Interior Columbia Technical Recovery Team (ICTRT) classified this population as “Large” based on its historic habitat potential. A “Large” population is one that requires a minimum abundance of 1,000 wild spawners and an intrinsic productivity greater than 1.56 recruits per spawner (R/S) to be viable.

Historically, it is estimated that from 2-3 million spring/summer Chinook returned to the entire Snake River each year (NPCC 2004). The portion returning to the East Fork Salmon River and Herd Creek is unknown but was likely in the tens of thousands. Spawning likely took place in the mainstem, Herd Creek and several small tributaries.

2 Current Conditions

The East Fork Salmon Chinook population is considered a spring/summer run. Adult returns to the subbasin consist of both hatchery- and natural-origin fish. With the exception of Rapid River stock, natural- and hatchery-origin Chinook in the Salmon River drainage are listed as Threatened. Since 1997, an experimental conservation hatchery program has operated in the East Fork Salmon River. This program releases maturing adults to the river to spawn volitionally. Adults are developed from eggs sourced from natural redds using hydraulic extraction methods. The program is currently assessing the contribution to the next generation from captive adult outplants.

Spawning occurs from mid-July through late September. Juveniles leave the system as yearlings starting in early March and continuing into the spring.

Current (1960 to 2005) abundance (number of adults spawning in natural production areas) has ranged from 11 fish in 1995 to 3,374 fish in 1961. Abundance in recent years has been moderately variable. The most recent 10-year geometric mean number of natural-origin spawners was 169 fish (NOAA Draft Recovery Plan). Redd count averages in index areas generally were less than 100 from 1992 to 2003 (StreamNet).

AHA modeling data submitted by IDFG estimate current adult escapement and adjusted productivity for the natural-origin population at 138 and 0.67, respectively. The model also estimates that five hatchery-origin spring and summer Chinook stray into this population each year (estimate does not include potential straying impact of adults released through captive rearing program).

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 HSRF assigned this population as Contributing. The population currently meets the broodstock criteria for a Primary population designation.
- **Recovery Goal for Abundance:** The ICTRT defined the East Fork Salmon River spring/summer 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: 1.46; Capacity: 1,500

2.2 Current Hatchery Programs Affecting this Population

The IDFG also operates a conservation broodstock program in the East Fork Salmon River. This program returns approximately 100 hatchery-reared Chinook salmon to natal spawning areas annually (ongoing since 1997). Fish are reared at the IDFG Eagle Fish Hatchery through smoltification then transferred to NOAA’s Manchester Research Station for rearing on seawater through maturation. The IDFG is currently assessing whether successful next generation production occurs from the release of prespaw adults.

In 1991, IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the USFWS initiated a large-scale Chinook supplementation study that will continue through 2012. The study incorporates treatment and control streams in the Clearwater and Salmon subbasins. The East Fork Salmon River is a treatment 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 2014 following a five-year period of “no treatment.”

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: five fish. Projected strays are produced primarily from the segregated program operating at the Sawtooth Fish Hatchery.

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 1.0 to 1.4. Average abundance of natural-origin spawners (NOS) would increase from approximately 134 fish to approximately 435 fish. The harvest contribution of the natural and hatchery populations would go from approximately 15 fish to 47 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 Salmon River Chinook salmon that emphasizes maintaining existing natural spawning populations. Currently this population is consistent with the HSRG-defined standards of a Primary population in terms of hatchery influence (PHOS less than 0.05), although abundance levels are low.

The IDFG operates a conservation hatchery program in the East Fork Salmon River. Ongoing since 1997, this program sources eggs from natural redds. Fish are reared at the IDFG Eagle Fish Hatchery through smoltification then transferred to NOAA's Manchester Research Station for rearing on seawater through maturation. Adults are trucked back to natal waters and released for natural spawning. The last release of adults in the East Fork Salmon River will be in 2009. IDFG is currently assessing the production potential of this conservation strategy.

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.

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 East Fork Salmon River Spring/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	None None	-	0%	0%	3%	0.00	134	1.0	15	0
No Hatchery	None None	-	0%	0%	0%	1.00	435	1.4	47	-
HSRG Solution	None None	-	0%	0%	3%	0.00	188	1.1	21	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	501	1.4	55	0