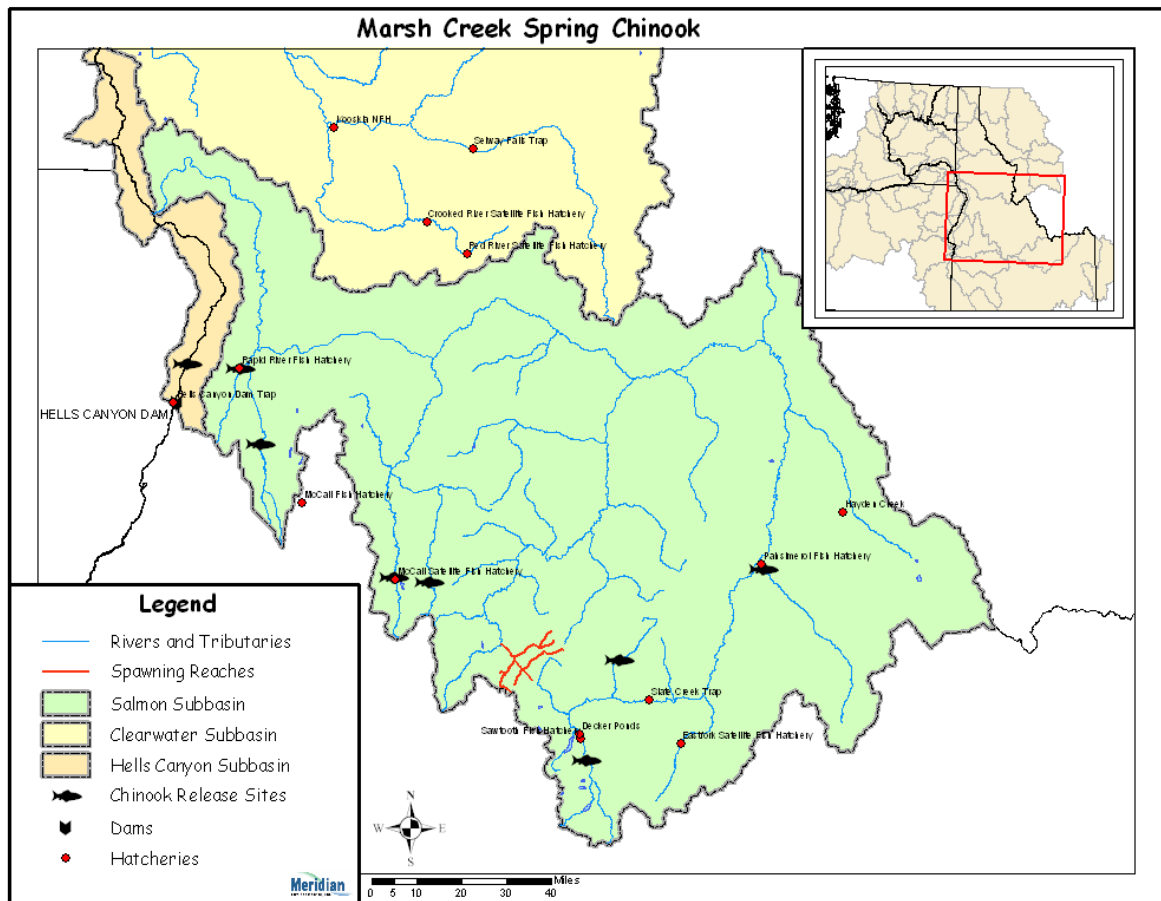


Hatchery Scientific Review Group Review and Recommendations

Salmon - Marsh Creek Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Salmon Marsh Creek Spring Chinook

This population is considered part of the Snake River Spring/Summer Chinook ESU that is classified as threatened under the Endangered Species Act. The Interior Columbia Technical Recovery Team (ICTRT) listed this population as “Basic” based on its historic habitat potential. A “Basic” population is one that requires a minimum abundance of 500 natural spawners and an intrinsic productivity greater than 2.21 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 Marsh Creek is unknown, but was probably in the low thousands.

2 Current Conditions

Adult spring/summer Chinook returns to the subbasin consist of natural-origin fish only. No hatchery strays have been found during spawning surveys for this population. The natural-origin population is listed as Threatened. Portions of Marsh Creek have been degraded by past land use activities such as mining, grazing and logging, which have reduced Chinook abundance. Spawning takes place in Marsh Creek from mid-July through late September. Juveniles emigrate from the system as yearlings in the spring of the year.

From 1957 to 2003, natural population abundance (number of adults spawning in natural production areas) has ranged from fewer than 5 fish in 1995 and 1999 to 1,104 fish in 1967. Abundance in recent years has been highly variable. The most recent 10-year geomean number of natural spawners was 41 fish. Redd counts in Marsh Creek have generally been less than 100 from 1995-2002 (StreamNet); however, redd counts exceeded 200 in 2001 and 2002.

AHA modeling data submitted by IDFG estimate current adult escapement and adjusted productivity for the natural-origin population at 82 and 1.17, respectively.

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 Marsh Creek Chinook population as “Basic” and identified a minimum abundance threshold of 500 natural-origin adults.
- **Productivity Improvement Expectation:** The ICTRT productivity standard associated with a population defined as “Basic” is 2.21.
- **Habitat Productivity and Capacity:** Productivity: 1.3; Capacity: 650

2.2 Current Hatchery Programs Affecting this Population

There is no Chinook salmon hatchery program operating in the Middle Fork Salmon River drainage.

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 project incorporates treatment and control streams in the Clearwater and Salmon subbasins. Marsh Creek 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. IDFG operates a screw trap on Marsh Creek as part of the ISS program. 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 fish.
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 0 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 remain unchanged at 1.2. Average abundance of natural-origin spawners (NOS) would increase from approximately 82 fish to approximately 127 fish. The harvest contribution of the natural population would go from approximately nine fish to 14 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).

<p>Observations</p> <p>Managers have identified a strategy for Marsh Creek 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).</p> <p>There are no releases of hatchery-origin Chinook salmon within the Middle Fork Salmon River Major Population Group.</p> <p>Recommendations</p> <p>The HSRG recommends that managers continue to monitor status and trend information for natural populations of Chinook salmon in Marsh Creek as well as monitor presence/absence and the proportion of hatchery fish in natural production areas.</p>

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Marsh Creek 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%	0%	1.00	82	1.2	9	0
No Hatchery	None None	-	0%	0%	0%	1.00	127	1.2	14	-
HSRG Solution	None None	-	0%	0%	0%	1.00	114	1.2	12	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	0%	1.00	190	1.4	21	0