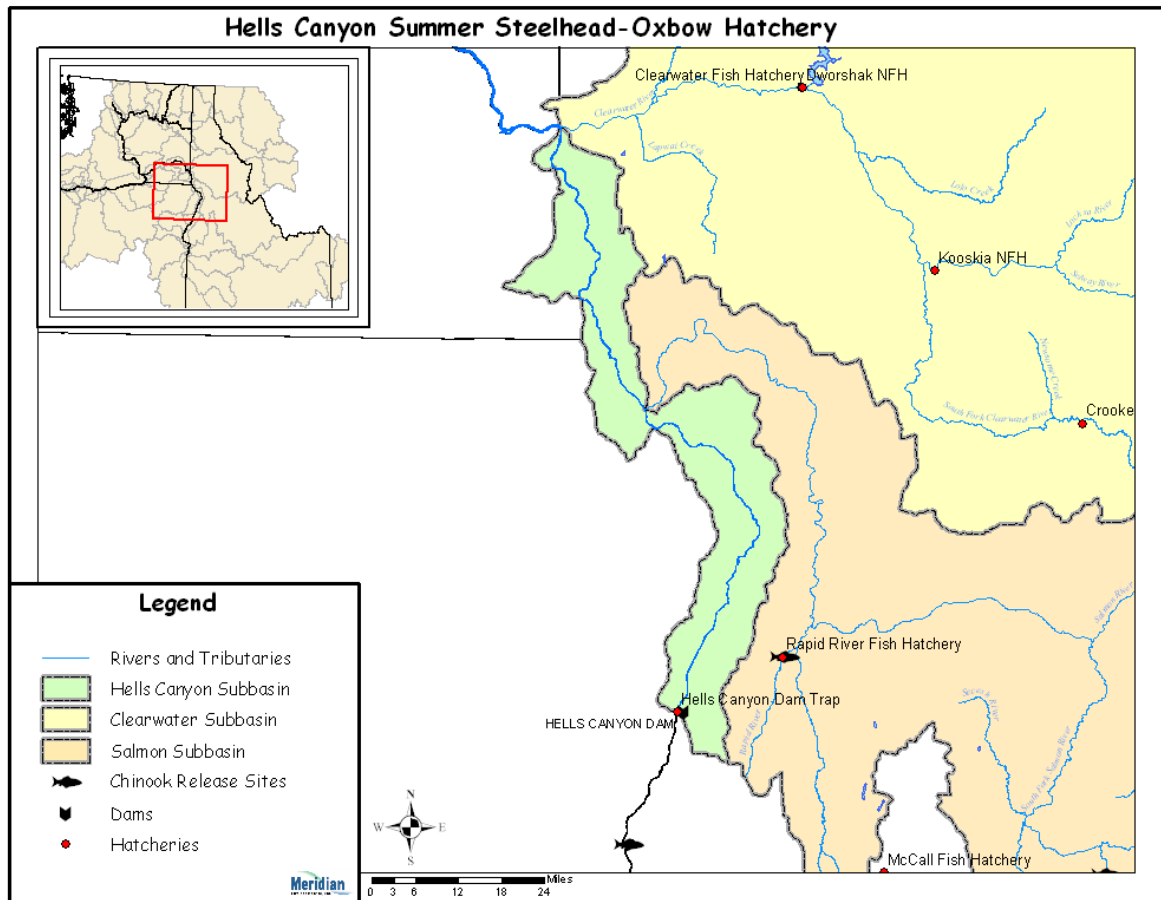


Hatchery Scientific Review Group Review and Recommendations

Snake Hells Canyon Summer Steelhead (A-run) Population and Related Hatchery Programs

January 31, 2009



1 Snake Hells Canyon Summer Steelhead (A-run)

The Snake Hells Canyon Summer Steelhead (A-run) population is part of the Snake River Basin Steelhead Distinct Population Segment (DPS) that includes all naturally spawned populations of steelhead in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho (62 FR 43937; August 18, 1997). Several artificial propagation programs are considered part of the DPS: the Tucannon River natural stock, the North Fork Clearwater River stock reared at Dworshak National Fish Hatchery (NFH) and Clearwater Fish Hatchery and released in the Clearwater and Salmon rivers¹, East Fork Salmon River local stock, and the Little Sheep Creek/Imnaha River Hatchery steelhead hatchery programs. The DPS was listed as a threatened under the ESA on August 18, 1997; this status was reaffirmed on January 5, 2006.

According to the ICTRT, the DPS has six major population groupings (MPGs): Lower Snake River, Clearwater River, Grande Ronde River, Salmon River, Hells Canyon, and the Imnaha River (ICTRT 2006).

The Hells Canyon MPG contains four steelhead populations, but three (Powder River, Burnt River and Weiser River) are extirpated. A few steelhead occupy some tributaries within Hells Canyon, a population that is considered functionally extirpated. However, the Hells Canyon tributary region is now designated as a component of the Wildhorse-Powder population, and belongs to the Hells Canyon MPG.

Snake River Basin steelhead trout enter fresh water from June to October and spawn during the following spring from March to May. Emergence occurs by early June in low elevation streams and as late as mid-July at higher elevations. Snake River steelhead usually smolt at age-2 or age-3 and reside in marine waters for 1 to 3 years prior to returning to their natal stream to spawn at 4 or 5 years of age.

There are no estimates of historical steelhead abundance in the Hells Canyon MPG.

2 Current Conditions

As noted above, a small number of steelhead occupy some tributaries within the Hells Canyon, although the population is considered functionally extirpated since most of the historic spawning and rearing habitat is upstream of Hells Canyon Dam.

A segregated harvest hatchery program is operated at Niagara Springs and Oxbow hatcheries (see below) to provide mitigation for production lost due to the construction of the Hells Canyon Complex.

2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the Snake Hells Canyon steelhead population.

- **ESA Status:** The Snake River Basin steelhead DPS was listed as threatened on August 18, 1997; the threatened status was reaffirmed on January 5, 2006.
- **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.

¹ Artificial propagation programs for steelhead in the Clearwater River subbasin are based on the North Fork Clearwater stock trapped at the base of Dworshak Dam when construction blocked access to the North Fork in 1969.

- Recovery Goal for Abundance: NA
- Productivity Improvement Expectation: NA
- Habitat Productivity and Capacity: Productivity: 2; Capacity: 500

2.2 Current Hatchery Programs Affecting this Population

One summer steelhead hatchery program at the Oxbow Fish Hatchery has the potential to affect this population. Adult steelhead are trapped immediately downstream of Hells Canyon Dam (downstream of Oxbow Dam) and trucked to Oxbow Hatchery. The majority of adults are trapped in the fall (90%). Spawning and egg incubation to the eyed-stage of development occurs at the Oxbow Hatchery (an Idaho Power facility). No natural-origin fish are incorporated in the broodstock design. Natural-origin adults trapped at Hells Canyon are returned to the river downstream of the dam. Final incubation and rearing occur at Niagara Springs Hatchery (also an Idaho Power facility). The program's goal for the Snake River (a segregated harvest program) is to release approximately 525,000 A-run steelhead smolts (4.5 fpp) into the Snake River below Hells Canyon Dam. All smolts are 100% adipose fin clipped (30,000 receive coded wire-tags and 300 receive PIT tags). The program has an R/S of 12.6.

The first priority for this program is to produce eggs to meet the mitigation goal for smolt releases to the Snake River downstream of Hells Canyon Dam (525,000 smolts) and to the Little Salmon River (275,000 smolts). Approximately 900 fall-trapped adults are over-wintered at the Oxbow Hatchery and spawned in the spring to satisfy these releases.

A second priority for this program is to provide adult steelhead to the Idaho Fish and Game (IDFG) and Oregon Department of Fish and Wildlife (ODFW) for recreational fisheries in blocked areas upstream of the Hells Canyon complex and to the Nez Perce Tribe as a subsistence program. The IDFG fraction (up to 1,000 adults) is generally released in the Boise River. The ODFW fraction (up to 1,000 adults) is generally released in Hells Canyon pool. The Nez Perce fraction (up to 1,000 adults) is incorporated in their food distribution network.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from integrated in-basin programs: NA
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 388 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 0.9 to 1.8. Average abundance of natural-origin spawners (NOS) would increase from approximately 209 fish to approximately 222 fish. The harvest contribution of the natural and hatchery populations would go from approximately 3,718 fish to approximately 26 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

The majority of the historic habitat for this population is no longer accessible. Managers have identified a strategy for this population that emphasizes maintaining the current hatchery mitigation program. For the purposes of this analysis, the HSRG assumed this population to be Stabilizing, and this segregated harvest program is operating consistent with the HSRG-defined standards of a Stabilizing population.

This program supplies 525,000 smolts for release to the Snake River downstream of Hells Canyon Dam. The program is partial fulfillment of the Idaho Power Company mitigation responsibility. In addition, this program generates 275,000 smolts for the Little Salmon River (in a different population zone). Adult steelhead are trapped immediately downstream of Hells Canyon Dam (downstream of Oxbow Dam) and trucked to Oxbow Hatchery. The majority of adults are trapped in the fall (90%). Spawning and egg incubation to the eyed-stage of development occurs at the Oxbow Hatchery (an Idaho

Power facility). No natural-origin fish are incorporated in the broodstock design. Natural-origin adults trapped at Hells Canyon are returned to the river downstream of the dam. Final incubation and rearing occur at Niagara Springs Hatchery (also an Idaho Power facility).

This program provides a significant annual terminal harvest contribution. It provides adult steelhead to the IDFG and ODFW for recreational fisheries in blocked areas upstream of the Hells Canyon complex and to the Nez Perce Tribe as a subsistence program. The IDFG fraction (up to 1,000 adults) is generally released in the Boise River. The ODFW fraction (up to 1,000 adults) is generally released in Hells Canyon pool. The Nez Perce fraction (up to 1,000 adults) is incorporated in their food distribution network.

Recommendations

The HSRG has no specific recommendations for this hatchery program.

The HSRG encourages managers to explore opportunities to increase the harvest contribution, such as increasing daily harvest limits.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Hells Canyon Summer Steelhead (A-run). 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%	45%	0.00	209	0.9	24	0
	Seg Harv	525.4	95%						3,694	1,403
No Hatchery	None None	-	0%	0%	0%	1.00	222	1.8	26	-
HSRG Solution	None None	-	0%	0%	27%	0.00	130	0.9	15	0
	Seg Harv	525.4	95%						3,602	777
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	24%	0.00	152	1.0	17	0
	Seg Harv	525.4	85%						3,602	655