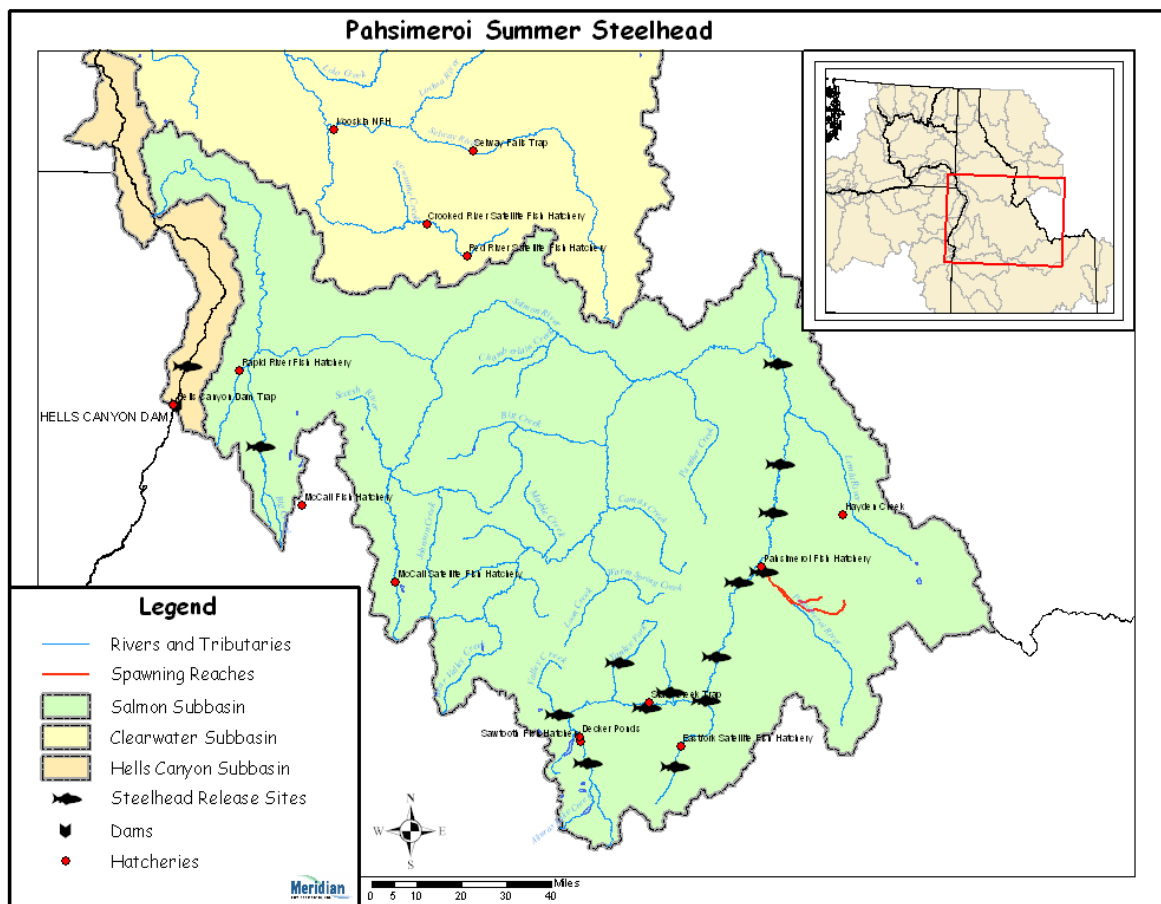


Hatchery Scientific Review Group Review and Recommendations

Salmon River Pahsimeroi River Summer Steelhead A-Run Population and Related Hatchery Programs

January 31, 2009



1 Salmon Pahsimeroi River Summer Steelhead (A-Run)

The Pahsimeroi River steelhead population is part of the Snake River Steelhead Distinct Population Segment (DPS). The DPS contains both A and B run steelhead. The Pahsimeroi River population is an “A” run, is classified as threatened under the Endangered Species Act, and is identified as “Intermediate” by the ICTRT. An “Intermediate” population is one that requires a minimum abundance of 1,000 natural spawners and an intrinsic productivity greater than 1.15 recruits per spawner (R/S) to meet the 5% extinction risk criteria established by the ICTRT.

Historically, it was estimated that over two million steelhead returned to the Columbia River Basin, with about 25% of these originating from the Snake River. Ice Harbor Dam counts indicate that over a 100,000 steelhead returned to the Snake River in the early 1960s. There are no reliable estimates of the percentage of fish that have returned historically to the Pahsimeroi River.

2 Current Conditions

This population includes the Pahsimeroi River and its tributaries, as well as the mainstem Salmon River and all tributaries downstream to the mouth of the Lemhi River. Spawning occurs over the period from mid-march through mid-June. Juveniles emigrate from the system in the spring at ages 1-4, with the majority of the emigrant’s age 2 and 3.

Current population abundance (number of adults spawning in natural production areas) is based on counts of natural-origin steelhead intercepted at the Pahsimeroi Fish Hatchery weir. Natural-origin spawners have ranged from 17 to 460 fish since 1985. Geometric mean abundance for the most recent ten years is 73 fish. For Snake River steelhead “A” run populations lacking in direct abundance and productivity data, the ICTRT developed preliminary estimates representing an average population of this run type using Lower Granite wild dam counts. Abundance for the average “A” run steelhead in recent years has been moderately variable. The most recent 10-year geometric mean number of natural spawners was 456 fish. The most recent 13-year SAR adjusted and delimited geometric mean of returns per spawner was 1.69.

Steelhead parr density in the Pahsimeroi River has generally been less than twelve age-1 parr per square meter from 1996 through 2002 (NPCC 2004).

The Pahsimeroi Hatchery program was initiated with progeny of adult steelhead trapped at Oxbow and Hells Canyon dams from 1966 through 1968. Beginning in 1967, juvenile steelhead produced from spawning events that resulted from these collections were released in the Pahsimeroi River. Oxbow-origin smolts were released into the Pahsimeroi River and the upper Salmon River intermittently through 1970. Adult broodstock collections were initiated at the Pahsimeroi Hatchery in 1969. Returning Snake River stock and some indigenous Salmon River stock were trapped and used as broodstock. Additionally, B-run steelhead smolts of Dworshak National Fish Hatchery-origin were released into the Pahsimeroi River in 1974 and 1978.

For AHA modeling, IDFG estimated natural-origin fish escapement and adjusted productivity for the natural-origin A-Run steelhead population was 134 and 0.74, 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 Steelhead are listed as threatened under ESA.
- Population Description: For the purpose of this review, the HSRG assigned this population as Contributing. The population currently meets the broodstock criteria for this population designation.
- Recovery Goal for Abundance: The ICTRT defined the Pahsimeroi River A-run steelhead population as “Intermediate” 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 “Intermediate” is 1.15.
- Habitat Productivity and Capacity: Productivity: 1.65; Capacity: 1,029

2.2 Current Hatchery Programs Affecting this Population

The single hatchery program that may affect the Pahsimeroi River steelhead population is described below.

Salmon Pahsimeroi (A-Run-Pahsimeroi). This is a segregated harvest program with a broad planting strategy. Within the Pahsimeroi population unit, the following releases occur:

Pahsimeroi River at the hatchery site: 860,000 smolts

Salmon River at Colston Corner: 140,000 smolts

Salmon River at Shoup Bridge: 80,000 smolts

Broodstock used to generate smolts for these releases are collected at the Pahsimeroi Hatchery weir or the Sawtooth Hatchery weir. No natural-origin fish are used as broodstock for this program. Spawning and early egg incubation occurs at both hatcheries. Final incubation and all rearing occur at Hagerman National Hatchery, Magic Valley Hatchery, and Niagara Springs Hatchery. All juvenile fish are adipose fin-clipped and a portion of receive coded wire and PIT-tags. Juveniles are transported to release sites in mid-April. The program has an R/S value of 12.6.

Few hatchery fish are present in the Pahsimeroi River because a weir located at the Pahsimeroi Hatchery is able to remove more than 95% of all hatchery-origin adult returns to the subbasin.

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: 43 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 0.8 to 1.5. Average abundance of natural-origin spawners (NOS) would increase from approximately 52 fish to approximately 309 fish. The harvest contribution of the natural and hatchery populations would go from approximately 5,441 fish to approximately 45 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 Pahsimeroi River A-run steelhead that emphasizes maintaining existing natural spawning populations as well as maintaining the current hatchery mitigation program. Currently this population is consistent with the HSRG-defined standards for a Contributing population (pHOS less than 0.1).

The upper Salmon River (upstream of the confluence of the Middle Fork Salmon River) is managed primarily for harvest. This management strategy is based on the assumption

that steelhead were not historically abundant in this part of the Salmon River drainage as they were in the Middle Fork and South Fork Salmon River drainages.

The LSRCP mitigation objective for the Upper Salmon River A-run program is to return 11,660 adults from the Magic Valley Fish Hatchery program and 13,600 adults from the Hagerman National Fish Hatchery program to the project area upstream of Lower Granite Dam. Additionally, the Idaho Power Company objective is to produce 200,000 pounds of steelhead smolts (approximately 900,000 smolts) for release to Salmon River waters. Idaho Power Company production is reared exclusively at the Niagara Springs Fish Hatchery.

There is a segregated harvest release at the Pahsimeroi Hatchery and in the mainstem Salmon River downstream of the Pahsimeroi River. Based on coded wire-tag recovery, there is no evidence that these fish stray into other natural production areas; however, little information is available to describe the location of adult returns other than at fixed weir sites or through recoveries associated with mainstem sport fisheries.

A-run broodstock are trapped at the Pahsimeroi and Sawtooth hatcheries. Spawning and early incubation occurs at both facilities. For these releases, no natural-origin adults are incorporated in the spawning design. Final incubation and juvenile rearing occurs at Hagerman National Fish Hatchery, Magic Valley Fish Hatchery, and Niagara Springs Fish Hatchery. Smolts produced from broodstock programs at the Pahsimeroi and Sawtooth hatcheries undergo wide distribution in the Salmon River drainage. All smolts released within this population group are adipose fin-clipped with a portion coded wire and PIT-tagged for evaluation purposes.

There are two unacclimated releases of A-run steelhead to the Salmon River between the Lemhi and the Pahsimeroi rivers that originate from adults trapped at the Pahsimeroi Hatchery (one site) and/or Sawtooth Hatchery (one site). The number of yearling smolts released in the river section between the Lemhi River and the Pahsimeroi is 220,000. In addition, there is an unacclimated release of 860,000 smolts directly below the weir on the Pahsimeroi. Currently only natural-origin fish are passed upstream of the weir on the Pahsimeroi River, which is very effective at removing hatchery-origin adults.

Recommendations

The HSRG recommends sourcing broodstock from the Pahsimeroi Hatchery for releases that occur between the Pahsimeroi and Lemhi rivers.

The HSRG notes that there is a general lack of information related to steelhead abundance, productivity, spatial structure and diversity as well as straying of hatchery fish into natural production areas. An effort should be made to improve this information base.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Pahsimeroi River 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	0%	0%	17%	0.00	52	0.8	8	0
	Seg Harv	1086.8	90%						5,433	2,162
No Hatchery	None None	0.0	0%	0%	0%	1.00	309	1.5	45	-
HSRG Solution	None None	0.0	0%	0%	14%	0.00	55	0.8	8	0
	Seg Harv	1081.3	90%						5,406	2,151
HSRG Solution w/ Improved Habitat	None None	0.0	0%	0%	5%	0.00	169	1.1	25	0
	Seg Harv	1081.3	90%						5,406	2,151