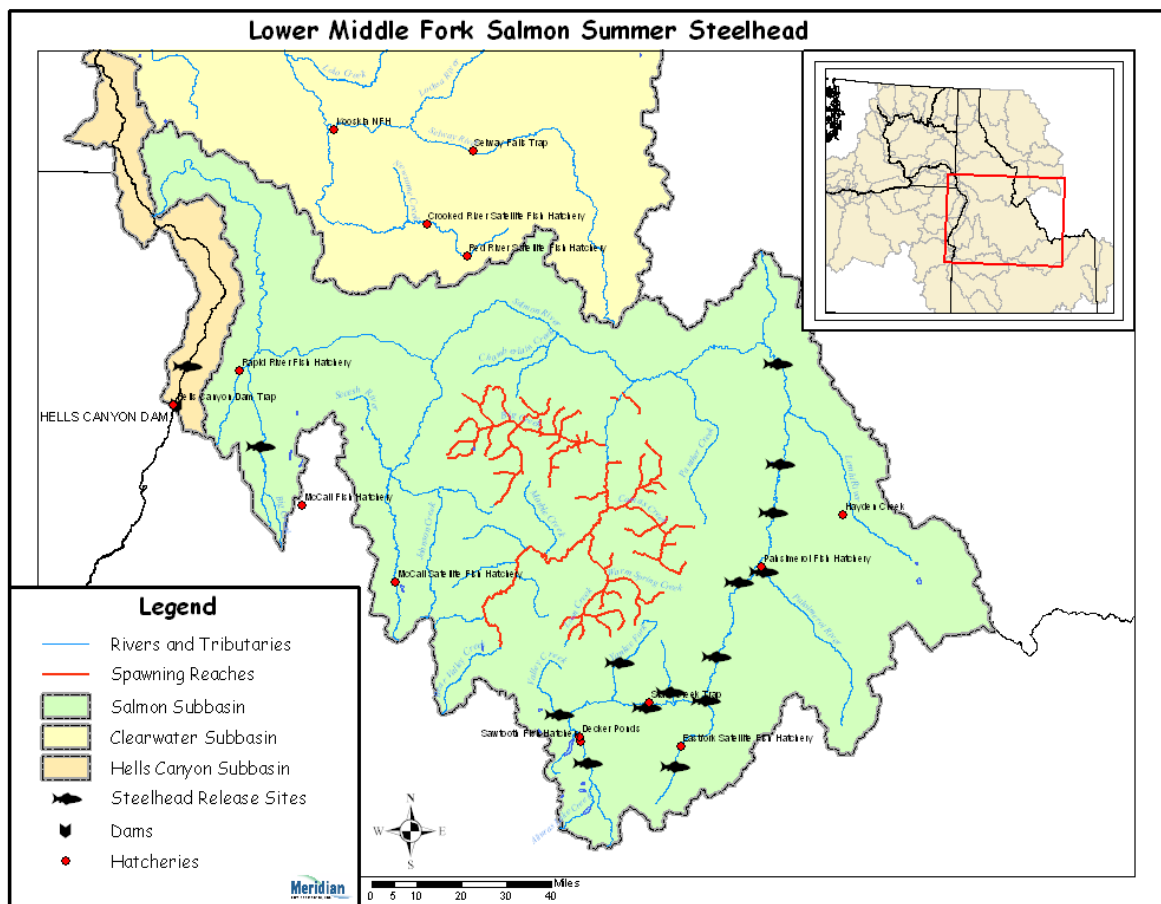


# Hatchery Scientific Review Group Review and Recommendations

## Salmon River Lower Middle Fork Summer Steelhead B-Run Population and Related Hatchery Programs

January 31, 2009



## 1 Salmon Lower Middle Fork Summer Steelhead (B-Run)

The Middle Fork Salmon River Lower Mainstem steelhead population is part of the Snake River Steelhead Distinct Population Segment (DPS). The DPS contains both A- and B-run steelhead. This population is a B-run, classified as threatened under the Endangered Species Act, and 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 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 Lower Middle Fork.

## 2 Current Conditions

This population includes all steelhead spawning in the Lower Middle Fork and its tributaries, up to and including Loon Creek. Spawning occurs from mid-March through mid-June. Juveniles emigrate from the system in the spring at ages 1-4, with most emigrating at ages 2 and 3.

Current population abundance (number of adults spawning in natural production areas) is unknown. There are no weirs where steelhead escapement can be monitored. Steelhead redds were counted by IDFG in most years from 1987 through 1998 in Middle Fork Salmon River tributary reaches. Not all spawning habitat was surveyed when counting redds, so a total population count is not available for any year. From 1987 through 1998, total redds counted each year in the two transects surveyed ranged from 0 to 143.

For extant Snake River steelhead “B” run populations above Lower Granite Dam lacking in direct abundance and productivity data, the ICTRT developed an average dataset to be applied as a surrogate for these populations. The dataset was generated using the time series of “B” run natural fish at Lower Granite Dam (TAC 2002) and dividing by nine (the number of extant “B” run populations above the dam). Abundance for the average “B” run steelhead in recent years has been moderately variable. The most recent 10-year geometric mean number of natural spawners was 272 fish. From 1986 to 1998, returns per spawner for the average “B” run steelhead dataset ranged from 0.24 (1990) to 6.63 (1998). The most recent 13-year SAR adjusted and delimited geometric mean of returns per spawner was 0.85. Steelhead parr density in the Lower Middle Fork has generally been less than four age 1 parr per square meter (NPCC 2004).

For AHA modeling, IDFG estimated natural-origin fish escapement and adjusted productivity for this population was 713 and 2.00, respectively. Although little data is available, the number of hatchery adults spawning naturally in the basin is assumed to be low.

### 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 Primary. The population currently meets the broodstock criteria for this population designation.
- Recovery Goal for Abundance: The ICTRT defined the Lower Middle Fork Salmon River B-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: 2.5; Capacity: 1,587

## 2.2 Current Hatchery Programs Affecting this Population

No hatchery programs are present in this area; however, AHA modeling indicates that some hatchery strays from the following program may spawn in the Lower Middle Fork Salmon River:

- Salmon/ Little Salmon Summer Steelhead (A and B-Run programs)

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: 14 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 be unchanged at 2.0. Average abundance of natural-origin spawners (NOS) would increase from approximately 713 fish to 721 fish. The harvest contribution of the natural and hatchery populations would go from approximately 200 fish to approximately 202 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 Lower Middle Fork Salmon River B-run steelhead that emphasizes maintaining existing natural spawning populations. Currently this population is operating consistent with the HSRG-defined standards of a Primary population (pHOS less than 0.05).

There are no releases of hatchery-origin steelhead within the Middle Fork Salmon River drainage of the Salmon River Major Population Group. The proximity of this population to the mainstem migration corridor suggests there may be a higher number of hatchery strays to this population than to other Middle Fork Salmon River populations.

#### **Recommendations**

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 Salmon Lower Middle Fork Summer Steelhead (B-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%	1.00	713	2.0	200	0
No Hatchery	None None	-	0%	0%	0%	1.00	721	2.0	202	-
HSRG Solution	None None	-	0%	0%	0%	1.00	713	2.0	200	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	0%	1.00	861	2.2	242	0