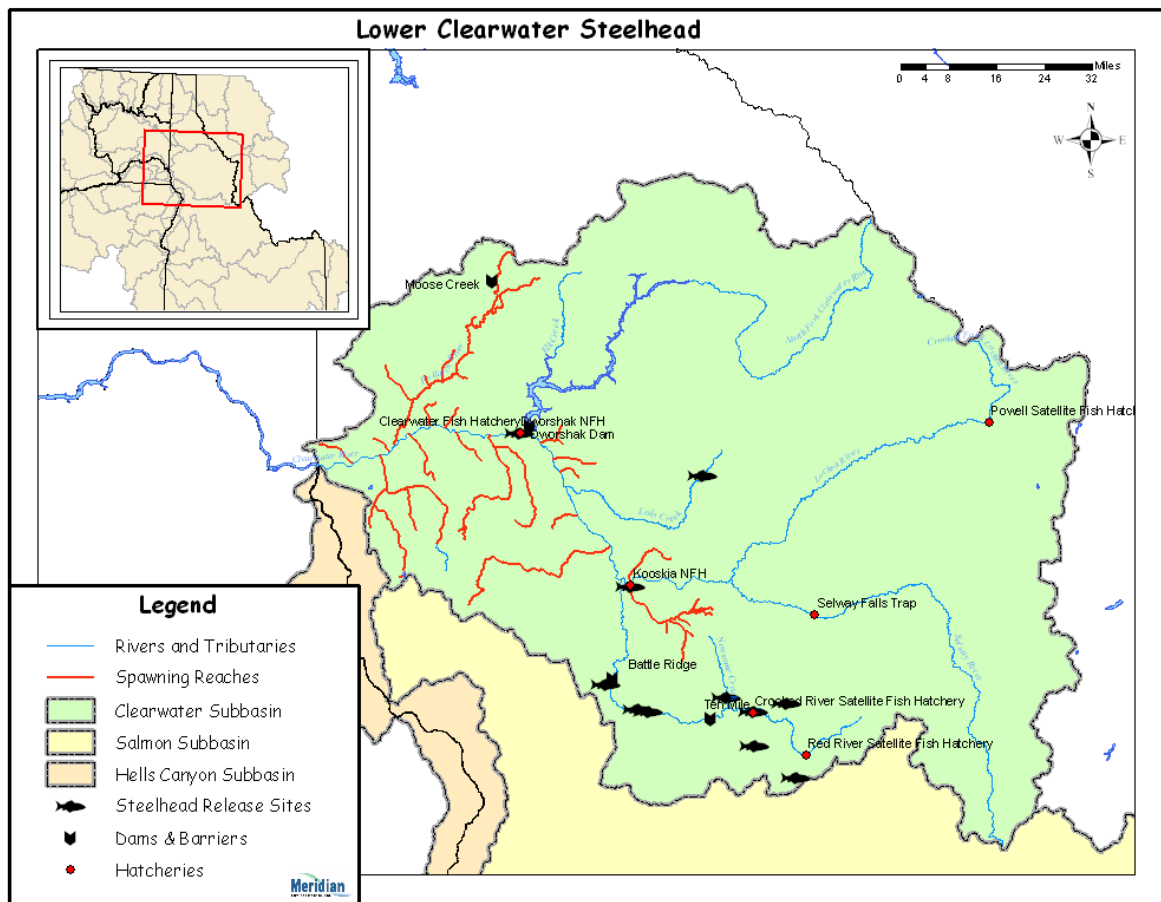


Hatchery Scientific Review Group Review and Recommendations

Lower Clearwater Summer Steelhead (A-run) (Potlatch) Population and Related Hatchery Programs

January 31, 2009



1 Lower Clearwater Summer Steelhead (A-run)

The Lower Clearwater mainstem steelhead population is part of the Snake River Basin Steelhead Distinct Population Segment (DPS) that includes all naturally-spawned populations 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.

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), and contains both A and B-run steelhead (based on migration timing, ocean-age and adult size). The Lower Clearwater population is an A-run (natural population) and is part of the Clearwater River MPG. The population is found in the South Fork Clearwater and its tributaries downstream of Mill Creek, the Middle Fork Clearwater and its tributaries, and the mainstem Clearwater and tributaries (with the exception of the North Fork Clearwater) downstream to the confluence with the Snake River. Like all populations in the MPG, the Lower Clearwater population occupies areas upstream from the historical Lewiston Dam, which was in place from 1927 to 1973. Although the dam was fitted with a fish ladder, it provided only marginal passage for migrating steelhead adults and smolts (Cramer et al. 1998). Unlike Chinook salmon, steelhead were able to maintain access to the Clearwater River subbasin during the dam's existence, and therefore are included in the DPS. The Lower Clearwater mainstem population resides in the lower portions of the Middle and South Fork Clearwater rivers and their tributaries. A break in habitat characteristics separates it from the North Fork.

The Interior Columbia Technical Recovery Team (ICTRT) classifies Lower Clearwater summer steelhead as a "Large" population based on historical habitat potential (ICTRT 2005). A "Large" population is one that requires a minimum abundance of 1,500 natural spawners and an intrinsic productivity greater than 1.1 recruits per spawner (R/S) to meet the 5% extinction risk criteria established by the ICTRT.

According to the Draft Snake River Steelhead Recovery Plan, 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 years 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 lower Clearwater River.

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

2 Current Conditions

The Lower Mainstem Clearwater Steelhead population has five major spawning areas: Big Canyon Creek, Clear Creek, Lapwai Creek, Lawyer Creek, and the Upper Potlatch River).

Current natural population abundance (number of adults spawning in natural production areas) is unknown because there are no methods (weirs, traps, etc.) or surveys to enumerate adults. Surveys of juvenile density or abundance are conducted in some stream reaches. Fish densities are generally low throughout this population, except for a few areas where streams are fed by perennial groundwater sources. Large numbers of hatchery-origin steelhead pass through the population in the mainstem Clearwater River, both as juveniles and adults. Those fish originate from hatchery programs upstream of the population. It is unknown how many downstream migrating juvenile steelhead cease their migration and become freshwater residents in the population, or how many upstream migrating adults stop short of their release locations and spawn in the population.

For AHA modeling, IDFG estimated natural-origin fish escapement and adjusted productivity for this population was 983 and 3.68, respectively.

2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the Lower Clearwater River 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 Primary. The population currently meets the broodstock criteria for this population designation.
- **Recovery Goal for Abundance:** The ICTRT defined the Lolo Creek A-run steelhead population as “Large” and identified a minimum abundance threshold of 1,500 natural-origin adults.
- **Productivity Improvement Expectation:** The ICTRT productivity standard associated with a population defined as “Large” is 1.1.
- **Habitat Productivity and Capacity:** Productivity: 5.21; Capacity: 1,430

2.2 Current Hatchery Programs Affecting this Population

The Dworshak NFH operates a segregated (harvest) steelhead program in Clear Creek (Middle Fork Clearwater River). The Kooskia NFH was constructed on Clear Creek as a spring Chinook mitigation program. An adult weir at Kooskia NFH operates in March and April to collect and enumerate steelhead. Hatchery-origin adults are outplanted in areas identified by the Nez Perce Tribe, while natural-origin adults are passed upstream of the hatchery weir. The program releases approximately 300,000 smolts into Clear Creek on the Middle Fork Clearwater River. All smolts are adipose fin-clipped and derived from B-run broodstock collected at Dworshak NFH. Approximately 5,000 smolts are fitted with PIT-tags. Natural-origin broodstock is not used in this segregated program. According to the ICTRT, the Lower Clearwater A-run population exhibits no evidence of hatchery influence on their genetic composition. Other hatchery programs operating in Lolo Creek and the South Fork Clearwater River produce juveniles and

adults that travel through the lower Clearwater River population zone. This program has an R/S of 35.0.

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: 88 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 3.9 to 4.6. Average abundance of natural-origin spawners (NOS) would increase from approximately 983 fish to approximately 1,115 fish. The harvest contribution of the natural and hatchery populations would go from approximately 3,469 fish to approximately 162 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 Clearwater River A-run steelhead that emphasizes maintaining existing natural spawning populations. Currently, this population is consistent with the HSRG-defined standards for Primary population designation (pHOS less than 0.05).

The Dworshak National Fish Hatchery releases approximately 300,000 B-run steelhead in the Lower Clearwater River population area. Fish are 100% adipose-fin clipped and a portion PIT-tagged for evaluation purposes. This is a segregated harvest program with no natural-origin fish in the broodstock. Smolts are released downstream of the Kooskia National Fish Hatchery. An adult weir is operated in March and April at the Kooskia facility. Natural-origin steelhead are passed upstream of the Kooskia weir into Clear Creek while hatchery-origin adults are transferred to the Nez Perce Tribe for outplanting. Broodstock for this program is collected at the Dworshak National Fish Hatchery. Incubation and rearing to release occur at Dworshak.

There is little information on hatchery straying; however, monitoring in the Potlatch River has identified less than 2% hatchery fish. The HSRG has no information to suggest that “up-river” B-run hatchery programs are significantly impacting Lower Clearwater River A-run steelhead populations.

Recommendations

Managers could consider the benefits and disadvantages of developing a locally derived broodstock for the Kooskia release. Additionally, the HSRG recommends that managers discontinue outplanting hatchery adults collected at this facility in other waters that support natural spawning.

The managers should coordinate the programming of all salmon populations reared in the Clearwater Fish Hatchery, Dworshak National Fish Hatchery, Kooskia National Fish Hatchery and Nez Perce Tribal Hatchery to maximize the benefits of available water supply, appropriate water temperature, and rearing containers. Operating these four major hatcheries as a coordinated system would facilitate the movement of programs/populations between and among the different hatcheries. This would maximize survival by producing fish in good condition for release at the appropriate life stage.

The HSRG notes that there is a general lack of information about 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 Lower Clearwater Summer Steelhead. 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%	2%	0.00	983	3.9	143	0
	B-Run Clear Cr Seg Harv	298.0	10%						3,326	158
No Hatchery	None None	-	0%	0%	0%	1.00	1,115	4.6	162	-
HSRG Solution	None None	-	0%	0%	2%	0.00	1,000	4.0	145	0
	B-Run Clear Cr Seg Harv	298.0	20%						3,326	197
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	2%	0.00	1,139	4.4	166	0
	B-Run Clear Cr Seg Harv	298.0	10%						3,326	158