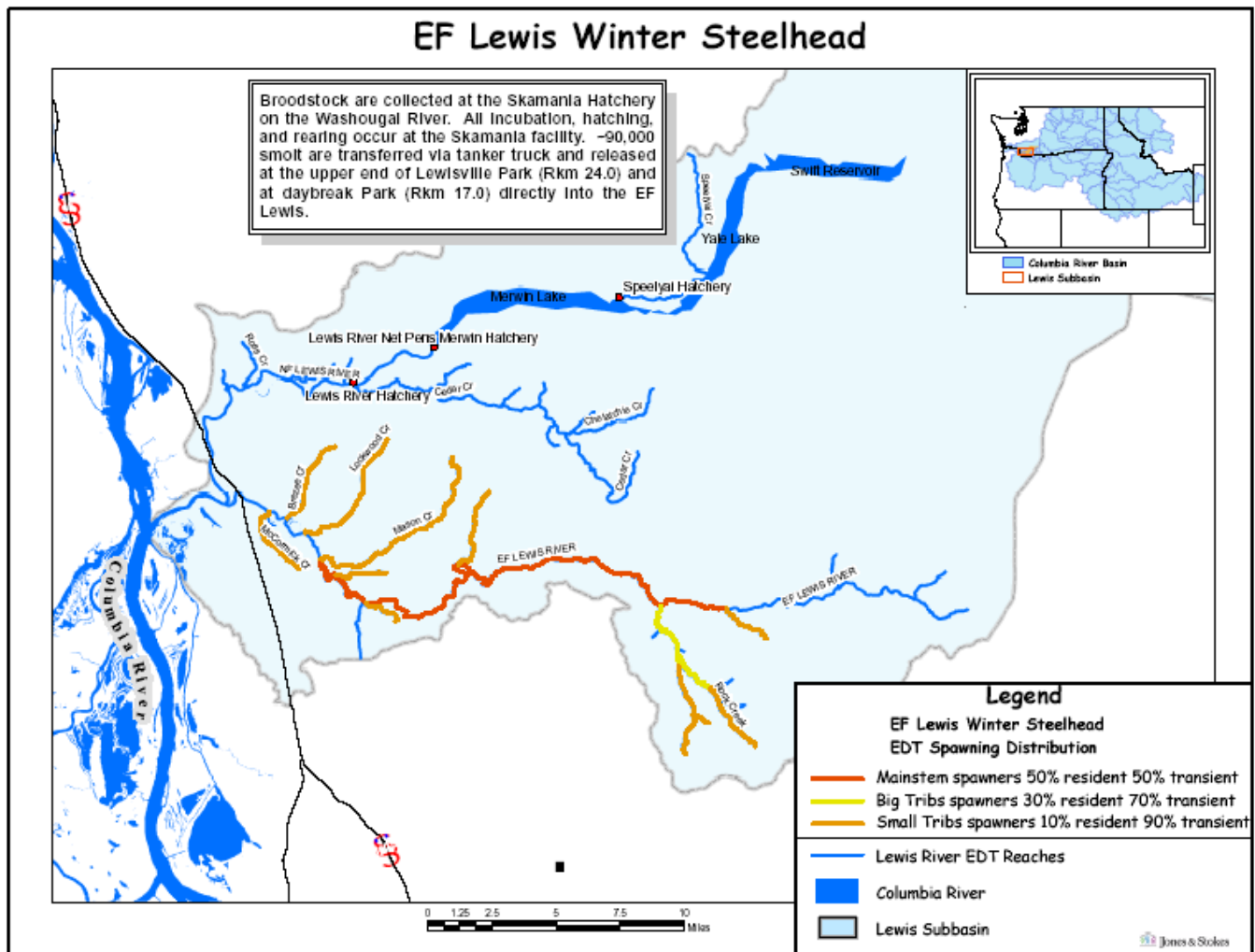


Hatchery Scientific Review Group Review and Recommendations

East Fork Lewis River Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 East Fork Lewis River Winter Steelhead

East Fork Lewis River winter steelhead were identified as a stock based on their distinct spawning distribution and later run timing. Spawning takes place in the East Fork Lewis River and its tributaries from early March to early June.

Stock status was rated as Depressed in 2002 because of chronically low escapements. A new escapement index was instituted in 1997 and its relationship to the previous escapement index is currently unknown. The escapement index that was used through 1995 showed a trend of chronically low escapements in the East Fork Lewis, and there are no indications that the status of the stock has improved in recent years.

Genetic sampling was conducted in 1996; however, comparisons of allele frequencies between this stock and other lower Columbia steelhead stocks for determining stock distinctiveness are not very informative (Myers et al. 2002).

2 Current Conditions

2.1 Current Population Status and Goals

- **ESA Status:** This population is listed as threatened and is part of the Lower Columbia River ESU.
- **Population Description:** The population has been designated as Primary in the Lower Columbia River Recovery Plan.
- **Current Viability Rating:** Medium
- **Recovery Goal for Abundance:** 500 fish
- **Productivity Improvement Expectation:** 25%
- **Habitat Productivity and Capacity (from EDT):** Productivity: 4.37; Capacity: 6.5 (<http://www.nwcouncil.org/fw/subbasinplanning/lowerColumbia/plan/>)

2.2 Current Hatchery Programs Affecting this Population

Fish planted in the East Fork Lewis River are progeny from the Skamania (Washougal subbasin) Hatchery that were originally an early returning winter run of Chambers Creek origin. This is a direct plant of 90,000 smolts. For summer populations, the progeny of 20 broodstock are transferred to the East Fork (again from Skamania hatchery), resulting in approximately 24,000 smolts. The current hatchery program is described as a segregated harvest program. There are no hatchery facilities located on the East Fork Lewis River. The estimated number of hatchery strays affecting this program is:

- Hatchery strays from in-basin integrated hatchery program: N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 475 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 Adjusted Productivity (with harvest and fitness factor effects from AHA) would increase from 2.1 to 4.1. Average abundance of natural-origin spawners (NOS) would increase from 270 to 587. Harvest contribution of the natural and hatchery populations would go from 817 to 34.

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 East Fork Lewis winter steelhead population is listed as a Primary population for recovery. Two segregated hatchery steelhead programs affect this population: a 90,000 early winter smolt release and a 30,000 summer steelhead smolt release, both direct plants into the East Fork Lewis River from Skamania Hatchery.

There are no hatchery facilities on the East Fork Lewis or adult collection facilities to manage the number of hatchery-origin adults spawning naturally. There is no capability to capture unharvested winter steelhead in the East Fork Lewis. This causes a genetic impact and the ecological effects may be significant. The proportion of hatchery fish on the spawning ground exceeds 60%, resulting in an effective pHOS greater than 10%.

Recommendations

Due to the ecological and genetic risks from the segregated winter steelhead program on the ESA listed winter steelhead, this program should be modified in one of three ways to meet standards of a primary population: (1) reduce the size of the current segregated winter steelhead hatchery program to approximately 20,000 smolts; (2) reduce the size of the current segregated winter steelhead hatchery program to approximately 45,000 smolts and manage to remove 50% of the unharvested hatchery adults; or (3) replace with an integrated winter run program of approximately 40,000 smolts (with pNOB of 100%) and manage to remove 50% of the unharvested hatchery adults. All of these options represent a reduced genetic and ecological risk compared to current conditions. In any case, manage acclimation and release to reduce residualism, and recapture unharvested adults to the extent possible.

This stream is a good candidate to be a Wild Steelhead Management Zone. This would require eliminating all hatchery releases in the East Fork Lewis.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for East Fork Lewis River Winter 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%	23%	0.00	270	2.1	16	0
	Seg Harv	90.7	0%						801	1
No Hatchery	None None	-	0%	0%	0%	1.00	587	4.1	34	-
HSRG Solution	Int Both	40.3	50%	0%	4%	0.96	485	4.0	387	111
	Seg Harv	-	0%						-	-
HSRG Solution w/ Improved Habitat	Int Both	40.3	50%	0%	4%	0.96	563	4.4	392	111
	Seg Harv	-	0%						-	-