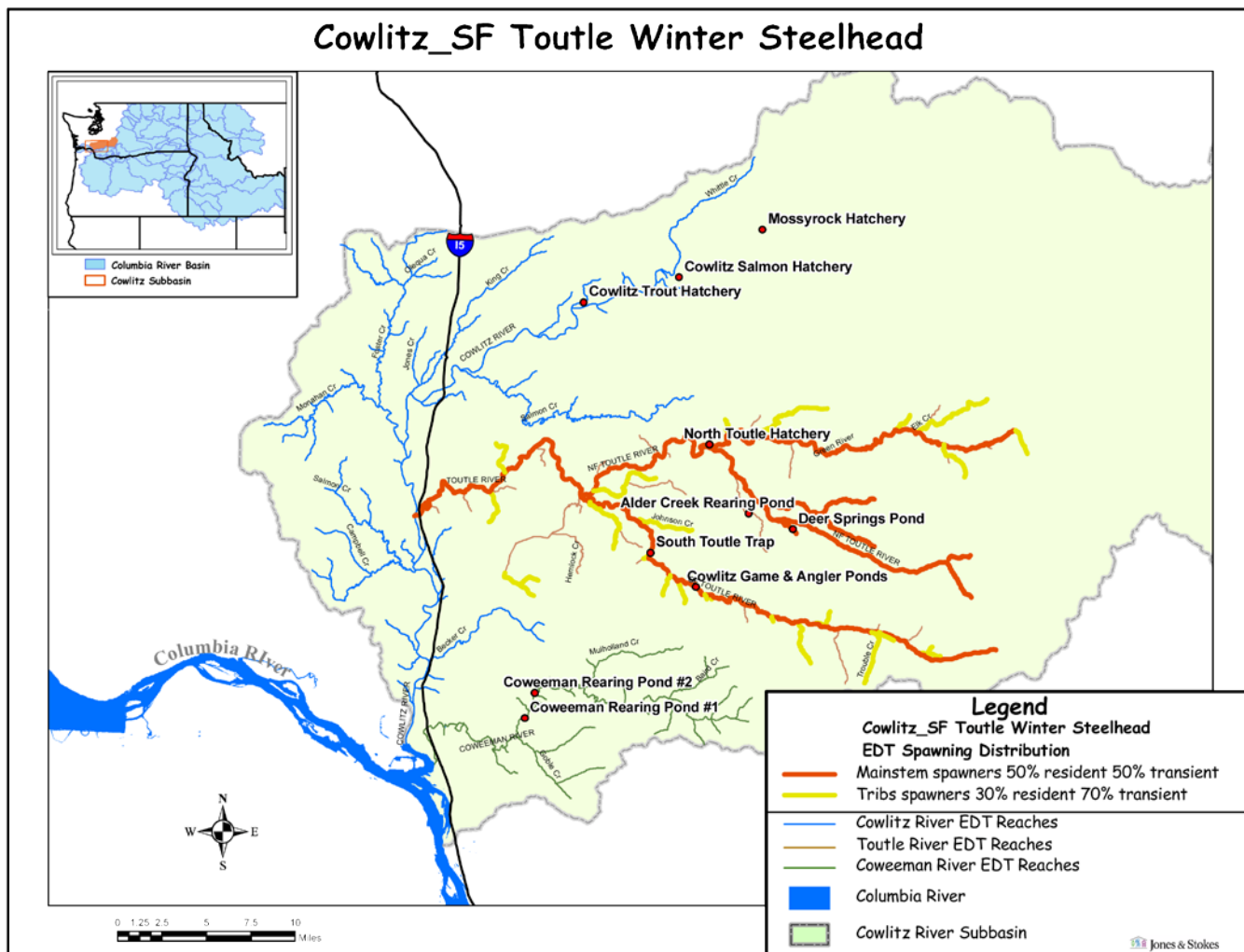


Hatchery Scientific Review Group Review and Recommendations

South Fork Toutle Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 South Fork Toutle Winter Steelhead

South Fork Toutle winter steelhead were identified as a stock based on their distinct spawning distribution. Most spawning takes place in the South Fork Toutle River and in tributaries such as Studebaker, Johnson, and Bear creeks. Spawning generally occurs from March through early June. This is a native stock with wild production. Aside from several small fry plants after the 1980 eruption of Mount St. Helens, hatchery winter steelhead have not been stocked into the South Fork Toutle River (SaSSI 2002).

Stock status was rated Depressed in 2002 because of chronically low escapements (low from 1994 to the present). An escapement goal of 1,058 fish has been established for this stock.

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

This is a segregated program that releases 25,000 Skamania stock smolts into the South Fork of the Toutle River.

- ESA Status: Late winter steelhead are listed as threatened and are part of the Lower Columbia River Steelhead DPS.
- Population Description: Primary
- Current Viability Rating: Medium
- Recovery Goal for Abundance: 550
- Productivity Improvement Expectation: 35%

Habitat Productivity and Capacity (from EDT): Productivity: 3.58; Capacity: 1,038

2.2 Current Hatchery Programs Affecting this Population

The program that plants 25,000 summer steelhead (Skamania origin) may affect this population. These fish are reared for a short duration in the lower subbasin. There is no hatchery winter steelhead program.

- PNI and pHOS Estimates (include straying from all hatchery programs): pHOS is 4%
- Estimated Productivity (with harvest and fitness factors effects from AHA): 2.4 for the native winter steelhead
- Projected Average Natural Origin Escapement: 678 winter steelhead
- Average Harvest Contribution: 522 hatchery summer steelhead and 39 natural winter steelhead
- Hatchery strays from in-basin integrated hatchery program: N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 150 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 2.4 to 3.3. Average abundance of natural origin spawners (NOS) would increase from 678 to 949. Harvest contribution of the natural and hatchery populations would go from 561 to 55.

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 South Fork Toutle winter steelhead population is listed as a Primary population for recovery. There is no hatchery program for late winter steelhead, but there is a straying issue due to segregated summer run steelhead plants in the Toutle (in both North Fork [25,000] and South Fork [25,000] which originate from Skamania Hatchery). The South Fork Toutle has no capability to capture unharvested summer steelhead. This causes a small genetic impact, but the ecological effect may be significant. The effective pHOS currently is 4% (Kostow, 2003, 2004, 2006).

Recommendation

Due to the ecological and genetic risks from the segregated summer 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 hatchery program (to about 15,000 smolts); (2) manage to remove hatchery adults (increase harvest or adult trap); or (3) replace with an integrated winter run program (up to 40,000 smolts). In any case, manage acclimation and release to reduce residualism to the extent possible. If the program were retained at the current level but an additional 20% of returning adults were removed through harvest or other means, one would expect an improvement in abundance and productivity of the natural population along with reduced ecological and genetic risk while retaining harvest benefits.

This stream is a good candidate to be a wild steelhead management zone.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for South Fork Toutle 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%	4%	0.00	678	2.4	39	0
	Summer Seg Harv	24.7	0%						522	1
No Hatchery	None None	-	0%	0%	0%	1.00	949	3.3	55	-
HSRG Solution	None None	-	0%	0%	2%	0.00	846	2.9	49	0
	Summer Seg Harv	23.9	20%						508	7
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	1,033	3.4	60	0
	Summer Seg Harv	23.9	20%						508	7