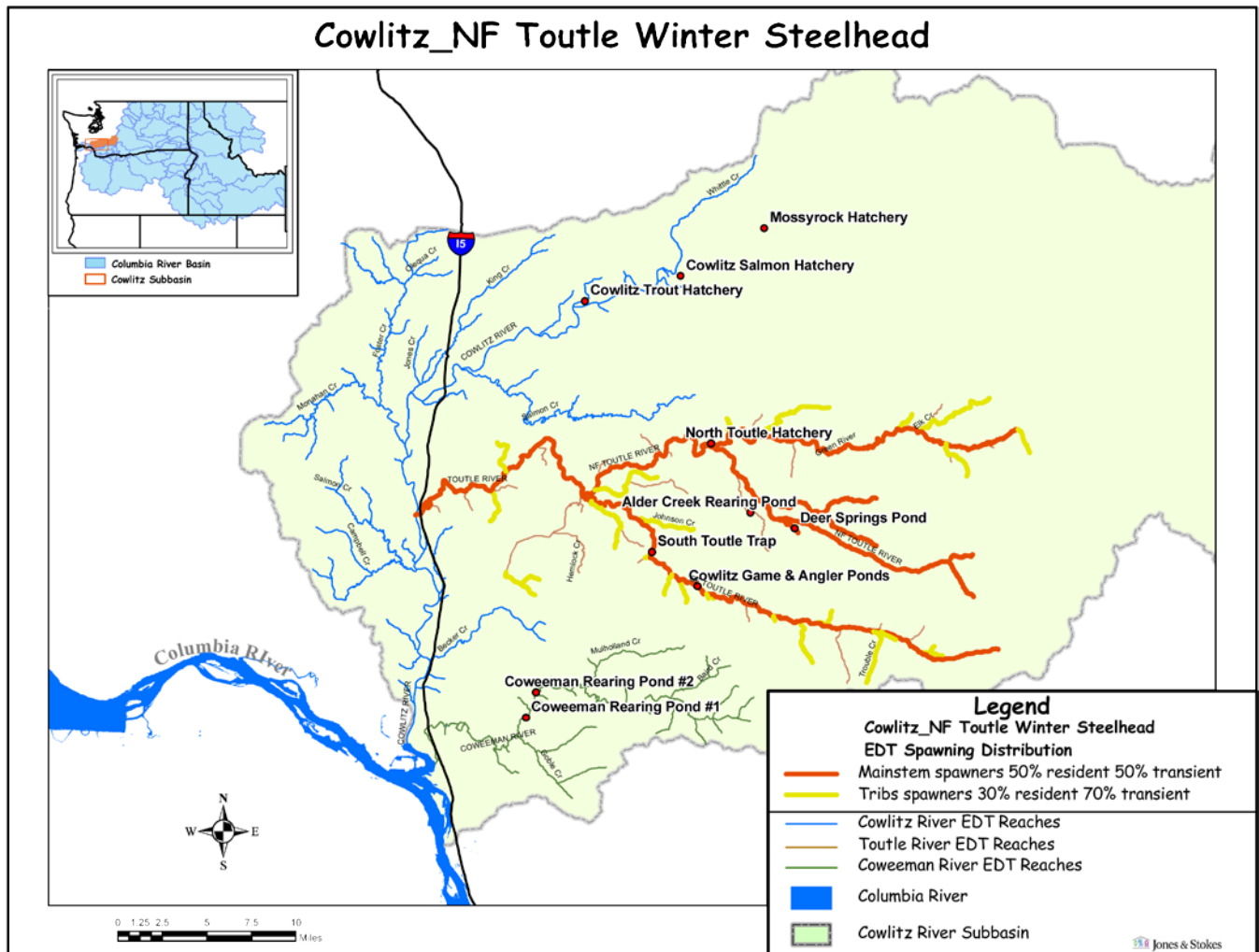


Hatchery Scientific Review Group Review and Recommendations

North Fork Toutle Winter Steelhead Population and Related Hatchery Programs

January 31, 2009



1 North Fork Toutle Winter Steelhead

Mainstem and North Fork Toutle winter steelhead were identified as a stock based on their distinct spawning distribution. Stock status was rated Depressed in 2002 because of chronically low escapements. Escapements have been consistently low as a result of habitat degradation caused by the Mt. St. Helens eruption in 1980. No escapement goal has been established for this stock.

Most spawning takes place in the mainstem and North Fork Toutle rivers generally from March through early June (SaSSI 2002). Spawning also occurs in tributaries such as Alder and Deer creeks.

Genetic sampling was conducted in 1995; 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).

Green (Toutle) winter steelhead were identified as a stock based on their distinct spawning distribution. This is a native stock with wild production (SaSSI 2002). An escapement goal of 1,100 fish has been established. Stock status was rated Depressed in 2002 because of chronically low escapements. Most spawning takes place in the Green River and in tributaries such as Devil, Elk, and Shultz creeks. Spawning generally occurs from March through early June.

These populations were combined in this analysis as they are not separated in the Lower Columbia River Recovery Plan.

2 Current Conditions

2.1 Current Population Status and Goals

This is a segregated hatchery program releasing Skamania summer steelhead. The current program is 25,000 yearling smolts.

- ESA Status: Late winter steelhead, native to this system, are listed as threatened, and are part of the Lower Columbia River Steelhead DPS.
- Population Description: Primary
- Current Viability Rating: Very Low
- Recovery Goal for Abundance: 600
- Productivity Improvement Expectation: 125%

Habitat Productivity and Capacity (from EDT): Productivity: 2.79; Capacity: 963

2.2 Current Hatchery Programs Affecting this Population

The current program is a segregated harvest program of Skamania stock summer steelhead that releases 25,000 smolts into the North Fork Toutle River.

- pHOS Estimates (include straying from all hatchery programs): 6%
- Estimated Productivity (with harvest and fitness factors adjusted from AHA): 1.6 productivity of the native winter steelhead
- Projected Average Natural Origin Escapement: 424 winter steelhead

- Average Harvest Contribution: 436 summer steelhead and 25 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 1.6 to 2.6. Average abundance of natural origin spawners (NOS) would increase from 424 to 795. Harvest contribution of the natural and hatchery populations would go from 461 to 46.

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 North 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). This causes a small genetic impact, but the ecological effect may be significant. The effective pHOS currently is 6%.

Recommendations

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; (2) manage to remove hatchery adults; or (3) replace with an integrated winter run program. In any case, manage acclimation and release to reduce residualism to the extent possible. If the program is converted to an integrated program, it should have a PNI greater than 0.67 and a pHOS less than 30% (for example, 142,000 release and pNOB of 30%). Means will be needed to collect natural-origin adults and to remove at least 90% of the unharvested returning hatchery-origin adults.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for North 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%	6%	0.00	424	1.6	25	0
	Seg Harv	24.7	0%						436	0
No Hatchery	None None	-	0%	0%	0%	1.00	795	2.6	46	-
HSRG Solution	Int Harv	142.2	90%	0%	4%	0.87	666	2.5	1,936	605
	Seg Harv	-	0%						-	-
HSRG Solution w/ Improved Habitat	Int Harv	142.2	90%	0%	3%	0.91	802	2.8	1,944	605
	Seg Harv	-	0%						-	-