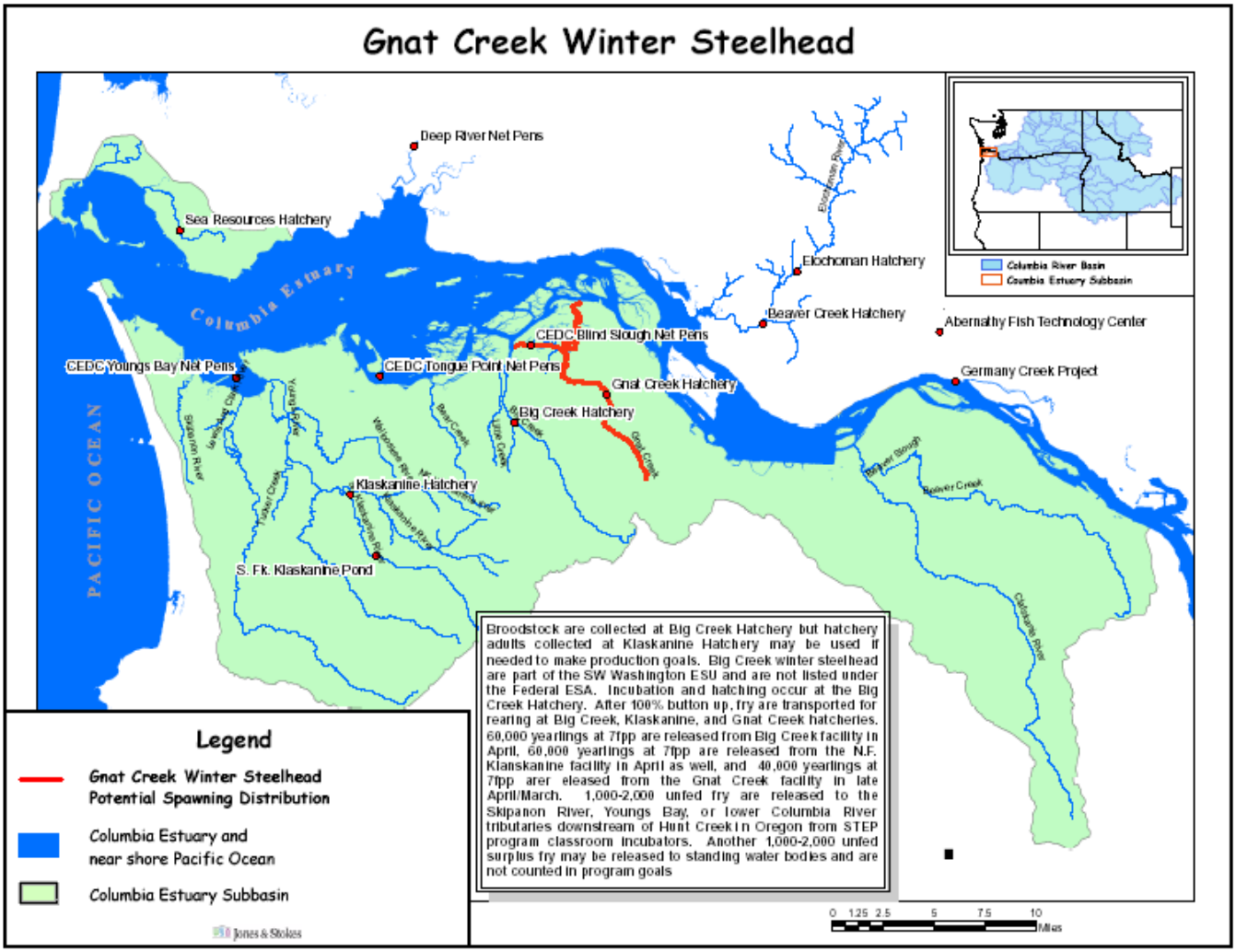
Hatchery Scientific Review Group
Review and Recommendations

Gnat Creek Winter Steelhead Population
Population and Related Hatchery Programs

January 31, 2009



1 Gnat Creek Winter Steelhead

Gnat Creek is a small Oregon tributary that enters the Columbia River about 17 miles east of Astoria. Gnat Creek has an impassable falls shortly above the hatchery so little habitat is available to support natural spawning.

2 Current Conditions

2.1 Current Population Status and Goals

This is a hatchery population, the purpose of which is to support harvest. This program obtains 40,000 winter steelhead from the Big Creek Hatchery in December which are then reared to 7 fpp and released directly into Gnat Creek in early April.

- ESA Status: This population is not listed. It is within the Southwest Washington Coast Steelhead DPS.
- Population Description: Little habitat exists in Gnat Creek to support a viable natural population. An impassible falls is located immediately above the hatchery. The current population is hatchery origin. Any natural-origin steelhead would likely be progeny of hatchery fish. Unmarked steelhead are also likely mismarked hatchery fish.
- Current Viability Rating: Likely Very Low
- Recovery Goal for Abundance: NA.
- Productivity Improvement Expectation: Very low
- Habitat Productivity and Capacity: Productivity: 4.0; Capacity: 25 assigned for this review

2.2 Current Hatchery Programs Affecting this Population

The hatchery program releases 40,000 marked smolts at 7 fpp. Broodstock origin is Big Creek Hatchery and occasionally Big Creek stock from Klaskanine Hatchery. Juvenile steelhead are received at Gnat Creek Hatchery in December, and then reared until release in early April.

- pHOS Estimates (include straying from all hatchery programs): 18%
- Estimated productivity (with harvest and fitness factor effects from AHA): 1.81
- Projected Average Natural Origin Escapement: 9 adults
- Average Harvest Contribution: 118 adults

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 16 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 1.8 to 3.6. Average abundance of natural origin spawners (NOS) would increase from approximately 9 fish to approximately 18 fish. Harvest contribution of the natural and hatchery populations would go from approximately 118 fish to approximately 2 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

This population is considered a Stabilizing population. There is a 40,000 segregated winter steelhead smolt release program.

Recommendations

The HSRG has no specific recommendations for this program.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Gnat Creek 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	-	90%	0%	18%	0.00	9	1.8	1	0
	Seg Harv	40.0	90%						117	96
No Hatchery	None None	-	0%	0%	0%	1.00	18	3.6	2	-
HSRG Solution	None None	-	90%	0%	12%	0.00	9	1.9	1	0
	Seg Harv	40.0	90%						117	96
HSRG Solution w/ Improved Habitat	None None	-	90%	0%	9%	0.00	11	2.2	1	0
	Seg Harv	40.0	90%						117	96