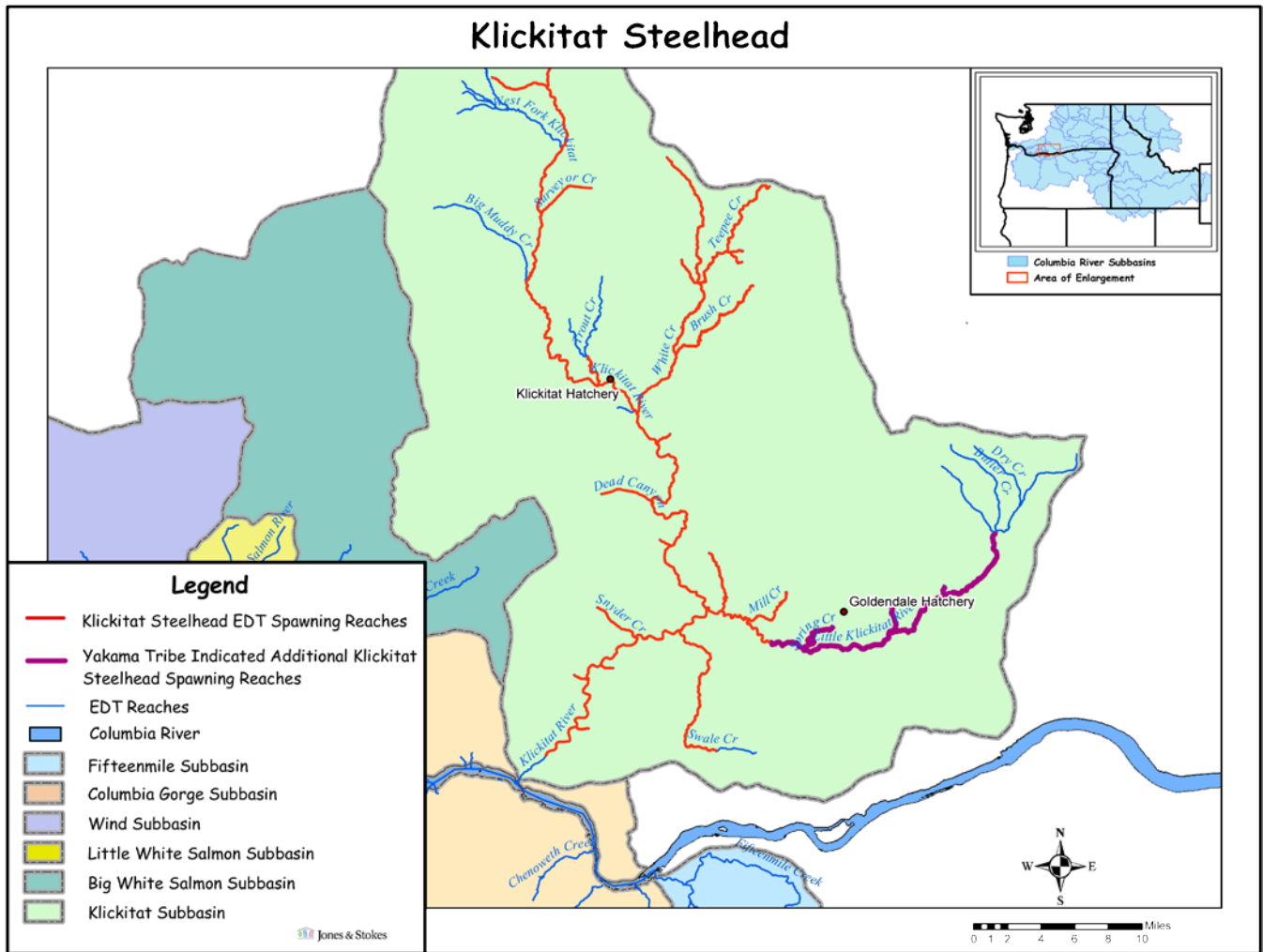


Hatchery Scientific Review Group Review and Recommendations

Klickitat Steelhead Population and Related Hatchery Programs

January 31, 2009



1 Klickitat Steelhead

The Interior Columbia Technical Recovery Team combined natural summer and winter Klickitat steelhead populations into one population because spawning areas overlap and samples from the sport fishery do not show strong segregation. Genetic information (Phelps et al. 2000) indicates some degree of genetic differentiation between tributaries of the Klickitat River, with Upper Klickitat, White Creek, and Trout Creek appearing to be most different from the Skamania Hatchery stock.

Washington Department Fish & Game identifies both a summer-run population (SaSI #6833) and winter-run population (SaSI #6840) in the Klickitat River subbasin. The native Klickitat winter run is one of only two populations of inland winter steelhead in the United States- the other is in Fifteenmile Creek.

Native Klickitat steelhead are part of the Mid-Columbia Steelhead Distinct Population Segment (DPS). The Mid-Columbia Steelhead DPS, as described by National Marine Fisheries Service (NMFS), occupies the Columbia River Basin from Mosier Creek, Oregon, upstream into the Yakima River subbasin in Washington. In proposing to list this ESU, NMFS cited low returns to the Yakima River, poor abundance estimates for Klickitat River and Fifteenmile Creek winter steelhead, and an overall decline for naturally producing stocks within the ESU (NMFS 1999).

Spawning occurs from early March through early June and is concentrated in the Klickitat and Little Klickitat rivers with some spawning also taking place in Swale, White and Trout creeks and their tributaries.

2 Current Conditions

2.1 Current Population Status and Goals

This section describes the current population, status, and goals for the *natural* population.

- ESA Status: Native Klickitat steelhead are part of the Mid-Columbia Steelhead DPS which was listed as Threatened under the ESA in 1999. This status was reaffirmed in 2005.
- Population Designation: Using a rating system similar to that used by the recovery planners for the Lower Columbia and Willamette arrives at a designation of Primary.
- Current Viability Rating: Unknown
- Recovery Goal for Abundance: Unknown
- Productivity Improvement Expectation: Unknown.
- Habitat Productivity and Capacity (from EDT): Productivity: 4.20; Capacity: 1,621; with passage at Castile Falls Productivity: 4.5, Capacity: 2,597

2.2 Current Hatchery Programs Affecting this Population

Summer steelhead from the Skamania River are released into the Klickitat River at RKM 16.1, 29.0, 40.3, and 45.1 (HGMP 2004). Smolt releases average around 100,000 annually (22-year average) and are released at ~6.7 fish per pound (14-year average) in late April to early May. Brood collection, spawning, and rearing all take place at the Skamania Hatchery on the Washougal River. The program operates as a Segregated Harvest program collecting only hatchery origin brood from the Washougal River.

- For future out-plants to the Klickitat River, the Yakima/Klickitat Fisheries Project (YKFP) Transition Plan (Oshie and Ferguson 1998) calls for phasing out Skamania Hatchery stock and shifting to supplementation of naturally spawning Klickitat stock. Implementation of this new effort would be conducted at the Klickitat Hatchery.

Estimated number of hatchery strays affecting this program:

- Hatchery strays from in-basin integrated hatchery program: N/A
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 415 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 PNI (proportionate natural influence) 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 2.6 to 4.2. Average abundance of natural-origin spawners (NOS) would increase from 1,241 to 2,053. Harvest contribution of the natural and hatchery populations would go from 2,918 to 996.

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 current segregated program (100,000 direct plant summer steelhead from Skamania Hatchery) is consistent with management principles for a Primary summer steelhead population. There is little data available on winter steelhead in the Klickitat subbasin.

If considering an integrated program, there are a number of implications including residualism, infrastructure costs, and challenges collecting spawning broodstock over the entire run.

Recommendations

Either an integrated or segregated summer steelhead program can be operated consistent the HSRG guidelines for a Primary population (PNI >0.67 for an integrated program or a pHOS less than 5% for a segregated program). However, each has a different set of potential risks and benefits.

With a segregated program, considerations include collection of broodstock from Klickitat Hatchery (local broodstock of Skamania origin) and would require adult collection facilities to minimize straying.

For an integrated program, considerations would include sufficient infrastructure for broodstock collection and rearing. Program goals would likely be met with a 25% pNOB objective. A concern with integrated steelhead programs is the potentially high rate of residualism.

The HSRG supports ongoing winter steelhead data collection by managers and improved data collection facilities such as the fish trap facility proposed at Lyle Falls.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Klickitat 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%	6%	0.00	1,241	2.6	602	0
	Seg Harv	100.5	0%						2,316	0
No Hatchery	None None			0%		1.00	2,053	4.2	996	-
HSRG Solution	Int Harv	120.4	80%	0%	4%	0.87	2,001	4.0	2,972	308
	Seg None	-	0%						-	-
HSRG Solution w/ Improved Habitat	Int Harv	120.4	80%	0%	3%	0.88	2,276	4.5	3,105	308
	Seg None	-	0%						-	-