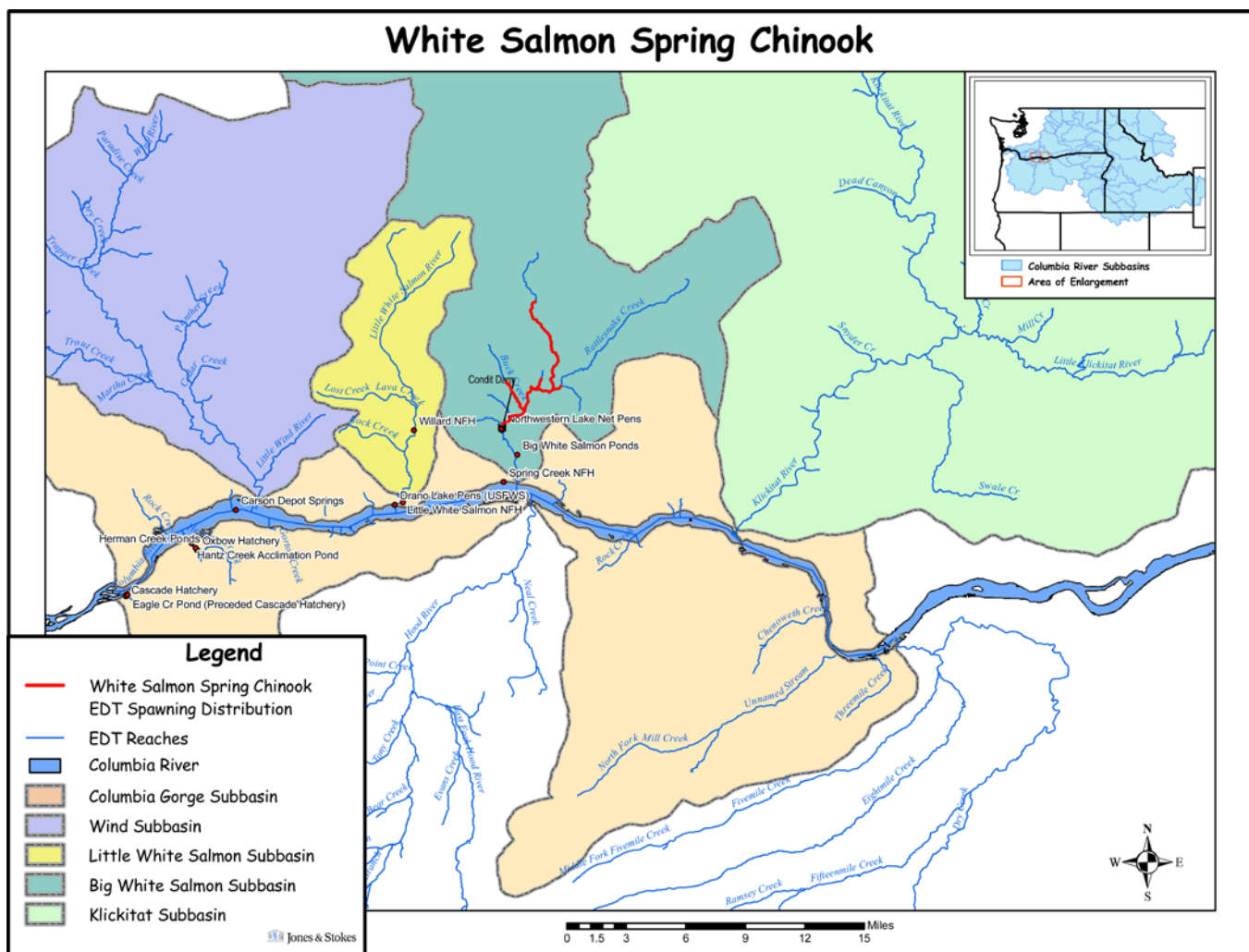


Hatchery Scientific Review Group Review and Recommendations

White Salmon Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 White Salmon Spring Chinook

Chinook salmon are native to the White Salmon River (WDF et al. 1993). Their historical distribution extended from the mouth up to above Husum Falls (RM 12) in the mainstem, and Rattlesnake Creek. It is unclear if the Chinook salmon observed at Husum Falls were spring or fall Chinook salmon. Since Condit Dam inundated a gorge in the White Salmon River, it is unclear if barrier waterfalls existed to maintain a separation between spring and fall Chinook salmon.

Condit Dam, built in 1913 at RM 3.4, blocks access to habitat upstream. Spring Chinook were extirpated from the White Salmon subbasin, likely because of the lack of fish passage at Condit Dam. Carson stock has been released periodically in the basin since the 1980s. Spring Chinook spawning escapement is estimated from redd surveys. Escapement averages slightly more than 100 fish. Most spawners are presumed to be of hatchery origin; their reproductive success is unknown.

Spring Chinook adults return as immature fish between February and May. Eggs remain in the gravel until emergence, which occurs from February to April, depending on water temperatures. Shortly after fry colonization, juveniles begin their outmigration. Spring Chinook juvenile can continue rearing until October. Outmigration for yearlings occurs during the following spring.

For the purposes of EDT modeling, spring Chinook distribution extended from the mouth to Little Buck Creek. EDT modeling indicates wild spring Chinook abundance in the absence of harvest has declined from 871 spawners in the historic condition to no fish currently.

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:** White Salmon River spring Chinook are part of the Lower Columbia Chinook ESU, which was listed as Threatened under the ESA in 1999.
- **Population Description:** The White Salmon spring Chinook population is designated as a Contributing population in the Lower Columbia Salmon Recovery and Subbasin Plan (LCSR&SP 2004). The LCSR&SP describes current viability as Very Low with a viability goal of Low.
- **Recovery Goal for Abundance:** 400.
- **Productivity Improvement Expectation:** Unknown.
- **Habitat Productivity and Capacity (e.g., from EDT):** Productivity: 0, Capacity: 0 (with no passage at Condit Dam); Productivity: 3.1, Capacity: 871 (with passage at Condit Dam).

2.2 Current Hatchery Programs Affecting this Population

There are no spring Chinook hatchery programs targeting the White Salmon subbasin. Reintroduction of this stock would include use of an outside stock and would require passage upstream of Condit. The best stock source may be from the Klickitat; however, this location is outside the lower Columbia ESU. Criteria would need to be evaluated for appropriate source

stocks for reintroduction. The White Salmon River target of “low” recognizes the long time frame required to restore a locally-adapted natural population from an out-of-basin stock.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin integrated hatchery program: NA.
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 31 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 Recommendations 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 be unchanged without passage at Condit Dam and would increase from 1.31 to 2.63 if passage were provided. Average abundance of natural-origin spawners (NOS) would be unchanged without Condit Dam passage and would increase from 227 to 504 with passage. Harvest contribution of the natural and hatchery populations would be unchanged without Condit Dam passage and would increase from 27 to 61 if passage were provided.

3.2 HSRG Observations/Recommendations

In the Observations and Recommendations 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 incorporate all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

<p>Observations</p> <p>Currently, there are no native spring Chinook in the White Salmon River. When Condit Dam is removed, it will be necessary to reintroduce spring Chinook.</p> <p>With successful reintroduction, the stock could achieve its numeric recovery goal. Donor sources appear to be limited; the closest source is the Klickitat River, which is outside the ESU. We assume that reintroduction may include some hatchery production for a limited amount of time.</p> <p>Recommendations</p> <p>During reintroduction, it is recommended that strays from outside sources should be monitored.</p>
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Table 1. Results of HSRG analysis of current condition and HSRG Solution for White Salmon Spring Chinook. 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	-	0%	0%	0%	0.00	0	0.0	0	0
	None									
No Hatchery	None	-	0%	0%	0%	0.00	0	0.0	0	-
	None									
HSRG Solution	None	-	0%	0%	0%	0.00	0	0.0	0	0
	None									
HSRG Solution w/ Improved Habitat	None	-	0%	0%	0%	0.00	0	0.0	0	0
	None									