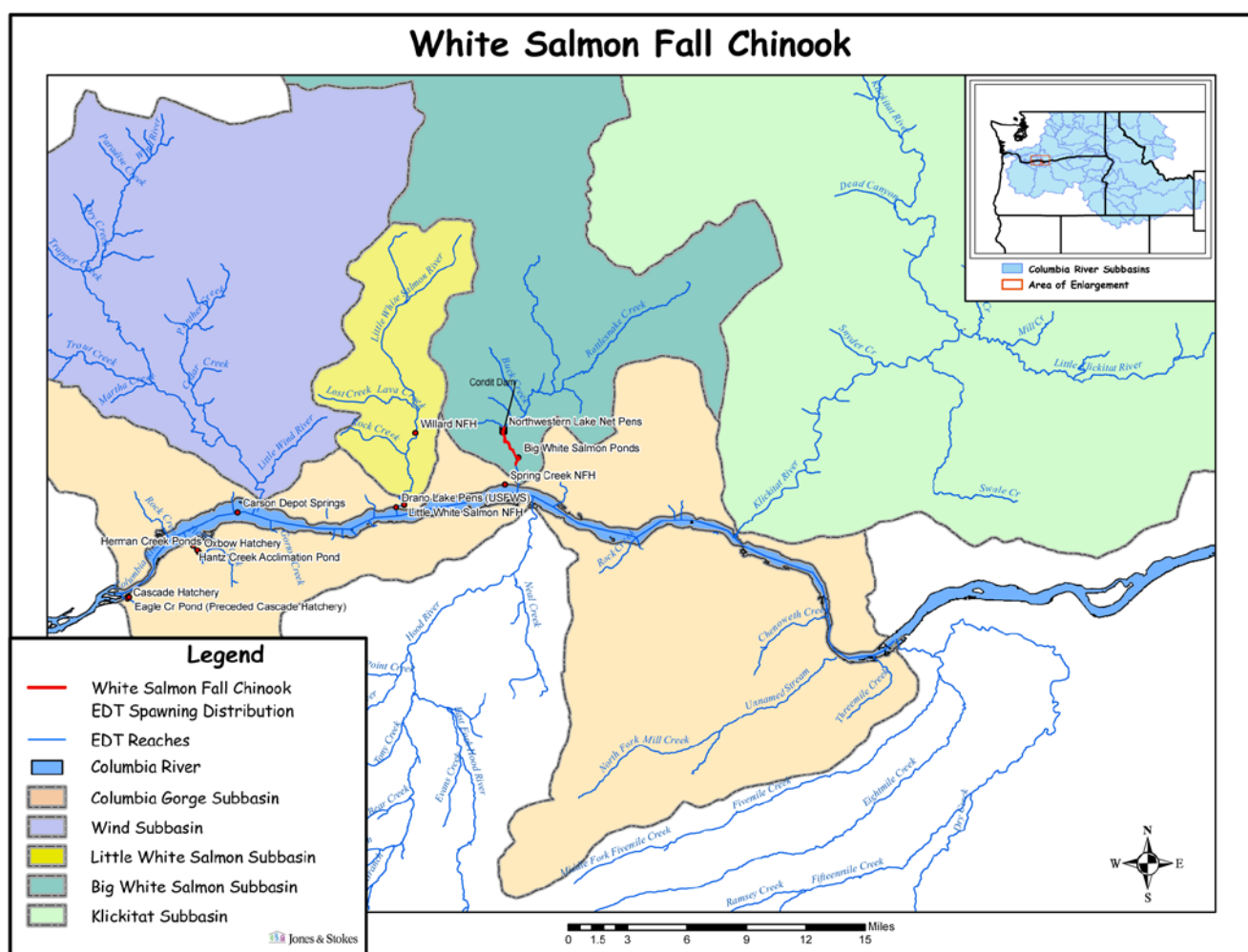


Hatchery Scientific Review Group Review and Recommendations

White Salmon Fall Chinook Population and Related Hatchery Programs

January 31, 2009



1 White Salmon Fall Chinook Salmon

The White Salmon River has both tule and bright natural spawning Chinook. Tules are native to the White Salmon River and listed for protection under ESA. The brights are not native and not listed under the ESA. Historically, the tule fall Chinook population was large in the White Salmon. Spawning is currently confined to the lower 3 miles of mainstem White Salmon River below Condit Dam (RM 3.3).

The tule fall Chinook is a mixed stock with composite production. The White Salmon River tule fall Chinook stock is represented both in wild spawners and in local hatchery programs. Tule fall Chinook were used as broodstock to create the Spring Creek Hatchery tule fall Chinook program in 1901. Strays from Spring Creek NFH have been recovered in the White Salmon River.

The estimated wild escapement of tule fall Chinook from 1992 to 2004 averaged 319 fish, ranging from 32 to 1,696 adults. Based on EDT modeling, the current tule fall Chinook abundance at equilibrium is expected to be 982 adults in the absence of harvest. Although escapement of tule fall Chinook increased in 2001, stock status was rated depressed in 2002, due to chronically low escapements. Loss of historic spawning habitat above Condit Dam may contribute to poor stock performance. Fall Chinook enter the river from August through October and are usually near final stages of maturity upon entry. Tule spawning generally occurs in October, earlier than in the White Salmon River bright fall Chinook. No genetic analysis has been done on White Salmon River tule fall Chinook.

The upriver bright (URB) fall Chinook is a non-native stock with composite production. White Salmon River URB fall Chinook appear to be derived from the Little White Salmon National Fish Hatchery URB fall Chinook. Escapements have been fairly stable and the stock status was rated healthy in 2002. Spawning is confined to the lower 3 miles of the mainstem White Salmon River below Condit Dam. Spawning generally occurs in October, later than the White Salmon River tule fall Chinook stock.

The Spring Creek Hatchery is located immediately downstream of the river mouth and straying of returning hatchery adults to the White Salmon River is consistent. A treaty Indian fishery targets Spring Creek Hatchery fish near the river mouth. The White Salmon population is targeted for medium viability.

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 fall Chinook are part of the Lower Columbia Chinook ESU, which was listed as Threatened under the ESA in 1999.
- Population Description: The White Salmon fall 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 Low with a viability goal of Medium.
- Recovery Goal for Abundance: 900.
- Productivity Improvement Expectation: Unknown.

- Habitat Productivity and Capacity (e.g., from EDT): Productivity 6.08; Capacity 1,172 (with Condit Dam in place); according to EDT results, fall Chinook potential is the same or slightly less with removal of Condit Dam.

2.2 Current Hatchery Programs Affecting this Population

No fall Chinook hatchery programs occur within this basin.

The Spring Creek Hatchery program, which originated from White Salmon fall Chinook stock, is located immediately downstream of the river mouth and produces fish that stray into the White Salmon River. Since 1992, Spring Creek Hatchery tules have accounted for more than 30% of the natural spawning fish. The percentage of hatchery fish spawning naturally has ranged from 0% to 86% during this period. Based on allozyme analysis, WDFW identified Spring Creek Hatchery tules as genetically different than all other tule stocks.

There is a segregated harvest program for URB fall Chinook at the Little White Salmon/Willard NFH Complex. The purpose of the program is to provide mitigation (production for fisheries) for the federal hydropower system impacts, other development, to meet obligations under the U.S. v Oregon court agreement, and to produce 1.7 million fry for transfer to the Yakima River Basin. A total of 2 million sub-yearling URB fall Chinook salmon are reared and released on-site from Little White Salmon NFH as part of the Corps of Engineers' John Day Dam mitigation program (HGMP 2004).

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: 675 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 increase from 0.6 to 1.2. Average abundance of natural-origin spawners (NOS) would decrease from 128 to 38. Harvest contribution of the natural and hatchery populations would go from 533 to 159.

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 incorporates all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

Observations

Removal of Condit Dam will open additional habitat for tule fall Chinook. This population receives significant numbers of strays from neighboring hatchery populations, both tules and upriver brights.

The best available broodstock for reintroduction/recovery of the White River tule population is currently being evaluated.

Recommendations

If managers determine there is a need to control the stray fish from nearby hatcheries to achieve a pHOS consistent with a contributing population (less than 0.1), a control weir could be considered in the lower river. Other means, such as selective harvest of hatchery fish in the terminal area, also might be considered.

The HSRG supports the USFWS effort to PIT-tag a representative portion of the release for the purpose of developing in-season management information. All fish currently are mass-marked and a portion is coded-wire tagged for monitoring harvest contribution, stray rates and to provide other relevant biological information.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for White Salmon Fall 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%	80%	0.00	128	0.6	533	0
	None									
No Hatchery	None	-	0%	0%	0%	1.00	38	1.2	159	-
HSRG Solution	None	-	0%	0%	67%	0.00	317	1.4	408	0
	None									
HSRG Solution w/ Improved Habitat	None	-	0%	0%	65%	0.00	352	1.5	452	0
	None									