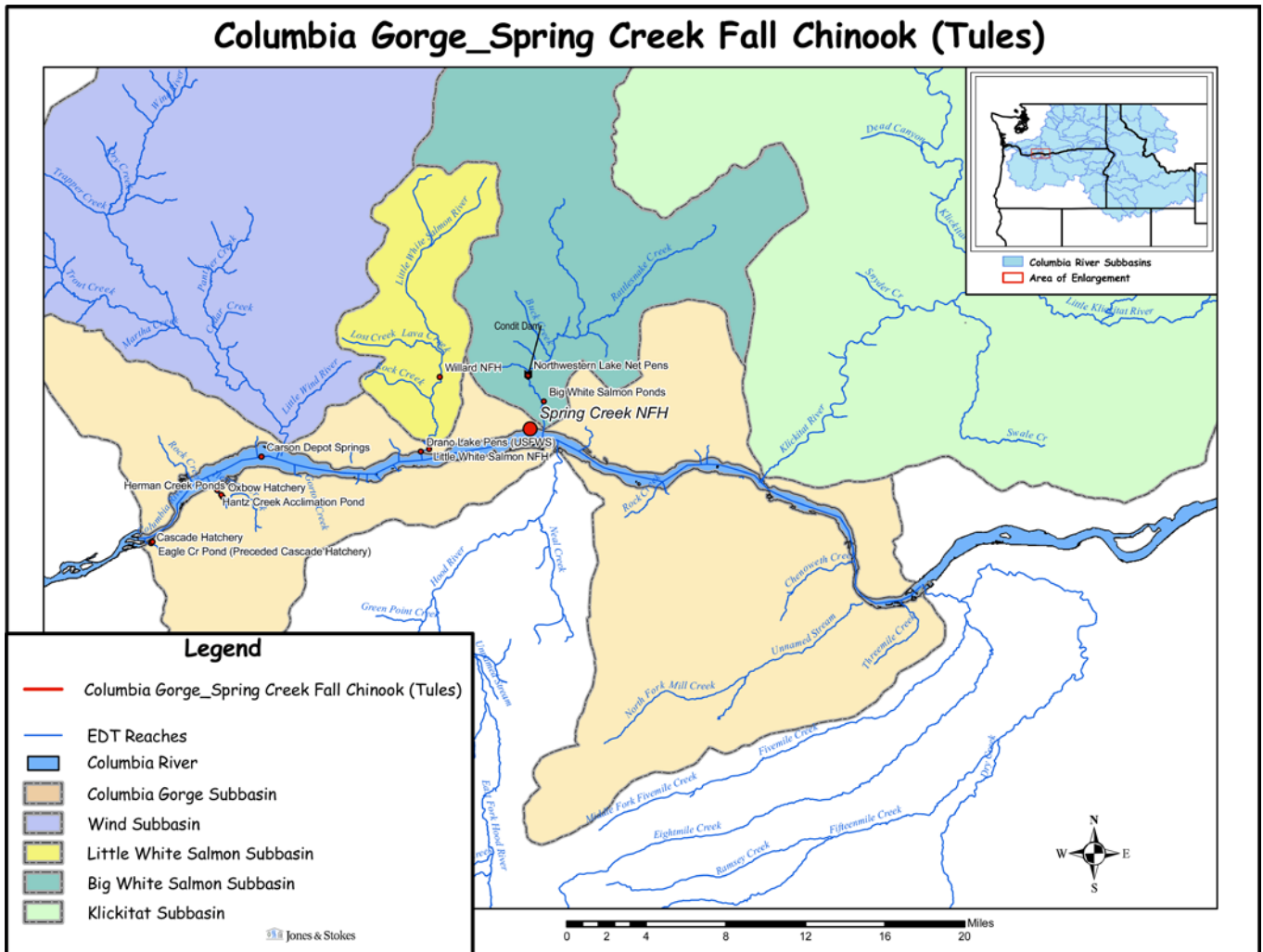


Hatchery Scientific Review Group Review and Recommendations

Columbia Gorge Spring Creek Fall Chinook Population and Related Hatchery Programs

January 31, 2009



1 Columbia Gorge Spring Creek Fall Chinook

The Spring Creek fall Chinook (tule) is a segregated hatchery population. There is no natural self-sustaining fall Chinook population in Spring Creek.

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. The hatchery component of Columbia River fall Chinook is considered part of the ESU (including those from the Spring Creek Hatchery), but is not essential for recovery.
- **Population Description:** There is no natural population; this is a hatchery population.
- **Recovery Goal for Abundance:** There is no natural population; this is a hatchery population.
- **Productivity Improvement Expectation:** There is no natural population; this is a hatchery population.
- **Habitat Productivity and Capacity (e.g., from EDT):** There is no natural population; this is a hatchery population.

2.2 Current Hatchery Programs Affecting this Population

The purpose of the tule fall Chinook program at Spring Creek National Fish Hatchery is to mitigate for lost and degraded habitat and fish populations caused by the construction and operation of the Columbia River hydropower system by producing locally adapted broodstock for sport, commercial, tribal, and international harvest. The Spring Creek tule fall Chinook broodstock originated from the White Salmon River, a mile from the location of the hatchery, and is the stock of choice for reintroduction in the White Salmon River pending Condit Dam removal. Approximately 15,100,000 fingerling fall Chinook are released on-site annually.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin integrated hatchery program – from AHA summary: NA.
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs – from AHA summary: 1,660 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).

Harvest contribution of the natural and hatchery populations would go from 70,994 to 0.

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).

Observations

The HSRG noted that all unmarked fish were returned to the river. At the present time, the origin of these unmarked fish is unclear (e.g., truly natural-origin fish or mis-clipped hatchery-origin fish).

The management policy and practice for incorporating jacks in spawning protocols is unclear to the HSRG.

The Spring Creek Hatchery is a 90% water re-use system. This has been identified as a risk factor and is being evaluated by the USFWS.

This program sees very high survival rates relative to other programs in the region and consistently is a major contributor to the tule harvest.

Recommendations

Continue the program as currently operated.

The HSRG supports the USFWS objective 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 coded-wire tagged for monitoring harvest contribution, stray rates and to provide other relevant biological information.

The HSRG recommends that managers implement a BKD control strategy for their spring and summer/fall Chinook hatchery programs where BKD has proved a recurring problem. Ideally, the strategy should include culling (destroying) eggs/progeny from hatchery- and natural-origin brood that are found to be infected with the BKD agent. However, because brood fish with high levels of the BKD agent are more likely to transmit the agent to their progeny than brood with lesser levels of the agent, the culling of eggs/progeny from infected brood fish, should, at the very least, be applied to those with high levels of the BKD agent (e.g., ELISA OD value of 0.4 and above when broodstock are not in short supply and ELISA OD value of 0.6 and above when broodstock are in short supply). In addition, in programs using ESA-listed natural-origin brood fish, the culling of their eggs/progeny may, at the managers' discretion, be dispensed with. However, the ESA-listed broodstock should be injected, pre-spawning, with an appropriate antibiotic (preferably, azithromycin at 40 mg/kg fish), and the resulting eggs should be surface-disinfected with an iodophor. All pre-spawning brood injections may be limited to females, ESA-listed or otherwise.

Finally, eggs and hatchlings derived from broodstock found to be heavily infected with the BKD agent should be incubated/reared in isolation from those obtained from broodstock with no or lesser levels of the BKD agent. In addition, the hatchlings should be reared at the lowest possible densities (below current standards), and, at the first signs of infection with the BKD agent, they should be treated with orally administered erythromycin (100 mg/kg fish) for 28 days. The treatment should be repeated if there is evidence that the BKD agent has persisted in the hatchlings.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Columbia Gorge Spring Creek Fall Chinook (Tules – Hatchery). 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										
	Seg Harv	15,044.9	90%						70,994	5,658
No Hatchery										
HSRG Solution										
	Seg Harv	15,044.9	90%						59,397	15,673
HSRG Solution w/ Improved Habitat										
	Seg Harv	15,044.9	90%						59,397	15,673