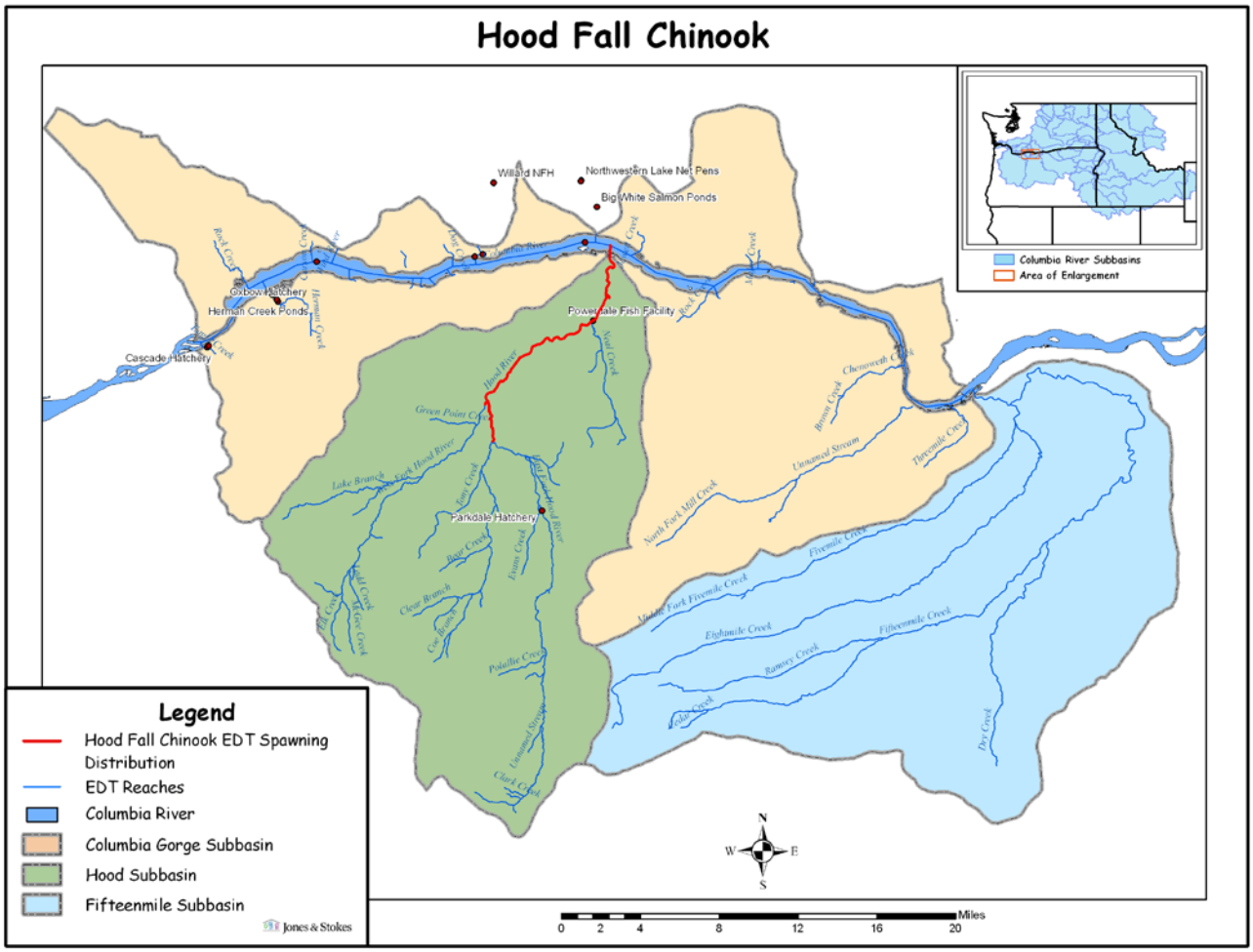
Hatchery Scientific Review Group
Review and Recommendations

Hood River Fall Chinook
Population and Related Hatchery Programs

January 31, 2009



1 Hood River Fall Chinook

Tule fall Chinook are native to the Hood River subbasin, but their abundance has been consistently low in recent years. For the period from 1992-2003, the annual return of fall Chinook to Powerdale Dam has averaged 26 fish, with a range from 6 to 70 (Hood River Subbasin Plan 2004). Between 1992 and 1998, fall Chinook returns to Powerdale Dam ranged from 6 to 36 unmarked fish, with 2 to 7 marked hatchery strays (Olson and French 1999).

The historical fall Chinook run in the Hood River is believed to have always been low, although higher than current levels. Area fish managers believe that egg-to-fry and fry-to-smolt survival is extremely poor for fall Chinook in the Hood River, due in large part to natural factors. Most fall Chinook spawning occurs in the Hood River mainstem, where high glacial sediment loading and a flashy peak flow pattern leads to poor overwinter incubation survival. Shallow stream margin and off-channel habitats important to emergent and early fry survival are scarce in the mainstem Hood River, due natural channel morphology and habitat modification (Hood River Subbasin Plan 2004).

Fall Chinook enter the Hood River from early July through October and spawn in late September through early November. Outmigrant trap data from 1994 to 2001 suggests that wild spring Chinook predominantly migrated out of the Hood River in the fall (Underwood et al. 2003). Ocean-type fall migrants (those that outmigrate in late summer/fall after emergence) are estimated to make up 85% of the population. Stream-type residents and transients (those that either leaver the subbasin as yearlings in the second spring after emergence and near their spawning reaches, or rear by redistributing to locations downstream from their spawning reach) make up 15% of the population. The majority of the fall Chinook spawn in the lower Hood River below Powerdale Dam, although spawning also occurs in the lower East Fork and West Fork Hood River and Neal Creek. Fall Chinook spawning occurs in late September through early November (Hood River Subbasin Plan 2004).

Fall Chinook in the Hood River are believed to be hatchery strays and the progeny of hatchery strays. Coincident with a record high run at Bonneville Dam, 109 fall Chinook returned to Powerdale Dam in 2003. The prior record since continuous trapping began in 1992 was 36 (Hood River Subbasin Plan 2004).

NOAA (2005) estimates that 100% of the historical estimated 35 river miles of potential fall Chinook spawning habitat are still intact (Updated Status of West Coast ESUs).

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: Hood fall Chinook are part of the Lower Columbia Chinook ESU which was listed as threatened under the ESA in 1994.
- Population Designation: The Hood fall Chinook population is designated as a Stabilizing population in the Lower Columbia Salmon Recovery and Subbasin Plan (LCSR&SP 2004).
- Current Viability Rating: The LCSR&SP describes current viability as Unknown with a viability goal of Low+.

- Recovery Goal for Abundance: Unknown.
- Productivity Improvement Expectation: Unknown.
- Habitat Productivity and Capacity (from EDT): Productivity 1.47; Capacity 4,227.

2.2 Current Hatchery Programs Affecting this Population

No fall Chinook hatchery program currently operates in the Hood River; however, about 188 adult fall Chinook from other programs are estimated to stray into this system annually. Under the current scenario, pHOS is estimated at 80%, even though no hatchery fall Chinook are released in the basin. Annually, approximately 30 natural-origin adults are estimated to return to the Hood River.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 188 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 0.1 to 0.3. Average abundance of natural-origin spawners (NOS) would decrease from approximately 30 fish to approximately 0 fish. Harvest contribution of the natural and hatchery populations would go from approximately 127 fish to approximately 0 fish.

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).

Observation

The habitat potential for fall Chinook in the Hood River is extremely poor and for that reason this population is not a candidate to contribute to recovery of the ESU.

Recommendations

The HSRG recommends that managers continue to monitor the contribution of hatchery strays in the Hood River.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Hood River 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 None	-	0%	0%	80%	0.00	30	0.1	127	0
No Hatchery	None None	-	0%	0%	0%	1.00	0	0.3	0	-
HSRG Solution	None None	-	0%	0%	61%	0.00	51	0.3	67	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	58%	0.00	59	0.4	77	0