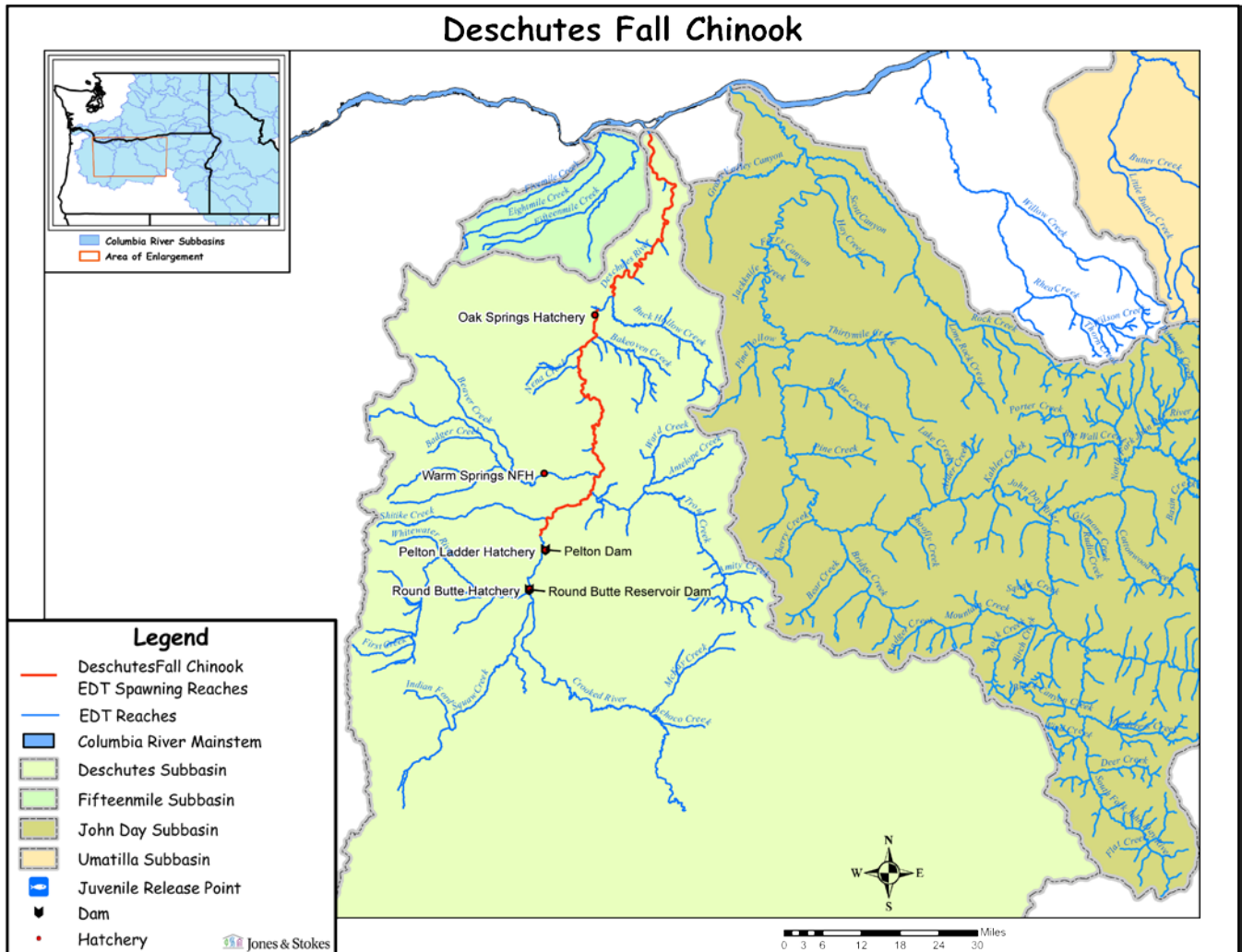


# Hatchery Scientific Review Group Review and Recommendations

## Deschutes Summer-Fall Chinook Population and Related Hatchery Programs

January 31, 2009



# 1 Deschutes Summer-Fall Chinook

The Deschutes River enters the Columbia at RM 205 above Bonneville and The Dalles dams. It drains 10,500 square miles (the second largest subbasin in the state). Originating in the Cascade Mountains, the Deschutes flows north along the eastern margin of the hills where the Cascades meet the low-lying flats to the east.

"Ocean type" Chinook (fall/summer run) typically enter the Pelton Trap during June and July. Prior to construction of the Pelton-Round Butte Hydroelectric Project, "ocean type" Chinook were thought to spawn in areas currently inundated by the project reservoirs and in the river areas immediately upstream (ODFW 2003).

A summer Chinook run is thought to have once returned to the Deschutes; however, this run is believed to have been lost after construction of the Pelton-Round Butte Project. Today, research suggests that only two indigenous races of Chinook salmon — spring Chinook and summer/fall Chinook — spawn and rear in the Deschutes subbasin. During the past 30 years, fish managers have not found any temporal or spatial separation during spawning in the lower Deschutes River that could verify distinct populations of summer and fall Chinook salmon within the subbasin. Both segments of the run appear to spawn in the same areas during the same time period and interbreeding between the two has been suspected for many years, suggesting that only one run exists (Deschutes Subbasin Plan 2004).

Fall Chinook spawn and rear in the lower 100 miles of the mainstem Deschutes River. ODFW and the Warm Springs Tribes have recorded fall Chinook salmon redds from RM 1 upstream of Moody Rapids to the area of the Pelton Fish Trap at RM 99.8. Following completion of the Pelton-Round Butte Project, most spawning occurred in the 6 miles of the lower Deschutes River from Dry Creek to the Pelton Reregulating Dam (Jonasson and Lindsay 1988; Huntington 1985). However, most fall Chinook have spawned downstream from Sherars Falls since the 1980s. Fall Chinook spawning has not been documented in any Deschutes River tributaries (Deschutes Subbasin Plan 2004).

The size of the fall Chinook run varies considerably from year to year, but is now substantially larger than in the past. This rise is primarily due to increased fall Chinook escapement to spawning areas in the lower Deschutes below Sherars Falls. Fish escapement above Sherars Falls has stayed relatively constant. Annual estimated escapement of fall Chinook spawners averaged 7,146 fish from 1977 to 2003, and ranged from a low of 2,205 fish in 1984 to a high of 20,678 in 1997. Annual escapement of adult fall Chinook upstream from Sherars Falls averaged 2,438 fish from 1977 through 2003, and 2,597 fish from 1993 through 2003. Annual spawning escapement of adult fall Chinook from the mouth of the Deschutes River up to Sherars Falls averaged 3,708 fish for the period 1977 through 2003, and 7,237 fish for the period 1993 through 2003 (French and Pribyl 2004) (Deschutes Subbasin Plan 2004).

## 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: Naturally spawning summer-fall Chinook in the Deschutes system are included in the Deschutes River Summer-Fall Run Chinook ESU, which was determined to not require listing under the ESA in 1998.
- Population Designation: Using a rating system similar to that used by the recovery planners for the lower Columbia and Willamette results in a designation of Primary for Deschutes summer-fall Chinook.
- Current Viability Rating: Unknown.
- Recovery Goal for Abundance: Unknown.
- Productivity Improvement Expectation: Unknown.
- Habitat Productivity and Capacity (from EDT): Productivity: 5.75; Capacity: 29,411.

## 2.2 Current Hatchery Programs Affecting this Population

No fall Chinook hatchery program currently operates in the Deschutes River; however, about 171 adult fall Chinook from other programs are estimated to stray into this system annually. Under the current scenario, pHOS is estimated at 1%. Annually, approximately 9,200 natural-origin adults are estimated to return the Deschutes River.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from out-of-basin hatchery programs: 171 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 2.5 to 2.7. Average abundance of natural-origin spawners (NOS) would increase from approximately 9,210 fish to approximately 9,841 fish. Harvest contribution of the natural and hatchery populations would go from approximately 10,735 fish to approximately 11,472 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 incorporates all factors affecting productivity (i.e., habitat quality, hatchery fitness effects, and harvest rates).

#### **Observations**

The Deschutes River fall Chinook population was reviewed as a primary population. There are no hatchery programs for fall Chinook that operate in the Deschutes River. It is estimated that out-of-basin strays do not contribute to the natural spawning population.

#### **Recommendations**

The HSRG recommends that this population continue to be managed for natural production as a primary population.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Deschutes Summer 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%	1%	0.00	9,210	2.5	10,735	0
No Hatchery	None None	-	0%	0%	0%	1.00	9,841	2.7	11,472	-
HSRG Solution	None None	-	0%	0%	1%	0.00	9,492	2.6	11,063	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	10,757	2.8	12,539	0