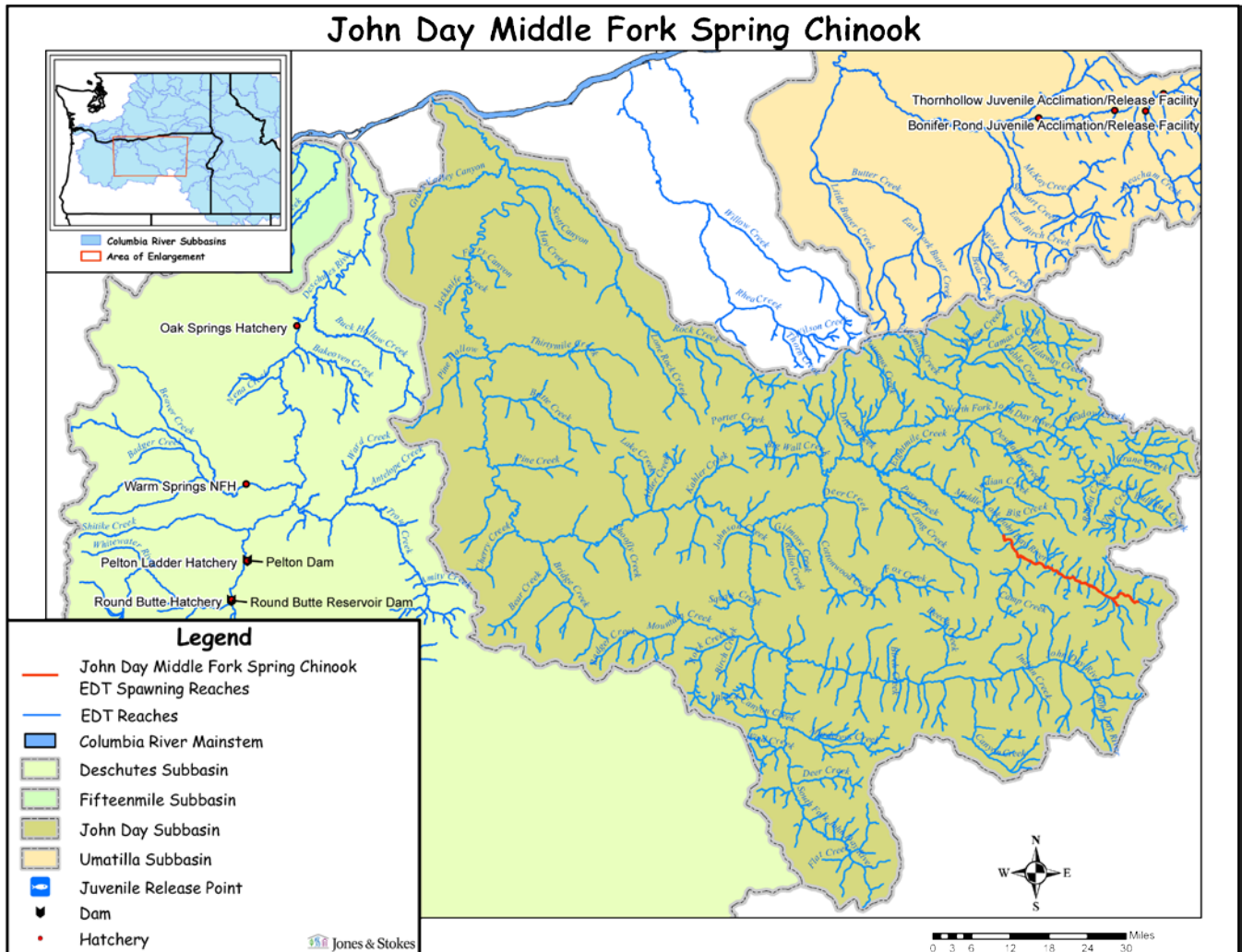


# Hatchery Scientific Review Group Review and Recommendations

## John Day-Middle Fork Spring Chinook Population and Related Hatchery Programs

January 31, 2009



# 1 John Day-Middle Fork Spring Chinook

The John Day subbasin is located in northeastern Oregon in the southern section of the Columbia Plateau Ecological Province. This approximately 5,067,500-acre (8,000 square miles) drainage area is bound by the Columbia River (Lake Umatilla) to the north, the Blue Mountains to the east, the Aldrich Mountains and Strawberry Range to the south, and the Ochoco Mountains to the west. The John Day subbasin incorporates portions of Grant, Wheeler, Gilliam, Sherman, Wasco, Jefferson, Umatilla, Morrow, Crook, Harney, Baker and Union counties (John Day Subbasin Plan 2005). The John Day River is one of the few remaining systems in Oregon with persistent anadromous fish populations unaffected by direct hatchery releases or dams. The Middle Fork John Day watershed drains 806 square miles with a perimeter of 158 miles. Watershed elevations range from 2,200 feet near the mouth of the Middle Fork to over 8,200 feet in the headwater areas. From its headwaters to its confluence with the North Fork, the Middle Fork John Day measures approximately 55 miles.

John Day spring Chinook enter the mouth of the Columbia River in February to begin the 217-mile migration upriver to the confluence of the John Day and Columbia rivers. Spring Chinook returning to the John Day typically enter the river in early July and hold in cold-water refugia until they are sexually mature and ready to spawn in late August through September (John Day Subbasin Plan 2005). After emergence in March and April, juveniles reside in downstream rearing areas for approximately 12 months before outmigrating the following spring, with migration peaking past Spray (RM 170) on the mainstem during the second week in April (Lindsay et al. 1985). In 2000, record numbers of spring Chinook salmon spawned in the index areas of the John Day River. According to unpublished data from the ODFW, a total of 477 redds were counted in the North Fork John Day that year, when in 1995 only 27 redds were tallied. In the declining Granite Creek system, 241 redds were counted, more than double the 20-year average. Spawning populations in both the mainstem and Middle Fork John Day Rivers were the highest recorded since 1959. Contributing factors probably include improved ocean conditions, success in habitat restoration (screened diversions, improved adult and juvenile fish passage, efficient irrigation, riparian cover) and improved management practices (USBR 2003).

During critical low water years, some fish may encounter passage and spawning difficulties in some upper subbasin streams. Flows necessary for migration are available most years. However, juveniles moving out of unfavorably high stream temperatures in some mainstem reaches to cooler water in tributaries are blocked from some streams because of low flows, passage barriers, irrigation demands or a combination of the three. Research studies in the John Day subbasin revealed that when mean daily stream temperatures exceed 68°F, young Chinook disappear from mainstem habitat either through escape to cooler tributaries where available, or through mortality (ODFW 1990).

All angling for salmon in the John Day subbasin has been prohibited since 1976. The Confederated Tribes of the Umatilla Indian Reservation have a limited subsistence fishery on Granite Creek and on the North Fork between Highway 395 and Big Creek (excluding tributaries). This tribal fishery has been conducted in the last decade with a variable annual quota of 100 fish or less (ODFW 1995).

The upper Middle Fork John Day River, where the Oxbow Conservation Area is located, has been identified as a high priority area in the subbasin since the early 1970s. In 2001, the Northwest Power and Conservation Council approved the Confederated Tribes of Warm Springs' proposal to purchase the property with funding from the Bonneville Power Administration. Since

then, project efforts have focused on fish and wildlife habitat protection and enhancement. Efforts include extensive tree and shrub planting, floodplain and river channel restoration, correction of fish passage problems, weed control, and irrigation usage.

## 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 spring Chinook in the John Day system are included in the Middle Columbia River Spring-run Chinook ESU, which is not listed under the ESA.
- **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.
- **Current Viability Rating:** Unknown.
- **Recovery Goal for Abundance:** Unknown.
- **Productivity Improvement Expectation:** Unknown.
- **Habitat Productivity and Capacity (from EDT):** Productivity: 3.5; Capacity: 1,500.

### 2.2 Current Hatchery Programs Affecting this Population

No spring Chinook hatchery program currently operates in the Middle Fork John Day River. Under the current scenario, pHOS is estimated at less than 1%.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from out-of-basin hatchery programs: 7 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).

No spring Chinook hatchery program currently operates in the John Day River and it is estimated that spring Chinook from out-of-basin programs make less than a 1% contribution to the natural spawning populations in the basin. Given these assumptions, there would be minimal change to productivity, natural-origin spawning, or harvest for the John Day Middle Fork spring Chinook population under our No Hatchery scenario. Our analysis estimated adjusted productivity (with harvest and fitness factor effects from AHA) would increase slightly from 3.0 to 3.1. Average abundance of natural-origin spawners (NOS) would increase from approximately 959 fish to approximately 983 fish. Harvest contribution of the natural population would remain unchanged at approximately 135 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).

#### **Observations**

The Middle Fork John Day River spring Chinook population was reviewed as a Primary population. There are no hatchery programs for spring Chinook that operate in the basin, and it is estimated that out-of-basin strays make less than a 1% contribution to the natural spawning populations in the Middle Fork John Day River.

#### **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 Middle Fork John Day 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 None	-	0%	0%	1%	0.00	959	3.0	134	0
No Hatchery	None None	-	0%	0%	0%	1.00	983	3.1	137	-
HSRG Solution	None None	-	0%	0%	1%	0.00	958	3.0	134	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	1,110	3.3	155	0