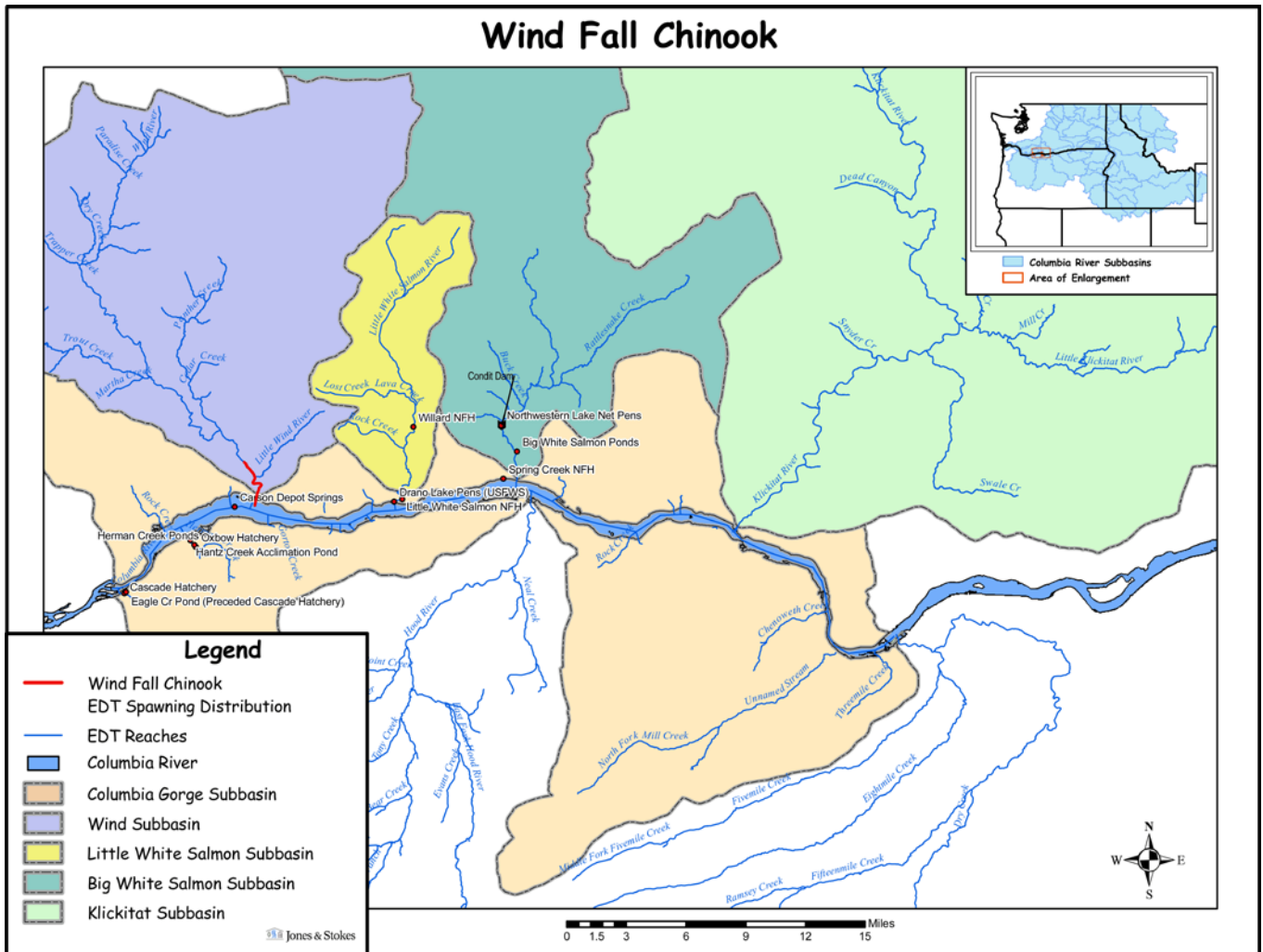


Hatchery Scientific Review Group Review and Recommendations

Wind River Fall Chinook Population and Related Hatchery Programs

January 31, 2009



1 Wind River Fall Chinook

The historical Wind River adult Tule fall Chinook population is estimated at 2,500 to 3,500 fish. The current natural spawning number in the tributaries is 0 to 400 fish. A significant portion of their historic spawning habitat was inundated by the Bonneville pool. There is consistent straying to the Wind River from returning Spring Creek Hatchery tule adults and upriver bright fall Chinook and competition from hatchery and naturally produced upriver bright fall Chinook.

Natural spawning occurs primarily in the lower mainstem Wind River downstream of Shipherd Falls (RM 2). A fish ladder and trap was installed at the falls in 1956 prior to which the falls was a barrier to all species except summer steelhead. Fall Chinook have been observed up to the Carson National Fish Hatchery (NFH) at RM 18, but the majority of spawning occurs in the lower 2 miles of the mainstem; spawning may also occur in the Little Wind River (RM 1). All fall Chinook caught in the trap at Shipherd Falls are now returned to the river below the falls. WFDW biologists doubt that fall Chinook are able to swim over the falls (Kelly Harlan, WDFW, personal communication) (SaSSI 2005).

The upstream migration of Bonneville pool tule stock fall Chinook in the Columbia River occurs from August through September; peak counts at Bonneville Dam range from September 4-9. Tule fall Chinook enter the Wind River in September, where spawning occurs from mid-September to early October. Ages range from 2-year old jacks to 4-year old adults, but age 3- and 4-year old spawners predominate. Fry emerge from January through March, depending on time of egg deposition and water temperature. Fall Chinook fingerlings emigrate from the Wind River in spring. Juvenile rearing occurs near and downstream of the spawning areas. Juveniles migrate from the Bonneville tributaries in the spring and early summer of their first year (Subbasin Plan 2004).

Wind River tule fall Chinook were identified as a stock based on their distinct spawning distribution, river entry timing (September) and spawning timing, appearance (darker skin color and paler flesh on entering freshwater than is seen in bright fall Chinook), and age composition (4-year old spawners predominate). This is a mixed stock with composite production. Frequent egg transfers from the Spring Creek NFH to the Carson NFH have been made, and coded-wire tagged Spring Creek fall Chinook have been observed in the Wind River. It is believed that hybridization between native tule fall Chinook and Spring Creek fall Chinook has occurred (SaSSI 2005).

Total escapement ranged from 0 to 1,845 adults from 1964 through 2003. Spawning abundance has not improved appreciably since the 1992 stock status rating (depressed). Recent escapements have been higher, but very low escapements from 1990 through 1995 may have reduced genetic diversity within the stock. Status was rated critical in 2002, because of chronically low escapements (SaSSI 2005).

The NMFS Status Assessment for the Wind River fall Chinook indicated a 0.52 risk of 90% decline in 25 years, 0.67 risk of 90% decline in 50 years, and 0.74 risk of extinction in 50 years. Fall Chinook smolt capacity was estimated at 206,608 for the Wind River basin. Naturally produced fall Chinook fry are observed each year in the lower Wind River smolt trap, documenting successful natural spawning.

There are significant numbers of upriver bright stock fall Chinook (not part of the lower Columbia ESU) that spawn in the lower Wind River, with spawning escapements from 1988-2001 that ranged from 25-1,101 (average 397). The upriver bright spawners originated from

strays produced at Little White Salmon and Bonneville hatcheries. Most of their spawning takes place in the lower 2 miles of the mainstem Wind River below Shipherd Falls.

The upstream migration of mid-Columbia bright fall Chinook in the Columbia River occurs from August to October; with peak counts at Bonneville Dam ranging from September 4-9. Mid-Columbia bright fall Chinook enter the Wind River in late September to October and spawn from late October through November, later than the Wind River Tule fall Chinook stock. Ages range from 2-year old jacks to 6-year old adults, with age 4- and 5-year old spawners predominating. Fry emerge in the spring, depending on time of egg deposition and water temperature. Fall Chinook fingerlings emigrate from the Wind River in spring and early summer.

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: Wind River Tule fall Chinook are part of the Lower Columbia Chinook ESU, which was listed as Threatened under the ESA in 1994.
- Population Description: The Wind River Tule fall Chinook population is designated as a Stabilizing 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 Low.
- Recovery Goal for Abundance: 100.
- Productivity Improvement Expectation: Unknown.
- Habitat Productivity and Capacity (e.g., from EDT): Productivity 4.54; Capacity 692.
- Populations Affected by this Hatchery Program Include: NA.

2.2 Current Hatchery Programs Affecting this Population

Fall Chinook hatchery releases into the Wind River were discontinued after 1976. The stock is influenced by consistent strays from the Spring Creek tule fall Chinook program and other fall Chinook hatchery programs in the Columbia Gorge.

The Spring Creek tule fall Chinook program is a segregated harvest program with an annual release goal of 15,100,000 fingerlings on-site, in the Columbia River.

Competition from hatchery and naturally produced upriver bright fall Chinook may impact natural-origin Tule Fall Chinook.

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: 756 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 0.5 to 0.9. Average abundance of natural-origin spawners (NOS) would decrease from 81 to 0. Harvest contribution of the natural and hatchery populations would go from 339 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

This small tributary to the Bonneville pool contributes some spawning habitat for strays from nearby hatchery programs.

Recommendations

The HSRG has no specific recommendations for this population.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Wind 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%	87%	0.00	81	0.5	339	0
No Hatchery	None None	-	0%	0%	0%	1.00	0	0.9	0	-
HSRG Solution	None None	-	0%	0%	76%	0.00	189	1.0	244	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	74%	0.00	209	1.1	269	0