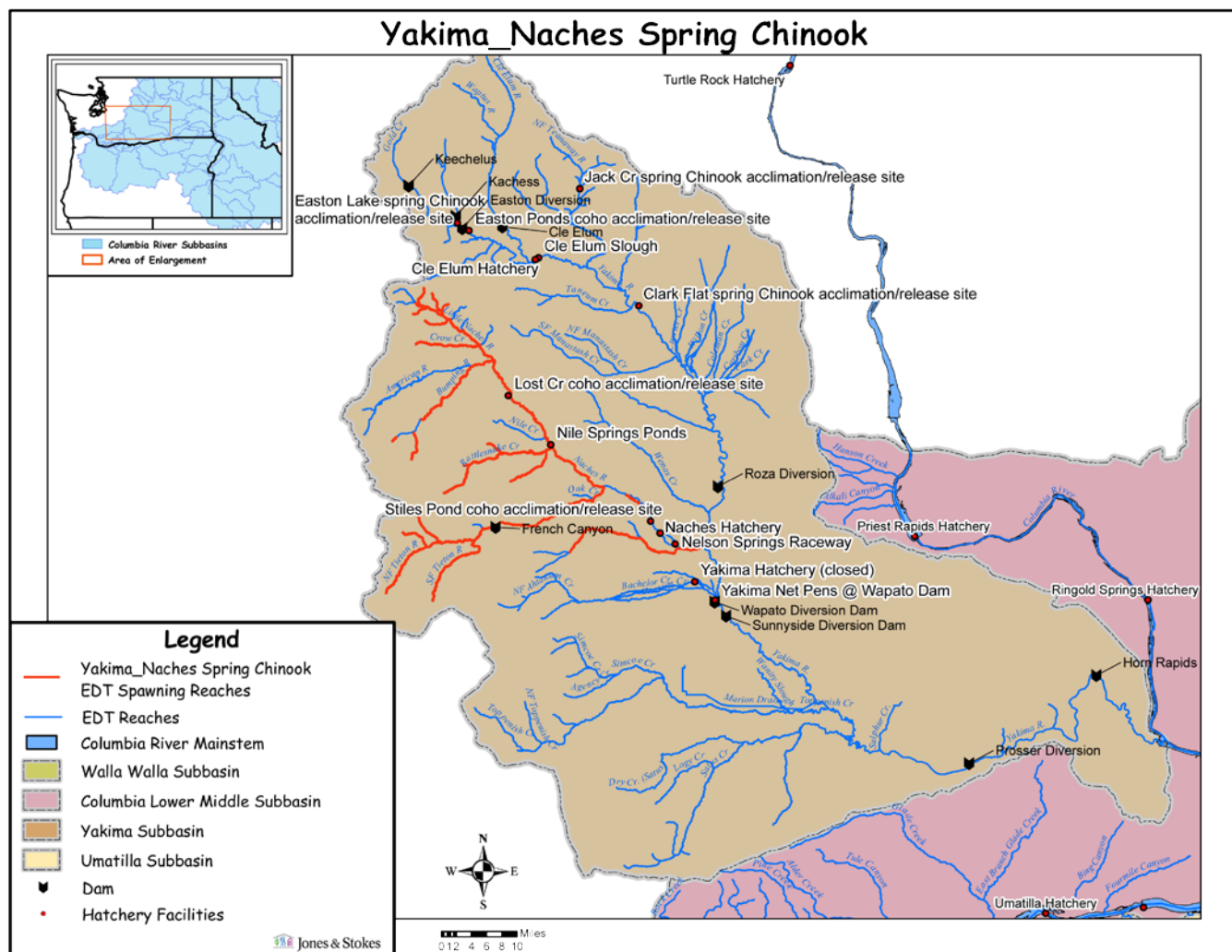


Hatchery Scientific Review Group Review and Recommendations

Naches Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Naches Spring Chinook

The Yakima subbasin supports three genetically and demographically distinct stocks of spring Chinook: the American River stock (numerically smallest), the Naches River stock (numerically intermediate) and the upper Yakima stock (numerically largest). Estimates of the size of historical Yakima spring Chinook returns (all stocks) range from approximately 50,000 (Kreeger and McNeil 1993) to 200,000 (Yakima Subbasin Plan 1990). Currently, about 27% of Yakima spring Chinook are Naches stock. If current and historical stock composition is similar, the historical Naches population may have been as small as 13,500 or as large as 54,000. From 1981 to 2007, escapement to the Naches has ranged from 86 to 3,914 fish, with a mean of 447. No hatchery-reared spring Chinook have been released in the Naches River since 1987. Like the upper Yakima stock, returns and escapements have increased markedly since 2000. Mean escapement for the period 1981 to 1999 was 798; for the period 2000 to 2007, mean escapement was 2,037 (Bill Bosch, Yakama Nation, personal communication, 2007). Although the first spring Chinook returns from the Cle Elum Supplementation and Research Facility (CESRF) occurred in 2000 (jacks) and 2001 (adults), no marked CESRF fish have been recovered during intensive spawning surveys in the Naches watershed (Dave Fast, Yakama Nation, personal communication, 2007).

Since 1982, in-basin harvest of NORs has ranged from 25 to 2,305, with a mean of 608. Assuming harvest is proportional to the mean relative abundance of Yakima spring Chinook stocks, the mean annual harvest of Upper Yakima, Naches and American River NORs has been 365, 163 and 79, respectively. All of the Naches and American River fish were taken in the non-selective tribal fishery.

Spawning reaches shown in the map represents the likely historic range of spring Chinook in the Naches watershed. Dams in the Tieton and Bumping rivers do not have fish ladders. Spring Chinook spawning occurs in the mainstem Naches from the confluence of the Tieton River (RM 17.5) to the confluence of the Little Naches and Bumping Rivers (RM 44.6), as well as in Rattlesnake Creek, the Little Naches River and its tributaries, and in the Bumping River downstream of the reservoir. Spring Chinook spawning generally occurs from early September through early October (Yakima Subbasin Plan).

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:** Native Naches Spring Chinook are part of the Middle Columbia Spring-run Chinook ESU, which NOAA has determined does not warrant listing under the ESA at this time.
- **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; SaSSI rates as depressed.
- **Recovery Goal for Abundance:** NA, because not listed.
- **Productivity Improvement Expectation:** 1.2 to 1.3 (C. Frederickson, Yakama Nation, personal communication).
- **Habitat Productivity and Capacity (from EDT):** Productivity: 2.61; Capacity: 2,121.

2.2 Current Hatchery Programs Affecting this Population

Although no hatcheries, including the CESRF hatchery in the upper Yakima, release spring Chinook into the Naches River, releases of non-native hatchery smolts (primarily of Carson stock) were made between 1959 and 1987 (Yakima Subbasin Summary). The degree of introgression between Naches and outplanted stocks is not known, but is likely minimal because most of the releases were made in the upper Yakima, and because Naches and upper Yakima stocks are genetically and demographically quite different (Yakima Subbasin Summary). To date, no marked CESRF HORs have been recovered in the Naches watershed (Dave Fast, Yakama Nation, personal communication, 2007).

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: 17 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 2.7 to 2.9. Average abundance of natural-origin spawners (NOS) would increase from 1,609 to 1,698. Harvest contribution of the natural and hatchery populations would go from 514 to 543.

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 Box is not yellow?

The Naches spring Chinook is an intermediate sized primary population with a pHOS of <5%. This population is used as a control stream for the upper Yakima hatchery research program. Since 2000, only 7 adipose-clipped fish have been recovered from the Naches watershed. There are no adult or smolt monitoring facilities on the Naches. Recent DNA work on smolts at Prosser allows some estimation of smolt production from the three populations of spring Chinook in the Yakima.

Recommendations

The HSRG recommends that managers continue to monitor the Naches population of spring Chinook. Develop adult monitoring facilities in the lower Naches. Increase carcass monitoring to refine estimates of out-of-basin straying into the Naches. Continue to work with the Bureau of Reclamation to restore more normative flows to the Naches and upper Yakima.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Naches 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	1,609	2.7	514	0
No Hatchery	None None	-	0%	0%	0%	1.00	1,698	2.9	543	-
HSRG Solution	None None	-	0%	0%	1%	0.00	1,618	2.7	517	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	1,894	3.1	605	0