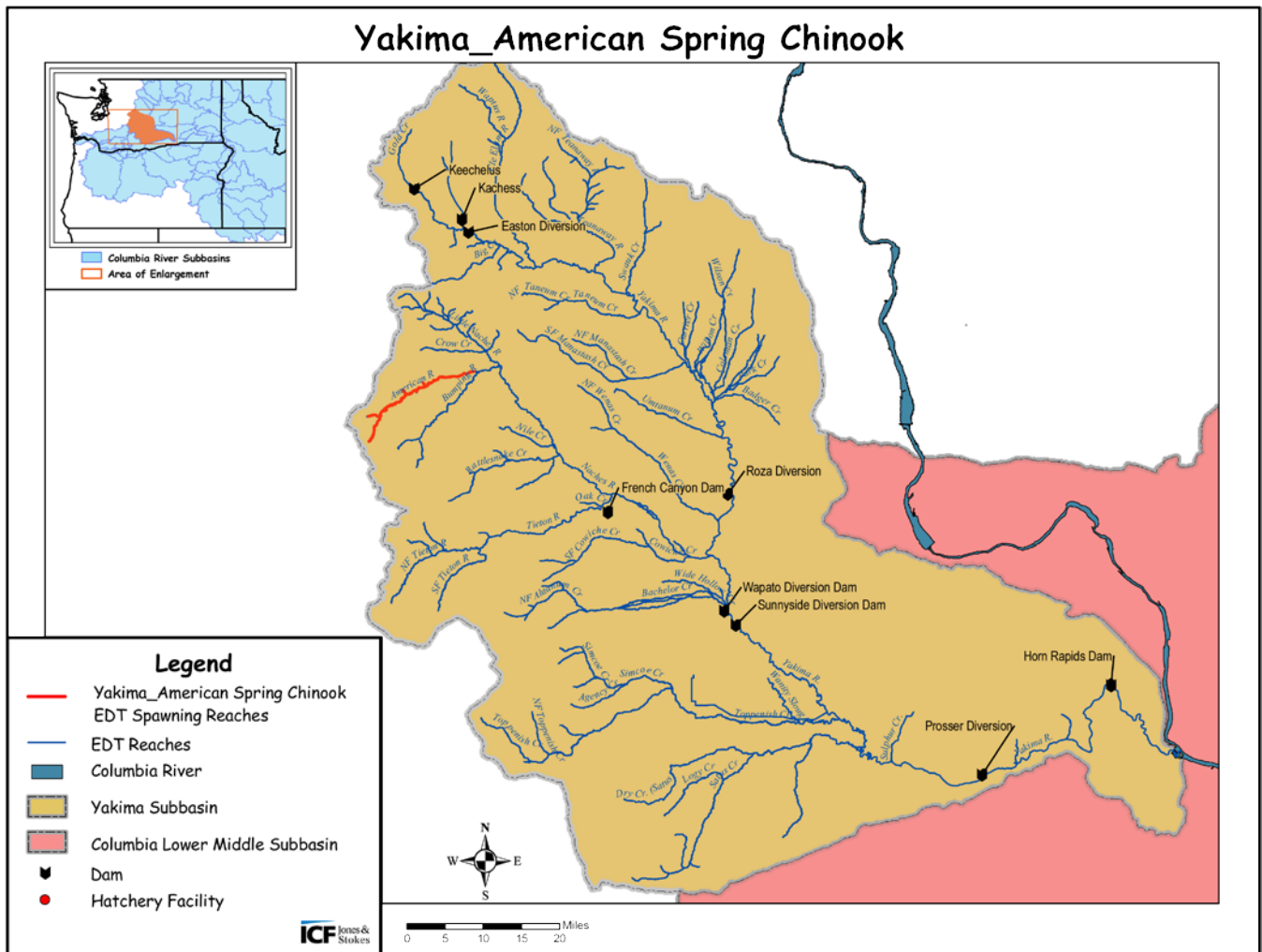


Hatchery Scientific Review Group Review and Recommendations

American River Spring Chinook Population and Related Hatchery Programs

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1 American River 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 13% of Yakima spring Chinook are American River stock. If current and historical stock composition is similar, the historical American River population may have been as small as 6,500 or as large as 26,000 fish. From 1981 through 2007, escapement to the American River ranged from 22 to 1,918, with a mean of 502 fish. Hatchery-reared spring Chinook have never been released in the American River. Like the upper Yakima and Naches stocks, returns and escapements have increased markedly in recent years, although the year of increase in the American is 2001 instead of 2000 (probably due to the fact American River fish are almost entirely age-5 whereas Naches and upper Yakima fish are predominantly age-4). Mean escapement from 1982 to 2000 was 395, while from 2001 to 2007, mean escapement was 869 (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 American River 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. Most of the Naches and American fish were taken in the non-selective tribal fishery. However, terminal sport fisheries in 2002, 2004 and 2008 (no sport fishery in 2003, 2005-2007) were mark-selective fisheries targeting adipose-clipped upper Yakima CESRF hatchery fish in order to reduce pHOS on the upper Yakima River spawning grounds.

Spring Chinook spawning in American River occurs almost exclusively in the American River itself (not in tributaries) and is concentrated between RM 1 and RM 15. Spawning generally occurs from late July or early August through September (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:** 1.17 to 1.28 (C. Frederickson, Yakama Nation, personal communication).

- Habitat Productivity and Capacity (from EDT): Productivity: 3.89; Capacity: 418.

2.2 Current Hatchery Programs Affecting this Population

No hatchery-reared spring Chinook have ever been released in the American River, and no marked hatchery fish have ever been recovered during American River spawning surveys (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: 4 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 4.1 to 4.3. Average abundance of natural-origin spawners (NOS) would increase from 381 to 395. Harvest contribution of the natural and hatchery populations would go from 122 to 126.

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 American River population of spring Chinook is genetically distinct, due to age structure that is predominantly 5-year-old fish. This population exists in cold water at a high elevation, and has a spawn timing that begins in late July and ends by early September. Any out-of-basin strays that did migrate into the American would likely be temporally excluded from successfully spawning with the local population. The pHOS for this primary population is less than 5%.

Recommendations

The HSRG recommends that managers continue to monitor the American River population of spring Chinook and use in-season adult return estimates to regulate the selective sports fishery in the lower Yakima River. Develop adult monitoring facilities in the lower Naches to monitor adult returns.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for American River 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	381	4.1	122	0
No Hatchery	None None	-	0%	0%	0%	1.00	395	4.3	126	-
HSRG Solution	None None	-	0%	0%	1%	0.00	383	4.1	122	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	1%	0.00	436	4.6	139	0