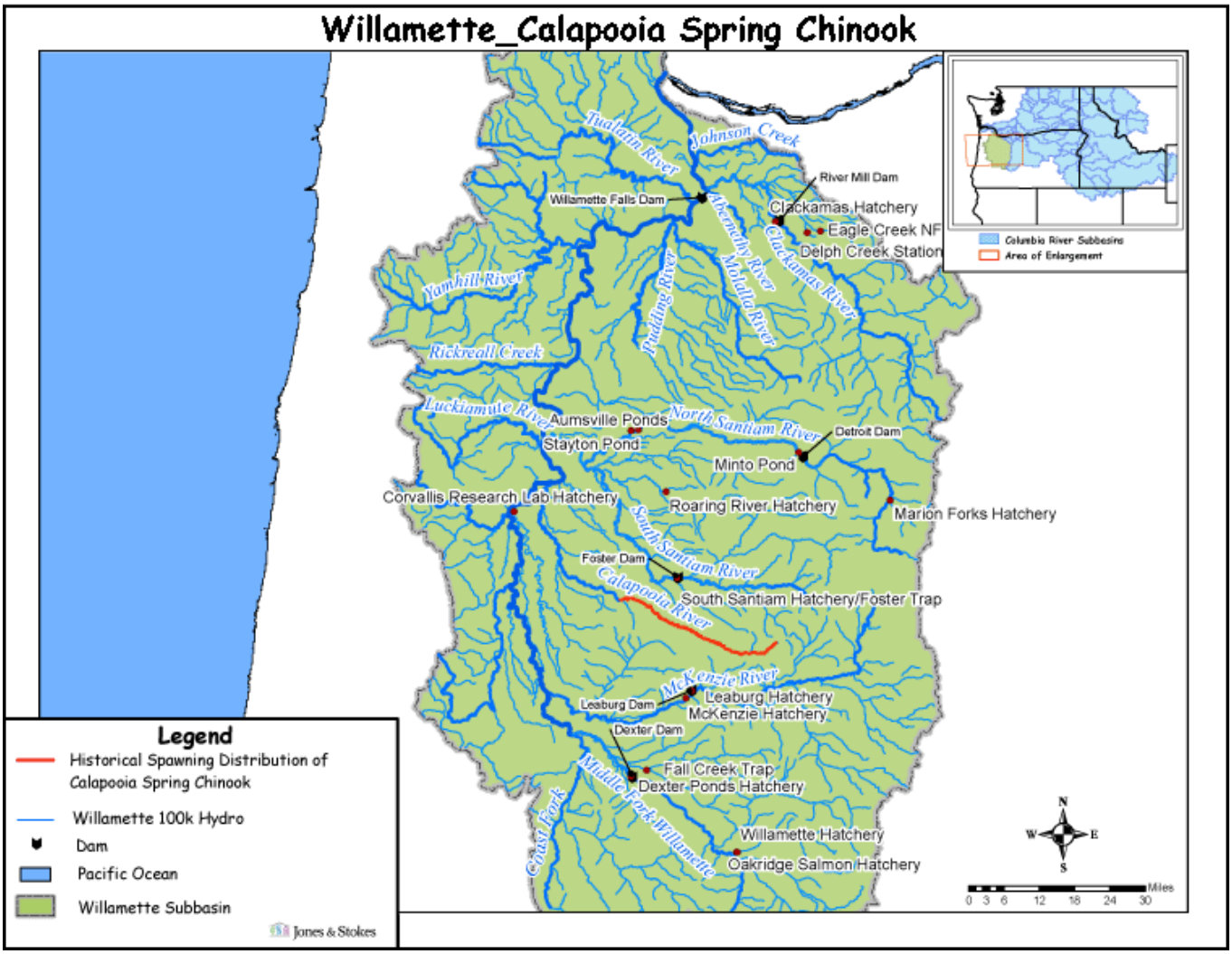
Hatchery Scientific Review Group
Review and Recommendations

Willamette – Calapooia Spring Chinook Salmon Population and Related Hatchery Programs

January 31, 2009



1 Calapooia Spring Chinook Salmon

A small run of spring Chinook salmon historically existed in the Calapooia River, comprising one of seven demographically independent populations of spring Chinook salmon in the Upper Willamette River Spring Chinook Salmon ESU (Meyers et al. 2003). Parkhurst et al. (1950) reported that in 1941 the run size was approximately 200 adults, while Mattson (1948) estimated the run at 30 adults in 1947. Today, the Calapooia natural spring Chinook population is believed to be extirpated, or nearly so (Nicholas 1995; Meyers et al. 2003; Subbasin Plan).

Historically, spring Chinook salmon used the river between Holley (RM 45) and just upstream from the confluence with United States Creek (RM 80) for spawning and rearing (Wevers et al. 1992). Today, most of the spring Chinook spawn upriver in the forested portion of the subbasin (RM 45). Parkhurst et al. (1950) estimated suitable habitat for 9,000 fish. In contrast, in the 1960s the estimated run size was only 100 to 500 fish (Willis et al. 1960). Nicholas (1995) considered the Calapooia River run extinct with limited future production potential (Subbasin Plan).

Some sub-yearling spring Chinook have been observed in off-channel areas of the Willamette and the lower reaches of valley floor tributaries. Their movements may be timed to co-occur with (or may be triggered by) fall and early winter freshets which flood habitat that would be unsuitable during summer because of high temperatures and low flow (Kenaston 2003). ODFW has found spring Chinook fingerlings up some valley floor tributaries as far as 20 miles from the mainstem. Juvenile spring Chinook salmon from other upper Willamette populations, including the McKenzie, have been observed during the winter in seasonal streams in the lower Calapooia subbasin (personal communication, Colvin, Oregon State University, 2004; 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: Calapooia spring Chinook are part of the Upper Willamette River Chinook Salmon ESU, which was listed as threatened under the ESA in March 24, 1999 (64 CFR 14308).
- Population Description: The Calapooia spring Chinook population has not been assigned a designation. This population is considered extirpated, or nearly so by TRT, and it was given a Stabilizing designation for the HSRG review.
- Recovery Goal for Abundance: Unknown.
- Productivity Improvement Expectation: Unknown.
- Habitat Productivity and Capacity: Productivity 1.5; Capacity 100.

2.2 Current Hatchery Programs Affecting this Population

Hatchery releases into the Calapooia occurred from 1981 to 2003 from various within-ESU sources (Santiam, Willamette, Dexter Ponds, McKenzie) (Subbasin Plan). In recent years, live adults (ODFW Stock #24) from the South Santiam Hatchery have been outplanted into the Calapooia River. A 2002 survey of 11.1 miles of the Calapooia above Brownsville found 16 redds (Schroeder et al. 2002); in 2003, 2 redds were documented. The carcasses recovered in the

Calapooia in 2002 were too decomposed to determine the presence or absence of fin clips; however, it was assumed that these were hatchery fish outplanted from the South Santiam hatchery (Schroeder et al. 2002; Subbasin Plan). In 2003, about 200 adult hatchery-origin spring Chinook were released into the Calapooia (Schroeder et al. 2003; McElhany et al. 2007 review draft). These hatchery fish are likely responsible for producing the 2 redds observed. Of 48 carcasses surveyed in 2003, 43 (90%) were fin-clipped hatchery fish; the origin of the other 5 fish was unknown, as not all hatchery-origin fish are clearly fin-clipped (Schroeder et al. 2003). A survey of 27 female carcasses in the Calapooia in 2003 found 100% pre-spawning mortality (Schroeder and Kenaston 2004; McElhany et al. 2007 review draft).

Inventory efforts in recent years have shown natural production ranging from very poor (no juveniles observed) to encouraging (294 juveniles per mile observed). Overall, successful natural production potential appears to be low.

As directed by the Calapooia River Basin Management Plan (OAR-500-1666), the Calapooia River will be managed for natural production of spring Chinook. The latest releases of surplus hatchery-origin adults occurred in 2003, but hatchery Chinook may be used again if necessary to enhance natural production to a sustainable level.

No hatchery program for spring Chinook currently operates in the basin; however, about 31 adult spring Chinook from other programs are estimated to stray into this system annually. Under the current scenario, pHOS is estimated at 55%, even though no hatchery spring Chinook are released in the Calappoia River. Annually, approximately 20 natural-origin adults are estimated to return to Gnat Creek.

Estimated number of hatchery strays affecting this population:

Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 31 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 0.6 to 1.2. Average abundance of natural-origin spawners (NOS) would increase from approximately 10 fish to approximately 14 fish. Harvest contribution of the natural and hatchery populations would remain unchanged at three 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

There are no hatchery programs for spring Chinook that operate in this basin. Out-of-basin strays are estimated to make up 55% of the natural spawning population. This proportion of hatchery fish on the spawning grounds would only be consistent with designation as a Stabilizing population.

Recommendations

The HSRG recommends that this population be managed for natural production as a Stabilizing population.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Calipooia 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%	44%	0.00	10	0.6	3	0
No Hatchery	None None	-	0%	0%	0%	1.00	14	1.2	3	-
HSRG Solution	None None	-	0%	0%	43%	0.00	11	0.6	2	0
HSRG Solution w/ Improved Habitat	None None	-	0%	0%	39%	0.00	13	0.7	3	0