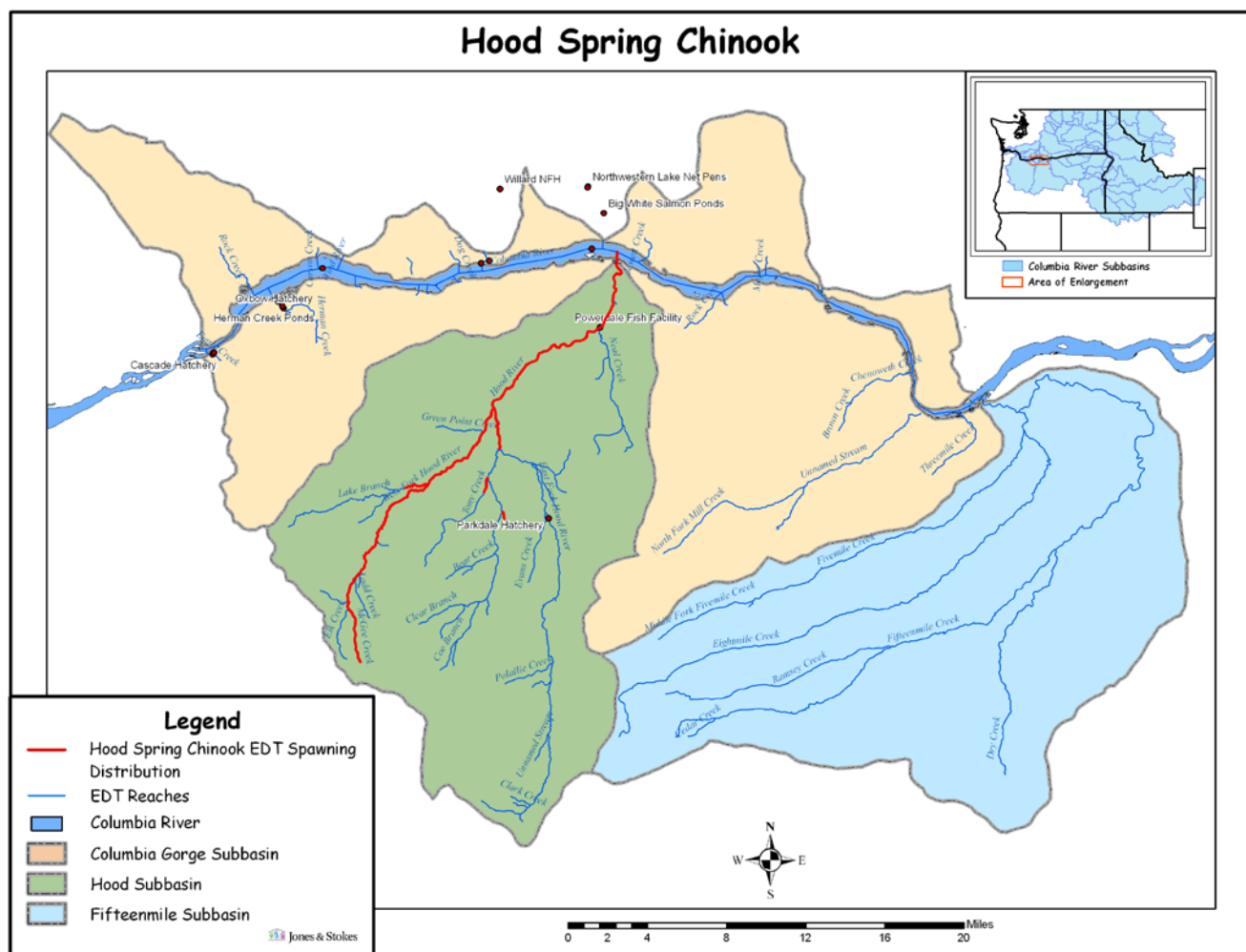


Hatchery Scientific Review Group Review and Recommendations

Hood River Spring Chinook Population and Related Hatchery Programs

January 31, 2009



1 Hood River Spring Chinook

The indigenous Hood River spring Chinook stock was extirpated by the early 1970s (CTWS and ODFW 1991). A population is being reintroduced as part of the HRPP using spring Chinook from the Deschutes River. From 1994 to 2002, the number of returning hatchery spring Chinook increased, while the number of wild (naturally produced) fish decreased, suggesting that the hatchery program was not meeting its supplementation goal (Underwood et al. 2003).

Escapement data from 2002 to 2006 indicates a trend of increasing natural-origin spring Chinook in the Hood River (Olsen 2007). Outmigrant trap data from 1994 to 2001 suggests that a majority of the wild spring Chinook migrate out of the Hood River in the fall (Underwood et al. 2003).

Spring Chinook enter the Hood River from April to September and spawn beginning in mid-August through late September. Spawning occurs throughout the mainstem West Fork and part way up Elk, McGee and Jones creeks and the lower mile of Lake Branch (Hood River Subbasin Plan 2004).

Recruits per spawner (R/S) estimates for spring Chinook were less than 1.0 from 1993-1995, due to poor egg-to-smolt survival. Hood River egg-to-smolt survival was very low, averaging 0.55% compared to an average egg-to-smolt survival of 8.71% in the Warm Springs River (Underwood et al. 2003).

NOAA (2005) estimates that 99% of the historical estimated 150 river miles of potential spring Chinook spawning habitat are still intact (Updated Status of West Coast ESUs).

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:** Hood River spring Chinook are part of the Lower Columbia Chinook ESU which was listed as threatened under the ESA in 1994.
- **Population Designation:** The Hood spring Chinook population is designated as a Primary population in the Lower Columbia Salmon Recovery and Subbasin Plan (LCSR&SP 2004).
- **Current Viability Rating:** The LCSR&SP describes current viability as Unknown with a viability goal of High.
- **Recovery Goal for Abundance:** Unknown.
- **Productivity Improvement Expectation:** Unknown.
- **Habitat Productivity and Capacity (from EDT):** Productivity: 1.21, Capacity: 1,779.

2.2 Current Hatchery Programs Affecting this Population

An integrated conservation program is currently being operated by ODFW in conjunction with the Confederated Tribes of the Warm Springs. The hatchery program is a conservative approach that has started with a lower hatchery smolt allocation (125,000 smolts). The CTWS has proposed increasing the program size to 150,000 smolts. With the lower hatchery production, risks to listed steelhead should be minimized while HRPP monitors any potential impacts.

Hood River spring Chinook were extirpated in the late 1960s and 1970s following a glacial debris torrent in a tributary of the West Fork Hood River. The Hood River spring Chinook salmon reintroduction program used Carson stock spring Chinook for Hood subbasin releases from 1986 to 1992. Deschutes (Round Butte) spring Chinook have been the designated donor stock since 1993.

The Deschutes stock has two components. The Round Butte Fish Hatchery component was founded from spring Chinook captured in the Pelton Fish Trap located on the Deschutes River at RM 100.0. This hatchery stock has been periodically supplemented with fish or eggs from the Warm Springs National Fish Hatchery stock.

The Warm Springs National Fish Hatchery stock originated from wild spring Chinook arriving at the hatchery diversion dam fish trap on the Warm Spring River (tributary to the Deschutes). The stock has been comprised primarily of hatchery-origin adult spawners, but some wild adults have been periodically included into the hatchery production egg takes.

Hood River broodstock is collected at the Powerdale Fish Facility and is comprised entirely of hatchery-origin adults. Round Butte broodstock is used when Hood River returns do not meet broodstock needs. The total number of spring Chinook collected for broodstock will not exceed 110 fish for the short term. For the long term, the number of brood collected could increase to 150 fish if it is determined that the number of smolts released should be increased to 150,000.

Estimated number of hatchery strays affecting this population:

- Hatchery strays from in-basin integrated hatchery program: 228 fish.
- Hatchery strays from in-basin segregated and out-of-basin hatchery programs: 24 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 1.0. Average abundance of natural-origin spawners (NOS) would increase from approximately 195 fish to approximately 2 fish. Harvest contribution of the natural and hatchery populations would go from approximately 253 fish to approximately 0 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 HSRG premise for recommendations is based on the manager's conclusion that the natural Hood River population was extirpated and a decision made to reintroduce spring Chinook using an out-of-ESU hatchery population for rebuilding. It is our understanding that the managers investigated other options, and the Deschutes source was the best choice.

The reintroduction program has a long-term potential to meet the HSRG broodstock management standards for a Primary population designation. However, given current habitat quality, unstable incubation habitat, and limited quantity spawning habitat, the abundance potential is limited.

The managers have taken the important step of discontinuing the practice of importing broodstock from out-of-basin.

The HSRG has general concerns with the practice of transferring fish between basins because of the risk of pathogen transfer (and stress) and straying. The manager's intent to construct additional rearing facilities in the basin could reduce or eliminate this risk.

Removal of the Powerdale Dam in 2010 will result in loss of current hatchery broodstock collection, research studies, and a means of precisely managing spawning composition. Weir sites in the tributaries of the Hood River are being considered, but appear to have lower precision than the Powerdale facility.

Recommendations

Managers should continue to use only Hood River returns for broodstock and eventually convert the program to an integrated program that meets the HSRG broodstock standards for a Primary population. The goal for the program should be to use 100% natural-origin broodstock to the extent possible.

We would recommend developing incubation and rearing facilities in the Hood River for this program. In doing so, managers should apply best hatchery management practices to minimize disease problems.

We support the manager’s intent to install and operate a weir in the West Fork Hood River to achieve both conservation and harvest goals. Scenarios evaluated by the HSRG assumed that the proposed weir in the West Fork Hood River is sufficient to manage the spring Chinook reintroduction, harvest, and conservation.

A fish weir at the Powerdale site would provide a unique opportunity and certainty for meeting research and management goals. Continuing these studies has value in the region, because results would aid in understanding several very important hatchery and natural population management issues.

The HSRG recommends that managers continue to implement their apparently successful BKD strategies, which include culling.

Table 1. Results of HSRG analysis of current conditions and HSRG solution for Hood 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 | Int Cons | 125.9 | 50% | 0% | 51% | 0.00 | 195 | 0.5 | 253 | 83 |
| | | | | | | | | | | |
| No Hatchery | None None | - | 0% | 0% | 0% | 1.00 | 2 | 1.0 | 0 | - |
| HSRG Solution | Int Cons | 147.0 | 25% | 0% | 68% | 0.60 | 354 | 0.7 | 471 | 303 |
| | | | | | | | | | | |
| HSRG Solution w/ Improved Habitat | Int Cons | 147.1 | 25% | 0% | 62% | 0.62 | 449 | 0.8 | 484 | 303 |
| | | | | | | | | | | |