

1 Ringold Hatchery Spring Chinook

This is a segregated hatchery program and does not have an associated natural population.

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: Not listed. NMFS (1999) does not consider the Carson National Fish Hatchery spring-run Chinook stock listed or as part of the Upper Columbia River spring-run Chinook salmon ESU.
- Population Designation: NA.
- Current Viability Rating: NA.
- Recovery Goal for Abundance: NA.
- Productivity Improvement Expectation: NA.
- Habitat Productivity and Capacity (from EDT): NA.

2.2 Current Hatchery Programs Affecting this Population

The Ringold spring Chinook program is a segregated harvest program that is based on Columbia River spring Chinook Carson stock. The purpose of this program is to produce Chinook salmon that contribute to treaty Indian and non-Indian sport and commercial fisheries to mitigate for losses associated with the federal Columbia River hydropower system and habitat degradation in the Columbia River Basin. This program is to release up to 500,000 yearling spring Chinook salmon smolts.

Initially built as part of the Columbia River Fisheries Development Program, Ringold Springs was originally used in conjunction with the Lyons Ferry Fish Hatchery as part of the Lower Snake River Compensation Plan (LSRCP) on the Snake River to rear 1.1 million spring Chinook salmon. Funding was provided by NOAA Fisheries via the annual Mitchell Act budget for Columbia River hatchery fish production. In 1999, Mitchell Act funding was terminated for spring Chinook production and the last brood year (1998) was released prematurely in January 2000.

Ringold Springs began operation in 1962 with releases starting in 1963. A funding hiatus due to the loss of federal monies suspended spring Chinook production at Ringold with the 1982 brood (released in 1984). This spring Chinook production program has been started and stopped several times since then. Recently it was restarted and smolts are scheduled for release in 2008.

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) funded a 500,000-spring Chinook program using stock from the Little White Salmon National Fish Hatchery (NFH) for release at Ringold Springs Hatchery (a WDFW facility) as a way to reestablish a source of spring Chinook adults for harvest and reintroduction strategies. The last return of age 4 adults occurred in 2002, providing a sport harvest of about 200 fish and an additional 212 adult fish for the CTUIR to release into the South Fork Walla Walla. In 2003, 21 (presumed to be 5-year fish) were transferred to the CTUIR for release into the Walla Walla.

No adult spawning or incubation is currently possible at this facility, due to high water temperatures, making it dependant on other hatcheries for egg take and early rearing. Broodstock for this program are collected at Little White Salmon NFH, where typically, broodstock collection requires up to 1,500 adults. To facilitate another 500,000 fish for transfer to Ringold Hatchery, approximately another 250 spawning adults are needed. Little White Salmon NFH is situated just above Drano Lake, a water body through which the Little White Salmon flows before joining the Columbia River at RM 162. Adults are spawned and juveniles reared until they are transferred as fingerlings to Ringold Hatchery for release as yearling smolts. Ringold Hatchery is located at RM 352 of the mainstem Columbia River.

From 1995 to 2000, the number of fish released has ranged from 390,000 to slightly over 1.1 million yearling smolts. Releases in the late 1990s averaged about 400,000 fish. Fish were not released from 2001 to 2004. Releases have begun again using a variety of brood sources including Entiat NFH. Survival rates of Ringold spring Chinook are reported to be low (2005 HGMP), ranging from 0.07% to 0.19% in 1993 to 1997. Currently there is no funding for the continuation of this program; 2011 will be the last year for spring Chinook returns for this program unless funding is restored.

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: NA

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.

Our analysis estimated adjusted productivity (with harvest and fitness factor effects from AHA) would remain at zero. Average abundance of natural-origin spawners (NOS) would remain at zero. Harvest contribution of the natural and hatchery populations would go from 160 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

The purpose of this hatchery program is to provide harvest. The program is maintained from out-of-basin broodstock imported from other hatcheries. There appears to be little opportunity for genetic interaction between this segregated harvest program and natural spawning stocks.

Broodstock collection potential appears to be adequate for the needs for this program and better than for fall Chinook. In some years, predation and disease have resulted in high mortality in this program. Currently there is no funding for the continuation of this program; 2011 will be the last year for spring Chinook returns for this program unless funding is restored.

Recommendations

Transition to the use of local broodstock derived from returns to the Ringold facility. This would require facility upgrades to allow for adult collection, handling, holding, incubation and rearing.

The HSRG recommends that managers implement a BKD control strategy for their spring and summer/fall Chinook hatchery programs where BKD has proved a recurring problem. Ideally, the strategy should include culling (destroying) eggs/progeny from hatchery- and natural-origin brood that are found to be infected with the BKD agent. However, because brood fish with high levels of the BKD agent are more likely to transmit the agent to their progeny than brood with lesser levels of the agent, the culling of eggs/progeny from infected brood fish, should, at the very least, be applied to those with high levels of the BKD agent (e.g., ELISA OD value of 0.4 and above when broodstock are not in short supply and ELISA OD value of 0.6 and above when broodstock are in short supply). In addition, in programs using ESA-listed natural-origin brood fish, the culling of their eggs/progeny may, at the managers' discretion, be dispensed with. However, the ESA-listed broodstock should be injected, pre-spawning, with an appropriate antibiotic (preferably, azithromycin at 40 mg/kg fish), and the resulting eggs should be surface-

disinfected with an iodophor. All pre-spawning brood injections may be limited to females, ESA-listed or otherwise.

Finally, eggs and hatchlings derived from broodstock found to be heavily infected with the BKD agent should be incubated/reared in isolation from those obtained from broodstock with no or lesser levels of the BKD agent. In addition, the hatchlings should be reared at the lowest possible densities (below current standards), and, at the first signs of infection with the BKD agent, they should be treated with orally administered erythromycin (100 mg/kg fish) for 28 days. The treatment should be repeated if there is evidence that the BKD agent has persisted in the hatchlings.

Table 1. Results of HSRG analysis of current condition and HSRG Solution for Ringold Hatchery 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										
	Seg Harv	487.1	70%						160	504
No Hatchery	None None	-	0%	0%	0%	0.00	0	0.0	-	-
HSRG Solution										
	Seg Harv	486.8	70%						160	144
HSRG Solution w/ Improved Habitat										
	Seg Harv	486.8	70%						160	144