



U.S. Fish and Wildlife Service - Pacific Region
Columbia River Basin Hatchery Review Team

Columbia River Basin, Lower Columbia Province *Clackamas River Watershed*



Eagle Creek National Fish Hatchery Assessments and Recommendations

Final Report, Summary

July 2007

Summary

Long-term conservation needs of natural salmonid populations and their inherent genetic resources require a reexamination of the role of hatcheries in basin-wide management and conservation strategies. Hatcheries must be viewed as part of the environmental and ecological landscape to help achieve both conservation and harvest goals. These goals need to be part of a holistic and integrated strategy that combines habitat, hydropower and harvest needs for conserving and managing fishery resources. These strategies must establish short- and long-term goals for both hatchery-propagated and naturally-spawning populations.

To ensure that its hatchery programs are best meeting conservation and harvest goals, the US Fish and Wildlife Service (Service) began, in October 2005, a three-year review of 21 salmon and steelhead hatcheries that the Service owns or operates in the Columbia River Basin. The goal of this review is to ensure that Service hatcheries are operated in accordance with best scientific principles, and contribute to sustainable fisheries and the conservation of naturally-spawning populations of salmon, steelhead and other aquatic species. The Service's review process is modeled after the recent Puget Sound and Coastal Washington Hatchery Reform Project¹. The Service plans to complete its reviews by the end of 2008.

The report presented here provides benefit/risk assessments and recommendations for salmon and steelhead propagation programs conducted at Eagle Creek National Fish Hatchery (NFH). Eagle Creek NFH is located within the Clackamas River watershed, a tributary to the lower Willamette River near Portland, Oregon.

The Review Team considered, as a foundation for its assessments, four characteristics of each salmonid stock in the Clackamas River watershed: *biological significance*, *population viability*, *habitat* conditions, and *harvest* goals. The Review Team attempted to use both short- (15 years) and long-term (50–75 years) goals for each salmonid stock, as identified by the fishery comanagers², as a foundation for assessing the benefits and risks of the Service's hatchery programs. Source documents not readily available to the general public, including appendices and background documents for this report, are accessible via the Service's hatchery review website.³

Eagle Creek NFH

Facility Overview: Eagle Creek NFH is located approximately 40 miles southeast of Portland, Oregon on Eagle Creek, a tributary to the Clackamas River near Estacada, Oregon. The hatchery was authorized by the Mitchell Act (16 USC 755-757; 52 Statute 345) May 11, 1938 and amended on August 8, 1946, (60 Statute 932) to assist with conservation of fishery resources in the Columbia River Basin. Eagle Creek NFH began operation in 1956 with the primary purpose to support commercial and recreational fisheries consistent with its mandate under the Mitchell Act. Today, the hatchery propagates coho salmon and winter-run steelhead with direct on-station releases of 500,000 and 150,000 yearling smolts, respectively. The hatchery is also responsible for maintaining two fishway

¹ www.lltk.org/HRP.html

² Comanagers in the Clackamas River watershed are the Oregon Department of Fish and Wildlife, National Marine Fisheries Service (NOAA Fisheries), and the U.S. Fish and Wildlife Service.

³ www.fws.gov/Pacific/fisheries/HatcheryReview/

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ladders on Eagle Creek downstream from the hatchery. The current personnel plan for the hatchery lists seven full-time employees. The annual operation and maintenance (O&M) budget (FY2006) for the hatchery is \$538,000 from NOAA Fisheries (Mitchell Act) plus \$50,000 from the Service's USFWS Fisheries Program. Capital improvements to Eagle Creek NFH have totaled \$3,246,370 during the period 2000-2006.

Coho salmon

Program overview: The program is intended to operate as a *segregated harvest* program within the Clackamas and Eagle Creek watersheds with returning hatchery-origin adults used exclusively for broodstock. The broodstock objective at Eagle Creek NFH is to collect and spawn 3,000 adults annually with an on-station release of 500,000 yearling smolts into Eagle Creek. Those on-station releases support recreational fisheries in Eagle Creek and commercial/recreational fisheries in the ocean, lower Columbia, Willamette, and Clackamas rivers. Eagle Creek NFH also assists the Yakama Nation and the Nez Perce Tribe with reintroducing extirpated coho salmon in the Yakima (mid-Columbia region) and Clearwater (Snake River region) rivers, respectively, by providing up to 700,000 fertilized (eyed) eggs and 1.05 million yearling coho for those tribal programs. The Review Team did not specifically review either tribal program but included fish produced for those programs as part of the coho program at Eagle Creek NFH (Appendix B). In addition, up to 700,000 eyed coho eggs are provided annually to Idaho Department of Fish and Game (IDFG), upon request, for incubation and rearing at an Idaho State Hatchery followed by release into an inland reservoir to support recreational fisheries. The coho broodstock at Eagle Creek NFH was originally developed in the late 1950's from Sandy River, Toutle River and Big Creek stocks, all of which are outside the Clackamas River watershed but within the *Lower Columbia River Coho Evolutionarily Significant Unit* (ESU). NOAA Fisheries considers Eagle Creek NFH coho to be part of the Lower Columbia River Coho ESU. An ESA recovery plan for the lower Columbia River is currently under preparation and will address recovery strategies for this ESU.

Benefits: The coho reintroduction programs in the Yakima and Clearwater rivers were initiated in the 1990's and are in progress. As a result, the long-term conservation goals of those programs have not yet been realized. The short-term goal of those transfers is to first establish hatchery propagated runs back to the respective rivers. The long-term goal is to re-establish self-sustaining natural populations in the respective watersheds. Coho salmon were extirpated from the upper Columbia and Snake rivers several decades ago, and reintroduction of coho salmon to those watersheds is a high priority for the Tribes. With respect to harvest benefits, Eagle Creek NFH coho contributed an average harvest of 2,609, 1,794, and 2,300 adult fish per year in the ocean, Columbia River, and Clackamas River/Eagle Creek areas, respectively, for brood years 1993-2000 (smolt release years 1995-2002). Adult escapements back to the hatchery averaged 13,939 fish per year over the same period. More than 16,000 coho (2,685 age 2+ jacks and 14,153 age 3+ adults) returned to Eagle Creek NFH in the fall of 2006. Adult coho trapped at the hatchery in excess of broodstock needs are provided to tribes and the Oregon Food Bank. For the years 1999-2003, an average of 1,657 coho salmon were distributed to tribes, and an average of 13,584 coho were distributed to food banks.

Risks: Major risks identified by the Review Team include (a) potential failure of a deteriorating surface water intake pipe, (b) egg incubation densities and raceway rearing densities that exceed recommended fish culture guidelines, and (c) genetic and ecological risks to ESA-listed natural populations of coho in the Clackamas River watershed. The Team was concerned that releases of juvenile coho from an introduced hatchery stock could impede recovery of naturally spawning populations in the Clackamas River.

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Recommendations for current program: The Review Team identified 24 specific recommendations to reduce risks and/or improve benefits of the current coho salmon program. These recommendations include: (a) reduce the total number of spawned adults and fertilized eggs to the maximum numbers needed to meet program objectives; (b) reduce egg incubation densities and maximum raceway rearing densities to established guidelines for coho salmon (9,000 eggs per tray and a maximum 0.3 density index, respectively) and resize the coho program, if necessary, to meet those guidelines; (c) reduce the number of coho released on station from 500,000 to 350,000 yearling smolts per year, and (d) transfer up to 150,000 pre-smolt juveniles to Columbia River estuary net-pen *Select Area Fisheries Enhancement* program in years when adult returns to the hatchery exceed current broodstock needs for upriver transfers and on-station releases, but only if Eagle Creek NFH can support those net pen transfers consistent with recommended fish rearing densities. The Team also recommends developing a formal egg transfer agreement with IDFG in response to annual requests, or terminate those transfers altogether.

Alternatives to Current Program: The Review Team considered the pros and cons of eight alternatives to the existing coho program. These alternatives include the current program with full implementation of all program specific recommendations, with reduction of on-station releases from 500,000 to 350,000 yearling smolts annually (Alternative 1). As a short-term goal, the Review Team recommends continuation of the existing program (Alternative 1) to meet the eyed egg and fish transfer needs of the coho reintroduction programs in the Yakima and Snake rivers. However, the Review Team also recommends that those transfers be reevaluated after no more than three coho generations (nine years) as a “sunset clause” relative to the adult return benchmarks for terminating transfers from Eagle Creek NFH to the Yakima and Snake Rivers, respectively. When egg and fish transfers are no longer needed for the coho reintroduction programs, the Review Team recommends replacing the current out-of-basin hatchery stock with an endemic Clackamas River integrated coho broodstock (Alternative 2), contingent upon the recovery strategies specified in the pending Oregon component of the Lower Columbia River Recovery Plan. Developing an integrated Clackamas River broodstock is intended to reduce extinction risks and assist with recovery of ESA listed natural populations of coho salmon in the Clackamas River with the added goal of providing future harvest benefits in Eagle Creek after the transition is complete and habitat improvements have occurred. This latter program would, most likely, not provide fish for the Columbia River estuary net-pen programs until after the viability of natural populations in the Clackamas River basin has increased.

Steelhead

Program overview: The program is intended to operate as a *segregated harvest* program within the Clackamas and Eagle Creek watersheds with returning hatchery-origin adults used exclusively for broodstock. The primary purpose of the program is to support “early-run” (December-February) recreational fisheries on winter steelhead in Eagle Creek, the lower Clackamas River, and the lower Willamette River. The broodstock objective is to collect and spawn 350 hatchery-origin adults annually with an on-station release of 150,000 yearling smolts into Eagle Creek. The broodstock was originally derived in the late 1960’s and 1970’s from Big Creek Hatchery steelhead (Lower Columbia River, ODFW) but includes some ancestry from native Eagle Creek steelhead, Skamania Hatchery (Washington Department of Fish and Wildlife) winter steelhead, and *Donaldson* rainbow trout from the University of Washington. NOAA Fisheries excludes Eagle Creek NFH steelhead from the *Lower Columbia River Steelhead Distinct Population Segment (DPS)*, although natural populations within the Clackamas River are part of that DPS. The pending Oregon component of the Lower Columbia River ESA Recovery Plan is under preparation and will address recovery strategies for steelhead in the Clackamas River.

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Benefits: The program provides an annual recreational harvest benefit of approximately 1,000 steelhead in Eagle Creek, and 500-1,500 steelhead in the lower Clackamas and Willamette Rivers.

Risks: Major risks identified by the Review Team include (a) potential failure of a deteriorating surface water intake pipe, and (b) genetic risks to ESA listed natural populations of steelhead in the Clackamas River watershed, including Eagle Creek, and ecological risks to steelhead and ESA listed coho salmon from the non-DPS Eagle Creek NFH steelhead stock.

Recommendations for Current Program: The Review Team identified ten specific recommendations to reduce risks and/or improve benefits of the current steelhead program. These recommendations include (a) reduction of on-station steelhead releases from 150,000 to 100,000 smolts annually to reduce genetic and ecological risks to ESA listed natural populations in the Clackamas River basin, (b) additional actions to trap and remove as many hatchery-origin steelhead adults as possible to further reduce genetic and ecological risks, and (c) continued monitoring of genetic and ecological interactions between hatchery-origin and natural-origin steelhead in Eagle Creek.

Alternatives to Current Program: The Review Team considered the pros and cons of six alternatives to the existing steelhead program, including the current program with full implementation of all program specific recommendations (Alternative 1). The Review Team recommends continuation of the current steelhead program with full implementation of all recommendations, including reduction in annual releases to 100,000 smolts and continuation of ongoing genetic and ecological interaction studies for three additional years (2008-2010). After three years, when the specific risks of the current program to natural populations of salmon and steelhead are more fully understood, the current steelhead program should be reevaluated and either (a) continued with full implementation of risk aversion measures (Alternative 1), or (b) terminated (Alternative 4) if the risks imposed by the current program will most likely impede recovery of ESA-listed natural populations in the Clackamas River. The Review Team concluded that genetic and ecological risks of the current steelhead program to ESA listed natural populations in the Clackamas River could be significant but that existing data specific to Eagle Creek NFH program were insufficient at this time to warrant termination of the program. Both the Oregon Department of Fish and Wildlife (ODFW) and Portland General Electric (PGE) have taken significant actions in recent years to reduce hatchery and hydropower risks, respectively, in the Clackamas River basin in response to ESA listings. The Review Team concluded that the Service should operate Eagle Creek NFH consistent with the actions already taken by ODFW and PGE under the ESA. The Review Team further concluded that actions to help recover ESA-listed salmon and steelhead in the Clackamas River need to encompass the entire watershed, including the lower basin and Eagle Creek.

Conclusions

The Review Team concluded that the current coho salmon program at Eagle Creek NFH is providing a potential long-term conservation benefit to the reintroduction of coho salmon in the Yakima and Snake rivers. However, those transfers from Eagle Creek NFH should not continue indefinitely but should follow a sunset clause consistent with the adult return benchmarks for their termination in the two respective watersheds.

The Team also concluded that Eagle Creek NFH spawns more adult fish (both coho and steelhead), incubates more eggs, and rears more juveniles than are necessary to meet current program objectives.

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Those surpluses appear to contribute to egg loading and juvenile rearing densities that exceed fish culture guidelines and densities at other NFHs. Those surpluses may also add unnecessary labor requirements to the hatchery staff which has been reduced in recent years because of budget cuts. Accordingly, the Team recommends reducing on-station releases of coho from 500,000 to 350,000 yearling smolts per year, and reducing on-station releases of steelhead from 150,000 to 100,000 yearling smolts per year. These reductions are further motivated by the need to reduce genetic and ecological risks to ESA listed natural populations in the Clackamas River basin.

The Review Team further concluded that the high biological significance of Clackamas River coho salmon within the Lower Columbia River Coho ESU provides strong motivation for Eagle Creek NFH to transition from the current out-of-basin *segregated* coho broodstock to an *integrated* native Clackamas River broodstock, contingent upon a pending Lower Columbia River ESA Recovery Plan. The intent of such a transition would be to reduce extinction risks of Clackamas River coho, reduce genetic and ecological risks to ESA listed natural populations, and potentially assist with recovery of natural populations, particularly in the lower Clackamas River basin. Such a program could also provide future harvest benefits in Eagle Creek and the Clackamas River after some level of recovery had been achieved. Detailed genetic studies of coho populations within the Clackamas River basin would need to be completed before a native broodstock plan could be developed.

The Review Team was concerned about the genetic and ecological risks posed by the current out-of-basin non-DPS steelhead program to ESA listed natural populations of salmon and steelhead in the Clackamas River. The Review Team recommended several aversion measures to reduce current risks, including the continuation of ongoing genetic and ecological interaction studies for three additional years (2008-2010) to quantify those risks. If, after three years, the Service concludes that the current steelhead program will most likely impede recovery of ESA listed populations in the Clackamas River, then the Review Team recommends that the program be discontinued. The Review Team further concluded that development of a native Clackamas River steelhead broodstock at Eagle Creek NFH is not desirable because of (a) culture difficulties of rearing “late-run” native winter steelhead at Eagle Creek NFH and (b) ODFW has already developed a native “late-run” Clackamas River steelhead program.

In the long run, the Review Team concluded that Eagle Creek NFH needs to support hatchery programs that are consistent with conservation and recovery goals for native fish species in the Clackamas River while, at the same time, continuing to provide harvest benefits where possible. The Team strongly advises the Service to closely track completion of the Lower Columbia River ESA Recovery Plan and adjust future program goals for Eagle Creek NFH consistent with the recovery strategies identified in the Plan. Adult returns of coho in surplus of broodstock needs could be used to produce juvenile fish for transfer to net pen releases in the Columbia River estuary, but only in a manner consistent with the Team’s incubation and rearing density recommendations for coho at Eagle Creek NFH.