

Mitigation for Blockage of Landsburg Dam

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The anadromous fish conservation strategies are designed to mitigate for the blockage to fish passage created by the Landsburg Diversion Dam. These strategies are designed to complement other regional efforts to protect and restore declining stocks in the Lake Washington Basin by providing resources for reconnecting habitat, incubation of sockeye and research/monitoring activities that support the development of better understanding of salmonids in the Cedar River. The intent is to implement biologically and environmentally-sound solutions that (1) contribute to the recovery and persistence of healthy, harvestable runs of anadromous fish in the Cedar River and Lake Washington Basin; (2) have a high likelihood of success; and (3) maintain a safe, high quality drinking water supply.

Implementation of these actions involves multi-agency, tribal and stakeholder involvement, guidance from expert scientists, monitoring commitments and adaptive management. As the HCP is initiated and implemented over a 50 year period, a great deal of effort has been and will continue to be made to seek qualified technical guidance for HCP activities. The resulting discussions and documents provide opportunities to integrate monitoring information with the developing understanding of the Lake Washington ecosystem.

Each component of the mitigation response is briefly described below. Monitoring or research activities associated with each component will be highlighted.

Fish Passage

Anadromous salmonids have not entered the protected Cedar River watershed in nearly a century. The HCP will provide upstream and downstream passage for coho, chinook and steelhead, providing access to 17 miles of high-quality mainstem and tributary habitat above Landsburg Dam. Construction is expected to begin this year and all facilities are expected to be operational in 2003. The absence of anadromous passage for about 100 years provides an opportunity to assess the consequences of colonization of reconnected habitat. NMFS and SPU have supported two years of fieldwork to establish baseline nutrient conditions, assess resident trout populations and document habitat. Plans are in place to monitor the numbers of fish migrating upstream of Landsburg Dam and to monitor nutrient levels over time.

Interim mitigation for coho, chinook and steelhead

The City has agreed to provide funding for eight years to support recovery of chinook, coho and steelhead. Options include research, supplementation or other actions as defined by the technical and policy committees associated with the Landsburg Mitigation Agreement. To date, funding from this program has been used by WDFW for gathering additional information about chinook that spawn in the Cedar River.

Sockeye hatchery

The recruitment of sockeye fry from the Cedar River is regularly impacted by scour-induced mortality. The HCP provides continued support for the interim sockeye hatchery at Landsburg that has been operating continuously since 1991. This project has produced between 600,000 and 17 million fry per year and, on average, hatchery production has represented about one third of the total fry leaving the Cedar River. Subject to completion of the environmental review and approval of program and design documents, a replacement hatchery will be built and operational by 2005. The new facility would be used to incubate sockeye eggs and the resulting fry will be released soon after emergence to rear naturally in the lake. The replacement hatchery will have a capacity that is double that (34 million fry) of the interim

facility and will have a temperature-controlled water source to control development so that it more closely matches incubation conditions in the river.

Significant effort has gone into the development of guidelines for the hatchery program by independent scientists who are experts in the genetic, ecological, fish health issues associated with hatchery production and interaction with wild populations. A goal has been to design a program that is as natural as possible so that adults that result from the hatchery-released fry will be successful when they return to spawn in the Cedar River. The program is also designed to minimize, if not eliminate, effects on other salmon in the Lake Washington basin.

Additional experts, including hatchery critics, have been tasked with the development of operating protocols and the adaptive management program for the new facility. An adaptive management plan identifies uncertainties that will guide monitoring work and describes a functional process for including scientific input in decisions on how the hatchery should operate. This project has been developed to minimize hatchery effects and is expected to provide valuable information on the effectiveness of this approach. This information could be useful in hatchery reform efforts.

The monitoring program provides significant opportunity to learn about the life history of sockeye and their interactions with other species by committing significant resources over 50 years. The long term nature of the funding commitment makes it feasible to design long term monitoring programs, and also allows flexibility to alter monitoring efforts as questions are answered and new ones develop. Presently the monitoring program supports: 1) fry marking and mark evaluation; 2) fry trapping at mouth of the Cedar River; 3) early life history diet and plankton evaluation; 4) fall juvenile trawl surveys; 5) adult survival, distribution and homing studies; 6) genetic evaluation of *Onchorynchus nerka* populations. This ongoing research is being conducted by WDFW and University of Washington scientists.