Central Puget Sound Water Suppliers’ Forum members are dedicated to improving fish passage above dams. Together, two local projects overseen by Seattle Public Utilities and Tacoma Water have the potential to open more than 117 miles of anadromous fisheries habitat in Puget Sound watersheds.

Tacoma Headworks Fish Facilities

Tacoma’s Headworks diversion dam was constructed on the Green River in 1911, three and a half miles downstream of the eventual site of the US Army Corps of Engineers’ Howard Hanson Dam (HHD). Tacoma Water’s facility was the first complete barrier to adult salmon and steelhead in the Green River, and eliminated anadromous fish production in the upper watershed. The completion of HHD in 1962 created a further barrier to upstream passage and essentially isolated approximately 220 miles of watershed area (45% of the entire Green River watershed). Since most of the headwater streams in the upper watershed are otherwise unconstrained by levees or dikes, opening this area with a fish passage facility at the Headworks/HHD complex is expected to restore significant anadromous fish habitat.

Currently, Tacoma Water is near completion of the new fish passage facility, referred to as the Tacoma Headworks Fish Facility, consisting of upstream adult passage at Tacoma Headworks Dam and Howard Hanson Dams, and downstream juvenile bypass at Howard Hanson Dam and the Tacoma Diversion.

Upstream Adult Passage

The upstream adult passage operation includes a fish ladder at the Tacoma diversion combined with a trap-and-haul operation to pass adult fish from the Headworks to above HHD. In addition, the channel downstream of the Headworks diversion dam has been reshaped to attract fish to the ladder entrance. (A fish ladder at Howard Hanson Dam was also considered, but there were concerns about the height of the 235 foot dam, as well as reservoir level fluctuations and stress on migrating fish.)

The Headworks fish ladder and trap and haul facility will be completed and tested by the end of 2004. The trap and haul facility operates by guiding adult fish through an electronically controlled gate where they are sorted, identified, and held in holding ponds. They are then transferred into a specially outfitted truck using a method that does not require handling of the fish and hauled above HHD where they are released. The Muckleshoot Indian Tribe and WDFW are co-managers of Green River fish and wildlife resources; together with NOAA Fisheries and USFWS, they are evaluating the reintroduction of anadromous fish into the upper watershed. They will be determining how many and which species of fish should be considered for reintroduction to the upper watershed. The date that the trap and haul facility will begin operations has not yet been determined and is dependent upon fish management decisions by these entities.
The objective of the juvenile bypass at the Headworks diversion and HHD is to allow fish to safely bypass the dams on their way downstream. Tacoma has modified the existing Headworks diversion to safely bypass fish downstream below the diversion, and to eliminate the potential for fish to enter the Headworks intake. At HHD, the juvenile bypass strategy has not yet been completely developed. The current plan under consideration is to remove juveniles above the dam in a hopper and transport them downstream either via flume or truck.

**Landsburg Fish Passage Project**

In the watershed just north of Tacoma's fish passage project on the Green River, the City of Seattle recently opened seventeen miles of anadromous fisheries habitat on the Cedar River. On September 19, 2003, the first Chinook passed upstream of Landsburg Dam, the City of Seattle’s municipal water diversion and treatment facilities. This was potentially the first anadromous fish to access this reach in over 100 years. Landsburg is the site the City of Seattle’s municipal water diversion and treatment facilities on the Cedar River. The Landsburg Dam was constructed in 1900, and up until the completion of the new fish passage facilities in September 2003, the dam blocked all anadromous fish migration to seventeen miles of high-quality stream habitat in the protected Cedar River watershed. The recently completed fish passage facilities are an important element of Seattle’s Cedar River Watershed Habitat Conservation Plan (HCP), which has the goal of improving conditions for Chinook, Coho, and Steelhead migration.

These fish passage improvements have the support of the WDFW, USFWS, and NOAA fisheries. Other participants in the project include King County, Washington Department of Ecology, and US Army Corp of Engineers.

The objectives of the Landsburg Fish Passage Project are to allow access for all anadromous fish species in the Cedar River, except sockeye salmon (due to water quality and public health reasons), and to operate the downstream passage gate and intake screening facilities to safely pass downstream migrating fish while meeting HCP instream flow management requirements and municipal water needs. The Landsburg fish passage project includes four major improvements.

**Climate Forecast Evaluation**

This project also involved the evaluation of climate forecasts produced by the National Center for Environmental Prediction (NCEP). Research to date confirms that the temperature forecasts that are provided by NCEP are very useful in predicting the actual temperatures that will occur. Monthly correlation coefficients in the 90 percent range were common, suggesting that the NCEP forecasts can explain 90% of the natural variability. Precipitation forecasts were not as accurate, as was also expected.

**Summary**

Plans to reintroduce salmonids into the upper watersheds of both the Cedar and Green Rivers have targeted reintroduction of coho, chinook, and steelhead. An estimated 4,500 coho and 1,000 chinook may return to the Cedar River above Landsburg, while an estimated 6,500 coho and 2,300 chinook may return to spawn in the upper Green River watershed. Efforts of Central Puget Sound Water Suppliers Forum members to improve fish passage above dams in Puget Sound watersheds are proving to be quite successful. Together, Seattle Public Utilities and Tacoma Water’s work has the potential to open more than 117 miles of anadromous fisheries habitat for the first time in decades.