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# Fish to pass Oregon dams for first time in decades

A utility in Oregon (USA) is preparing to help fish migrate around its dams. The Pelton Round Butte project generates 465 MW of power at three dams located along a 20-mile stretch of the Deschutes River, a tributary of the Columbia. The project is owned by Portland General Electric and the Confederated Tribes of the Warm Springs, which worked together with 22 organizations and government agencies to reach an agreement as part of the relicensing of the hydropower facility. To help the fish migrate, they'll be screened from the intake of the top-most dam and trucked downstream of the dams.

## Project co-owned by utility and Native American tribe

Salmon and steelhead will migrate past a large series of dams for the first time since 1968, under the terms of an historic multiparty agreement.

The pact is one of the final steps in obtaining a new federal license for Pelton Round Butte, the only hydroelectric project in the United States jointly owned by a Native American tribe and a utility. The 465 MW project is one-third owned by Confederated Tribes of the Warm Springs and the remainder owned by Portland General Electric. The 20-mile long complex impounds the Deschutes River, a federal Wild and Scenic River and a tributary of the Columbia, about six miles west of Madras, Ore. The three dams, rising to as high as 440 feet, blocked salmon and steelhead migration in the Deschutes, Metolius and Crooked rivers above the project 36 years ago.

### Contacts

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Portland 97204  
USA

U.S. Department of Energy (DOE)  
1000 Independence Ave., SW  
Washington, DC 20585  
USA

The Confederated Tribes of the Warm Springs (CTWS) is a federally recognized Indian Tribe with 4312 members. Its reservation in north Central Oregon covers 1000 square miles.

## The bar for other dam operators across the country

A total of 22 organizations and government agencies, including the project owners, endorsed the agreement. The settlement demonstrates how water management and hydroelectric operations can be carried out in innovative ways that protect tribal resources, enhance the environment and aid in the recovery of threatened species.

Officials praised the agreement for its positive economic and environmental impact. Besides potentially reopening 226

miles of streams above the dams to fish migration, the plan allows for continued production of low-cost hydroelectric power at the facility, improves the Tribes' fish harvest and benefits recreational fishing. This agreement sets also the bar for other dam operators in the Northwest and across the country.

## Largest hydro project in Oregon

In the 1990s, the Tribes and PGE began planning for relicensing the project and restoring fish passage became the top priority. «Many generations will benefit from this agreement,» said CTWS Council Chairman Ron Suppah. «The next 50 years under this new license will create a blueprint for wise natural resources management that is so important to our Indian people and financial resources that are vital to the tribal organization. Adding electric power generation has diversified our economic base and supported programs ranging from public safety to health and education.»

«PGE and the Tribes share the stewardship of one of the West's most precious resources, the Deschutes River»,

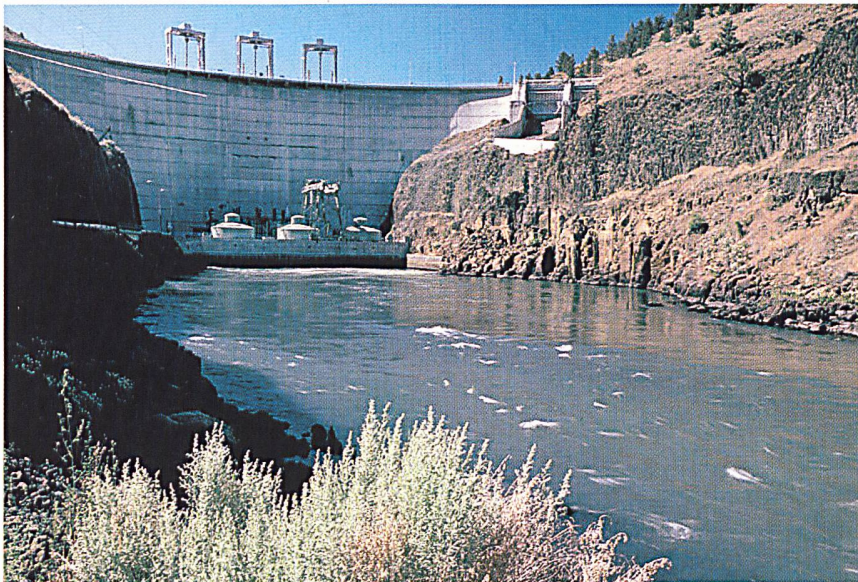


Lake Billy Chinook at Round Butte Dam (photos: Portland General Electric/PGE).





Round Butte Dam.



Pelton Dam.



Regulating Dam with fish passage facilities.

## Hydropower Facility to Install Fish-Friendly Turbines

The National Hydropower Association (NHA) announced that a utility in Washington State plans to install a fish-friendly turbine at a hydropower project on the Columbia River. The new turbine technology, developed with the support of DOE and the hydropower industry, is designed to increase the survival rate of migrating juvenile salmon that pass through the turbine. According to the NHA, the Grant County Public Utility District (PUD) will install one turbine later this year at the Wanapum Dam, which is part of the Priest Rapids Project. Field testing will start in early 2005, and if successful, the remaining nine turbines at the dam will also be upgraded to the new design. According to NHA, the new turbines will also boost the power production at the dam by about 15 percent.

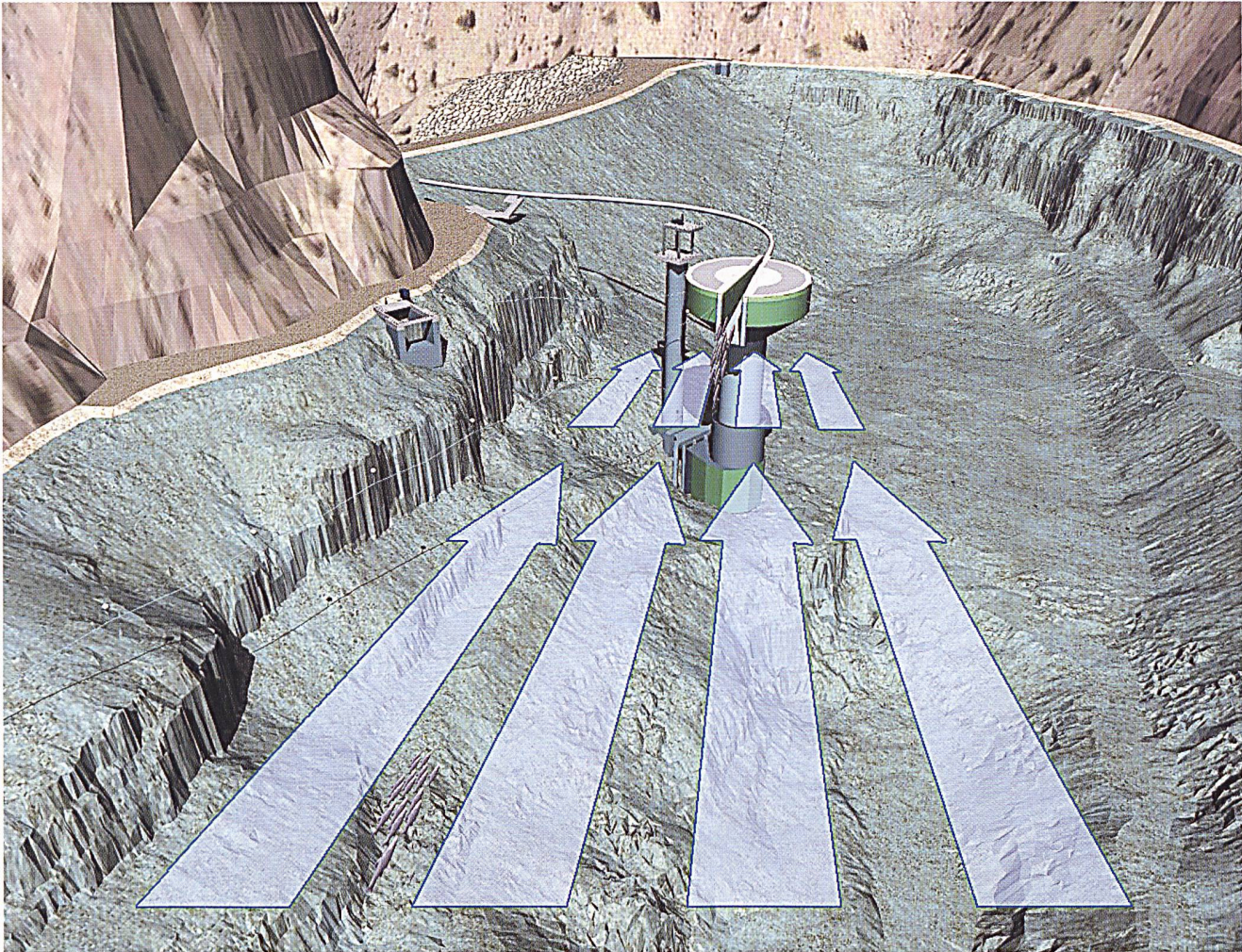
DOE/National Hydropower Association

## New turbine runner to reduce fish mortality

Alden Research Laboratory, Inc. (Alden) and Concepts NREC are conducting a research program to develop a new turbine runner to reduce fish mortality at hydroelectric projects. The program is part of the Advanced Hydropower Turbine Project sponsored by the U.S. Department of Energy (DOE). The conceptual design phase of the program defined a new hydro-turbine runner with a unique geometry that meets criteria that should allow safe passage of fish through the runner while achieving hydraulic power efficiency comparable to other turbines. The second phase of Alden/Concepts NREC's research program was the detailed design of a pilot scale test facility that could be used to quantify the effect on fish passing through the runner and verify the basic hydraulic characteristics of the new turbine. This report describes the construction phase for development of the Alden/Concepts NREC turbine, the third phase in Alden's participation in the DOE's Advanced Hydropower Turbine project. The pilot scale turbine test loop is located within an existing building at Alden in Holden, Massachusetts. The test facility is a closed flow loop with a pump, fish injection system, pilot scale turbine, and fish collection system. The pilot scale turbine includes a scroll case, wicket gates, runner, shaft dynamometer, and draft tube. The facility has auxiliary systems for holding and examining fish, controlling water quality, and monitoring turbine performance. Photographs documenting various stages in the equipment fabrication and test loop construction are provided.

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The key to the Pelton project's fish passage plan is a 270-foot underwater tower that will be constructed by the year 2008 to redirect surface currents in Lake Billy Chinook and collect fish for transport downstream, from where they can find their way to the ocean. The 130-foot wide disk at the top has a 30-foot by 40-foot wedge that will draw in enough water volume to pull most of the surface currents downstream, along with the migrating fish. The fish are then piped into a tank for transport downstream. The tower also will improve reservoir and river water quality, keeping the reservoir cooler in the summer and helping to maintain appropriate downstream temperatures. The tower's estimated cost is about \$60 million (U.S. Department of Interior, DOI).

said Peggy Fowler, PGE CEO and president. «Our customers depend on us to do the right thing for the environment. They also depend on us for electricity that powers vital aspects of everyday life. We're committed to deliver on both obligations.»

The hydro project was completed by PGE in 1964. The project is the largest hydroelectric facility completely within the state of Oregon, producing 1.5 billion kilowatt-hours of clean, renewable, peaking power for the Portland metropolitan area.

### The solution

Although it was constructed with fish passage facilities, the downstream system failed. Under the environmental policies of that era, raising fish in a hatchery was an appropriate way to offset the impact. The fish passage problem was created in

large part by the downstream currents in a reservoir taking a wrong turn. Young salmon and steelhead following the currents rarely found their way to the ocean.

The solution will be a 270-foot high underwater tower arising from the bottom of the lake behind Round Butte Dam. A 130-foot wide disk at the top of the tower will draw in most of the surface water, turning the currents and fish back downstream toward the dam. Fish will be screened at the intake and trucked downstream of the dams for release on their journey to the Pacific. The tower will also blend waters from various depths to improve the conditions, including water temperatures, for downstream fish.

### Prepared to spend more than \$135 million

Species to be reintroduced above the dams include summer steelhead (a feder-

ally listed threatened species) and spring Chinook salmon. Resident kokanee should naturally convert to sockeye salmon as they head downstream.

PGE and the Tribes are prepared to spend more than \$135 million dollars on the project during the 50-year term of the license, the vast majority going to fish-related measures. More than \$21 million is planned for fish habitat improvement on Deschutes River tributaries, including water rights acquisition.

The project's reservoirs and their shores are popular recreation sites, including camping, fishing, boating and water skiing. The plans do not restrict recreation and should actually improve recreational fishing for salmon and steelhead over the long run through increased populations and better habitat.

The Federal Energy Regulatory Commission is expected to act on the new license in late 2004 or early 2005.