

New Life for a Thirsty Gorge

By Christine Pratt

The Chelan River Gorge hasn't had a good, long, cool drink of water in more than 80 years. At least not the way nature intended.

Ruggedly beautiful, the rocky channel and gorge once guided the free-flowing Chelan River from its origin at the southernmost tip of Lake Chelan along a rolling-and-tumbling course to the Columbia River, four miles and more than 400 feet below.

Biologists say northern pikeminnow, chub and possibly cutthroat trout inhabited the river's upper reach — the approximately two-mile stretch below where the dam is today.

Osprey would circle for fish. Deer and rabbits would venture down for a drink and to nibble on the hardy wheatgrass and sage that softened the harsh desert climate.

Cougars would pad down to capture a meal.

The Lake Chelan Hydro Project, completed in 1927, blocked the river, dried up the gorge for most of the year and

destroyed much of the hardscrabble diversity.

But more than eight decades later, this dry and unforgiving ecosystem is about to make a comeback.

The Chelan County PUD is at work on a \$13.8 million project to restore a year-round flow to the Chelan River and retrofit

its lowest reach to lure spawning steelhead and chinook salmon to areas where they may never have spawned before.

Plans include a nature trail and picnic area in the river's upper reach and four yearly

whitewater events in the gorge for expert kayakers.

The rehab project is part of \$60 million to \$65.5 million in dam and other proj-



The Chelan Gorge will host white-water competitions for expert kayakers four times a year. Above, water from Lake Chelan cascades through the Chelan Gorge on its way to the Columbia River during annual spring spill.

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ects required by the PUD's new 50-year federal dam license. The projects include overhauling the powerhouse's two generating units, which produce 48 megawatts of electricity.

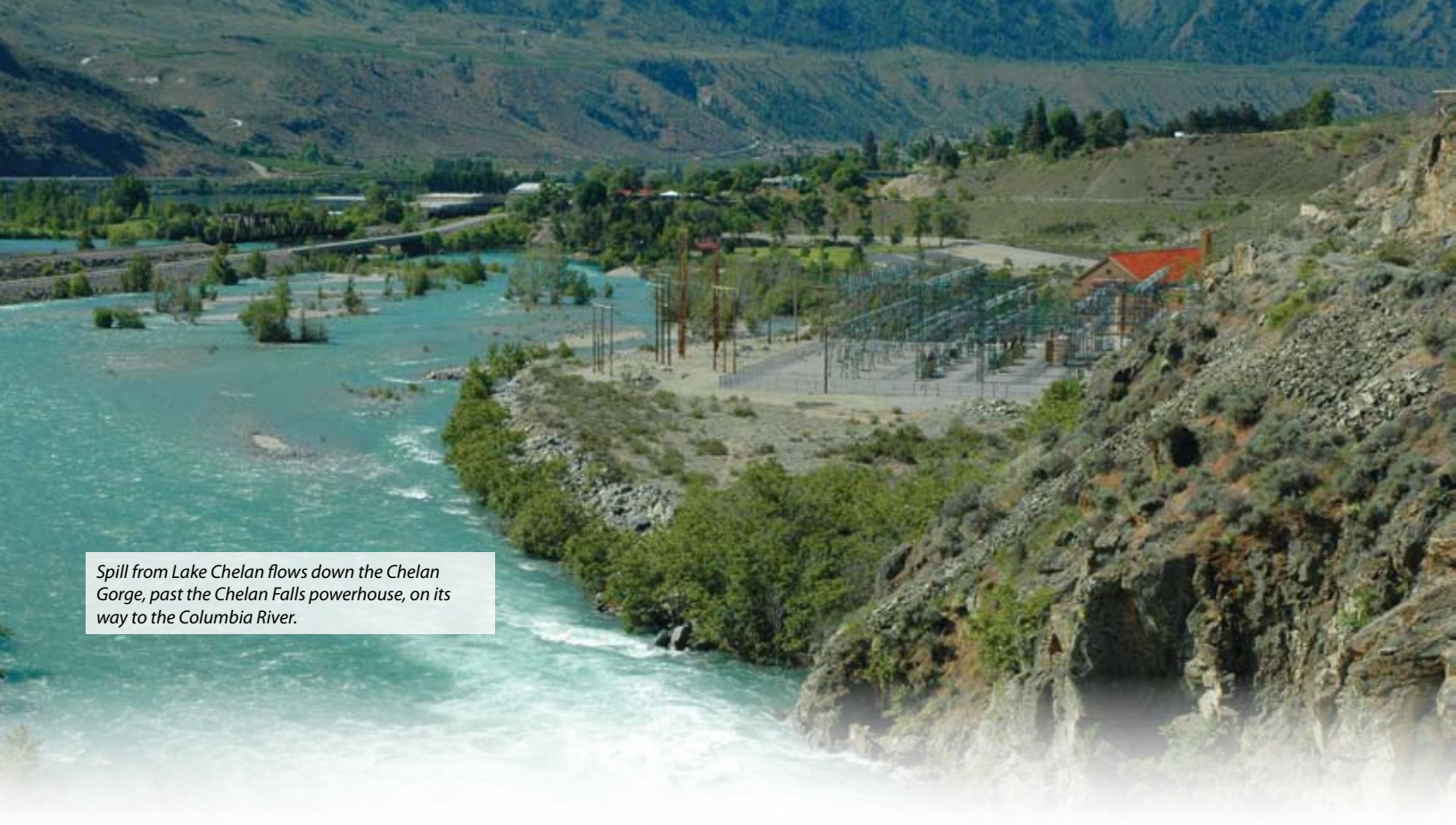
The Chelan Gorge rehab project is the product of years of debate that involved state and federal fish, wildlife and environmental agencies and a host of area community members.

Site work began in June and should be finished by fall 2009.

"I think it's an absolute one-of-its-kind, fascinating, unique project," says Jeff Osborn, a self-described PUD "bio-politician" for his dual role as fisheries biologist and dam-license negotiator.

"The components we're using have been done in small sections of other streams, but here we're building a new stream with all the

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Spill from Lake Chelan flows down the Chelan Gorge, past the Chelan Falls powerhouse, on its way to the Columbia River.

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components — channel, bank, substrate, boulders, logjams. Any feature you see in a naturally functioning stream, we're building from scratch."

He added, "We're going ahead with the best science and engineering, because there isn't a model to copy anywhere."

The completed project will:

- Restore a fraction of the Chelan River's old, year-round flow. The planned flow of 80 cubic feet per second (cfs) is equivalent to the low-flow average of the Entiat River.
- Redesign the Chelan River's lowest reach, near the dam's powerhouse, into a meandering stream that combines the best water flows, temperature, vegetation and streambed gravel to attract spawning steelhead and chinook salmon. These fish already spawn nearby, where the powerhouse tailrace channel merges into the Columbia River, just west of the Chelan Falls Road bridge. The new spawning habitat will cover about 2 acres.
- Build a new 1.5-mile hiking trail extension to Chelan's Riverwalk Loop Trail. The horseshoe-shaped trail will wind past the dam roughly south over rugged terrain into the Chelan River's upper

reach. It will then double back and head north along the Chelan River canyon.

Picnic areas, viewpoints and informative nature signs will dot the way.

- Starting next year, host gorge kayaking events the second and fourth weekends of July and September, when the dam is spilling water, increasing river flows to 300 to 450 cfs.

Wenatchee construction company Goodfellow Brothers is already at work using

heavy equipment to dig, grade and sculpt the lower reach. All this work can be seen from Chelan Falls Road as it passes the powerhouse.

An environmental consulting firm with expertise in stream restoration has worked with PUD biologists to design the new "habitat stream" with carefully placed logjams, boulder groupings, plants, river topography and the gravel that migrating fish prefer.

An in-river barrier system of boulders and concrete will protect the habitat stream work from washing away under river flows that will routinely reach 2,000 to 6,000 cfs

when the dam is spilling in early summer and fall.

At the planned year-round flow of 80 cfs, all the water coming out of the gorge will flow into the new habitat stream.

At higher flows, the project's design will preserve the new stream's 80 cfs flow and direct excess flow into another, roughly parallel channel, creating a divided river.

Spawning steelhead and chinook also need faster flows, but they arrive during seasons when the dam isn't usually spilling — from mid-March to mid-May for steelhead and from mid-October to late November for chinook.

To speed up stream flow during these spawning seasons, the PUD will use a pumping

system to supplement the 80 cfs river flow already coming from the dam.

A new pumping station, across from the powerhouse, will pump water from the powerhouse tailrace through a canal to an outlet just upstream of the habitat channel, increasing the flow to about 320 cfs.

The work at the top of the project — the dam — isn't as complicated.

Wenatchee construction company Goodfellow Brothers is already at work using heavy equipment to dig, grade and sculpt the lower reach. All this work can be seen from Chelan Falls Road as it passes the powerhouse.



Work proceeds on a dry Chelan Gorge. Water will now flow through the gorge year-round.
Photos: Chelan PUD

The Lake Chelan Hydro Project works via a 14- to 12-foot-diameter underground pipeline, called a “penstock,” that transports water from the dam 2.2 miles downhill to the powerhouse near the Columbia River.

The dam’s early engineers built a second pipeline or “tunnel stub” into the dam, in case future operators wanted to add a second penstock to feed more turbines at the powerhouse

Water flows later proved insufficient for powerhouse expansion, Chelan Gorge project manager Bill Christman said.

To reintroduce year-round flow into the Chelan River, workers will build a new pipeline off this existing, 17-foot-diameter tunnel stub. They’ll extend the pipeline some 200 feet downstream from the dam, up and over the existing penstock to an outlet at the riverbed.

The new pipeline will carry cold water from the bottom of the Chelan River to the outlet downstream where it will cascade into the riverbed, year-round.

The cold water temperature is important, Christman said. If the water isn’t cold enough when it begins its downhill journey, the region’s hot, arid summers will overheat the water as it flows, making it too warm to support fish.

Christman said engineers ruled out simply spilling from the dam year-round to

establish the constant flow, because in the summertime, surface river temperatures are too warm. Also, the lake level sometimes dips lower than the dam’s spill gates, making it impossible to guarantee a year-round spill.

Eight decades of yearly, high-volume spill events have added to the problem.

Acting as flash floods, these high flows of 2,000-6,000 cfs on average, with occasional historic spills of more than 20,000 cfs, have scoured the riverbanks of vegetation that once helped prevent erosion and possibly provided some shade to cool the water.

The planned flow of 80 cfs is much lower than the estimated 640 cfs or higher that likely flowed through the undammed river, biologists say. But it’s a negotiated number — a volume of water considered adequate for fish habitat, without overly limiting recreation and hydropower generation, Osborn said.

The new, year-round flow won’t result in a greatly reduced production of electricity, PUD officials say. It won’t lower the level of Lake Chelan, nor will it affect the PUD’s

seasonal adjustments of the lake’s levels to compensate for mountain snowmelt.

At the planned year-round flow of 80 cfs, the water exiting Lake Chelan will still be only about one-eighth of the water entering the lake from the Stehekin River at its lowest yearly average flow of about 640 cfs, Department of Ecology statistics show. The Stehekin River is the largest

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of 23 streams feeding the lake.

PUD biologists will study the evolution of their Chelan River rehab efforts for 10 years to gauge the effects. They’ll issue yearly progress reports to federal hydropower authorities.

The Lake Chelan Hydro Project is probably one of the region’s least ecologically disruptive dams. It doesn’t block the path of migrating fish, because salmon and steelhead were never able to navigate the steep, rocky gorge, many biologists say.

The project produces enough electricity to power some 20,000 homes, and its reservoir is a natural lake.

Studies funded by the PUD say that

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even before the dam was built, sometimes massive yearly floods scoured the river channel and gorge, washing away much vegetation.

At least two previous dams, built in 1892 and 1893 to raise the lake level for irrigation and steamboat navigation, already interrupted the river's natural flow. Massive floods damaged both these rustic structures.

At its best, the river's hot, rocky canyon topped by shrub-steppe habitat is harsh and unforgiving.

Why spend \$13.8 million on an experi-

ment to create barely 3 acres of additional spawning habitat that fish might not even use? Will the experiment even work?

"That was hotly debated," the PUD's Osborn said of a work group of biologists formed during the early and middle stages of dam relicensing. "Had we not felt it had a high likelihood of success, we never would have supported it for the life of the 50-year license."

Phil Archibald, U.S. Forest Service fishery biologist, said spawning fish have already been drawn to the Chelan River's lower reach during times of spill.

"If there were no signs that salmon and

steelhead had been present there, then this would be a big experiment," he said. "But if you get flow and substance over the right substrate (gravel), you'll get spawning."

Expense, he said, is relative. "What does one bomb cost in Iraq?" Archibald said. "I believe in fish and fisheries and habitat restoration. Because this is how we're going to regain salmon habitat in the upper Columbia — in bits and pieces."

"In returning the Chelan River to a functional aquatic ecosystem, we can't just focus on fish," Osborn said. "Because, obviously, if I'm a deer and I need a drink and there's water down there, I'm a lot more likely to go there for a drink. We really have to do this for more than just the fish." □

Christine Pratt is a reporter for the Wenatchee World. This article first appeared in The World July 19, 2008. Reprinted with permission.

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