

Scientists confine, study Chinook at restored Snoqualmie River habitat

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In newly restored river channels on the Snoqualmie, baby Chinook salmon are confined in 19 enclosures about the size of large suitcases as they munch on little crustaceans and invertebrate insects floating or swimming by.

What's in the salmon's stomachs, tracked by scientists, could hold clues about the species' survival.

The [river channels](#) near Fall City were excavated with heavy machinery and restored over the past two years — as part of the biggest habitat [restoration project](#) completed by King County. The channels span nearly a mile and give the river room to widen and narrow and, crucially, provide slow-moving water with logs and plants in which juvenile salmon can thrive.

Puget Sound Chinook are threatened under the Endangered Species Act, so these new refuges could help sustain the fish and their importance to local tribes, as well as to endangered southern resident orcas, which depend on Chinook as a primary prey.

Decades ago, the Snoqualmie ran unobstructed — constantly changing paths and bending across floodplains — gathering water from the mountains and eventually joining the Snohomish River and flowing to the sea. That changed when settlers hardened the river banks with levees and revetments made out of stone.

That process removed the logjams and slow-moving waters crucial to young salmon. Streams and rivers that are warming because of climate change also threaten salmon throughout the Northwest.

To figure out how the fish are faring in the reconstructed channels, King County research scientist Josh Kubo on Wednesday swept a net through the river to see what kind of tiny salmon food is available.

Kubo also analyzes the stomach contents of 90 salmon held in the enclosures, as well as the stomachs of wild chum, pink, coho, and Chinook salmon. To complete the task, he flushes the fish's stomach with a small tube of water.

The study will evaluate the first six to eight weeks of the juvenile Chinook salmon's life when it is most threatened in the watershed.

"It's what's called the 'bottleneck area,' where there is one of the biggest losses, and so we have the biggest chance to help improve that survival," Kubo said.

The results of the study will eventually be published, but recent observations showed the juvenile Chinook in the enclosures were eating well, with stomachs full of aquatic and terrestrial insects and even zooplankton, Kubo said.

The tiny baby Chinook salmon — each around 2 inches long — are just part of one of the science experiments along the river. The Snoqualmie Tribe is also monitoring 17 wells around the area to see how the restored floodplain will interact with groundwater and temperature. That information is crucial, especially in the summer when salmon rely on groundwater to replenish parts of the river with cool water.

The project, which costs \$19 million and consists of 145 acres, involved removing a levee from one bank and a stone revetment from the other. King County planted native trees and shrubs and added new structures to prevent flooding and erosion. Ground work like excavating the channel was completed last year, according to project manager Fauna Nopp.

Representatives from the local flood district and agriculture interests were also involved with the project, she said. Local landowners were enthusiastic about the restoration project since large floods have damaged local roads, structures and farmland, Nopp said.

In 2009, a flood scoured a large amount of topsoil from land owned by nearby Fall City Farms, and floods have routinely damaged a nearby asphalt road near the river, King County geologist Todd Hurley said. The

restored flood plain, which will give the river more room during heavy rains, is expected to lessen flooding upstream near a pumpkin patch, barn and rental house owned by Fall City Farm, Nopp said. The project also rebuilt and rerouted a portion of the local road away from the river.

The Raging River empties into the Snoqualmie River just upstream around Fall City, which means the restored flood plain should have a good source of gravel and wood for [salmon](#) habitat. Due to the confluence with the Raging River, the area had long been used by Native Americans before white settlers arrived, Hurley said.

"We saw thousands of fish in this reach this year, the first year that it was constructed, so it's a little hard for me not to get too excited," he said.

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