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Reversing dam's threat to fish stocks on Capilano River
Efforts increasing to help fish survive in a river that ranks second on the list of the province's most endangered

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The water in the Capilano River is much colder than it would normally be as a result of the presence of the Cleveland Dam upstream, just one of the challenges that the river's fish face.

Ken Ashley squeezes into a dry suit and steels himself for a day-long swim down the Capilano River to count salmon and assess the quality of rearing and spawning habitat. "This river is so cold, bone-chilling," says the manager of habitat restoration for B.C.'s ministry of environment.

Construction upstream of Metro Vancouver's Cleveland Dam in 1954 has resulted in unnaturally cold water being flushed downstream in summer from the base of the structure, discouraging fish growth at a time of year when food is most abundant.

"It's like they're living in a refrigerator," Ashley said. "That water should be 16 to 18 degrees (Celsius), not 10 to 11 degrees. It puts them in opposite, and takes them longer than normal to rear."

The negative impacts on fish do not stop there. The dam also restricts natural water flows as well as the downstream movement of gravels required for spawning.

And, perhaps worst of all, it requires smolts migrating to sea to take a flying leap down the 90-metre spillway into the rocks below, killing as many as 75 per cent in the process.

Ashley's swim down the Capilano River this sunny day with officials from Metro Vancouver and the federal fisheries department is a small step in developing water-use management plans for the region's Capilano and Seymour dams that take into consideration not just drinking water needs, but downstream ecological needs.

Ashley said later his swim turned up 340 adult coho, most of them at the top of the creek near the hatchery, 15 chinook, and not a single summer steelhead.

He noted that BC Hydro reluctantly developed water-use plans for its hydro dams starting in the mid-1990s, and now it's time for agencies such as Metro Vancouver to follow suit.

"Big organizations are resistant to change," he said. "There have been long-standing concerns about the health of the river because of the dam."

The production of a water-use plan is consistent with Metro Vancouver's new sustainability policy, which includes a commitment to "protect, restore and enhance natural ecosystems."

To that end, the region has teamed up with senior governments and the Living Rivers Trust Fund in a \$400,000 program this year to capture the smolts before they reach the spillway and transport them safely downstream.

About 10,000 smolts -- all coho salmon, except for 300 steelhead -- have been captured through two methods: two aluminum rotary screw-traps positioned in the upper Capilano River, and five net traps positioned closer to the dam along the shoreline where the smolts feed.

That represents an estimated one-quarter of the total number of smolts reared in the upper Capilano watershed.

Half of the smolts captured were tagged so their survival rate can be tracked once they return to the hatchery in two or three years, and so their survival can be compared with those that continue to slash down the spillway.

"It was a trial year, a real fishing experience" said Derek Bonin, a Metro Vancouver watershed manager. "I think we can do better next year."

Ottawa built the Capilano hatchery in 1971, which now helps to support a recreational and aboriginal fishery.

Between 6,541 and 16,758 adult coho per year returned to the Capilano hatchery during the four-year period ending 2007, in addition to 235 to 1,887 chinook (a species introduced to the river).

Only a few dozen steelhead return each year, most of them from the winter run.

The hatchery released between 507,658 and 633,514 coho smolts annually during that same time plus 507,658 to 587,020 chinook smolts. On average, 15,000 steelhead smolts are also released at the dam.

Between 5,949 and 6,368 adult coho are annually trucked above the dam to the upper Capilano River for release as well as a few thousand to tens of thousands of steelhead fry.

When smolts from these releases in the upper watershed seek to return to the ocean, they must navigate a gauntlet of hungry cutthroat trout that inhabit the reservoir year-round and then endure the dangers of the dam's concrete spillway.

The latest initiative to truck the smolts downstream below the dam follows a 2007 report by the Outdoor Recreation Council of B.C., which identified the Capilano as No. 2 on its annual list of most-endangered rivers.

Mark Angelo, the council's rivers chair and head of BCIT's fish, wildlife and recreation program, says the capturing and trucking of smolts downstream is a positive "stop-gap" effort in a long-term recovery program.

He would eventually like to see the installation of multiple ports in the dam to allow the withdrawal of water from various depths, and the installation of a smolt-passage facility entailing a directional net and flume at the top of the dam to safely deliver young fish safely to the bottom of the structure.

While the cost of installing both the smolt-passage facility along with the upgrading of the dam's port mechanism may cost several million dollars, the council argues this is just a small fraction of the \$600 million now being spent on upgrades to the Capilano-Seymour water system.

Of 12 rivers considered B.C.'s most endangered by the recreation council, half are threatened all or in part as a result of urban development: the Fraser (No. 2,) Kettle (6), Coquitlam (7), Okanagan (10), Salmon (11), and Little Campbell (12).

When it comes to urban rivers, the obstacles are rarely as obvious as a concrete dam. Pollution and habitat loss more commonly are the insidious threats to the survival of fish in urban areas.

Fixing a broken stream generally takes a variety of forms, including the stoppage of pollution sources, flood control, restoring and expanding riparian vegetation along shorelines, putting woody debris and gravel in streams, and creating riffles to increase oxygen content.

Angelo noted that when he came to BCIT more than 30 years ago, the lower end of nearby Guichon Creek had been culverted and paved over and the upper end dredged and channelled. "This little creek that used to sustain salmon had pretty much become a lifeless drainage canal," he said.

Since then, students and staff have slowly restored the creek, which is now home to cutthroat trout and a source of tranquility for anyone visiting BCIT. Farther downstream, Still Creek was once one of the most polluted streams in the region, but today boasts 200 metres of protected buffer near Burnaby Lake.

"There's probably no other urban stream in the country that's quite like that," Angelo said.

Angelo notes there are no government programs that specifically target urban streams, putting the onus on local grassroots community groups and environmental organizations to kick-start their protection.

The ranks of river advocacy groups have increased with the arrival of Fraser Riverkeeper, a non-profit group founded in the U.S. in 1999 by Robert F. Kennedy Jr. and dedicated locally to protection of water quality and fish habitat of the Fraser River and its surrounding waters, including the southern Strait of Georgia.

One of its main campaigns is to pressure Metro Vancouver to hasten the upgrading of its Lions Gate and Iona Island sewage plants to secondary from primary treatment. The group also encourages boaters and kayakers to report pollution violations, and favours launching private prosecutions as needed to crack down on offenders.

Meanwhile, at Britannia Creek on the Sea to Sky Highway, installation in 2005 of a water-treatment plant to capture toxic metals leaching from the old mine upstream is starting to show benefits.

"It was once of the most toxic sites in North America," Angelo said. "Go there now and you are starting to see life come back in terms of algae and insects."

B.C. Rivers Day on Sunday (www.riversday.bcit.ca) is an opportunity for tens of thousands of British Columbians to celebrate importance of rivers and become part of a growing global movement (www.worldriversday.bcit.ca).

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