

New salmon habitat created by melting glaciers could be threatened by mining claims, study finds

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Thousands of salmon on the West Coast of North America are finding their way into new streams left behind as glaciers retreat. But a new

study suggests mining companies are too keen on the newly exposed mineral deposits beneath the shrinking glaciers—and few policies are in place to protect the emerging habitats.

The paper led by researchers from Simon Fraser University, the University of Montana, Taku River Tlingit First Nation, and Gitanyow First Nation Hereditary Chiefs highlights a broad global challenge as many environmental policies struggle to keep pace with [climate change](#).

Just a couple decades after some new streams were created, researchers have found thousands of fish, said Jonathan Moore, the lead researcher on the paper and a professor at Simon Fraser University. Salmon have evolved through dynamic landscapes with [glaciers](#)' ebbs and flows and are specially equipped to find new habitats where they can flourish.

Most North American [salmon](#) watersheds or regions are being influenced by contemporary glacier retreat. These glaciers are rapidly declining in volume, thickness and area, accelerated by recent human-caused climate warming. About 60% to 100% of glaciers are predicted to disappear from western Canada by 2100.

As glaciers shrink, some of the streams they feed will become warmer, flows depleted and salmon will become stressed and in some situations die.

Although the loss of glaciers will decrease [water storage](#) and cooling capacity that threatens people and aquatic ecosystems downstream, researchers have found that some glacial retreat will leave behind thousands of miles of new salmon rivers over the coming decades in western North America.

Overall, the net effects of glacier retreat on salmon will likely depend on the phase of glacier retreat, the traits of salmon species, and local

environmental, geographic and ecological characteristics of watersheds.

In Glacier Bay, Alaska, new river systems created by retreating glaciers were colonized by pink salmon within three decades of formation. Sockeye heading up to spawn in the Tulsequah River in Northwestern British Columbia have nearly found their way into a 100-meter deep lake where a glacier stood just two decades ago.

And salmon are returning to spawn in the cool glacial melt of Strohn Creek in the Meziadin Watershed, where few fish historically spawned.

But as salmon began making their way up Strohn in 2016, the Gitanyow First Nation began tracking notice of work claims in the watershed.

"We were just learning that this area was prime emerging habitat, and also a hotspot for (mining) exploration," said Tara Marsden/Naxginkw, the Wilp Sustainability Director for the Gitanyow Chiefs office and a co-author of the paper.

The November study found that across 114 subwatersheds forecast to have new salmon habitat in the ice-covered transboundary region shared by northern B.C. and Alaska, 25 had more than 50% of future habitat within about 3 miles of mining claims, and 17 watersheds had more than 90%.

Researchers found that more than half of future salmon habitat in Canada has either medium or high mineral potential, an indicator of future potential mining pressure.

While Indigenous First Nations have long worked to safeguard their unceded lands from potentially harmful extractive practices like mining, Canadian crown governments are today recognizing the importance of Indigenous traditional knowledge, rights and title. Both the Government

of Canada and the province of British Columbia have committed to protecting 30% of lands by 2030.

Being at the forefront of Indigenous leadership is not new for the Taku Tlingit, the First Nation said in a statement. It was almost twenty years ago when the Taku River Tlingit First Nation won a Supreme Court case that reinforced the B.C. provincial government's requirement to consult with the nation in approving environmental permits or certificates.

Taku River Tlingit leaders are now in negotiations with the provincial and federal to strengthen support and to establish crown recognition of the 1.85 million hectare T'akú watershed Indigenous Protected and Conserved Area, an area three times the size of Prince Edward Island and along the border between northwestern British Columbia and southeast Alaska. The IPCA protects all major salmon rivers, including future predicted salmon habitats, as well as important wildlife habitats and cultural landscapes.

"Taku River Tlingit have a sacred relationship with our territory, reflected in the concept of Lingít Kusteeyí (Tlingit Way of Living), which encompasses caring for all life," Jìnik/Charmaine Thom, spokesperson for the Taku River Tlingit, said in a statement.

In 2021, the Gitanyow Hereditary Chiefs established the Meziadin Indigenous Protected Area, inviting other governments and industry leaders to consult on the management plan. It protects more than 50,000 hectares of spawning habitat and outlines the vision, permitted and prohibited activities that Gitanyow can share with industry and use in consultation with government.

"What's really different nowadays is that Indigenous peoples are really leading in scientific exploration and research," Marsden said.

"We can't pretend that we don't know anymore, we know," Marsden said of climate change's impacts. "And now what? What action has to be taken now? We can move quicker than colonial governments in doing declarations and management plans and things like that. But it's their decision whether to follow the lead of an Indigenous nation."

British Columbia's Mineral Tenure Act is basically a two-zone system: in a park or not, Marsden said. If it's not in a park, then it's largely open to exploration by [mining companies](#).

But the B.C. Supreme Court recently ruled that the Mineral Tenure Act violated the duty to consult with First Nations, and ordered the Province to modernize the Act in the next year and a half.

"We're kind of in this situation where we're trying to push: look, we're in the Anthropocene [era]," said Mark Connor of Taku River Tlingit fisheries. "Things are changing quickly, we've got to change how we think about these kinds of policies, and start thinking about how we're going to protect areas, not for what they are right now ... but in 50 to 100 years, this is going to be super important."

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