

New study suggests indigenous practices can help revitalize pacific salmon fisheries

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The Heiltsuk Nation's traditional-style fish weir in the Koeve River in British

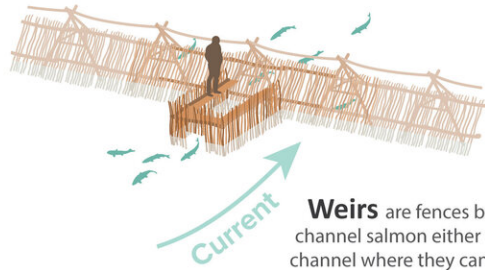
Columbia, allow fishers to target specific salmon runs and enable in-season monitoring, where fishers can assess a run's health in real time, while releasing non-target species unharmed. Credit: BDeroy

Across the North Pacific, salmon fisheries are struggling with climate variability, declining fish populations, and a lack of sustainable fishing opportunities. According to a study published today in *BioScience* from a team of Indigenous leaders and conservation scientists, help lies in revitalizing Indigenous fishing practices and learning from Indigenous systems of salmon management.

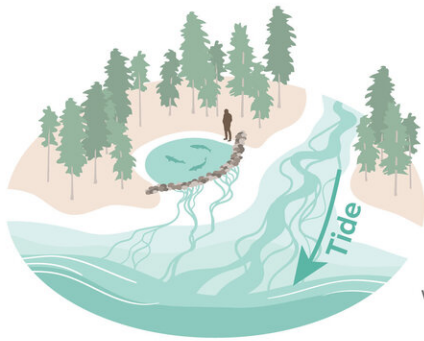
"Salmon and the communities that depend on them have been pushed to the brink by two centuries of extractive natural resource management," says lead author Dr. Will Atlas, Salmon Watershed Scientist with the Portland-based Wild Salmon Center. "But the tools, practices, and governance systems of Indigenous Peoples maintained healthy salmon runs for millennia before that. Their knowledge is still here."

The paper documents how, for thousands of years, Indigenous communities around the North Pacific maintained sustainable salmon harvests by using in-river and selective fishing tools like weirs, traps, wheels, reef nets and dip nets. Following European contact, these traditional fisheries and governance systems were suppressed, and often outlawed outright, as commercial fishing interests came to dominate fisheries.

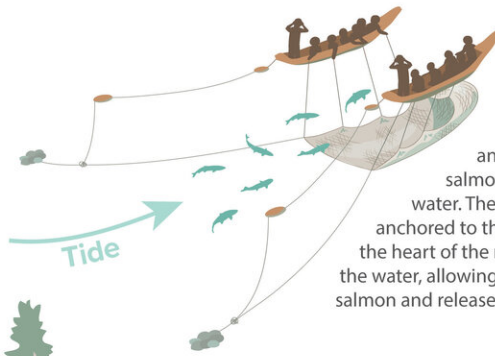
"As they're currently built, mixed-stock salmon fisheries are undermining the biodiversity needed for Pacific salmon to thrive," says Dr. Atlas. "Luckily, we have hundreds of examples, going back thousands of years, of better ways to fish. These techniques can deliver better results for all communities."



Weirs are fences built across rivers that channel salmon either into a trap, or narrow channel where they can be easily caught.



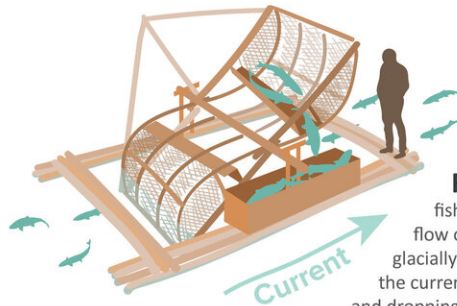
Fish traps built at or adjacent to the river mouth catch staging salmon as they wait to move into the river. Fish move in shore when the tide is high and are stranded behind stone or wooden trap walls when the tide subsides.



Reef nets capture migrating salmon in the ocean and are effective in locations where salmon migrate through shallower water. The upstream ends of net leads are anchored to the bottom, funneling salmon into the heart of the net. The net is then lifted out of the water, allowing fishers to selectively harvest salmon and release non-target species.



Dip nets are a ubiquitous, effective, and simple way of catching migrating salmon. Most effective at narrow canyons and cascades where fish are concentrated along the shore, dip netting sites are often passed down through families for generations.



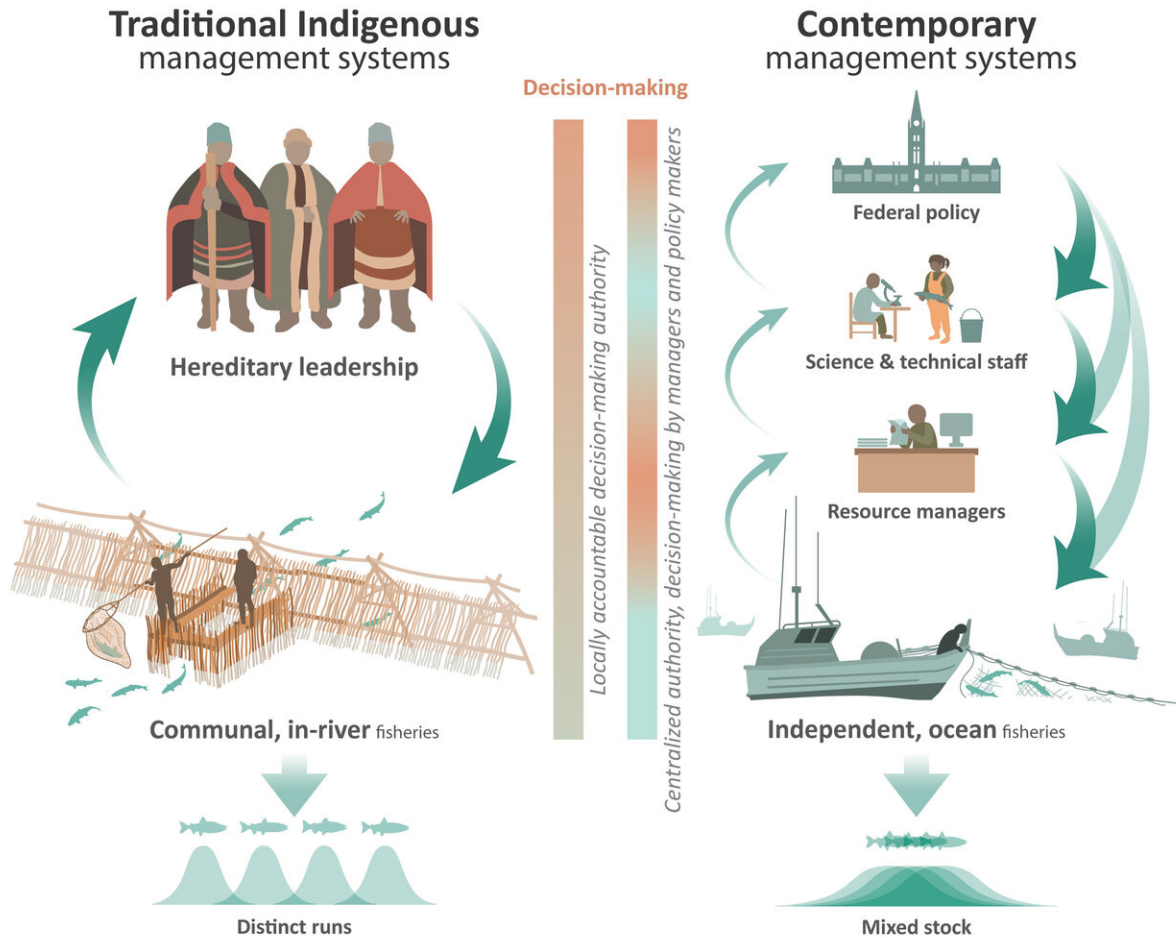
Fish wheels are a stationary fishing technology powered by the flow of the river. They are often used in glacially turbid rivers. The wheel spins with the current, scooping fish out of the water and dropping them in a holding box unharmed.

A diversity of traditional salmon fishing methods still being used around the North Pacific allow fishers to target salmon runs in or close to river systems--rather than in the open ocean, where more vulnerable and healthy stocks intermingle. Selective fishing tools also enable in-season monitoring, where fishers can assess a run's health in real time, while releasing non-target species unharmed. Credit: From Will Atlas, et. al. 2020

A key example explored in the study is Indigenous people's focus on terminal fisheries. By targeting salmon runs in river systems—rather than in the ocean, where more vulnerable and healthy stocks intermingle—Indigenous people harvest individual, known salmon runs. Selective fishing tools, like the Heiltsuk Nation's traditional-style fish weir in the Koeye River in British Columbia, also enable in-season monitoring, where fishers can assess a run's health in real time, while releasing non-target species unharmed.

"In my Nation, we use fish wheels, an ancient technology that used to be made out of cedar and natural fibers," says co-author Andrea Reid, a citizen of the Nisga'a Nation and an assistant professor in Indigenous Fisheries at the University of British Columbia's Institute for Oceans and Fisheries. "Today, we use modernized fish wheels to monitor, mark, and study the fish, to understand how they are doing in a rapidly changing world."

Indigenous salmon management knowledge stems from more than respect for a primary food source. For many communities, salmon are at the center of creation stories, ceremonies, family structures, and cultural identity.



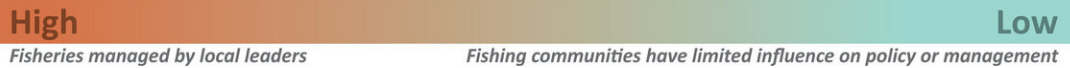
Mixed-stock harvest risks



Catch stability



Local governance



Fishery selectivity



Social-ecological resilience



Indigenous salmon management systems center on local, community-based

governance. Restoring Indigenous governance can help decentralize salmon management decisions at a time when diverse climate impacts are challenging watersheds like never before. Credit: From Atlas, et. al 2020

"The ancient relationship between Heiltsuk and salmon infiltrates every aspect of Heiltsuk life," says co-author William Housty, a member of the Heiltsuk Nation and Board Chair with the Heiltsuk Integrated Resource Management Department in Bella Bella, British Columbia. "Our modern-day management of salmon is based on the values of respect, reciprocity, and wellbeing."

As colonization severed access to traditional fisheries, Tribes and First Nations have experienced complex, ongoing harms. Restoring Indigenous co-governance to salmon management is a crucial part of the reconciliation process. According to the study's authors, restoring Indigenous governance can also help decentralize salmon management decisions at a time when diverse climate impacts are challenging watersheds like never before.

"In an era of rapid global change, we must explore different salmon management approaches," says co-author Dr. Jonathan Moore, a professor in Biological Sciences at British Columbia's Simon Fraser University. "By reinvigorating Indigenous practices, we can bring time-tested lessons to salmon fisheries and take a positive step toward recognizing the cultural fabric that has woven salmon and humans together for millennia." There's still hope for these fisheries, the authors say, if managers embrace Indigenous communities' focus on terminal fisheries and selective fishing tools, strengthen Indigenous co-governance, and decentralize [salmon](#) management decisions with climate resiliency in mind.

More information: *BioScience* (2020). [DOI: 10.1093/biosci/biaa144](https://doi.org/10.1093/biosci/biaa144)

Provided by Wild Salmon Center

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