

Industrial Development Looming Over Salmon Hotspot

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The Skeena River is a large free-flowing river that runs for over 550 km through northwest British Columbia from its headwaters to the ocean. The Skeena River supports hundreds of populations of six species of salmon and is the second largest salmon-producing river in Canada after the Fraser River. An incoming tsunami of industrial development is planned for the estuary at the mouth of this watershed, including a potash loading facility, an expanded rail, road, and utility corridor, and two liquefied natural gas (LNG) terminals, with large pipelines to supply them. A new study suggests that these projects are located in a hotspot of salmon biodiversity that supports many different recreational, commercial, and First Nations fisheries.

The study was written by Charmaine Carr-Harris (Masters student at SFU in Biological Sciences), Dr. Jonathan Moore (Assistant Professor at SFU in Biological Sciences and REM), and Dr. Allen Gottesfeld (Skeena Fisheries Commission).

The scope of these industrial projects is enormous. “One of the projects plans to dredge up 7.7 million m³ of sediment—that is the equivalent of filling 2424 hockey rinks with 2 m deep of sediment” says Jonathan Moore. For context, this would bury 92% of all of the indoor tournament-sized rinks in all of Canada (there are 2631 indoor tournament rinks in Canada according to the International Ice Hockey Federation 2013).

While the salmon life cycle begins and ends in freshwaters, they pass through the estuaries when they migrate to the ocean as smolts to grow, and again when they return as adults to spawn to die. This study focused on this smolt migration period; previous research suggests that the period right when smolts enter estuaries and the ocean is particularly important for determining the proportion of salmon that will return one to four years later. The proposed developments are in the region where the north arm of the Skeena River enters the estuary.

This study presents the results from a large-scale trawl and seine sampling program across two years (2007 and 2013) to quantify juvenile salmon in the Skeena River estuary, including in areas slated for industrial development. The study compared five regions in the estuary, one of which contains the industrial developments. All species of Pacific salmon were captured during this study, and salmon were found in all regions of the estuary that were surveyed.

“We caught salmon in all regions, in some cases with industrial drilling rigs looming above us,” says Charmaine Carr-Harris.

The region of the estuary with proposed industrial development contained particularly high abundances of some species in some years. Specifically, juvenile sockeye salmon were 2-8 times more abundant in the proposed development areas than other estuary regions in both years. This

region also contained the highest abundances of Chinook salmon in 2007 and coho salmon in 2013.

Genetic identification was used to identify the origin of Chinook and sockeye salmon smolts and revealed that the estuary habitats where developments are proposed are linked to salmon and salmon fisheries from throughout the Skeena River watershed. For instance, sockeye salmon smolts sampled within the region with proposed industrial development originated from 13 different populations, including populations from Alastair, Kalum, and Lakelse Lakes in the Lower Skeena, Sustut Lake in the high interior, four different populations of Babine Lake sockeye, and Morice Lake in the Bulkley system.

“We understand that the estuary is critical salmon habitat for Morice Chinook and sockeye salmon. It must be protected” says Walter Joseph, Wet’suwet’en Fisheries Director.

These different salmon populations support numerous commercial, recreational, and First Nations fisheries. The Fisheries Act states that “No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.”

“First Nations are extremely reliant on Skeena salmon. Skeena First Nations have sacrificed food in the face of conservation concerns as recent as last year” says Stu Barnes from Kispiox, chairman of the Skeena Fisheries Commission.

The study “Migratory bottlenecks as integrators of species- and population-level diversity: The Skeena River estuary, its salmon, and industrial development” can be found at PeerJ Pre-Prints and can be found at <https://peerj.com/preprints/375/>. “The study has not been externally peer-reviewed yet. The study is currently going through peer-review. However, we felt the need to make the study public now, as decisions about these industrial projects are currently being made,” says Jonathan Moore.

The public comment period for the Environmental Impact Statement for one of these projects closes on May 1, 2014 and can be found on www.eao.gov.bc.ca.

More information and pictures can be found at:
<https://moorelab.wix.com/moorelab#!floodtide/c1ht9>

For further information, please contact:

Charmaine Carr-Harris, ccarrhar@sfu.ca

Jonathan Moore, 778-782-9246, jwmoore@sfu.ca



Juvenile pink and coho salmon in the Skeena River estuary. Note the industrial drilling rig in the background. Photo: J. Moore