

**THE PROJECT (PNW LNG)**

**Critical environmental concerns regarding the proposed project, including the revised project plans, remain unaddressed.** The baseline data for important species is inadequate. Key potential negative environmental impacts of the project, especially regarding fish populations and their fisheries, remain insufficiently quantified. There is little to no scientific evidence that mitigation plans would be successful. The proposed project still represents an enormous alteration to the Skeena River estuary ecosystem and beyond.

- If the corresponding pipeline is also considered as well as the offloading facility, this project would still entail dredging approximately 1 million m<sup>3</sup> of materials from the Skeena River estuary (690,000 m<sup>3</sup> from the materials offloading facility and 300,000 m<sup>3</sup> for the pipeline).
- These sediments contain buried dioxins and furans.
- Disturbed sediments can shade or smother eelgrass, potentially degrading the adjacent Flora Bank eelgrass habitat.
- The pipeline to supply the LNG would cross over 1000 watercourses.
- Lelu Island and its shoreline, which provides key habitat for juvenile salmon and other species, would be completely altered.

**The new design poses new environmental and cultural risks that have not been properly assessed.**

- PNW LNG has contracted out the accommodation camp for the estimated 3,500 to 4,500 temporary workers to be operated by an independent third party in Port Edward/Prince Rupert, with no control over its environmental or cultural effects such as increased recreational fishing pressure.
- The jetty out to the berth is now almost twice as wide (now 27 m wide, previously 15 m) and is 300 m longer (now 2.7 km long, consisting of 1.6 km of suspension bridge and 1.1 km of conventional pipe pile trestle). The potential negative impacts of this increased size of the project have not been quantified. For example, the bridge will shade habitats underneath, offer refuge for potential predators, offer new hazards for boat traffic, and may alter behaviour of marine animals.
- The noise of the new construction plans as well as noise and light pollution from operations could cause mortality or behavioural changes for marine organisms.
- It is unclear how the new construction plans and tanker activity would alter water flows and sedimentation patterns (as noted by Dr. Patrick McLaren). These water flows and sedimentation processes control the maintenance of Flora Banks—it could erode or be smothered.
- There has not been a public comment period for the revised project.

## SCIENCE ON ESTUARIES AND SALMON

The estuary is the ecosystem where juvenile salmon make the physiologically challenging transition from fresh- to salt-water. Because all salmon must travel through the estuary, all salmon rely on this habitat, even if they spawn hundreds of km upriver. Thus, a productive and intact Skeena River estuary supports salmon populations that support fisheries that operate throughout the watershed.

Science has found that estuary ecosystem health is connected to salmon population vitality. Previous research has documented that loss of estuary habitat leads to dramatically lower survival of salmon. A study of 27 estuaries in western North America found that Chinook salmon survival was 1/3 lower in degraded estuaries compared to pristine estuaries<sup>1</sup>.

However, it is unknown why industrial development in estuaries leads to salmon population declines. It could be some combination of contamination with toxins, too many new predators, loss of food, destruction of shelter, or other unknown factors. Thus, there is little to no scientific evidence that mitigation plans would be successful. For example, the revised project proposes to have a 2.7 km long bridge that crosses over salmon estuary habitats. However, previous research has found that juvenile salmon avoid swimming under bridges in estuary habitats<sup>2,3</sup>. This potential effect has not been incorporated in the Environmental Assessment.

New research by SFU and First Nations groups<sup>4</sup>, as well as historic research by government scientists<sup>5,6</sup>, found that the area that is proposed to be developed is particularly important for Skeena salmon. Of five regions in the estuary that were examined in the recent Skeena estuary study, the region proposed for development around Lelu Island contained the highest abundances of sockeye, Chinook, and coho salmon in at least one of the two years.

Through genetic analyses of juvenile salmon, this recent salmon estuary study<sup>4</sup> found that juvenile salmon captured in the estuary originated from habitats throughout the Skeena River watershed, as well as the Nass, Stikine, and other coastal watersheds. These data are direct evidence that the estuary habitat supports many different salmon populations and their fisheries, including First Nations fisheries from throughout the watershed.

## QUOTES

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- “The Lelu Island area of the Skeena River estuary, where this LNG facility is proposed, contains particularly high abundances and biodiversity of some of the most important salmon species in the Skeena.”
- “Past science has shown that industrial development in estuaries degrades salmon populations, and our research documented that the area proposed for development supports particularly high numbers of salmon and links them to fisheries from throughout the watershed.”
- “Science indicates that industrial development in the estuary poses real risk to Skeena salmon populations and the fisheries that depend on them.”

**REFERENCES**

<sup>1</sup>Magnusson and Hilborn. 2003. *Estuaries* 26: 1035-1046.

<sup>2</sup>Tolf et al. 2007. *North American Journal of Fisheries Management* 27: 465-480.

<sup>3</sup>Munsch et al. 2014. *North American Journal of Fisheries Management* 34: 814-827.

<sup>4</sup>Carr-Harris et al. 2014. *PeerJ PrePrints* 2:e375v1.

<sup>5</sup>Manzer 1956. *Prog Rep Fish Res Board Canada* 2956.

<sup>6</sup>Higgins and Shouwenberg 1973.