

Letter from scientists regarding Roberts Bank Terminal 2

To: Honourable Steven Guilbeault, Minister of Environment and Climate Change Canada

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From: Canadian, US and international scientists with study areas that include the Fraser River Estuary, salmon, and/or Southern Resident killer whales

Date: Feb 7, 2022

Re: Vancouver Fraser Port Authority Roberts Bank Terminal 2 Expansion

We, the undersigned scientists, considering the conclusions of the Canadian Environmental Assessment Agency's (CEAA)¹ report that found significant adverse and cumulative effects from the proposed Roberts Bank Terminal 2 expansion, urge you to consider this project within the scope of your stated biodiversity and species recovery commitments. **If the recovery of Canada's endangered and iconic wildlife is a priority for the government of Canada, as stated, then it must reject the proposed Terminal 2 project.**

Background

In this letter, we highlight the role of British Columbia's Fraser River Estuary as internationally and regionally important habitat for at-risk species, including Fraser Chinook salmon (*Oncorhynchus tshawytscha*) and the terminus of critical habitat for Southern Resident killer whales (*Orcinus orca*). We outline specific threats to these species from the project and provide supporting conclusions from the Impact Assessment Agency report that highlight the biological rationale for rejecting this project.

In March of 2020, the Impact Assessment Agency federal review panel concluded that the Roberts Bank Terminal 2 expansion project would have significant adverse and cumulative effects to populations of Fraser Chinook salmon. This is due to the proposal's habitat-footprint in the Fraser Estuary and from the migration disruption of outmigrating juvenile salmon caused by the terminal's placement. The panel also concluded that the project, including its associated increase in marine shipping, would amplify underwater noise in the Salish Sea, leading to significant adverse effects on endangered Southern Resident killer whales.

In August 2020, the previous Federal Minister of the Environment and Climate Change placed the project on hold when he requested the Vancouver Fraser Port Authority² (VFPA/Port) provide additional specific information on the potential cumulative impacts to fish, fish habitat and species at risk, as well as the

¹ Assessment of VFPA's Roberts Bank Terminal 2 proposal began under the *Canadian Environment Assessment Act* (2012) but the final report was issued under the *Impact Assessment Act* (2016) by the Impact Assessment Agency of Canada in 2020. The report will be cited as such henceforth.

² Commonly referred to as the Port of Vancouver.

feasibility of potential mitigation measures. There is currently no proven offsetting known to mitigate the effects of Roberts Bank Terminal 2 to species at-risk.

We call on the federal government to carefully consider the following findings.

Evidence

As a nursery and feeding ground, the Fraser River Estuary connects a food web linking fish, birds and marine mammals across thousands of kilometres of the North Pacific Ocean. Even at a fraction of their former abundance, it is still the rearing and migration grounds for Canada's largest runs of Pacific salmon.

The Port is proposing to double the size of its current shipping terminal at Roberts Bank in the heart of the Fraser Estuary. At 85 hectares (210 acres), the existing terminal is already a significant footprint, including its four-kilometre long causeway across the Fraser delta that acts as a barrier to the natural movement of fish, invertebrates, freshwater, fine sediments and nutrients.

Research published since the panel hearing shows more than 100 species considered at risk of local extinction rely on habitats within and surrounding the Fraser Estuary (Kehoe et al., 2020). We are concerned that construction of Terminal 2 will impact ecological conditions that support a saltwater marsh, eelgrass, mudflats, juvenile salmon and other critically important fishes, migratory birds, and other species, placing further stress on an estuary that has already lost more than 85% of its floodplain habitat (Finn et al., 2021). We are especially concerned about the impacts from the expanded terminal footprint on populations of Fraser Chinook salmon, increased noise and potential ship strikes associated with expanded shipping traffic on endangered Southern Resident killer whales, and the potential impacts to intertidal biofilm and its implications for migratory shore birds such as Western sandpipers (ECCC, 2018).

Transboundary species: Fraser Chinook salmon and Southern Resident killer whales

Fraser Chinook salmon are an international transboundary species with habitat ranges spanning from the Fraser River and the Salish Sea, to the North Pacific Ocean. They are subject to the international Pacific Salmon Treaty (PST), and are of ecological, economic, and cultural importance to both the United States and Canada. The Impact Assessment report concluded that Terminal 2 would have adverse and cumulative effects on ocean-type juvenile Chinook salmon from the South Thompson and Lower Fraser portions of the Fraser River watershed. Fraser River Chinook salmon are known to be a critical food for Southern Resident killer whales (Hanson et al., 2010).

Southern Resident killer whales are a distinct transboundary population of Resident killer whales that are listed as endangered under Canada's *Species at Risk Act (SARA)* (SARA 2002, s. 27) and the US *Endangered Species Act (ESA)* (ESA 1983). As of Fall 2021, there are only 73 individuals remaining in this population, a drop of 25% in only 2.5 decades.

Legally protected critical habitat for Southern Resident killer whales is located within the transboundary

marine waters of the Salish Sea from the Juan de Fuca to Southern Georgia Strait. These waters are managed jointly by Canada, the US, the Province of British Columbia, Washington State, and informed by the interests of dozens of First Nations and Tribes (ECCC, 2020). They are heavily transited by vessels visiting dozens of ports and marinas on each side of the border. Notably, the Fraser Estuary is the north eastern perimeter of legally protected critical habitat for Southern Resident killer whales. The Impact Assessment Agency report concluded that Terminal 2 would result in significant adverse cumulative effects on Southern Resident killer whales due to impacts to Chinook salmon prey availability, underwater noise affecting their foraging success, and potential ship strikes.

Due to the importance of Fraser Chinook to fisheries in both British Columbia and the United States, and their importance as primary prey for Southern Residents, Terminal 2 has implications for the persistence of these two significant transboundary species. Thus, any decision by Canada's regulatory agencies regarding the approval of Roberts Bank Terminal 2 is of international concern.

Outlined below are the specific threats posed by Terminal 2 to Fraser Chinook salmon and Southern Resident killer whales, and the conclusions of the Impact Assessment Agency report regarding these threats.

Fraser River Chinook salmon

1. The threat to South Thompson River and Lower Fraser ocean-type Chinook salmon

The summer and fall runs of ocean-type Chinook salmon from the South Thompson and Lower Fraser, respectively, are the only Chinook populations in the Fraser River abundant enough to support limited harvest by commercial, sport and First Nations fisheries, both in Canada and the US; all others are effectively closed to harvest because so few Chinook from these populations remain. Chinook salmon from the South Thompson River are the only Fraser population evaluated by COSEWIC (Canada's federal species assessment body) not considered to be at some level of risk of extinction. Most (14/16) Fraser Chinook populations assessed by COSEWIC are threatened or endangered. This includes the threatened Harrison River population and the endangered Maria Slough population of ocean-type Chinook that rely on the Fraser estuary. Canada manages Harrison River Chinook salmon under an international Pacific Salmon Treaty obligation to meet a minimum escapement goal of 75,100 spawners. This goal has not been met in nine of the last ten years.

'The Panel concluded that two populations of Fraser Chinook salmon, the Lower Fraser and South Thompson River populations, are particularly vulnerable to Project effects due to their life history and extensive utilization of Roberts Bank habitat'. 'The Panel concludes that the Project would result in a residual adverse effect and an adverse cumulative effect on ocean-type juvenile Chinook salmon populations from the Lower Fraser and South Thompson rivers. The effects would be significant' (Impact Assessment Agency, 2020)

2. Barrier for migrating juvenile Chinook and loss of habitat

The existing terminal at Roberts Bank already has a significant footprint with a four-kilometre long causeway

across the intertidal Fraser delta that facilitates truck and rail transit between the terminal and the shore. The expansion would extend and widen the causeway and add another 108 hectares (267 acres) of terminal in the middle of the estuary, infilling intertidal habitats used by juvenile Chinook salmon and extending the migration barrier further into subtidal waters with higher salinity, more predators, and less food. Terminal expansion shrinks the size of the estuary, brings more lights (which attract predators) and noise, changes water flow and fine-sediment recruitment, and circulation patterns. These changes will adversely affect the survival of ocean-type Fraser River Chinook salmon that require a functioning estuary to feed and grow.

‘The federal review panel concluded terminal expansion would create a larger barrier to juvenile Chinook salmon wanting to migrate into the eelgrass beds on the south side of the shipping terminal. The Panel concludes that the Project will have an adverse residual effect on juvenile Chinook salmon due to migration disruption, coupled with minor adverse effects in the acoustic and light environments during construction and operations. This effect would be high in magnitude, local in extent, permanent in duration, and irreversible. The Panel concludes that this effect would be significant’ (Impact Assessment Agency, 2020).

3. Adverse and cumulative effects on ocean-type juvenile Chinook salmon

The Fraser Estuary is critical for the survival of ocean-type Chinook salmon from the Lower Fraser River and South Thompson River parts of the Fraser watershed (Chalifour et al., 2019; Chalifour et al., 2020), including threatened and endangered populations from the Harrison River and Maria Slough. These salmon rely on the shallow, low-salinity waters of the Fraser Estuary for one-two months as juveniles (Chalifour et al., 2020) while they feed and grow.

‘The Panel concludes that the Project would result in a residual adverse effect and an adverse cumulative effect on ocean-type juvenile Chinook salmon populations from the Lower Fraser and South Thompson Rivers. The effects would be significant’ (Impact Assessment Agency, 2020).

Southern Resident killer whales

1. Importance of Fraser Chinook salmon populations

There is a relationship between Fraser Chinook salmon abundance and Southern Resident killer whale vital rates (Velez-Espino et al., 2014) and between Fraser Chinook abundance and use of core critical habitat by Southern Resident killer whales (Shields et al., 2018). South Thompson River and Lower Fraser River populations of ocean-type Fraser Chinook salmon have also been ranked as priority stocks for Southern Resident killer whales (Hanson et al., 2010; NOAA, 2018). The Panel concluded that the terminal would have significant adverse cumulative effects on the persistence of these salmon populations.

‘The Panel considers it important, as acknowledged by the Proponent, that Chinook salmon spawning runs originating from the Lower Fraser River system and the South Thompson River are of greatest overall importance in the diet of Southern Resident killer whales (Impact Assessment Agency, 2020).

2. Southern Residents are nutritionally-stressed killer whales

Reduced prey availability (i.e., the abundance of preferred Chinook salmon), is a primary factor limiting the recovery of Southern Resident killer whales (Ford et al., 2010; Hanson et al., 2021; Ward et al., 2009). As such, Southern Resident killer whales have been characterized as nutritionally-stressed (Matkin et al., 2017). Considering the importance of the Fraser Estuary as rearing grounds for Chinook salmon, and the importance of Fraser Chinook salmon in the diets of Southern Residents, the decreased abundance of preferred prey within critical habitat constitutes critical habitat destruction for Southern Resident killer whales.

‘The Panel concludes that the Project would result in a residual adverse effect on prey availability for Southern Resident killer whales, and the effect would be moderate in magnitude due to the nutritionally stressed state of the population. The effects would be regional in extent, permanent in duration, irreversible, and continuous. This residual effect would result in the partial loss of legally defined critical habitat for Southern Resident killer whales’ (Impact Assessment Agency, 2020).

3. Increased underwater noise from shipping traffic effects foraging

The expansion of Roberts Bank Terminal 2 will result in an increase in shipping container traffic in the Salish Sea by about 25%³. Southern Residents are already in the presence of boats and ships 85% of the time they use the inside waters of the Salish Sea (Lacy et al., 2015). More ships increase underwater disturbance and reduce the quiet time Southern Residents can feed without noise interfering with the echolocation their predatory search behavior depends on to catch salmon. Reductions in feeding success in the presence of vessels can be as high as 19% when vessels are a near continuous presence⁴.

‘The Panel accepts the information on record that indicates underwater noise levels in the Salish Sea are already high, and too noisy for Southern Resident killer whales’ (Impact Assessment Agency, 2020).

‘The Panel concludes that the Project and marine shipping associated with the Project would result in a significant adverse cumulative effect on the Southern Resident killer whale’ (Impact Assessment Agency, 2020).

4. Increased risk of extinction

Analysis conducted by Fisheries and Oceans Canada on the long term viability of Southern Resident killer whales determined that the likelihood of functional extinction (one sex remaining) within 75-97 years was 26% under existing conditions (Murray et al., 2019; Murray et al., 2021). An increase in underwater noise coupled with declining Fraser River Chinook salmon abundances that are anticipated from Roberts Bank Terminal 2, would further intensify the prey availability and prey accessibility problems that are

³ Based on the Review Panel’s expected increase of 1.5 ships/day or 520 transits/year for a total of 2046 transits/yr in 2030. If tanker traffic from the Trans Mountain Expansion Project and other increases are considered, vessel traffic is expected to increase by 37% above 2015 levels.

⁴ Based on calculations in Lacy et al. (2015) and Lacy et al. (2017).

limiting the recovery of Southern Resident killer whales. It is probable that further reduced prey availability and further increased underwater noise and disturbance would have population-level effects and increase their likelihood of extinction (Lacy et al., 2017).

‘Based on the effects due to the Project and marine shipping associated with the Project on underwater noise, Chinook salmon prey availability and potential ship strikes, and in the absence of effective and mandatory mitigation measures, the Panel concludes that there would be a significant adverse effect on the Southern Resident killer whale’ (Impact Assessment Agency, 2020)

Recent research publications

Since the Impact Assessment Agency review process, three papers have been published with conclusions that provide further peer reviewed evidence that confirm and elevate the importance of the Fraser Estuary to the survival of threatened and endangered species. Chalifour et al. (2019) demonstrated the importance of eelgrass habitats at Roberts Bank in contributing to the mosaic of connected conditions that support juvenile salmon within the Fraser Estuary. Chalifour et al. (2020) found that individual Chinook salmon spend an average of 42, and up to 90 days, rearing and feeding on the estuary delta growing an average 0.57 mm /day. Kehoe et al. (2020) demonstrate that it is not too late to save 102 Fraser Estuary species at risk of local extinction. But to do so, important conservation steps must occur. The likelihood of recovery for these species increases if no further industrial development occurs in the estuary.

Lack of quantified evidence that mitigation/compensation offsets negative effects on habitat

Due to the lack of quantitative evidence that habitat compensation in the Fraser River Estuary can offset the negative effects incurred by development projects (Quigley and Harper, 2006; Lievesley et al., 2016), and that the panel identified the absence of effective and mandatory mitigation measures to reduce noise and disturbance impacts on Southern Resident killer whales, **we urge the government to err on the side of caution when considering an approval that lacks scientific evidence to support it.**

A risk averse path, such as the *precautionary approach*, dictates informed prudence in the face of doubt and high uncertainty. Examples such as *Principles for Wild Living Resources* described by Holt and Talbot (1978) or the *Management Procedures* put in place by agencies like the International Whaling Commission (1994), identify safety factors when the risk of irreversible changes or long-term effects from actions are possible, in order to assure such outcomes will not occur.

Habitat offsetting emerged as a strategy to reduce the negative effects to biodiversity from development (Gardner et al., 2013). However, the lack of extensive evidence demonstrating the effectiveness of offsetting (Quigley and Harper, 2006; Lievesley et al., 2016; zu Ermgassen et al., 2019) has resulted in concerns regarding its use and suitability to adequately compensate for lost habitat (Bull et al., 2013).

A driving principle of offsetting or compensation is the ‘No Net Loss’ (NNL) principle, where negative ecological effects from development are required to be fully offset to ensure that population sizes persist and remain stable after project completion (Bull et al., 2013). The NNL principle was adopted by Fisheries and Oceans Canada in 1986 to allow for development in and around fish habitat while striving

to conserve their productive capacity.

In the Fraser Estuary, a failure of the NNL principle was that it identified compensation sites based on a few narrowly focused species, resulting in a siloed approach to habitat compensation that failed to ‘replace’ natural habitat.

Lievesley et al. (2016) surveyed the effectiveness of NNL compensation sites constructed between 1983 and 2010 in the Lower Fraser River and estuary. Only 33% of compensation sites attained their intended function and met the desired area of native species cover, with all of them having significantly less native species coverage compared to reference sites (Lievesley et al., 2016). The invasive reed canary grass (*Phalaris arundinace*) was assessed as the dominant plant species in 20% of sites. Notably, Lievesley et al. (2016) found that despite up to three decades since site construction, time did not make an appreciable difference on increasing the proportion of native species. Hartman and Miles (1997) found the success rate of measures to create or improve spawning and rearing habitat in a Fraser River tributary was never 100%.

A Canada wide study of fish habitat compensation projects found that 50% were not compensating for damages on a 1:1 ratio (Quigley and Harper, 2006). In California, only 46% of compensatory wetlands met their habitat area requirements (Ambrose and Lee, 2007). Quigley and Harper (2006) found it was simply not possible to compensate for some habitats. Failure to account for such limitations hinders Canada’s goal of conserving fish habitat.

Previous offsetting projects by the Vancouver Fraser Port Authority

During the Panel Review for Roberts Bank Terminal 2, the VFPA submitted two examples of previous compensation projects that were intended to demonstrate their ability to successfully implement and complete compensation works. However, both projects failed to meet their initial designs, and required follow up work to improve their function (Scott, 2019). To date, the VFPA has yet to provide evidence that indicates their compensation projects successfully achieved their intended goals. Furthermore, the use and success of habitat offsetting in the Fraser River Estuary is poorly studied and understood (Lievesley et al., 2016). Scientific evidence is insufficient to demonstrate either the effectiveness of habitat compensation or that offsetting projects can compensate for the loss of critical estuary habitat incurred from Terminal 2. Due to the lack of scientific evidence, offsetting proposals cannot be characterized as providing effective mitigation.

‘Unconventional offsetting’ proposed to compensate for the adverse effects from Roberts Bank Terminal 2

In August of 2020, the VFPA initiated a request for ‘unconventional offsetting’ proposals to examine governance options for implementing a non-conventional offsetting program. How such a program would compensate for the adverse effects of Terminal 2 on critical habitats and at-risk populations of Chinook salmon and Southern Resident killer whales is unknown. Because no effective habitat mitigation has been identified, unconventional offsetting is not a compensation for further declines in wild salmon

populations and the increased extinction risk for Southern Resident killer whales.

Conclusion

Ultimately, there is substantial evidence demonstrating that significant adverse effects from Roberts Bank Terminal 2 are anticipated on Fraser Chinook salmon and Southern Resident killer whales. The Panel has made it clear that approving Terminal 2 will adversely impact these important at-risk species. There is also a lack of evidence demonstrating that habitat offsetting can successfully mitigate the adverse effects.

We, the undersigned scientists, conclude that if the conservation and recovery of Canada's endangered and iconic wildlife species are a priority for the government of Canada (as previously stated), then the proposed Roberts Bank Terminal 2 project must be rejected.

Rejection of the project and protection of the Fraser Estuary as critical habitat for at-risk species would demonstrate the Federal government's stated commitment to its biodiversity targets. This includes adhering to its 2011 commitment to manage its lands and waters to support biodiversity and conservation outcomes at local, regional and national scales, and reduce direct and indirect pressures and cumulative effects on biodiversity by 2020. It would also demonstrate federal commitment to the letter and intent of legislation like Canada's *Species at Risk Act* and directive policies like Canada's Wild Salmon Policy. Investments in conservation and biodiversity have also been shown to be investments in the prosperity of current and future generations.

Sincerely,

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Supporting signatures from experts in the topics addressed in the letter

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CC:

Honourable Prime Minister Justin Trudeau

Impact Assessment Agency of Canada

Vancouver Fraser Port Authority

Honourable Joyce Murray, Minister of Fisheries, Oceans and the Canadian Coast Guard

Ministry of Forests, Lands, Natural Resource Operations, and Rural Development

Ministry of Environment and Climate Change Strategy

Ministry of Agriculture, Food and Fisheries

Major and Council, City of Delta
Mayor and Council, City of Richmond
Mayor and Council, City of Vancouver

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