

FLNRORD CLOSING REMARKS

Roberts Bank Wildlife Management Area

Summary

The Roberts Bank Wildlife Management Area (WMA) is provincial conservation land that protects 8,770 hectares of mudflat, eelgrass, and tidal marshes immediately adjacent to the proposed port expansion. The Roberts Bank WMA is one of five such WMAs conserving and protecting regionally to internationally significant fish and wildlife species throughout the Fraser River delta.

FLNRORD acknowledges that some impacts to the ecology of the Fraser River delta of the proposed port expansion are unavoidable. The Ministry appreciates that the Proponent has modelled expected impacts, proposed mitigations, and made the commitment to monitor their effectiveness.

Direct affects of the Project within the proposed Project footprint include the destruction of ecosystems requiring compensation, as described in the Proponent's Environmental Impact Statement.

Indirect affects of the proposed Project on biofilm, tidal marsh, and sedimentation may also occur:

- Federal government scientists from Environment and Climate Change Canada (ECCC) who have studied the biofilm at Roberts Bank are more capable than FLNRORD biologists of describing the anticipated effects of the proposed port development on the Roberts Bank biofilm and the migratory birds that rely upon biofilm.
- In the Environmental Impact Statement, the Proponent describes that "Hales (2000) estimated a 123% increase in intertidal marsh area at Brunswick Point from 1930 to 1994." However, as part of the Sturgeon Bank Marsh Recession Project, FLNRORD and ECCC have determined that approximately 50 hectares of the Brunswick Point tidal marsh has died off and converted into mudflats, resulting in a net decrease in marsh extent since 1979. The Ministry identifies this as an example of the limited understanding of the ecological and physical baselines and processes occurring within Roberts Bank and adjacent to ongoing and proposed port development.
- Previous port development appears to have altered the flow of sediment across Roberts Bank, and thus it is likely that the proposed port development will also alter the deposition of sediment along the foreshore. There is a need to understand how the proposed port development may alter sedimentation through the Roberts Bank foreshore.

Recommendations

FLNRORD recommends that the Panel make the following conditions of approval:

- conduct present-day and ongoing data collection of ecosystem extent and composition in the area around the proposed development before the anticipated increase in sea level begins to drown out these ecosystems. This data can be gathered conducting ground-truthed high-resolution multispectral imagery of the Brunswick Point and Tsawwassen tidal marshes to map marsh extent, vegetation community composition, and elevation. Information gathered should

then be shared with FLNRORD biologists and other potentially affected stake holders. This will enable us to establish an ecosystem baseline to compare to (i) historical states of the marshes and (ii) future changes to the marsh that may be a result of port expansion and sea-level rise.

There is a poor understanding of historic rates and patterns of sedimentation throughout the Brunswick Point and Deltaport foreshores.

FLNRORD recommends that the Panel make a condition for the proponent to carry out and share:

- collecting and analyzing sediment cores throughout the Roberts Bank foreshore approximately 1 m in depth that be used for (i) sediment grain size analysis and (ii) Cs and Pb dating analysis,

Sharing this data with FLNRORD biologists will enable the determination of how sedimentation has changed over time, possibly as a result of previous port development. It will also enable experts to understand historic rates and patterns of sedimentation in the area adjacent to the proposed port development which will help us to determine (i) the capacity of these intertidal and subtidal ecosystems to persist with sea-level rise, (ii) the effect of past port development on local sedimentation, and (iii) the anticipated effect on sedimentation of the proposed port development.

Cumulative Effects

Summary

Cumulative effects of historical, ongoing, and anticipated future anthropogenic actions continue to degrade the ecological integrity of the Fraser River estuary, including ineffective habitat compensation, ongoing development throughout the delta, and sea-level rise:

- Fish habitat compensation in the Fraser River estuary has been largely unsuccessful at creating, restoring, or enhancing fish habitat. A 2016 report published by the Community Mapping Network found that only one third of sampled marsh habitat compensation sites created from 1983-2010 are acceptably compensating for habitat losses, even though No-Net-Loss was required by Fisheries and Oceans Canada at the time. It is clear that it is more difficult to create a tidal marsh than to ensure existing marshes continue to persist and are resilient.
- The ecosystems of the Fraser River estuary are subject to the cumulative effects of development throughout the estuary since 1827. Such ecological degradation includes diking, urbanization, agriculture, industrial development, river dredging, construction of river training infrastructure, and colonization of invasive species. Impacts from the proposed Project are anticipated to degrade the ecological integrity of the area and contribute to the cumulative negative effects of development throughout the Fraser River estuary.
- In addition to past port development, the proposed port development may impair the ability of the tidal ecosystems of Roberts Bank to remain resilient with the predicted imminent increase in sea level. Communities throughout the delta rely upon the wave attenuation capacity of foreshore tidal marshes to contribute to our coastal flood protection defenses, in addition to the

network of dikes. However, throughout the Fraser River delta front, tidal ecosystems cannot migrate landward due to the presence of dikes; with sea level predicted to increase 1 m by 2100, sediment input and accretion will be necessary to ensure the foreshore marshes will be resilient and can persist with sea-level rise. Past port development appears to have contributed to the expansion of eelgrass (including both invasive Japanese eelgrass and native common eelgrass) in the intercauseway area by increasing light availability as a result of decreased suspended and dissolved sediment transported from the Fraser River to the intercauseway area. If additional port development at Roberts Bank further inhibits sediment delivery to the foreshore southeast of the Deltaport causeway, this will likely reduce the ability of these ecosystems to respond to sea-level rise.

Recommendations

Given that (i) marsh habitat compensation in the Fraser River estuary has historically been largely unsuccessful and (ii) the predicted increase in sea level is anticipated to drown out over 33% of the tidal marshes of the Fraser River estuary, there is an opportunity to direct required fish habitat compensation efforts toward sea-level rise ecosystem resilience. Rather than creating, restoring, or enhancing tidal ecosystems for compensation that will likely be drowned out by sea-level rise, there is a need for the Review Panel to recommend compensation measures to facilitate the ecological resilience of existing tidal ecosystems in the estuary with rising tides.

There is a need to reinstate the Fraser River Estuary Management Program, which was closed in 2013 by the Federal government. FREMP was an intergovernmental program that coordinated environmental management review and interagency communications for projects and shoreline developments in the Fraser River estuary. The Program also created a management plan for the estuary in 1993 that aimed to improve environmental quality in the estuary while providing economic-development opportunities and sustaining the quality of life in and around the estuary. Former project coordination responsibilities of FREMP became the responsibility of the VFPA, which is the primary driver for many development projects in the estuary. Though in November 2016 the Federal government announced a re-start of FREMP, there appears to have been little progress made since that announcement. The Review Panel should recommend to the Federal government to establish a new FREMP with stable funding and co-governance framework that involves First Nations. Since no single entity is responsible for the ecological integrity of the Fraser estuary, restarting FREMP is a key step toward shared stewardship of the estuary.

Given that the ocean is anticipated to rise by 1 m by 2100 and 2 m by 2200, all projects within the Fraser delta should be viewed through the lens of sea-level rise. Anticipated increases in sea level have significant implications for the most important salmon estuary and the most important migratory bird overwintering area in Canada. The resilience of proposed development and effect of proposed development on impairing the resilience of the adjacent area with rising sea levels should be considered.

FLNRORD recommends that the Review Panel make a condition of approval:

-the conducting hydrogeomorphic modelling incorporating ecogeomorphic feedbacks of the Roberts Bank area to (i) estimate the capacity of these ecosystems to respond to sea-level rise and (ii) help understand how the proposed port development may affect the ability of the tidal ecosystems of Roberts Bank to respond to increases in sea level. The necessary information for the modelling should be consulted with FLNRORD biologists and the model shared with appropriate stakeholders.

Sturgeon

Summary

Within the EIS sturgeon and their habitat were recognized only indirectly through other species that occupy the estuary. FLNRORD acknowledges that the proponent did some literature review and based this on old studies in the area. Subsequent public hearings identified Sturgeon as an important species that uses the estuary although the full extent of their use is unknown.

Presentations by FLNRORD and the First Nations, based on both the most recent research available and traditional knowledge indicate that the project area is in the sturgeon migration route. They also indicate that sturgeon use the estuary as important feeding habitat prior to and after breeding season. There is a lack of research information on exactly where the main feeding occurs in the estuary. Given the level of development and cumulative impacts on sturgeon habitat, FLNRORD recommends that the precautionary principle be followed regarding sturgeon in the project area.

Recommendations

FLNRORD acknowledges the proponent's efforts to reduce risks to all fish and fish habitat and suggests that for a relatively small cost of time and money, additional information can be accumulated by the proponent that appropriately reduces the risk to Fraser River sturgeon in the estuary.

FLNRORD recommends that the panel make the following conditions of approval:

- Mitigation monitoring using ultra high resolution side scan sonar assessments of the project and adjacent area during expected high and low use periods pre and post construction be carried out and submitted to FLNRORD biologists and potentially affected FN's

- Stringent monitoring by a qualified professional biologist during construction, including ultra high resolution side scan sonar if appropriate according to depth and water conditions;
- Support for fixed acoustic telemetry monitoring station(s) deployed at or adjacent to the project area to monitor for acoustic tagged sturgeon or other acoustic tagged fish use. The level of support and details of the monitoring program should be negotiated with FLNRORD biologist
- Given that sturgeon and most other species depend on the eulachon as the first major food source of the season, funding support towards ongoing and additional sturgeon and eulachon studies to be conducted in the lower reaches of the Fraser River and its' estuary. The level of funding support and the details of the studies should be negotiated with FLNRORD, potentially affected FN;s and the DFO.

Undertaking #22:

“BC FLNRORD to comment on changes occurring within the eight red and blue-listed estuarine communities at Roberts Bank and to provide an assessment of the loss of these within the BC FLNRORD’s management objectives for red-listed 8 communities.”

FLNRORD Response to Undertaking #22:

FLNRORD considers it important to evaluate impacts of the proposed Project on all eight red- and blue-listed wetland communities identified in the local assessment area, not strictly those that spatially overlap the causeway footprint. Though direct removal of community occurrences through causeway widening is evidently detrimental, the potential for negative indirect effects should be recognized, as the expected alteration to sedimentation and salinity could influence a broader extent of the coastline.

The Proponent has predicted an increase in net productivity of intertidal marsh, but generalizations such as this are not sufficient in the context of the management of listed communities, as they may not accurately reflect risk level. Uniform response to environmental changes cannot be assumed due to the high site specificity of these eight listed communities. Consequently, universally-positive benefits may not be realized, and the possibility exists for unanticipated negative impacts. Potential effects on each community should be carefully examined, particularly given the foundational role of plant communities in ecosystems and that alterations may have adverse implications for the diversity of organisms they support.

The conservation status ranks of these communities are based on aspects such as their extremely limited distributions along the B.C. coast and high threat level. This Project would contribute to the cumulative impacts of growing infrastructure development in the Fraser River estuary, noted as a prominent risk factor. Their recovery is hindered by data deficiencies that have prevented community-specific management plans from being developed, including numbers of occurrences, areas of occupancy within their ranges, and temporal trends being largely unknown. This lack of information renders it difficult to determine the effects of the Project, immediate or eventual, on the occurrences of these eight communities in the local assessment area or the consequences of their loss or degradation for long-term persistence in the region.

Due to this uncertainty, FLNRORD views any decline in the extent of these communities or their integrity as harmful to their recovery. In the absence of formalized management plans for these eight communities, the objectives of FLNRORD are to follow a precautionary approach that prioritizes protecting all occurrences of these communities, especially those red-listed, and avoiding disturbance to their natural ecological state as individual resilience levels are not well understood. Considering the potential for indirect effects across the local assessment area, FLNRORD emphasizes that mitigation measures and monitoring efforts should include all eight listed communities to ensure the maintenance or increase of their current area of occupancy and integrity over time.