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To:
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Re: Sufficiency and Technical Merit of the VFPA Environmental Assessment Information

1. WESTERN SANDPIPER & DUNLIN

Vancouver Fraser Port Authority (VFPA) concluded that Roberts Bank Terminal 2 would have an adverse impact on Western Sandpiper and Dunlin but the impact would not be significant. However, I believe the impact may well be significant, and the review panel should review VFPA's conclusion.

Adverse Impacts

Impacts to these shorebirds would include further loss and degradation of biofilm and mudflat habitats.

The causeway widening would eliminate 2.5 ha of marine intertidal biofilm-dominated substrates. VFPA states that this constitutes a loss of only 0.8% of all biofilm-dominated substrates (marine, freshwater and inter-causeway). However, this 2.5 ha constitutes almost 2% of the marine biofilm.

VFPA estimates that the total area of biofilm-dominated substrates in the local assessment area (LAA) is 325 hectares, in two categories: (regular) biofilm and low-density biofilm. Regular biofilm totals 191 ha, low-density totals 134 ha. Regular biofilm is more valuable to the shorebirds. Marine biofilm contains the highest proportion of regular biofilm.

The causeway widening would eliminate 42.4 ha (3%) of the intertidal sand-mud habitat in the LAA.

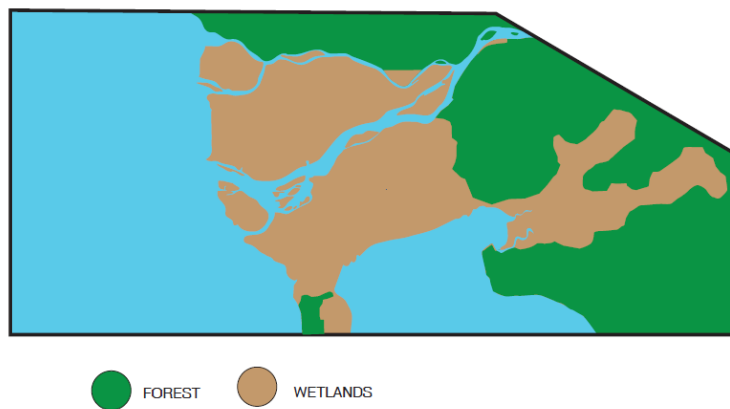
VFPA predicts that RBT2 would result in decreased salinity in the intertidal zones over much of the LAA. Biofilm biomass generally decreases with decreasing salinity. Project-related effects are predicted to result in decreased productivity for the marine-influenced biofilm assemblage during freshet. The predicted effect of the Project would be to shift the area of freshwater influence further toward the Roberts Bank causeway. The reduced richness of biofilm may result in less efficient feeding for the birds.

Significance

VFPA considers changes in productivity of 0 - 5% to be negligible, changes of 6 - 30% to be minor, and changes of 31 - 60% to be moderate. A simple percentage may be appropriate for rating changes to a large pristine environment. However, in the case of an already-heavily developed environment in which significant ecological degradation has occurred, rating the effect of further degradation by a simple numerical percentage is not logical.

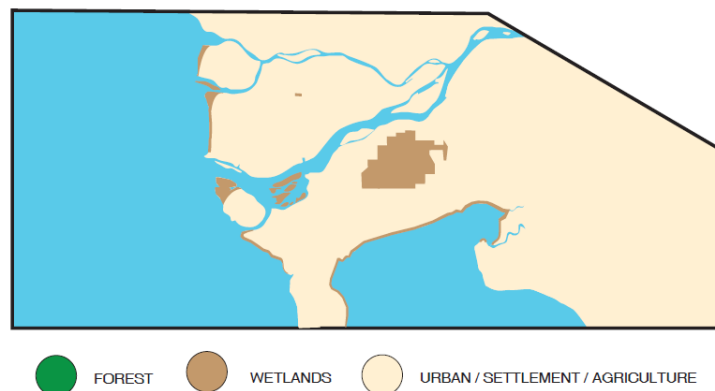
The significance of the loss and degradation of biofilm and mudflat habitats due to RBT2 cannot be assessed without putting these losses into historical context. These predicted losses of habitat come on the tail of more than a century of drastic losses.

The region looked like this in 1827:



Approximate land cover for the Fraser River Estuary in 1827^[1]

And now:



Current land cover for the Fraser River Estuary^[2]
(The undeveloped area at centre is Burns Bog)

Dyking of the river banks and foreshore began in the 1860s, with much of the estuary dyked by 1930. The dykes cut off most of the estuary from what had been a large, productive ecosystem.

The original forest is gone. The remaining marshland occurs only at Reifel Island in northwest Delta, islands in the south arm of the Fraser River, narrow strips along the shores of western Richmond, western Delta and Boundary Bay, and at Burns Bog.

Even these limited habitats have not survived unscathed. The dykes along the foreshore of Richmond and Delta restrict the tidal influence to narrow bands. The dykes along the river banks significantly modified the riverine habitats. The Sea Island section of Sturgeon Bank is immediately adjacent to Vancouver International Airport; besides the constant distraction of airplanes taking off and landing, controls on shorebirds, including use of raptors to scatter the birds, are in place to minimize risk of collisions with planes. Roberts Bank has the BC Ferries causeway and terminal and the Deltaport causeway and coal and container terminals, along with the associated vessel traffic. Much of the protected portion of Burns Bog has been compromised by former cranberry and blueberry farms.

Roberts Bank's extensive modification started with the dyking and farming. Developments have included the BC Ferries causeway and terminal (1958 - 1960), the Roberts Bank causeway and coal port facility (1960s, and expansion 1980 - 1984), the Deltaport container facility (1994 - 1996), and addition of third berth at Deltaport (2007 - 2010).

Construction of the Roberts Bank causeway led to the Fraser River sediment plume being largely eliminated from the inter-causeway area. The blockage of sediment-laden freshwater increased water clarity and light penetration, enabling eelgrass growth. Eelgrass beds expanded by approximately 100% since 1950, at the expense of tidal mudflats and areas of biofilm. The eelgrass expansion greatly reduced the value of the inter-causeway area for these birds. Also, the tidal channels that formed in the inter-causeway area further reduced productive habitat.

The trend in numbers of Western Sandpiper and Dunlin in the Fraser River estuary and Roberts Bank from the time of initial settlement by non-First Nations peoples is unknown. However, it is clear that the numbers would have declined, perhaps precipitously. The dyking and settlement would have taken a toll. Further decline will have occurred at Sturgeon Bank due to the airport.

Roberts Bank has experienced direct loss of tidal flats and biofilm habitats due to the various structures. The numbers of shorebirds prior to construction of the BC Ferries causeway in 1960 are unknown, as are the numbers prior to construction of the Roberts Bank causeway. Nevertheless, it can be safely assumed the numbers declined after these constructions. Moreover, the numbers undoubtedly declined after the Roberts Bank causeway was built because of the loss of biofilm and mudflat habitats in the inter-causeway area.

Drever et al, 2014 ^[3] noted that survey data shows no meaningful trend in the Western Sandpiper population since 1990. However, the surveys were performed at Brunswick Point and did not include the inter-causeway area created in the 1960s.

Little other data is available for population trends in Western Sandpiper and Dunlin in the area of Roberts Bank. The Coastal Waterbird Survey for the Strait of Georgia, covering 1999 to 2011 for the overwintering period, showed an average 8.9% per annum decline in numbers (33% overall decline) for Dunlin ^[4]. However, this is a short time period, and the causes of this decline are uncertain.

The loss of mudflat and biofilm habitats predicted for RBT2 would further impact shorebird numbers. Also, the decrease in salinity in the intertidal zones over much of the LAA could further impact shorebird numbers.

The science of sustainability for these shorebirds is limited. VFPA's assessment of ecological risk for these shorebirds due to a relatively limited amount of further degradation is simply an opinion. Science does not know what the threshold population for sustainability of these shorebirds is. The numbers may continue to decline incrementally as new losses or degradations of habitat occur, or they may decline precipitously. The population threshold for the passenger pigeon was apparently in the several millions of individuals, at which point it was doomed. Within a relatively short time, its population went from roughly three billion to exactly zero^[5].

2. JUVENILE SALMON

Adverse Impacts

The causeways and the Roberts Bank terminals may be interfering with access for juvenile Chinook and Chum salmon to the inter-causeway nearshore habitats, including the expanded eelgrass beds, by disrupting out-migration patterns from the Fraser River. Also, the juvenile salmon are more exposed to predators in the deeper waters which they are forced to pass through enroute from the Fraser River to the nearshore. The RBT2 terminal would further increase linear travel distance, migration pattern disruption, and time spent in deeper waters.

Significance

VFPA has conducted limited surveys and has documented that juvenile salmon are utilizing habitats along both sides of the Roberts Bank causeway and terminals, the BC Ferries terminal, and nearshore intertidal areas in the inter-causeway area. However, these surveys provide only limited insight into how extensively and effectively the habitats are being utilized, and trends in usage from pre-causeway days to now.

Fisheries & Oceans Canada has not collected data or conducted studies related to effects of the causeways on salmonids^[6]. The last surveys by Fisheries & Oceans Canada were conducted in the 1970s. Long-term surveys would be required to obtain an accurate sense of trends. The significance of the Roberts Bank causeway and terminals on numerical trends of juvenile salmon cannot be assessed due to lack of sufficient survey data.

In-depth discussions with Fisheries & Oceans experts are required to gain a better understanding of the effects of the existing causeway and terminals on juvenile salmon, and potential impact of the further impacts that would be caused by RBT2.

3. SHIPPING ROUTE CONSIDERATIONS

Notes

Unlike environmental assessments of other projects involving shipping through the Salish Sea (e.g., Trans Mountain Expansion), VFPA/CEAA decided that the environmental risks of marine shipping were of little consequence and could be ignored. Residents along the shipping route were kept in the dark about the RBT2 project.

VFPA/CEAA ignored their constitutional responsibility to consult with First Nations, within whose traditional territories the ships would traverse, disrupting traditional values and activities.

After the writer tipped off the First Nations along the shipping route about the project, VFPA/CEAA decided to include marine shipping in the EA, and accepted these First Nations into the EA process. However, VFPA/CEAA declined to bring the non-First Nations communities into the assessment process. They also did not bring US Indian groups into the process. No US Indian groups have been consulted or even notified, including Lower Elwha Klallam Tribe, Lummi Nation, Makah Tribe, Tulalip Tribes, Suquamish Tribe, and Swinomish Indian Tribal Community.

Ignoring the Makah Tribe is particularly egregious, given that the tribe was a major participant in the 2014 study *Vessel Traffic Risk Assessment (VTRA): Preventing Oil Spills from Large Ships and Barges In Northern Puget Sound & Strait of Juan de Fuca* prepared for Puget Sound Partnership by George Washington University and Virginia Commonwealth University. The study area included the Strait of Juan de Fuca and the approaches to and passages through the San Juan Islands, Puget Sound and Haro Strait/Boundary Pass. The study focused on three projects, including a project at Deltaport.

Ignoring the Lummi Nation is also unfortunate. In May 2016, the Nation stopped the Gateway Pacific Terminal project in its tracks by decision of the US Army Corps of Engineers, based on concerns about Lummi fishing rights. This would have been one of the largest coal export terminals in North America, to be located at Cherry Point north of Bellingham. This project had been in the works for years and was in the EA process, until the process was suspended in April 2016 to await the result of the Lummi's challenge.

The Makah Tribe and Lummi Nation are participants in the Trans Mountain Expansion EA, as are the other northwest Washington State tribes.

I will be corresponding with the Northwest Washington state Indian groups, including the Makah and Lummi, about the RBT2 project. The review panel might be well advised to open communications with the US Indian groups of the Salish Sea.

VFPA/CEAA decided that although marine shipping associated with the Project that is beyond the care and control of the Port is now to be addressed in the Marine Addendum, it is not considered to be part of the Project for the purposes of the EA. The Minister will not make a decision about whether marine shipping associated with the Project is likely to cause significant adverse environmental effects, and marine shipping will not be subject to conditions issued to the proponent in any decision statement allowing the Project to proceed.

However, for legal and policy reasons, the Crown consults with and, where appropriate, accommodates Aboriginal groups regarding the potential adverse impacts of its decision on Aboriginal or Treaty rights. Adverse environmental impacts are of concern to Aboriginal peoples and will be accommodated where appropriate. Thus, environmental concerns such as impacts on the Southern Resident Killer Whales and risks of oil spills are likely to be considered part of the Project.

3A. SOUTHERN RESIDENT KILLER WHALE POPULATION

Adverse Impacts

The Canadian Court of Appeal has confirmed that the quality of the critical habitat in Canada for the SRKWs must be legally protected, including prevention of harmful acoustic disturbance.^[7]

The numbers for this population dropped dramatically in the late 1960s and early 1970s due to live capture for aquariums. The population increased from a low of 70 after the live-captures ended in 1973, to 99 whales by 1995. A decline began in 1996. The number of southern residents is estimated at 83 as of April 2016, a drop of 16 individuals in the past 20 years.

The number of ships and boats in these waters has increased dramatically and continues to increase. The traffic can disrupt killer whales simply because more vessels are passing through their habitat and potentially disturbing how the whales move through the available space.^[8]

Existing underwater noise from commercial vessels is known to be adversely affecting the SRKWs. A significant amount of foraging opportunity has been lost, as noted in the Marine Shipping Addendum and EIS. If RBT2 were to proceed, additional loss of foraging opportunity is predicted. Similarly, existing underwater noise is adversely impacting SRKW vocalizations for navigation and communication.

Significance

VFPA assumes that past port activities and projects have had a significant adverse impact on SRKWs. Nevertheless, they consider that the added effects of Project-associated shipping would be very small and critical habitat would not be affected. However, with the recent sharp drop in numbers, rather than recovery, this assessment can be questioned.

Recovery of the SRKW has stalled since 1995, and the whales are now in sharp decline. Increased ship traffic in their critical habitat is one of several possible contributing reasons for this. Given that existing disturbance from underwater acoustic noise from commercial shipping is affecting the whales, further increase in large ship traffic would be folly.

3B. RISK OF OIL SPILLS

The sections of the EIS and Marine Shipping Addendum dealing with risk of oil spills suggest that the chances of a spill from a container ship are remote. However, spills from container ships happen frequently.

There are currently about 2,750 large foreign vessel arrivals (container ships, bulk carrier, roll on-roll off, and tanker) at VFPA terminals annually, or about 5,500 transits of the Salish Sea. The number of ships will increase when projects currently under construction are completed.

VFPA projects 260 ship arrivals per year at RBT2 if the project were to proceed (520 annual transits of the Salish Sea, and 780 vessel movements per year south of Victoria).

The marine shipping route from southern Strait of Georgia through to the west coast of Vancouver Island is considered very high risk for fuel oil spills.^[9] Haro Strait is considered high navigational risk due to its narrow confines, strong currents and high vessel traffic.

A 2013 report^[10] commissioned by the BC government indicated that response to a BC oil spill would be devastatingly slow and incomplete. The government concluded “more federal resources are needed to protect the west coast”.

A representative container ship carries about 2 million US gallons of fuel oil on a voyage from the west coast to Asia along the North Pacific great circle route. The fuel oil load per ship is increasing as larger container ships are introduced to the route. A spill can have a devastating environmental impact. Example: The 230,000 US gallon Bunker C oil spill 3 km off the coast just north of Portland Oregon from the oil barge Nestucca in 1988 resulted in oil drifting along the west coast of Vancouver Island north to near Cape Scott. Oil came ashore in patches from near Victoria to near Cape Scott. Beaches were oiled and shoreline ecosystems damaged. As many as 56,000 seabirds were killed, many crab and shellfish populations were oiled, in addition to herring spawning areas. Traditional native fishing practices were affected.

Relatively small spills can have a devastating impact. A spill of 936 barrels of Bunker C from the ship Kuroshima in 1997 at Unalaska Alaska contaminated 2.5 km of shoreline.

In April 2015, a fuel oil leak of about 2,800 litres occurred from the bulk carrier M/V Marathassa in English Bay, Vancouver. This small spill spread throughout Vancouver harbour and Burrard Inlet. It reached the shore of Stanley Park, other parks, and shorelines on the north shore. A number of local beaches were shut down for weeks.

Container ships are not double-hulled. The outer hulls of container ships serve as part of the fuel tank, which could rupture and release fuel in the event of collision or grounding.

The larger container ships are noisier, and leave greater wakes. These ships take longer to stop or change course in the event of emergency.

The newer, larger container ships are subjected to higher stresses in service and are prone to vibration-related phenomena that can damage the structure.^[11] It is disconcerting that 35 container ships have experienced structural failures since 1990, affecting floatability of the ships, yet the causes of the failures remain undetermined. In one case the ship snapped in half. These structural failures were not caused by accidents.^[12]

Sampling of Incidents

Time	Type of Ship	Location	
Dec 2015	Container ship Hanjin Aqua	Indonesia	Ran aground. Damage to hull, breaching of ballast compartments. Built 2013
Sept 2015	Container ship Meratus Banjar 2	Java Sea	Capsized and sunk. Two crew lost
Oct 2014	Container ship Simushir	off Haida Gwaii	Lost power, drifted in rough weather
Sept 2014	Container ships Colombo Express & Maersk Tanjong	Suez Canal	Ships collided; 65 ft dent in Colombo Express, 3 containers into the sea
Feb 2014	Container ship Svendborg Maersk	off northern France	520 containers lost at sea
Jan 2014	Container ship Cap Blanche	Mouth of Fraser River	Grounded
June 2013	Container ship MOL Comfort Post-panamax, built 2008	off Yemen	Ship snapped in half; cause has not been determined; 4,400 containers lost; 1,500 tonnes of fuel oil spilled
March 2013	Container ship Guangyangxingang	Off Shandong province, China	Capsized in strong winds and sunk; 13 crew members lost
2011	Container ship Rena	New Zealand	Ran aground; significant loss of fuel oil; declared New Zealand's worst ever maritime disaster; the ship cracked in two
2008	Container ship MSC Sabrina	St Lawrence River near Trois Rivieres, Quebec	Ran aground; took 30 days to free the ship; 400 containers had to be removed
2007	Container ship Republica di Genova	Antwerp Belgium	Capsized
2007	Container ship Cosco Busan	San Francisco CA	Hit the San Francisco - Oakland Bay bridge; 53,000 gallons fuel oil spill
2006	Container ship MSC Napoli	English Channel	Structural failure of hull; 103 containers lost; oil spill - hundreds of sea birds died; the salvage operation, including a controlled explosion to split the ship in two, took 1-1/2 years to complete
2006	Ferry Queen of the North	BC Coast	Sank after running aground, contained unknown amount of diesel fuel
2005	Container ship APL Panama	Ensenada, Mexico	Grounded; took 2-1/2 months to refloat the ship
2003	Container ship Cielo del Canada	Mouth of Fraser River	Grounded

REFERENCES

Unreferenced information is from VRPA documents.

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