

**Hearing Order OH-001-2014**  
**Trans Mountain Pipeline ULC (Trans Mountain)**  
**Application for the Trans Mountain Expansion Project (Project)**  
**Written Evidence**

Name of Intervenor: **Tsawwassen First Nation**

## **Part I – Introduction: Tsawwassen First Nation and the Trans Mountain Expansion Project**

### **1.1 First Nation Intervenor with Modern-day Treaty Rights**

1.1.2 The Tsawwassen First Nation (TFN) is the only intervenor that has participated fully in these proceedings that have modern-day Treaty rights pursuant to the *Tsawwassen First Nation Final Agreement Act*, S.B.C. 2007, c. c.39, S.C. 2008, c. 32. (TFNFA). The TFNFA is a constitutionally protected treaty pursuant to s. 35 of the *Constitution Act, 1982*. The Traditional Territory of the TFN reaches from the southern Gulf Islands, over to the Lower Mainland, encompassing much of Delta, Richmond, moving northward through New Westminster, up, and including the Pitt River area.

Tsawwassen First Nation Final Agreement [A3W8G0]

Traditional Territory Map – Appendix A; Tsawwassen First Nation Final Agreement Appendices [A3W8G1, PDF page 11 of 278]

1.1.3 If the Trans Mountain Expansion Project (TMEP) is approved, there is a real potential for a spill or some other related mishap that could adversely impact on the TFN constitutionally protected rights to fish, aquatic plants, migratory birds, and to TFN's interest in Killer Whale. There exists the real potential for long-term and catastrophic damage to the land and sea environment along the shipping route, including at Site FR (the Fraser River Crossing), at Site D (Salish Sea), and at Site E (Salish Sea/Salish Sea, Arachne Reef), Andrew Bak, a member of the TFN for all of his life, and long-time Territory Management Officer for the TFN, has provided his expertise with respect to the Tsawwassen people, their history, traditions and beliefs, their reliance on the Salish Sea for food, social and ceremonial purposes, but as well their cultural connection to the Salish Sea to the surrounding areas. Mr. Bak also has provided information regarding the mischaracterization of TFN's engagement by the proponent in these proceedings. The evidence set out in support of TFN's views and beliefs about the project, was also provided by experts Mike Demarchi, Vice-President, Senior Wildlife Ecologist, and Robert Bocking, Vice-President, Western Region, Senior Fisheries Biologist, both of LGL Limited, environmental research associates, Sidney, British Columbia.

## **2.1 Tsawwassen are Coast Salish Sea People**

2.1.1 In the Coast Salish language, Tsawwassen means “Lands facing the Sea”. The TFN are a Coast Salish people whose Lands are located along the water of the Salish Sea, situated between the Tsawwassen Ferry Terminal and the Metro Vancouver Super Port, and bordering the Corporation of Delta. Just north of the TFN Lands is the south arm of the Fraser River. TFN is the only First Nation on and fronting the Salish Sea. The current population of the TFN is approximately 470 members, with the majority living on TFN Lands. The population demographics show that the population of TFN is expected to increase to approximately 1092 persons by 2050.

Ch. 4, Lands, Tsawwassen Final Agreement [A3W8G0; PDF pages 53-73 of 228]

Tsawwassen Lands, Other Tsawwassen Lands, and Right of Refusal Lands, Appendix B; Tsawwassen First Nation Final Agreement Appendices [A3W8G1; PDF page 13 of 278]

L. Alm, Enrolment Registrar, Tsawwassen First Nation Census Forecast to 2050, May 2015. Appendix 1

2.1.2 Tsawwassen history is that we have been using and occupying the lands and waters in and around our traditional territory since time immemorial. In the 19<sup>th</sup> century, when the Dominion Government was “settling” Indian reserves in British Columbia, the commissioners found the Tsawwassen people at the very same location as we are located today, which was our primary wintering lands. TFN had, with other First Nations, various summering areas, eastward along the Fraser River, and also within the southern Gulf Islands.

## **3.1 The Tsawwassen are a Fishing People Reliant on the Salish Sea for Food, Social and Ceremonial, with Commercial Interests**

3.1.1 The Tsawwassen people have always been a fishing people. Our heavy reliance on fish, including intertidal bivalves and shellfish, for day-to-day sustenance is immeasurable. The TFN negotiated as part of the TFNFA, a percentage based quota of fish, which is harvested primarily on the south arm of the Fraser River. We also harvest shellfish, including Dungeness crab, in the waters fronting the TFN Lands for food, social and ceremonial purposes, another staple heavily relied on by TFN people.

Ch. 9, Fisheries; Tsawwassen First Nation Final Agreement [A3W8G0; PDF pages 87-105 of 228]

Map of Tsawwassen Fishing Area and Tsawwassen Intertidal Bivalve Area – Appendix J-1; Tsawwassen First Nation Final Agreement Appendices [A3W8G1; P. 277, PDF pages 281 of 376]

Tsawwassen Allocation for Fish and Aquatic Plants – Appendix J-1; Tsawwassen First Nation Final Agreement Appendices [A3W8G1; P. 279, PDF pages 283 of 376]

Tsawwassen First Nation Harvest Agreement (2006), Appendix 2

## **4.1 Trans Mountain Consistent Mischaracterization of its Engagement with TFN**

4.1.1 Trans Mountain has consistently and repeatedly mischaracterized its communication with TFN in its engagement with them, filing those mischaracterizations in these proceedings. A number of telephone conversations are noted in the table which are very problematic. Moreover, Trans Mountain did not disclose that telephone conversations would be tracked this way, and without that clarity, TFN administration staff, and others, spoke to Trans Mountain personnel on an

informal basis. Finally, there are some instances, where the proponent has simply omitted meetings that occurred with TFN.

- 4.1.2 Attached in Appendix 3a is a table which set out examples of the proponent's repeated mischaracterization of communication with TFN officials. Appendix 3b sets out examples of engagement with TFN omitted by the proponent in their consultation update.

Appendix A-4-26, Consultation Update 3, Part 2. [B306-20]; PDF pages 378-390 of 788.

Trans Mountain Mischaracterization of its Engagement with TFN – Appendix 3a

Meeting and Communications Omitted from Appendix A-4-26 – Appendix 3b

## **5.1 Potential Impacts of the Project on Aboriginal Interests – Aboriginal Engagement**

- 5.1.1 From the outset, TFN staff advised the Proponent's staff that, while TFN expected to be consulted about the Project, it was made it clear to the Proponent's staff, that a Traditional Land Use study was not critical because TFN had established treaty rights. TFN maintained that position throughout its engagement with Trans Mountain.

Vol 3b, Aboriginal Engagement, Tsawwassen First Nation, Appendix A-5-12, [A3S0U6; page 48 of 51]

- 5.1.2 Participation by TFN in this process has been an effort to appreciate the impacts will be on our treaty rights, our members, the Salish Sea and the resources it offers us, as well those impacts that could result with a spill or malfunction affecting marshes and lands. As noted, our community fronts the Salish Sea, and the south arm of the Fraser River is just north of our lands. We, the Tsawwassen people fish and harvest literally in our front yard – our one and only yard. We are deeply concerned with the potential of a spill or malfunction that could have irreparable implications on us and on the exercise of our Treaty Rights. In order to better understand what the implications may be for Tsawwassen and our rights and interests, we have worked with our experts to bring light to the reality that awaits us in the event of a spill or malfunction.

## **Part II - Tsawwassen First Nation Interests, Treaty Rights and the Project**

This part sets out a description of Tsawwassen First Nation Interests and Treaty Rights as they pertain to fish<sup>1</sup>, aquatic plants, migratory birds and Killer Whale. Their interactions with the proposed Project are then described.

### **6.1 Treaty Fishing Right and Harvest Agreement**

- 6.1.1 In accordance with the TFNFA which came into effect 3 April 2009, the Tsawwassen First Nation harvests Fish and Aquatic Plants for both domestic and commercial purposes. The Tsawwassen First Nation has a constitutionally protected Treaty right to harvest for domestic purposes Fish and Aquatic Plants within the defined areas of the Tsawwassen Fishing Area and the Tsawwassen

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<sup>1</sup> Fish are defined in the Tsawwassen Final Agreement as: a) fish, Intertidal Bivalves and other shellfish, crustaceans and marine animals, excluding cetaceans; b) the parts of fish, Intertidal Bivalves and other shellfish, crustaceans, and marine animals, excluding cetaceans; and c) the eggs, sperm, spawn, larvae, spat, juvenile stages and adult stages of fish, Intertidal Bivalves and other shellfish, crustaceans and marine animals, excluding cetaceans.

Intertidal Bivalve Harvest Area. That right is exercised by Tsawwassen citizens under the authority of the Tsawwassen Fisheries, Wildlife, Migratory Birds and Renewable Resources Act and is subject only to matters concerning conservation and, public health and safety. The Treaty specifies allocations for salmon and crab and other species of Fish and Aquatic Plants that are unallocated. For unallocated species, TFN may harvest to meet the food, social and ceremonial needs of the Nation. These unallocated species may include groundfish or any other species of interest to TFN within the Tsawwassen Fishing Area. Figure 6.1 identifies the Tsawwassen Fishing Area and the Tsawwassen Intertidal Bivalve Harvest Area along with the proposed pipeline and shipping routes of the TMEP. The Treaty right also includes the right to barter and trade and Tsawwassen members actively exercise this right.

- 6.1.2 The Tsawwassen Harvest Agreement (THA) also came into effect on 3 April 2009 for the purposes of providing commercial fishing capacity of the Tsawwassen First Nation. If Canada reduces the number of licences or terminates the Harvest Agreement Tsawwassen First Nation is entitled to be paid fair recompense. Tsawwassen also has treaty funds set aside to purchase future additional commercial capacity for both salmon and Dungeness crab.

TFN Harvest Agreement (2006), Appendix 2

- 6.1.3 Each year, Fisheries and Oceans issues licences for the Tsawwassen commercial allocation of Sockeye, Chum, while Pink salmon allocations occur in odd years only. Tsawwassen commercial allocations vary with the size of the Canadian Commercial Total Allowable Catch (CCTAC) for Sockeye and Pink salmon and the Terminal Commercial Catch (TCC) for Chum salmon. In addition, the THA allows for the commercial harvesting of Dungeness crab.

Ch. 9, Fisheries; Tsawwassen First Nation Final Agreement [A3W8G0; PDF pages 87-105 of 228]

TFN Harvest Agreement (2006), Appendix 2

- 6.1.4 Total salmon harvests by Tsawwassen comprise the Fishing Right catch (by species) and the Harvest Agreement catch (by species). Salmon harvests occur from June through October and Dungeness crab harvests occur primarily from April – November (Figure 6.2). The Eulachon harvest typically occurs from mid-April to mid-May.

- 6.1.5 Tsawwassen Domestic Allocations for Fish and Aquatic Plants are calculated using formulas described in the TFA (Appendix J-2). Information used to calculate the Tsawwassen food, social, and ceremonial (FSC) allocation for Sockeye salmon is based on the Canadian Total Allowable Catch (CTAC) as established by the Minister of Fisheries and Oceans. For example:

TFN FSC Sockeye salmon allocation =  $1\% \times \text{CTAC}$  for  $\text{CTAC} < 500,000$

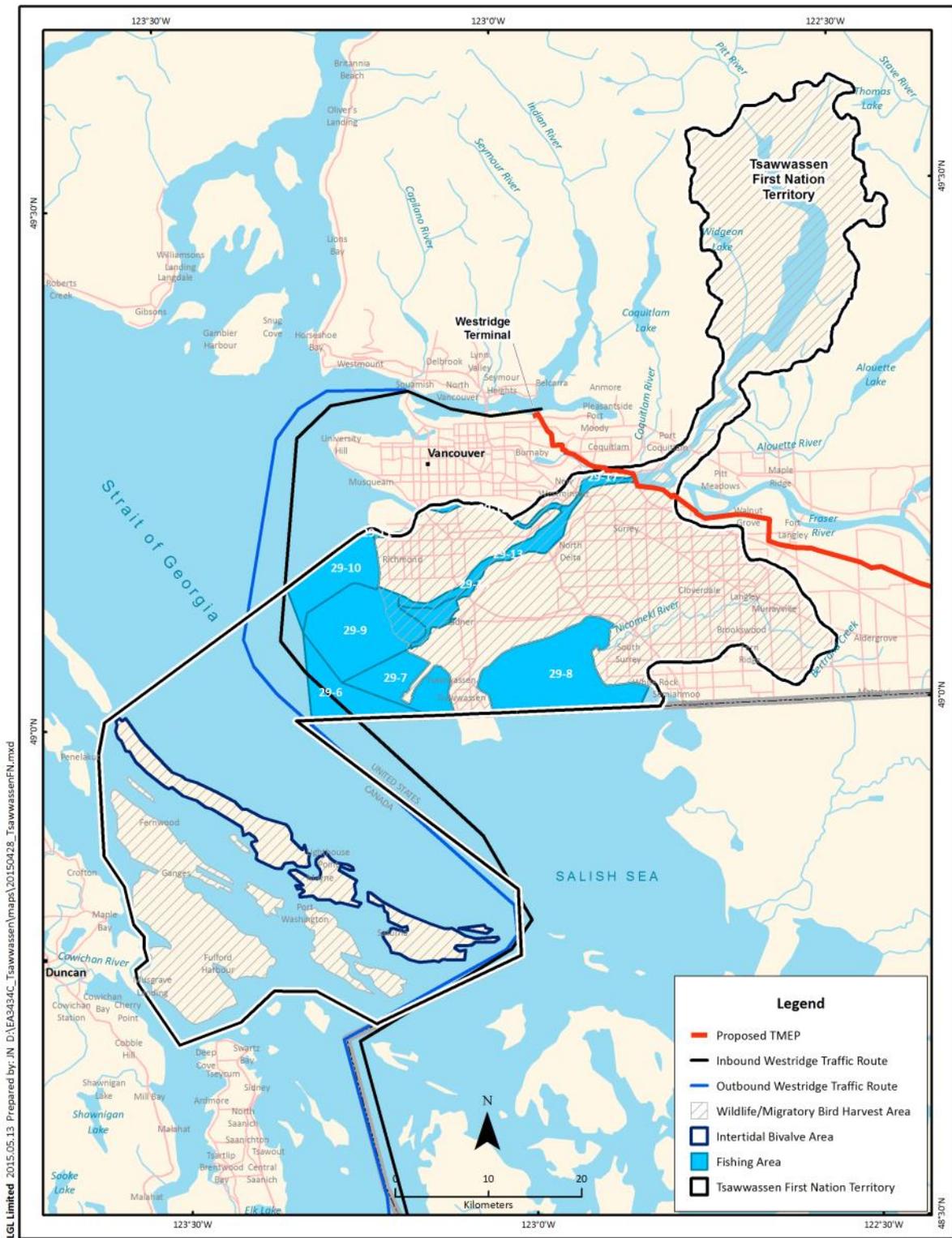


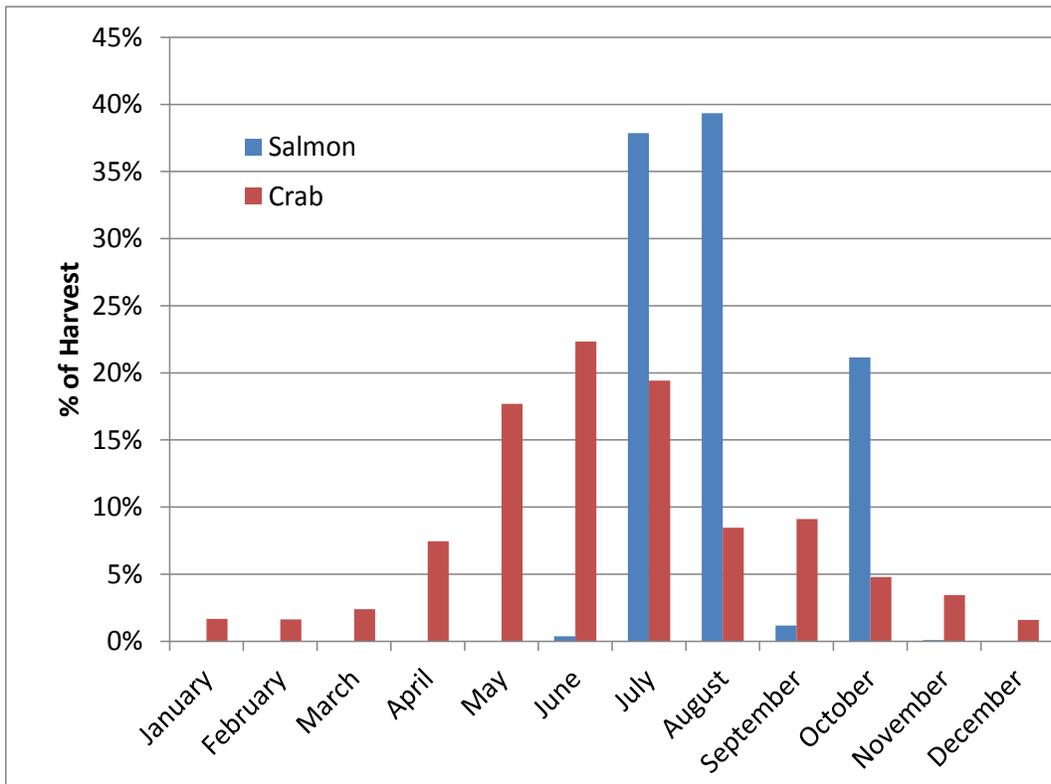
Figure 6.1 Tsawwassen Treaty harvest areas and TMEP land and marine routes.

Tsawwassen Territory Map – Appendix A; Tsawwassen First Nation Final Agreement Appendices [A3W8G1, PDF page 11 of 278]

Tsawwassen Fishing Area and Tsawwassen Intertidal Bivalve Fishing Area – Appendix J-1; Tsawwassen First Nation Final Agreement Appendices [ A3W8G2, PDF page 3 of 98]

Tsawwassen Wildlife Harvest Area – Appendix K-1; Tsawwassen First Nation Final Agreement Appendices [ A3W8G2, PDF page 11 of 98]

Tsawwassen Migratory Bird Harvest Area – Appendix L-1; Appendix K-1; Tsawwassen First Nation Final Agreement Appendices [A3W8G2, PDF page 15 of 98]



**Figure 6.2 Average timing of Tsawwassen salmon and Dungeness crab fisheries, 2009-2014. Source: Tsawwassen annual catch reports (e.g. Blakely et al 2014).**

Blakely, A.C., K. K. English, and L. Cassidy. 2009- 2014. Tsawwassen First Nation Post-Season Fisheries Reports. Appendix 4

6.1.7 Data collected throughout the fishing season may cause changes to the CTAC; thereby modifying the TFN allocation for Sockeye salmon. Any changes that may affect the FSC allocations are communicated to all parties involved through the Joint Fisheries Committee established under the Tsawwassen Treaty. Modifications to FSC allocations may occur pre-, during, and final in-season for an individual species.

- 6.1.8 Table 6.1 shows the Tsawwassen harvests of salmon and crab from 2009–2014 for the TFN Treaty Fishing Right (domestic harvests). Fraser Sockeye salmon is the dominant salmon species captured in this fishery. Dungeness crab is also caught in large quantities. Eulachon harvests are small only because of conservation concerns due to the extremely depressed state of Fraser River Eulachon which have been listed by COSEWIC as Endangered.
- 6.1.9 The importance of salmon, Dungeness crab and Eulachon to the Tsawwassen people cannot be overstated. Not only do these species provide sustenance as food to Tsawwassen citizens, they also have great cultural and economic importance. It is for these reasons that the Tsawwassen Treaty provides constitutional protection of the right to harvest them and why there is concern regarding the proposed Project.
- 6.1.10 It is also important that the NEB panel understands that the Tsawwassen Treaty Right to Fish and Aquatic Plants is not limited to just those species listed in Table 6.1. Rather, the Treaty Right extends to all Fish and Aquatic Plants for which there are harvest opportunities within the Tsawwassen Fishing Area and the Intertidal Bivalve Fishing Area. In particular, this includes species of importance to Tsawwassen such as Intertidal Bivalves, shrimp and prawns, and groundfish species.
- 6.1.11 Table 6.2 shows the Tsawwassen harvests of salmon and crab from 2009–2014 for the Tsawwassen Harvest Agreement salmon fisheries and Table 6.3 shows the landed value of salmon and Dungeness crab harvested in Tsawwassen fisheries. The landed value for salmon was calculated using unpublished price data for South Coast commercial fisheries. The landed value for Dungeness crab was calculated using 2008 price data from Yonis (2010) and adjusted using a 2% per annum inflation rate to estimate price for 2009-2014. **Because these are only landed values, they underestimate the true value of the harvest to TFN, if cultural values and replacement food (e.g. retail) values were added.**

TFN Harvest Agreement (2009), Appendix 2

Yonis, R. 2010. The Economics of British Columbia's Crab Fishery: Socio-Economic Profile, Viability, and Market Trends. Fisheries and Oceans report. Appendix 5

**Table 6.1 Salmon, Dungeness crab and Eulachon harvests (in pieces) by Tsawwassen exercising the Treaty Right to Fish and Aquatic Plants, 2009–2014 (Data from 2014 is yet to be published).**

| Year             | Chinook | Sockeye | Pink | Coho | Chum   | Dungeness |          |
|------------------|---------|---------|------|------|--------|-----------|----------|
|                  |         |         |      |      |        | Crab      | Eulachon |
| <b>2009</b>      | 995     | 1,132   | 72   | 57   | 1,320  | 24,712    | 784      |
| <b>2010</b>      | 338     | 15,226  | 2    | 3    | 2,019  | 21,558    | 656      |
| <b>2011</b>      | 583     | 9,995   | 84   | 43   | 2,414  | 20,327    | 629      |
| <b>2012</b>      | 440     | 6,649   | 2    | 22   | 2,577  | 24,441    | -        |
| <b>2013</b>      | 729     | 5,120   | 74   | 220  | 2,574  | 42,439    | 1,531    |
| <b>2014</b>      | 392     | 14,878  | 3    | 159  | 3,495  | 41,129    | 948      |
| <b>All Years</b> | 3,477   | 53,000  | 237  | 504  | 14,399 | 174,606   | 4,548    |

Blakely, et al, 2010-2014, Appendix 4

**Table 6.2 Salmon harvests by Tsawwassen authorized under the Tsawwassen Harvest Agreement, 2009–2014 (Data from 2014 is yet to be published)**

| Year             | Chinook | Sockeye | Pink   | Coho | Chum   |
|------------------|---------|---------|--------|------|--------|
| <b>2009</b>      |         |         |        |      |        |
| <b>2010</b>      | 174     | 98,315  | -      | 8    | 9      |
| <b>2011</b>      | 42      | 5,337   | 45,098 | 18   | 2,243  |
| <b>2012</b>      | 1       | -       | -      | 17   | 1,720  |
| <b>2013</b>      | -       | -       | 16,082 | -    | 5,934  |
| <b>2014</b>      | 670     | 79,574  | 4      | -    | 4,844  |
| <b>All Years</b> | 887     | 183,226 | 61,184 | 43   | 14,750 |

Blakely et al, 2010-2014, Appendix 4

**Table 6.3 Landed value of Salmon and Dungeness crab harvested in Tsawwassen fisheries<sup>2</sup> (Catch data from 2014 is yet to be published. Price data from DFO (unpublished), and Yonis (2010), Appendix 5**

<sup>2</sup> Includes harvests under the Treaty Right and Harvest Agreement for salmon and the Treaty Right for Dungeness crab.

| Year      | Chinook    |              | Sockeye    |          | Pink       | Coho         | Dungeness    |      | Total |
|-----------|------------|--------------|------------|----------|------------|--------------|--------------|------|-------|
|           |            |              |            |          |            |              | Chum         | Crab |       |
| 2009      | \$ 56,019  | \$ 10,799    | \$ 56      | \$ 449   | \$ 10,204  | \$ 179,279   | \$ 256,806   |      |       |
| 2010      | \$ 22,355  | \$ 842,729   | \$ 2       | \$ 112   | \$ 17,310  | \$ 159,526   | \$ 1,042,034 |      |       |
| 2011      | \$ 26,754  | \$ 147,435   | \$ 82,760  | \$ 505   | \$ 36,327  | \$ 153,425   | \$ 447,207   |      |       |
| 2012      | \$ 18,878  | \$ 63,938    | \$ 4       | \$ 323   | \$ 33,519  | \$ 188,166   | \$ 304,827   |      |       |
| 2013      | \$ 31,206  | \$ 49,235    | \$ 29,593  | \$ 1,820 | \$ 66,367  | \$ 333,264   | \$ 511,485   |      |       |
| 2014      | \$ 45,460  | \$ 908,267   | \$ 13      | \$ 1,315 | \$ 65,049  | \$ 329,436   | \$ 1,349,541 |      |       |
| All Years | \$ 200,671 | \$ 2,022,404 | \$ 112,428 | \$ 4,525 | \$ 228,776 | \$ 1,343,097 | \$ 3,911,900 |      |       |

DFO (unpublished)

Yonis, R. 2010, Appendix 5

6.1.12 Tsawwassen also has a number of general commercial fishing licences that provide income to the Nation and its citizens. These include four Dungeness crab licences, 3 Area E gillnet licences and 1 Area D/E salmon gillnet licence. The Tsawwassen Treaty also provides a mechanism for Tsawwassen to participate in new and emerging commercial fisheries that might occur in the future in the Salish Sea (Paragraph 106 of Chapter 9 of the Tsawwassen Final Agreement). The TMEP has the potential to affect these current and future commercial opportunities of TFN.

## 7.1 Effects of the Project on Tsawwassen Treaty Right to Fish and Aquatic Plants

7.1.1 If constructed, the TMEP will interact with the Tsawwassen Right to harvest Fish and Aquatic Plants primarily through two TMEP activities: 1) the crossing of the Fraser River near the Port Mann Bridge and 2) the transit of ships adjacent and through the Tsawwassen Fishing Area and the Tsawwassen Intertidal Bivalve Harvest Area. For both these TMEP activities, the primary concern is the potential for oil spills and subsequent effects on the TFN Treaty Right to Fish and Aquatic Plants and TFN commercial fishing opportunities either through the Tsawwassen Harvest Agreement of the general commercial fishery.

7.1.2 The shipping lanes that the tankers carrying oil from the TMEP travel along cross through the southwest corner of the Tsawwassen Fishing Area which is an active fishing area for Tsawwassen. This raises concerns for both safety and potential interference with Tsawwassen fishing.

7.1.3 An oil spill could infringe on the Tsawwassen Treaty Right to Fish and Aquatic plants by impacting the Fish and Aquatic Plants themselves (e.g. damage to organisms and habitat) or by impacting the harvesting of those Fish and Aquatic Plants by Tsawwassen through closures to fisheries for conservation, health or public safety reasons (e.g. closure of fisheries because of tainting of seafood or gear fouling). Spill response and clean-up activities could also interfere with Tsawwassen fisheries.

7.1.4 Using the Proponent’s data on return periods (Table 7.1) for an oil spill within the shipping lanes and for NewCase 1c<sup>3</sup> (NEB Filing B300-2 Trans Mountain Response to NEB IR TERMPOL Report and Outstanding Filings), the probability that an oil spill of 8250 m<sup>3</sup> or more will occur in the marine environment within the 50 year operating life of the TMEP is 8.8% with the proposed mitigations. The probability of an oil spill is calculated as the operating life of the Project (50 years) divided by the return period. The probability of at least one spill in 50 years increases to 17.6% for NewCase 1c when spills of any size are considered.

7.1.5 The distribution and abundance of salmon stocks throughout the Tsawwassen harvest area is extensive in both space and time. Salmon are present throughout the Tsawwassen harvest area as adults and as juveniles (Dunford 1975) in near-shore habitat and may be exposed to oil or condensate in the event of a spill at any time of the year. Adult salmon are in highest abundance in the Tsawwassen harvest area during May to October and juveniles are in highest abundance from March through August (Dunford 1975). Thus, an oil spill would likely impact one or several salmon stocks if it occurred between March and October.

Dunford, W.E. 1975. Space and Food utilization by Salmonids in Marsh Habitats of the Fraser River Estuary, M. Sc. Thesis, University of British Columbia, 1975. Appendix 6

Table 7.1 The probability of at least one marine oil spill during the life of the TMEP for various marine spill sizes and mitigation scenarios. Return period data is from NEB Filing B300-2 Trans Mountain Response to NEB IR TERMPOL Report and Outstanding Filings.

| Spill size (m <sup>3</sup> ) | Project Operating Life | Return Period          |                                       |  | Probability of a Marine Spill During the Project Operating Life |   |  |
|------------------------------|------------------------|------------------------|---------------------------------------|--|---|---|--|
|                              |                        | No Project (NewCase 0) | Project without mitigations (Case 1a) | Project with expanded tug escort + Enhanced Situational Awareness (NewCase 1c) | No Project - Refined after TERMPOL (NewCase 0)                  | Project - Refined after TERMPOL (without mitigations) (Case 1a) | Project with expanded tug escort + Enhanced Situational Awareness (NewCase 1c) |
| 16500                        | 50                     | 6,135                  | 901                                   | 2,841  | 0.8%  | 5.5%  | 1.8%   |
| 8250                         | 50                     | 1,227                  | 180                                   | 568  | 4.1%  | 27.8%   | 8.8%   |
| >0                           | 50                     | 613                    | 90                                    | 284  | 8.2%  | 55.6%   | 17.6%  |

7.1.6 The recovery time for marine resources affected by an oil spill varies but can be quite long (EVOSTC 2010; Table 9.1 of Volume 8b). Twenty years after the Exxon Valdez oil spill, near-shore and shoreline habitats (clams, mussels and intertidal communities) and marine sediments were still recovering. Still recovering means that these areas were still being negatively affected by residual effects of the spill or still being exposed to lingering oil. Oil spill recovery activities,

<sup>3</sup> NewCase 0 = no Project; NewCase 1a = With Project, forecast traffic in 2018 with no new mitigations; NewCase 1c = With Project, forecast traffic in 2018 with escort tugs through Salish Sea and Strait of Juan de Fuca plus Enhanced Situational Awareness as recommend in TERMPOL report by Transport Canada.

particularly high-pressure hot water washing, were identified as a contributing factor to delayed recovery.

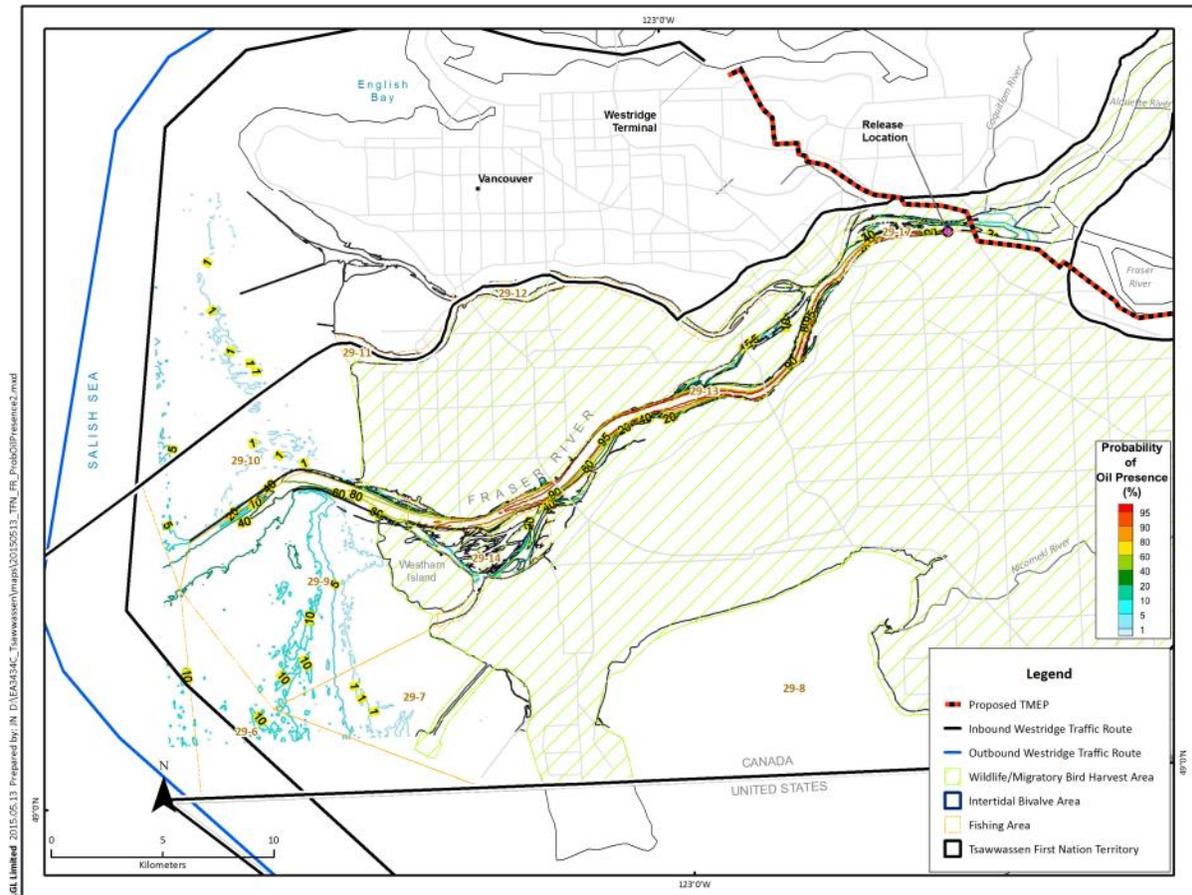
## **8.1 Effects of an Overland Spill at the Fraser River Crossing**

- 8.1.1 The Proponent modeled spills during spring, summer, fall and winter conditions. The spring (April – June), summer (July – September), and Fall (October – December) are the three periods that overlap most with the Tsawwassen fishing periods and hence are the credible worse cases. Figures 8.1 – 8.3 show for the Tsawwassen harvest areas, the probability of oiling, extent of shoreline oiling, and time to first contact for the spill scenarios performed by the Proponent at Site FR, overlaid with the Tsawwassen harvest areas. For illustrative purposes, only the figures for the summer period are shown. These results show that a pipeline spill of 1,250 m<sup>3</sup> at the Fraser River crossing would result in rapid and significant oiling of shoreline areas and fish habitat along the South Arm of the Fraser and onto Roberts Bank. These areas provide critical habitat for salmon and Eulachon as well as Dungeness crab at Roberts Bank. A spill during spring freshet would carry oil out into the Salish Sea and into the Tsawwassen bivalve harvesting area.
- 8.1.2 A spill at Site FR during the Tsawwassen fisheries would most certainly result in closures of Tsawwassen salmon and Eulachon fisheries by DFO<sup>4</sup>; fisheries which are already severely limited by the number and duration of allowable harvest days. Tsawwassen could suffer cultural and economic losses from such a spill.
- 8.1.3 Tsawwassen, along with other First Nations, use areas near the mouth of the Fraser River for cultural activities that are directly and inextricably linked to the harvest of salmon. Most notably among these activities is the ‘First Salmon’ ceremony. Once the first sockeye of the year is caught, the fillets are removed and shared amongst community members; the remains of the fish are arranged on a platter with plants, medicines and berries, and brought back to the water where it was caught. Prayers, songs and thanks are offered, and the platter is placed on the water. The sockeye may then return to its home and family.
- 8.1.4 It is believed that this show of respect is a necessary part of the life cycle of not only salmon, but of Coast Salish people as well; if we do not honour and protect the salmon, they will not share themselves with people. This practice reaches back to time out of mind, and is a fundamental aspect of the unique identity of the Coast Salish.
- 8.1.5 There are no other places where Tsawwassen can engage in this activity, within its territory. A spill in this environment would not only impact the physical health of salmon, and the physical habitat that they and the Tsawwassen rely on, but it may also have a direct and negative impact on the exercise of Coast Salish culture and spirituality; it could indelibly stain the landscape and our way of life.

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<sup>4</sup> Closures to the fishery could be made to ensure public health and safety and in subsequent years closures could occur if fish stocks remain depressed as a result of an oil spill.

8.1.6 The economic effects could be greatest if a spill occurred during the large cycle return year of Fraser sockeye as occurred in 2010 and 2014 (see Table 6.1 and 6.2).



**Figure 8.1 Simulated oil spill at Site FR; probability of oil presence for a 1,250m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.**

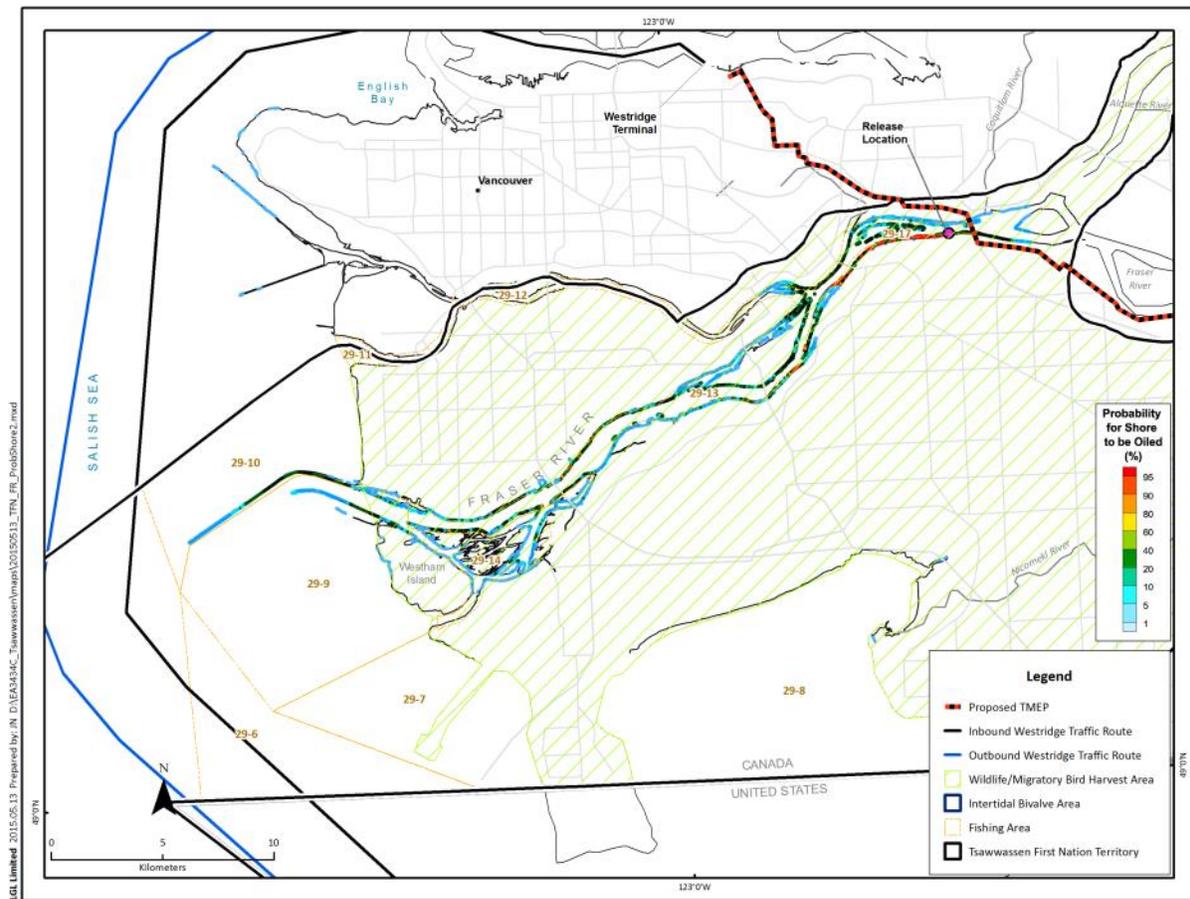
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Tsawwassen Migratory Bird Harvest Area – Appendix L-1; Appendix K-1; Tsawwassen First Nation Final Agreement Appendices [A3W8G2, PDF page 15 of 98]

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**Figure 8.2 Simulated oil spill at Site FR; probability for shore to be oiled for a 1,250m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.**

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(July – September), and Fall (October – December) are the three periods that overlap the most with the Tsawwassen fishing periods and for the 16,500 m<sup>3</sup> spill volume are the credible worse cases. Figures 9.6 – 9.8 show for the Tsawwassen harvest areas, the probability of oiling, extent of shoreline oiling, and time to first contact for the spill scenarios performed by the Proponent at Site D, overlaid with the Tsawwassen harvest areas. For illustrative purposes only the figures for the summer period are shown.

- 9.1.2 Stochastic modeling results presented in the TMEP Application (Volume 8B) show that accidental spills in the Salish Sea at Site D have a high or very high probability (>50%) of oil being present in the Tsawwassen harvest areas and would affect an area as large as 3,311 km<sup>2</sup> (including areas outside the Tsawwassen harvest areas)<sup>5</sup> for a 16,500 m<sup>3</sup> spill in summer (Table 6.1, Volume 8b) (Figure 9.1). Shoreline areas between Point Roberts and the Roberts Bank Terminal along with shoreline areas of the southern Gulf islands would be most affected (Figure 9.2). The time to first contact with these shoreline areas is short (Figure 9.3).
- 9.1.3 According to the TMEP Application (Volume 8b), of a total of 1,196 km<sup>2</sup> of shallow water habitat (<10 m depth) in the Regional Study Area, 264 km<sup>2</sup> has a high probability (>50%) of being oiled from a 16,500 m<sup>3</sup> spill in summer. At Roberts Bank, this is important Dungeness crab habitat and where the Tsawwassen fisheries on Dungeness crab take place.
- 9.1.4 A spill at Site D during the Tsawwassen fisheries targeting salmon or Dungeness crab could result in closures of the fishery by DFO; fisheries which are currently limited in the number and duration of allowable harvest days. Therefore, Tsawwassen could suffer cultural and economic losses from such a spill. The economic effects would be greatest if a spill occurred during the large cycle return year of Fraser Sockeye as was seen in 2010 and 2014.

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<sup>5</sup> We have not calculated the amount of marine area or shoreline area within Tsawwassen harvest areas that would be affected by a spill at either Site D or E but this could be done by Trans Mountain using their GIS data.



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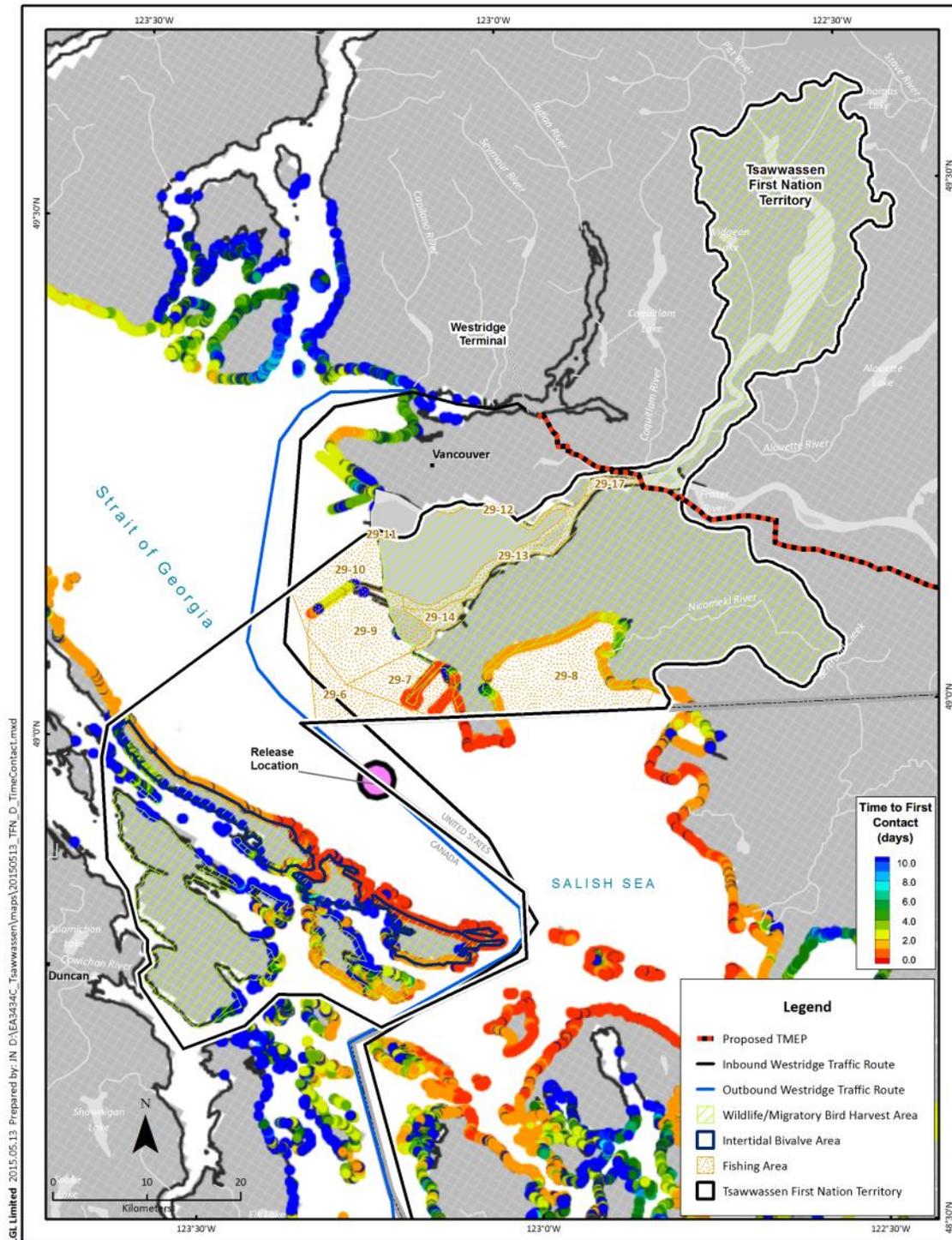
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**Figure 9.3** Simulated oil spill at Site D; time to first contact for a 16,500m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.

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## **10.1 Effects of a Marine Spill at Site E (Salish Sea, Arachne Reef)**

### 10.1.1 Site E (Salish Sea, Arachne Reef)

10.1.2. The Proponent modeled spills for spring, summer, fall and winter time periods and for two spill volumes (16,500 m<sup>3</sup> and 8,250 m<sup>3</sup>) at Site E in Salish Sea. The spring (April – June), summer (July – September), and Fall (October – December) are the three periods that overlap the most with the Tsawwassen fishing periods and for the 16,500 m<sup>3</sup> spill volume are the credible worse cases. Figures 10.1 – 10.3 show for the Tsawwassen harvest areas, the probability of oiling, extent of shoreline oiling, and time to first contact for the spill scenarios performed by the Proponent at Site E, overlaid with the Tsawwassen harvest areas. For illustrative purposes, only the figures for the summer period are shown.

10.1.3. Stochastic modeling results presented in the TMEP Application (Volume 8B) show that accidental spills in the Salish Sea at Site E have a lower probability (>10%) of oil being present in the Tsawwassen harvest areas but could still affect shoreline areas in the Tsawwassen harvest areas between Point Roberts and the Roberts Bank Terminal along with shoreline areas of the southern Gulf islands (Figure 10.2). The time to first contact with these shoreline areas is longer than for a spill at Site D (Figure 10.3).

10.1.4. Oiling of harvest areas from a spill at Site E during the Tsawwassen fisheries targeting salmon or Dungeness crab could result in closures of the fishery by DFO; fisheries which are currently limited in the number and duration of allowable harvest days. Therefore, Tsawwassen could suffer cultural and economic losses from such a spill.

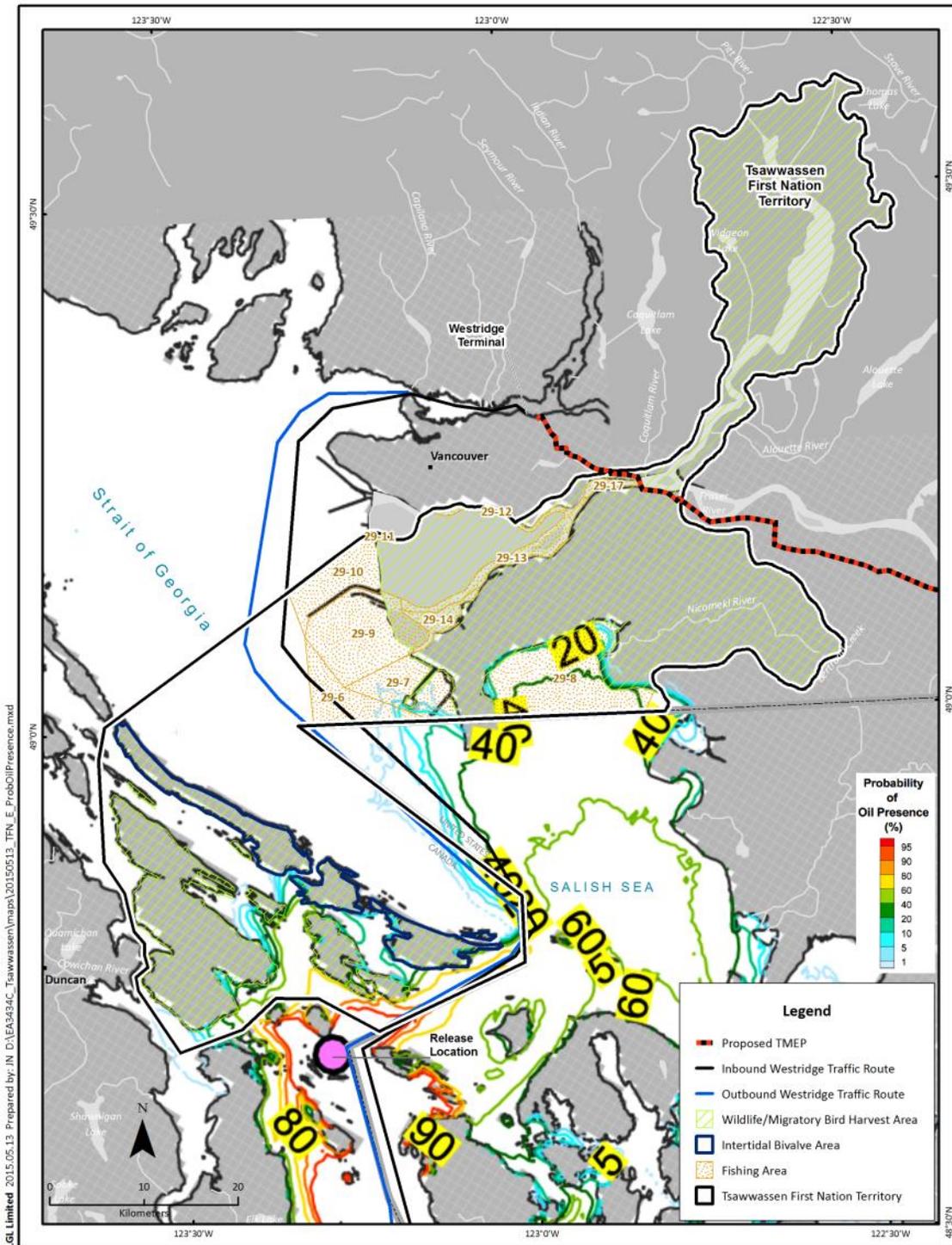


Figure 10.1 Simulated oil spill at Site E; probability of oil presence for a 16,500 m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.

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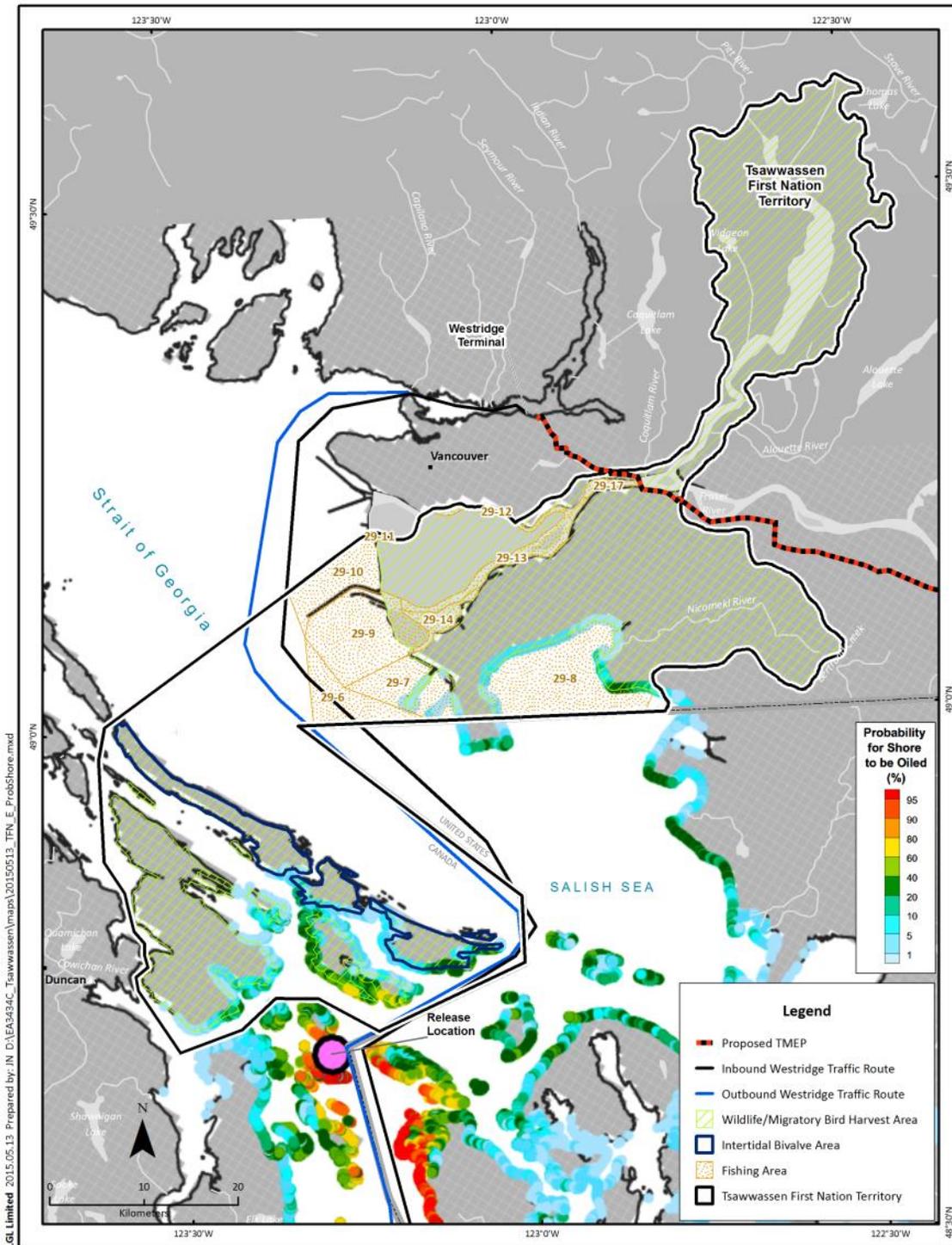


Figure 10.2 Simulated oil spill at Site E; probability for shore to be oiled for a 16,500m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.

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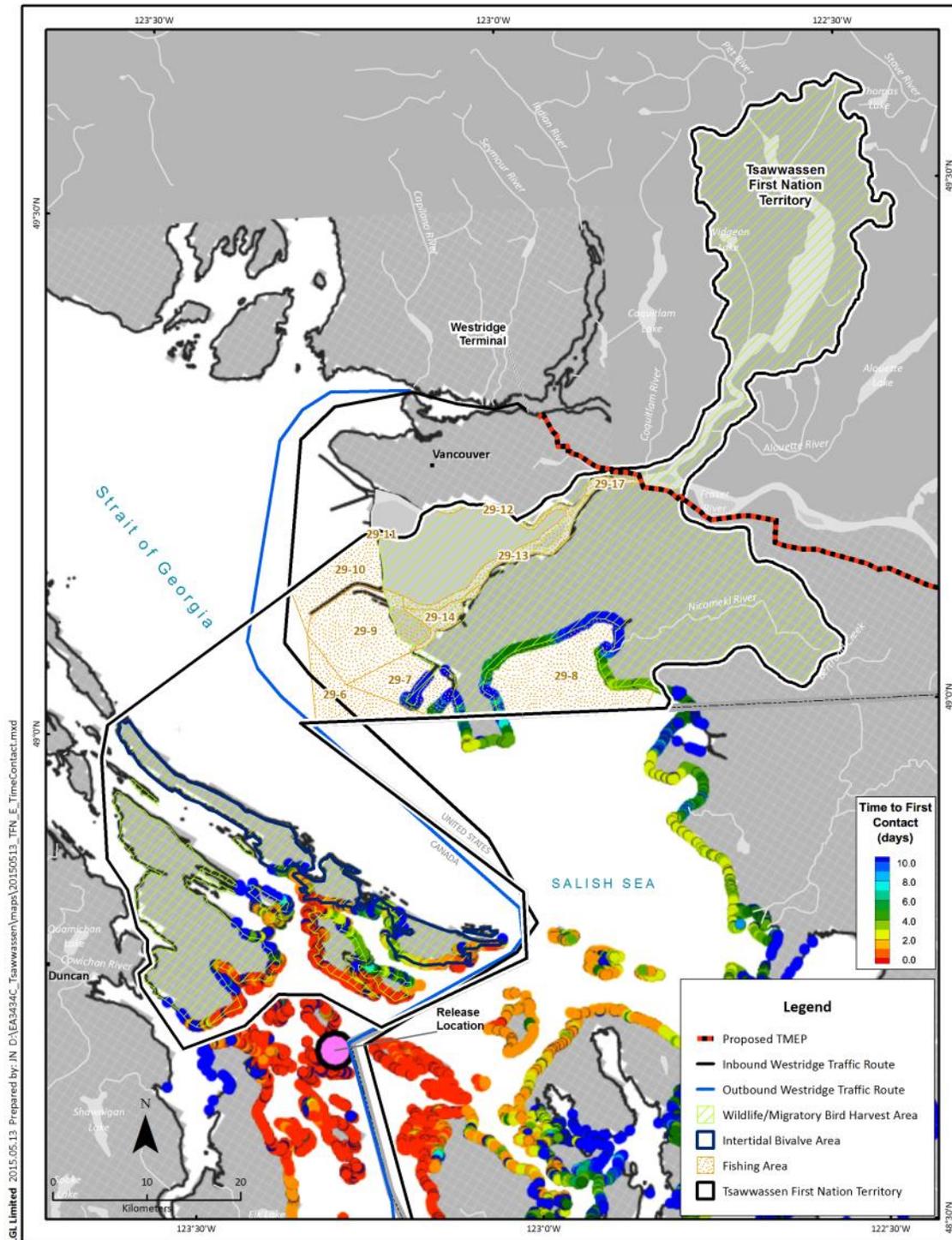


Figure 10.3 Simulated oil spill at Site E; time to first contact for a 16,500m<sup>3</sup> spill occurring in summer. Data sources: Tsawwassen Final Agreement and Volume 8C (Termpol Report) of the TMEP Application.

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## **11.1 Effects of the Project on Tsawwassen Treaty Right to Migratory Birds**

11.1.2. Tsawwassen First Nation has the right to harvest Migratory Birds for domestic purposes in the Tsawwassen Migratory Bird Harvest Area (see Figure 6.1) throughout the year in accordance with the Tsawwassen Final Agreement.

11.2.1 Importance of Fraser River Delta and Significance of Migratory Birds Culturally

11.2.2 The Fraser River sustains the largest delta on Canada's Pacific coast. The Fraser Delta covers ~680 km<sup>2</sup> of aquatic and terrestrial areas, stretching ~30 km from New Westminster westward to Sand Heads Lighthouse and from Point Grey southward to the international boundary (Butler and Campbell 1987). The Fraser River delta is a critical link in a series of migratory bird habitats along the Pacific Flyway between the arctic breeding grounds of North America and northeast Asia and wintering areas in southwestern North America, Central America, and South America. The delta supports some of the highest densities of wintering waterfowl, shorebirds, and raptors in Canada (Butler and Campbell 1987). Brackish marshes occupy ~3% of the delta and are some of the delta's last vestiges of ecological communities that exist in a similar state to those that existed prior to European contact. By serving as food for herbivores and detritivores and as structural habitat (cover) for fish and invertebrates, healthy brackish marshes in the Fraser River delta are integral to an ecosystem that supports high profile species of fish and migratory birds.

Butler, R. W. and R. W. Campbell. 1987. The Birds of the Fraser River Delta: Populations, Ecology and International Significance. Occasional Paper No. 65. Canadian Wildlife Service, Ottawa, Ontario. Appendix 7

11.2.3 It is difficult to overstate the value of migratory birds to Tsawwassen. Historically, Tsawwassen hunted and traded waterfowl with their territorial neighbours, bringing canoes full of them to upriver communities. The presence of migratory birds throughout Tsawwassen's traditional territory is even acknowledged in the naming of places – the western foreshore of Boundary Bay is known to Tsawwassen as *Tunuxun*, a Hunqum'i'num word which means 'ducks'.

Tsawwassen First Nation. *Reconstructing Culture: A Traditional Use Study of the Tsawwassen First Nation*. Tsawwassen, BC. (1998), Appendix 8

11.2.4 Although the Migratory Bird Harvest Area encompasses a large area of land and water, the opportunity to exercise the Treaty right is confined to a fraction of that area. First, only a small portion of that area is suitable habitat for the species (i.e., primarily waterfowl) harvested by TFN members. This is a result of natural conditions and the human-caused changes to the landscape initiated by forestry and agriculture that began in the 1850s (see North and Teversham 1984). Second, of that suitable habitat, a considerable fraction is closed to hunting as it is private property or public safety is a concern (see maps in: Fraser Valley Special Area Hunting Licence 2014–2015 edition). The result is that, for TFN members, some of the best remaining waterfowl hunting opportunities along the foreshore of the Fraser Delta are located adjacent to Tsawwassen Lands – an area vastly smaller than what was once available to Tsawwassen harvesters.

North, M.E.A. and J.M. Teversham. 1984. The Vegetation of the floodplains of the Fraser, Serpentine, and Nicomekl Rivers, 1859 to 1890. *Syesis* 17:47–66. Appendix 9

Fraser Valley Special Area Hunting Licence 2014–2015 edition, Ministry of Forests, Lands and Natural Resource Operations, B.C. Appendix 10

#### 11.3.1 Effects of a Spill of Diluted Bitumen

11.3.2 TFN has two main concerns about the TMEP and its implications for the Treaty Right, both of which are linked to the adverse effects of a spill of diluted bitumen that reaches the shore of the Fraser Delta. First, a spill that reaches the shoreline of the Fraser Delta is expected to result in animal and plant mortality via toxicity and smothering effects whereby the death and decay of vegetation leads to habitat degradation. Second, degraded environmental conditions are believed to have the potential to unreasonably limit or preclude the exercise of the right to harvest migratory birds for an unknown period of time.

11.3.3 Marine spill scenarios prepared by the Proponent and depicted above in figures 9.1-9.3 through 10.1-10.3 confirm that contamination by diluted bitumen, of that part of the shoreline of the Fraser Delta within the Migratory Bird Harvest Area, is a realistic outcome of a marine spill. The actual amount of hydrocarbons contacting the shore depends on a number of factors, including spill volume, spill trajectory (e.g., as affected by weather and tidal currents), spill response, and spill recovery.

11.3.4 Hutchinson (1982) described the influence of the elevation of the intertidal platform on the vegetation community of a brackish marsh in the Fraser Delta. Brackish marsh habitat of the Fraser delta can exist only where tidal inundation is frequent enough to prevent the establishment of ‘upland’ species (i.e., those not capable of tolerating marine conditions), and where the intertidal sediment platform is exposed often enough such that subtidal marine species such as eelgrasses and macrophytic algae cannot become established. The narrow band of brackish marshes of the Fraser Delta have been confined on the landward side by an elaborate network of dykes, ditches and pumping stations that confine the nearshore influence of the marine environment. Considering that the upland limit of the brackish marsh is now

defined and demarcated by the dykes, the net area of the marsh is solely dependent on the degree to which the marsh extends seaward. As with the threat that sea-level rise due to climate change poses to brackish marshes, any perturbations that decrease the elevation of the marsh platform will only serve to reduce its area. The deposition of diluted bitumen onto the brackish marshes of the Fraser Delta is believed to constitute such a perturbation. Just as roadside cutbanks of exposed soil are routinely hydro-seeded to provide soil stability that resists erosion, the deep root and rhizome networks of brackish marsh plants serve to bind the sediments and resist the erosional forces of waves and currents.

Hutchinson, I. 1982. Vegetation-environment relations in a brackish marsh, Lulu Island, Richmond, B.C. *Canadian Journal of Botany* 60: 452-462. Appendix 11

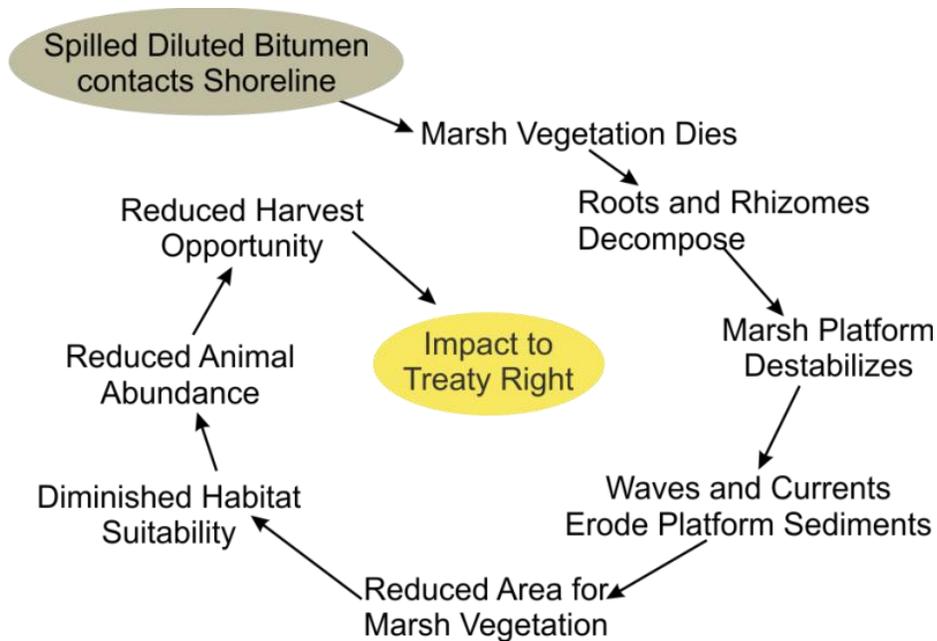
- 11.3.5 Intertidal marsh plants are key to reducing coastal erosion (Möller et al. 2014). Silliman et al. (2012) found that for intertidal marsh habitats affected by the recent *Deepwater Horizon* oil spill in the Gulf of Mexico, plant death led to sediment erosion and habitat degradation:

*“Our results suggest that oil-generated death of this stabilizing root matrix at the edges of these marshes triggered a geomorphic response that led to accelerated erosion of the marsh edge, hastening the degradation of the elevated platform on which marsh vegetation depends.”*

Möller et al. 2014. Wave attenuation over coastal salt marshes under storm surge conditions. *Nature Geoscience* 7: 727–731. Appendix 12

Silliman, B.R. et al. 2012. Degradation and resilience in Louisiana salt marshes after the BP–*Deepwater Horizon* oil spill. *PNAS* 109 (28): 11234–11239. Appendix 13

- 11.3.6 As summarized in Figure 11.1, the death of marsh vegetation and the subsequent decomposition of the root and rhizome network triggers a cascade of events that could lead to sediment erosion, a loss of a substrate for new plant growth, a loss of habitat for marsh-dependent species, a loss of animal abundance, and a loss of opportunities for humans to benefit from marsh resources. In the current context, this loss of opportunity translates into risks to the Tsawwassen First Nation and its ability to exercise its right to harvest migratory birds.



**Figure 11.1 Conceptual pathway by which the initiating event (spilled diluted bitumen that contacts the shoreline of the Fraser Delta) causes an impact to a treaty right such as the harvest of migratory birds under the Tsawwassen Final Agreement.**

11.3.7 In response<sup>6</sup> to Information Requests by TFN, the Proponent has consistently downplayed the risks of environmental damage of the brackish marsh ecosystem as a result of a catastrophic spill of diluted bitumen. For example, in Filing ID A4D3G2, Trans Mounted stated that it:

*“...is confident that plant mortality caused by exposure to crude oil or oil spill response activities in the unlikely event of a spill affecting Boundary Bay, Roberts or Sturgeon Banks would be minor and reversible, and that wide-spread erosion or other physical change to salt marsh and shoreline habitat is not a likely outcome of such an accident.”*

11.3.8 TFN has not seen any empirical evidence capable of substantiating such a high degree of confidence as the Proponent places in this assessment. Consequently, TFN has no choice but to accept the finding from those places where oil spills have been shown to degrade coastal marshes. Accordingly, we submit to the Panel that the Tsawwassen First Nation Right to Harvest Migratory Birds is presently at an as-yet-unknown level of risk from existing shipping and that an expansion of tanker traffic will only exacerbate this risk.

11.3.9 As it is with salmon, there may be cultural implications to reductions in harvests of migratory birds. The Tsawwassen First Nation Final Agreement allows Tsawwassen Members to barter in migratory birds with other aboriginal people, resident in Canada. Changes in the environment that reduce opportunities to harvest migratory birds also impact the ability of Tsawwassen

<sup>6</sup> Trans\_Mountain\_Response\_to\_Tsawwassen\_FN\_IR\_No.\_1\_-\_A3Y3U7  
 B280-3\_-\_Trans\_Mountain\_Follow-Up\_Response\_to\_NEB\_Ruling\_33\_-\_A4D3G2  
 Trans\_Mountain\_Response\_to\_Tsawwassen\_FN\_IR\_No.\_2 - A4H9H9

Members to trade and barter, which is an activity that is as important culturally, as it is economically. Historically, Tsawwassen has traded in waterfowl with neighbouring nations. Trading strengthened and affirmed traditional relationships between aboriginal individuals, families and even entire communities.

Ch. 11, clause 4, Fisheries; Tsawwassen First Nation Final Agreement [A3W8G0]

## **12.1 Effects of the Project on Tsawwassen First Nation Interests in Killer Whale**

### **12.1.1 Killer Whale Statistics**

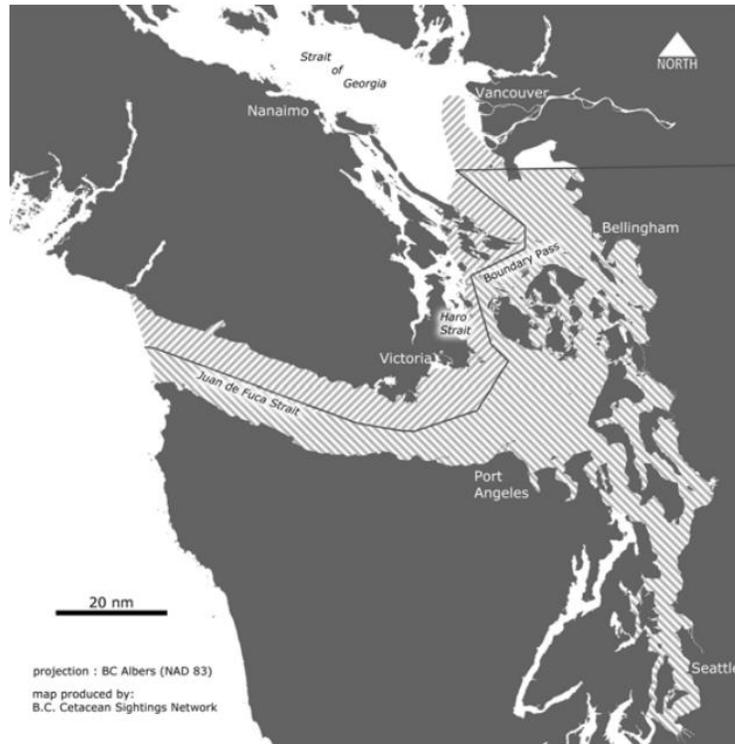
12.1.2 Southern Resident Killer Whale is Endangered and is on Schedule 1 of the Species at Risk Act (SARA) – the highest level of extant-species designation under SARA. In accordance with SARA, most of the Salish Sea has been delineated as critical habitat in the recovery strategy (Figure 12.0; Fisheries and Oceans Canada 2011), including the waters off the shore of Tsawwassen Lands. The whale population numbered 89 in 1998. As of 31 March 2015, the total was 81. At this point, population recovery seems unlikely unless drastic changes to those factors compromising the population’s demographics occur.

Species at Risk Public Registry: Species Profile – Killer Whale Northeast Pacific Southern Resident Population. Government of Canada. (online) May 2015. Appendix 14

Aquatic Species at Risk – Killer Whale (Northeast Pacific, Southern Resident Population). Fisheries and Oceans Canada. Government of Canada. (online) May 2015. Appendix 15

Southern Resident Orca Community Demographics, Composition of Pods, Births and Deaths since 1998. Orca Network. (online) May 2015. Appendix 16

Recovery Strategy for the Northern and Southern Resident Killer Whales (*Orcinus orca*) in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, 2011. Appendix 17



**Figure 12.0 Critical habitat for southern resident killer whales. The hatched area in US waters shows the approximate areas designated as southern resident critical habitat under the US Endangered Species Act (ESA). Source: Fisheries and Oceans Canada (2011)<sup>7</sup>.**

#### 12.2.1 Cultural Importance of Killer Whale

12.2.2 Tsawwassen First Nation does not have a history as a whaling nation, nor does it have any Treaty Rights to whales in the Salish Sea. That said, TFN has strong cultural ties to Killer Whale and a vested interest in its wellbeing.

12.2.3 Tsawwassen faces out onto the Salish Sea, and must cross it to access the southern Gulf Islands, in order to harvest shellfish, and to meet with territorial neighbours. As an acknowledgement of the population of *kwulhmulucun* (Killer Whales) who occupy the salt water, the Tsawwassen have adorned their ocean-going canoe with an image of the Killer Whale. The species also figures prominently in the stories of TFN citizens.

#### 12.3.1 Current Impacts on Killer Whale

<sup>7</sup> Fisheries and Oceans Canada. 2011. Recovery Strategy for the Northern and Southern Resident Killer Whales (*Orcinus orca*) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries & Oceans Canada, Ottawa.

- 12.3.2 In modern times there has been recognition that the perilous state of the Southern Resident race of Killer Whale is a result of human activities in and around the Salish Sea. From capture for the commercial aquarium industry, to chemical pollution, to depletion of key prey (Chinook salmon), to the ever-increasing levels of underwater noise, humans are pushing this race to the brink of extinction. TFN takes very seriously any assaults to these magnificent creatures whose very existence as a top predator in the Salish Sea is the ultimate indicator of the health of this ecosystem—the very ecosystem that sustains the lives and livelihoods of TFN citizens. A Sea that is fit for Killer Whale is one that is fit for TFN.
- 12.3.3 Of the many interactions between the proposed project and valued components along the ~980 km of pipeline from Alberta to the West Coast (Westridge Terminal), and the ~250 km of shipping lanes from the terminal out to the J- Buoy, the only non-accident effect the Proponent deemed “significant” was the sensory disturbance Killer Whale caused by underwater shipping noise in the Salish Sea<sup>8</sup>. Considering the great lengths to which proponents typically go to mitigate “significant” adverse effects to the point of non-significance, this conclusion is both telling and troubling.
- 12.3.4 Unlike the terrestrial portions of the project, the Proponent has limited influence over the operations of marine vessels calling to and from Westridge Terminal. There are presently a number of statutes that seek to protect the environment from harmful effects of spilled hydrocarbons and other chemical releases. Similarly, regulations governing ballast water provide a measure of protection from the harmful effects of invasive species. However, when it comes to the emission of underwater noise (most of which originates from the propeller [McKenna et al. 2012]), there are neither Canadian nor international regulations. As the world’s oceans have become increasingly polluted by noise, underwater noise in the marine environment has been identified as an issue of growing public concern for over two decades (National Research Council 2003). And still, governments have yet to mitigate this pollution by regulating or capping it.

McKenna, M.F., D. Ross, S.M. Wiggins, and J.A. Hildebrand. 2012. Underwater radiated noise from modern commercial ships. *Journal of the Acoustical Society of America* 131(1): 92–103. Appendix 18

National Research Council. 2003. Ocean noise and marine mammals. Committee on Potential Impacts of Ambient Noise in the Ocean on Marine Mammals. National Academies Press. Appendix 19

According to the Proponent<sup>9</sup>:

*“With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. Even though the Project contribution to overall sensory disturbance effects would be small, the potential effect of the increase in Project-related marine vessel traffic was*

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<sup>8</sup> see Table 4.3.7.9. in B18-29\_-\_V8A\_4.2.12.2\_TO\_T5.2.2\_MAR\_TRANS\_ASSESS\_-\_A3S4Y3

<sup>9</sup> B1-1\_-\_V1\_SUMM\_-\_A3S0Q7

*determined to be high magnitude, high probability and significant for southern resident killer whales.”*

12.3.5 If one accepts the theory that underwater noise in the Salish Sea currently poses a credible risk to Southern Resident Killer Whale and population recovery thereof, in recognition of the fact that (i) the proposed project will exacerbate the problem of underwater noise in the Salish Sea, and (ii) our understanding of what constitutes an acceptable level of underwater ambient shipping noise is rudimentary at best, adding more shipping noise to the underwater soundscape of the Salish Sea may be unjustifiably risk-prone. This is not to say that the proposed project will amount to some tipping point, but rather that the tipping point may have already been breached. What is urgently needed is serious regulatory action to attenuate underwater noise levels in the Salish Sea. Heading in the other direction and authorizing more noise is simply irrational and irresponsible if we are to have any real chance of recovering this valued species and cultural symbol of the Coast Salish Peoples.

### **13.1. Conclusion**

13.1.1 The TFN people will continue to reside in their traditional area, as they have done since time immemorial. The resources on lands and in the Salish Sea will continue to provide them with sustenance and support their dietary needs. A spill or related malfunction as a result of, or in connection with, the Project, could result in irreparable harm to the TFN people and their constitutionally protected rights. The views and beliefs of the TFN about the project, and what the key impacts could be on TFN have been set out here, which is supported by relevant information and expertise.

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| Blakely, A.C., K. K. English, and L. Cassidy. 2010 -2014. Tsawwassen First Nation Post-Season Fisheries Reports, 2014.   | 4      |
| Yonis, R. 2010. The Economics of British Columbia's Crab Fishery: Socio-Economic Profile, Viability, and Market Trends. Fisheries and Oceans report.   | 5      |
| Dunford, W.E. 1975. Space and food utilization by salmonids in marsh habitats of the Fraser River estuary. M.Sc. thesis, University of British Columbia, Vancouver.                                    | 6      |
| Butler, R. W. and R. W. Campbell. 1987. The birds of the Fraser River delta: populations, ecology and international significance. Occasional Paper No. 65. Canadian Wildlife Service, Ottawa, Ontario. | 7      |
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