# Appendix A Information Regarding Species of Special Conservation Status

## A.1 Ranking Systems

The Accord for the Protection of Species at Risk in Canada was signed in 1996 by most provincial, territorial, and federal government Ministers responsible for wildlife (including Alberta and British Columbia). The Accord commits signatories to preventing species in Canada from becoming extinct as a consequence of human activity. It requires that all provincial and territorial signatories have a general status evaluation system that is similar and comparable.

An international ranking system developed by NatureServe (formerly the Association for Biodiversity Information) incorporates spatial considerations into the ranking of species at risk. In this system, each species is assigned a global rank (G) that applies across its entire range, a national (N) rank for each nation in its range, and a sub-national (S) rank for each province or state in its range. Numerical modifiers are then used to rank species. This ranking system applies to all provinces, and each province separately determines how to incorporate this information into its own ranking system. For the terms used in the international ranking system, see Table A-1.

**Table A-1 Risk Ranking System – Terms Used for International Species**

| Ranking | Definition |
|---|---|
| 1 = Critically Imperilled | Because of extreme rarity or some other factor(s) making it especially susceptible to extirpation or extinction. Typically, five or fewer occurrences or very few remaining individuals. |
| 2 = Imperilled | Because of extreme rarity or some other factor(s) making it very susceptible to extirpation or extinction. Typically, six to 20 existing occurrences or very few remaining individuals. |
| 3 = Vulnerable | Because rare and local, found only in a restricted range (even if abundant at some locations), or because of some other factor (s) making it susceptible to extirpation or extinction. Typically 21-100 existing occurrences. |
| 4 = Apparently Secure | Because uncommon but not rare, and usually widespread in the province. Possible cause for long-term concern. Typically, more than 100 existing occurrences. |
| 5 = Secure | Because common to very common, typically widespread and abundant, and not susceptible to extirpation or extinction under present conditions. |

For the terms used in the provincial ranking systems for Alberta, see Table A-2. Terms for British Columbia follows in text.

**Table A-2 Risk Ranking System – Terms Used for Alberta Species**

| Status | Definition |
|---|---|
| *At Risk* | Any species known to be *At Risk* after formal detailed status assessment and designation as endangered or threatened in Alberta. |
| *May be at Risk* | Any species known to be *May Be At Risk* of extinction or extirpation, and is therefore a candidate for detailed risk assessment. |
| *Sensitive* | Any species that is not at risk of extinction or extirpation but might require special attention or protection to prevent it from becoming at risk. |
| *Secure* | A species that is not *At Risk*, *May Be At Risk*, or *Sensitive*. |

In Alberta, as indicated in the At Risk rank, threatened means a species likely to become endangered if limiting factors are not reversed, and endangered means a species facing imminent extirpation or extinction.

In British Columbia, the S rank is used to further sort species rankings into groups with similar conservation risks, using three lists:

- the Red List includes species that are legally designated as Endangered or Threatened under the provincial Wildlife Act (e.g., species with S ranks of 1, 2, 1-2, 1-3)
- the Blue List includes species not immediately threatened, but of concern because of characteristics that make them vulnerable or sensitive to human activities or natural events (e.g., species with S ranks of 2-3, 3, 3-4)
- the Yellow List includes common or all species not on the Red or Blue Lists (species with S ranks of 4, 4-5, or 3-4 (plants only)

See Table A-1 for a description of the S ranks.

The Red, Blue, and Yellow lists of British Columbia are comparable to Alberta's At Risk, May be at Risk and Secure rankings, respectively.

Federally, the Species at Risk Act (SARA) is the newest of several federal laws implemented to preserve and protect Canada's wildlife. The purpose of the SARA is to:

- prevent wildlife species from becoming extinct or extirpated
- secure the recovery of extirpated, endangered, and threatened species
- manage species of special concern to prevent them from becoming endangered or threatened

The SARA applies to wildlife species at risk nationally, as well as their critical habitat on federal lands and in aquatic environments. The SARA is applied alongside other federal legislation, including the Migratory Bird Convention Act, the Canada Wildlife Act, the Fisheries Act and the CEAA.

Under the federal system, species at risk are identified by COSEWIC. COSEWIC carries out an assessment of a species' status using the best available scientific knowledge, community knowledge, and traditional knowledge of the biology of the species. For the terms COSEWIC applies in the international ranking system, see Table A-3.

## Table A-3 Risk Ranking System – Terms Used for Federal Species

| Term | Definition |
|---|---|
| Species | Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora |
| Extinct (X) | A species that no longer exists |
| Extirpated (XT) | A species no longer existing in the wild in Canada, but occurring elsewhere |
| Endangered (E) | A species facing imminent extirpation or extinction |
| Threatened (T) | A species likely to become endangered if limiting factors are not reversed |
| Special Concern (SC) | A species of special concern because of characteristics that make it particularly sensitive to human activities and natural events |
| Not at Risk (NAR) | A species that has been evaluated and found to be not at risk |

The following tables (A-4 to A-11) provide information regarding species of special conservation status that might occur along the proposed pipeline RoW.

## Table A-4 Waterbirds of Conservation Concern Along the Proposed Pipeline Route

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Aechmophorus occidentalis* | Western grebe | G5 | S1B, S3N | R | S3B | Sensitive | – |
| *Pelecanus erythrorhynchos* | American white pelican | G3 | S1B, SZN | R | S2B | Sensitive | NAR |
| *Phalacrocorax auritus* | Double-crested cormorant | G5 | S2B, SZN | R | S3B | Secure | NAR |
| *Phalacrocorax pelagicus* | Pelagic cormorant | G5 | S4B, SZN | Y | – | – | – |
| *P. p. pelagicus* | Pelagic cormorant, subsp. *Pelagicus* | G5TU | S2B, SZN | R | – | – | – |
| *Botaurus lentiginosus* | American bittern | G4 | S3B, SZN | B | S3S4B | Sensitive | – |
| *Ardea herodias fannini* | Great blue heron | G5T4 | S3B, S4N | B | S3B, S1N | Sensitive | SC |
| *Nycticorax nycticorax* | Black-crowned night heron | G5 | SAB, S1N | Y | S2B | Sensitive | – |
| *Cygnus buccinator* | Trumpeter swan | G5 | S4B, S4N | Y | S3B | At Risk | NAR |
| *Branta canadensis occidentalis* | Dusky Canada goose | G5T2T3 | S1N | B | – | _ | – |
| *Lophodytes cucullatus* | Hooded merganser | G5 | S5B, SZN | Y | S1B, S1N | Secure | – |

## Table A-4 Waterbirds of Conservation Concern Along the Proposed Pipeline Route (cont'd)

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Grus canadensis* | Sandhill crane | G5 | S3S4B, SZN | B | S4B | Sensitive | – |
| *Pluvialis dominica* | American golden-plover | G5 | S3S4B, SZN | B | SNA | Secure | – |
| *Recurvirostra americana* | American avocet | G5 | S2B, SZN | R | S5B | Secure | – |
| *Heteroscelus incanus* | Wandering tattler | G5 | S3S4B, SZN | B | – | – | – |
| *Bartramia longicauda* | Upland sandpiper | G5 | S1S2B, SZN | R | S3B | Sensitive | – |
| *Sterna forsteri* | Forster's tern | G5 | S1B, SZN | R | S3B | Sensitive | DD |
| *Chlidonias niger* | Black tern | G4 | S4B, SZN | Y | S4B | Sensitive | NAR |
| *Uria aalge* | Common murre | G5 | S2B, S4N | R | – | – | – |
| *Brachyramphus marmoratus* | Marbled murrelet | G3G4 | S2B, S4N | R | – | – | T |

NOTES:

– Species does not have a ranking or listing

[a]G Rank = global rank, see Table A-1.
T = infraspecific (subspecies)
U = unrankable

[b]S Rank = subnational (provincial) rank. Modifiers used with the rankings are as follows:
B = indicates breeding status for a migratory species
N = indicates non-breeding status for a migratory species
Z = ranking not applicable (e.g., migrants only)
NA = conservation status rank is not applicable because the species is not a suitable target for conservation activities
1 = Critically imperiled
2 = Imperiled
3 = Vulnerable
4 = Apparently Secure
5 = Secure

[c]British Columbia Status Ranks are as follows:
R = red-listed
B = blue-listed
Y = yellow-listed

[d]See Table A-2 for definitions.

[e]See Table A-3 for definitions.
DD = data deficient

## Table A-5 Songbirds and Upland Game Birds of Conservation Concern Along the Proposed Pipeline Route

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Tympanuchus phasianellus (columbianus subspecies)* | Sharp-tailed grouse | G4T3 | S2S3 | B | S4 | Sensitive | – |
| *Columba fasciata* | Band-tailed pigeon | G4 | S3S4B, SZN | B | – | – | – |
| *Stellula calliope* | Calliope hummingbird | G5 | S4S5B, SZN | Y | S2B | Secure | NAR |
| *Picoides arcticus* | Black-backed woodpecker | G5 | S5B, SZN | Y | S2S3 | Sensitive | NAR |
| *Myiarchus crinitus* | Great-crested flycatcher | G5 | – | – | S2B | Sensitive | NAR |
| *Certhia americana* | Brown creeper | G5 | S4S5B, SZN | Y | S3S4 | Undetermined | – |
| *Cistothorus platensis* | Sedge wren | G5 | – | – | S2B | Sensitive | – |
| *Catharus minimus* | Gray-cheeked thrush | G5 | S4S5B | Y | S1B | Undetermined | – |
| *Vireo philadelphicus* | Philadelphia vireo | G5 | S3S4B | B | S4B | Secure | – |
| *Dendroica pensylvanica* | Chestnut-sided warbler | G5 | SNA | – | S2B | Secure | – |
| *Dendroica tigrina* | Cape May warbler | G5 | S2B, SZN | R | S2B | Sensitive | – |
| *Dendroica virens* | Black-throated green warbler | G5 | S3B, SZN | B | S3S4B | Sensitive | – |
| *Dendroica fusca* | Blackburnian warbler | G5 | – | – | S2B | Sensitive | – |
| *Dendroica castanea* | Bay-breasted warbler | G5 | S2B, SZN | R | S3B | Sensitive | – |
| *Oporornis agilis* | Connecticut warbler | G4 | S2B, SZN | R | S4B | Secure | – |
| *Wilsonia canadensis* | Canada warbler | G5 | S3S4B | B | S4B | Sensitive | – |

## Table A-5 Songbirds and Upland Game Birds of Conservation Concern Along the Proposed Pipeline Route (cont'd)

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Ammodramus leconteii* | Le Conte's sparrow | G4 | S3S4B, SZN | B | S5B | Secure | – |
| *Ammodramus nelsoni* | Nelson's sharp-tailed sparrow | G5 | S2B, SZN | R | S3B | Secure | NAR |
| *Dolichonyx oryzivorus* | Bobolink | G5 | S3B, SZN | B | S2S3B | Sensitive | – |

NOTES:
– Species does not have a ranking or listing
[a]G Rank = global rank, see Table A-1.
T = infraspecific (subspecies)
[b]S Rank = subnational rank. Modifiers used with the rankings are as follows:
B = indicates breeding status for a migratory species
N = indicates non-breeding status for a migratory species
Z = ranking not applicable (e.g., migrants only)
NA = Not Applicable
1 = Critically imperiled
2 = Imperiled
3 = Vulnerable
4 = Apparently Secure
5 = Secure
[c]British Columbia Status Ranks are as follows:
R = red
Y = yellow
B = blue
[d]See Table A-2 for definitions.
[e]See Table A-3 for definitions.

## Table A-6 Raptors of Conservation Concern Along the Proposed Pipeline Route

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Accipiter gentilis* | Northern goshawk | G5 | S4B, S4N | Y | S4B, S2S3N | Sensitive | – |
| *A. g. laingi* | Northern goshawk subsp. *laingi* | G5T2T3 | S2B, SZN | R | – | – | T |
| *Buteo platypterus* | Broad-winged hawk | G5 | SAS3B, SZN | B | S3B | Sensitive | – |
| *Buteo swainsoni* | Swainson's hawk | G5 | S2B, SZN | R | S4B | Sensitive | – |

## Table A-6 Raptors of Conservation Concern Along the Proposed Pipeline Route (cont'd)

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Falco peregrinus pealei* | Peregrine falcon subsp. *pealei* | G4T3 | S3B, SZN | B | – | – | SC |
| *Falco peregrinus anatum* | Peregrine falcon subsp. *anatum* | G4T3 | S2B, SZN | R | SNR | – | T |
| *Falco rusticolus* | Gyrfalcon | G5 | S3?B, SZN | B | S1N | Secure | NAR |
| *Otus kennicottii kennicottii* | Western screech owl subsp. *kennicottii* | G5TNR | S3 | B | – | – | SC |
| *Surnia ulula* | Northern hawk owl | G5 | S4S5B, SZN | Y | S3S4 | Secure | NAR |
| *G. g. swarthi* | Northern pygmy owl subsp. *swarthi* | G5T3Q | S3 | B | – | Sensitive | – |
| *Strix varia* | Barred Owl | G5 | S5B,SZN | Y | S2S3 | Sensitive | |
| *Asio flammeus* | Short-eared owl | G5 | S3B, S2N | B | S3B, S2N | May be at Risk | SC |
| *A. a. brooksi* | Northern saw-whet owl subsp. *brooksi* | G5T3 | S3 | B | – | Secure | – |

NOTES:
– Species does not have a ranking or listing
[a]G Rank = global rank, see Table A-1.
[b]S Rank = subnational rank. Modifiers used with the rankings are as follows:
B = indicates breeding status for a migratory species
N = indicates non-breeding status for a migratory species
Z = ranking not applicable (e.g., migrants only)
? = Inexact or uncertain due to limited information
1 = Critically imperiled
2 = Imperiled
3 = Vulnerable
4 = Apparently Secure
5 = Secure
[c]British Columbia Status Ranks are as follows:
R = red
Y = yellow
B = blue
[d]See Table A-2 for definitions.
[e]See Table A-3 for definitions.

## Table A-7 Amphibians of Conservation Concern Along the Proposed Pipeline Route

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Ambystoma macrodactylum* | Long-toed salamander | G5 | S5 | Y | S3 | Sensitive | – |
| *Ambystoma tigrinum* | Tiger salamander | G5 | S2 | R | S4 | Secure | E |
| *Ascaphus truei* | Coastal tailed frog | G4 | S3S4 | B | – | – | SC |
| *Bufo hemiophyrs* | Canadian toad | G4 | – | – | S4 | May be at Risk | – |
| *Bufo boreas* | Western toad | G4 | S4 | Y | S4 | Sensitive | SC |
| *Rana luteiventis* | Columbia spotted frog | G4 | S4 | Y | S3 | Sensitive | – |

NOTES:
– Species does not have a ranking or listing
[a]G Rank = global rank, see Table A-1.
[b]S Rank = subnational rank. Modifiers used with the rankings are as follows:
1 = Critically imperiled
2 = Imperiled
3 = Vulnerable
4 = Apparently Secure
5 = Secure
[c]British Columbia Status Ranks are as follows:
R = red
Y = yellow
B = blue
[d]See Table A-2 for definitions.
[e]See Table A-3 for definitions.

## Table A-8 British Columbia Provincial Ranking of Fish Species Along the Proposed Pipeline Route

| Scientific Name | Common Name | S Rank[a] | Provincial Status[b] |
|---|---|---|---|
| *Acipenser transmontanus pop.3* | White sturgeon (Nechako River population) | S1 | R |
| *Thymallus arcticus pop.1* | Arctic grayling (Williston Watershed population) | S1 | R |
| *Acipenser transmontanus pop.5* | White sturgeon (Upper Fraser River population) | S1 | R |
| *Acipenser transmontanus pop.4* | White sturgeon (Lower Fraser River population) | S2 | R |
| *Notropis hudsonius* | Spottail shiner | S1S2SE | R |
| *Margariscus margarita* | Pearl dace | S3? | B |
| *Oncorhynchus clarki clarki* | Cutthroat trout, *clarki* subspecies | S3S4SE | B |
| *Salvelinus confluentus* | Bull trout | S3 | B |
| *Salvelinus malma* | Dolly varden | S3S4 | B |

NOTES:

[a]S Rank = subnational rank. Modifiers used with the rankings are as follows:

- E = Exotic (introduced)
- ? = Inexact or uncertain due to limited information
- 1 = Critically imperiled
- 2 = Imperiled
- 3 = Vulnerable
- 4 = Apparently Secure
- 5 = Secure

[b]British Columbia Status Ranks are as follows:

- R = red
- Y = yellow
- B = blue

## Table A-9 Alberta Provincial Ranking of Fish Species Along the Proposed Pipeline Route

| Scientific Name | Common Name | S Rank[a] | Provincial Status[b] |
|---|---|---|---|
| *Cottus ricei* | Spoonhead sculpin | S3 | *May be at Risk* |
| *Salvelinus confluentus* | Bull trout | S3 | *Sensitive* |
| *Thymallus arcticus* | Arctic grayling | – | *Sensitive* |
| *Phoxinus eos* | Northern redbelly dace | S3 | *Sensitive* |
| *Catostomus macropheilus* | Largescale sucker | S2 | *Sensitive* |

NOTES:
– Species does not have a ranking or listing
[a]S Rank = subnational rank. Modifiers used with the rankings are as follows:
2 = Imperiled
3 = Vulnerable
[b]See Table A-2 for definitions.

## Table A-10 Marine Species of Special Concern within the Gateway Assessment Area

| Scientific Name | Common Name | G Rank[a] | Federal | | British Columbia | |
|---|---|---|---|---|---|---|
| | | | SARA Schedule 1[b] | COSEWIC Status[c] | S Rank[d] | Provincial Status[e] |
| *Balaenoptera musculus* | Blue whale | G3G4 | ✓ | E | S1N | B |
| *Sebastes paucispinis* | Bocaccio | - | – | T | - | – |
| *Oncorhynchus tshawytscha* | Chinook salmon | G5 | – | – | S4 | Y |
| *Oncorhynchus keta* | Chum salmon | G5 | – | – | S5 | Y |
| *Oncorhynchus kisutch* | Coho salmon | G4 | – | – | S4 | Y |
| *Oncorhynchus clarki* | Cutthroat trout | G4 | – | – | S4 | B |
| *Phocoenoides dalli* | Dall's porpoise | G4G5 | – | – | S4S5 | Y |
| *Salvelinus malma* | Dolly Varden | G5 | – | – | S3S4 | B |
| *Thaleichthys pacificus* | Euchalon | G5 | – | – | S2S3 | B |
| *Balaenoptera physalus* | Fin whale | G3G4 | – | SC | S1N | B |
| *Eschrichtius robustus* | Grey whale | G4 | – | SC | S2N | B |
| *Phocoena phocoena* | Harbour porpoise | G4G5 | – | SC | S3 | – |
| *Phoca vitulina* | Harbour seal | G5 | – | – | S5 | Y |
| *Megaptera novaeangliae* | Humpback whale | G3 | ✓ | T | S1N | B |
| *Orcinus orca* | Killer whale (northeast Pacific northern resident population) | G4G5T3Q | ✓ | T | S2 | R |
| *Orcinus orca* | Killer whale (northeast Pacific transient population) | G4G5T3Q | ✓ | T | S2 | R |
| *Dermochelys coriacea* | Leatherback seaturtle | G2 | – | E | S1S2N | – |

## Table A-10 Marine Species of Special Concern within the Gateway Assessment Area (cont'd)

| Scientific Name | Common Name | G Rank[a] | Federal | | British Columbia | |
|---|---|---|---|---|---|---|
| | | | SARA Schedule 1[b] | COSEWIC Status[c] | S Rank[d] | Provincial Status[e] |
| *Eubalaena japonica* | North Pacific right whale | – | – | E | - | R |
| *Callorhinus ursinus* | Northern fur seal | G3 | – | – | SNA | B |
| *Eumetopias jubatus* | Northern sea lion | G3 | – | SC | S2B,S3N | R |
| *Clupea pallasi* | Pacific herring | – | – | – | - | Y |
| *Leptocottus armatus* | Pacific staghorn sculpin | G5 | – | – | S5 | Y |
| *Lagenorhynchus obliquidens* | Pacific white sided dolphin | G5 | – | – | SNA | Y |
| *Oncorhynchus gorbuscha* | Pink salmon | G5 | – | – | S5 | Y |
| *Enhydra lutris* | Sea otter | G4 | ✓ | T | S2 | R |
| *Balaenoptera borealis* | Sei whale | G3 | ✓ | E | SHN | B |
| *Oncorhynchus nerka* | Sockeye salmon | G5 | – | – | S4 | Y |
| *Physeter macrocephalu* | Sperm whale | G3G4 | – | – | S1N | B |
| *Hypomesus pretiosus* | Surf smelt | – | – | – | - | Y |
| *Gasterosteus aculeatus aculeatus* | Three spined stickleback | G5 | – | – | S5 | Y |
| *Aechmophorus occidentalis* | Western grebe | G5 | – | – | S1B,S3N | R |
| *Phalacrocorax auritus* | Double-crested cormorant | G5 | – | – | S2B | R |
| *Phalacrocorax pelagicus* | Pelagic cormorant subsp. *pelagicus* | G5TU | – | – | S2B | R |
| *Branta Canadensis occidentalis* | Dusky Canada goose | G5T2T3 | – | – | S1N | B |

## Table A-10 Marine Species of Special Concern within the Gateway Assessment Area (cont'd)

| Scientific Name | Common Name | G Rank[a] | Federal | | British Columbia | |
|---|---|---|---|---|---|---|
| | | | SARA Schedule 1[b] | COSEWIC Status[c] | S Rank[d] | Provincial Status[e] |
| *Pluvialis dominica* | American golden-plover | G5 | – | – | S3S4B | B |
| *Heteroscelus incanus* | Wandering tattler | G5 | – | – | S3S4B | B |
| *Uria aalge* | Common murre | G5 | – | – | S2B,S4N | R |
| *Brachyramphus marmoratus* | Marbled murrelet | G3G4 | ✓ | T | S2B,S4N | R |

NOTES:

✓ = is listed in SARA

[a]G Rank = global rank, see Table A-1.

[b]Schedule 1 = Schedule 1 of SARA, 2005

[c]See Table A-3 for definitions.

[d]S Rank = subnational rank. Modifiers used with the rankings are as follows:

B = indicates breeding status for a migratory species

N = indicates non-breeding status for a migratory species

NA = conservation status rank is not applicable because the species is not a suitable target for conservation activities

1 = Critically imperiled

2 = Imperiled

3 = Vulnerable

4 = Apparently Secure

5 = Secure

[e]British Columbia Status Ranks are as follows:

R = red

Y = yellow

B = blue

## Table A-11 Mammals of Conservation Concern Along the Proposed Pipeline Route

| Scientific Name | Common Name | G Rank[a] | British Columbia | | Alberta | | Federal |
|---|---|---|---|---|---|---|---|
| | | | S Rank[b] | Provincial Status[c] | S Rank[b] | Provincial Status[d] | COSEWIC Status[e] |
| *Ursus arctos* | Grizzly bear | G4 | S3 | Blue | - | May be at Risk | SC |
| *Gulo gulo* | Wolverine | G4 | S3 | Blue | S3 | May be at Risk | SC |
| *Martes pennanti* | Fisher | G5 | S2S3 | Blue | - | Sensitive | - |
| *Rangifer tarandus* | Woodland caribou | G5 | S4 | - | S2 | At Risk | Threatened |
| *Myotis septenttrionalis* | Northern long-eared bat | G4 | S2S3 | Blue | S2S3 | May be at Risk | - |

NOTES:
[a]G Rank = global rank, see Table A-1.
[b]S Rank = subnational rank. Modifiers used with the rankings are as follows:
2 = Imperiled
3 = Vulnerable
[c]British Columbia Status Ranks are as follows:
R = red
Y = yellow
B = blue
[d]See Table A-2 for definitions.
[e]See Table A-3 for definitions.

# Appendix B  Scope of Factors to be Considered

This appendix provides a summary of the likely scope of the factors to be considered in the assessment for the preliminary elements listed in Section 5.3.1. Biophysical and human environment elements are presented separately.

For the biophysical environment, this summary highlights those aspects of construction and operations that will potentially interact with key biophysical elements and that may require assessment within the ESA document. It should be recognized that the appendix represents a preliminary list of potential assessment issues, and some issues may be subsequently dropped while others may be added, following further advances in Project design, and further public and regulatory consultation

As described in Section 5.1, the assessment will address all phases of the Project, including construction, operations, decommissioning, and abandonment. The activities that may occur during decommissioning and abandonment are likely to be similar to those listed for construction and, for clarity, are not repeated in the summary tables.

The reader will note that the table is formatted differently for human environment elements. This is to reflect a differentiating characteristic of human environment effects. In particular:

- these effects are not typically the result of a specific physical work or activity of the Project but rather they are the result of the Project as a whole
- some effects on the human environment are secondary or indirect.

For example, the project may, through project employment, lead to a change in household income, which would be a primary or direct effect. That, in turn, might influence community health and well-being, and these would be secondary or indirect effects.

## Table B-1 Scope of the Factors to be Considered: Biophysical Elements

| Element | Physical Work or Activity | Potential Assessment Issue |
|---|---|---|
| **Air Quality** | **Construction** | |
| | Slash burning on RoW and at facility sites | PM $_{2.5, 10}$, $NO_x$ emissions from burning |
| | Operation of construction-support equipment on RoW and at facility sites | PM $_{2.5, 10}$, $NO_x$ emissions from equipment and dust |
| | Operation of construction camps | PM $_{2.5, 10}$, $NO_x$ emissions from power supply at camps |
| | Marine vessel traffic (i.e., delivery of construction materials) | PM $_{2.5, 10}$, $NO_x$, $SO_x$ emissions from marine vessels |
| | All above-listed construction activities | Greenhouse gas emissions |
| | **Operations** | |
| | Hydrocarbon storage at terminal(s) and pump stations | Fugitive VOC emissions |
| | | Odours (from fugitive VOC emissions) |
| | Operational activities at marine infrastructure (loading/unloading of hydrocarbons; ship operations while berthed) | PM $_{2.5, 10}$, $NO_x$, $SO_x$, and fugitive VOC emissions from equipment, marine vessels, facilities and hydrocarbon handling |
| | Marine vessel traffic | PM $_{2.5, 10}$, $NO_x$, $SO_x$ emissions from marine vessel traffic |
| | All above-listed operational activities | Ozone precursor emissions |
| | | Greenhouse gas emissions |
| **Acoustic Environment** | **Construction** | |
| | Operation of construction-support equipment on RoW and/or at facility sites | Local noise levels |
| | Blasting on RoW and/or at facility sites | Local noise levels |
| | Marine vessel traffic (i.e., delivery of construction materials) | Local noise levels |
| | **Operations** | |
| | Operational activities at terminals and pump stations | Local noise levels |
| | Operational activities at marine infrastructure (loading/unloading of hydrocarbons; ship operations while berthed) | Local noise levels |
| | Marine vessel traffic | Local noise levels |

**Table B-1 Scope of the Factors to be Considered: Biophysical Elements (cont'd)**

| Element | Physical Work or Activity | Potential Assessment Issue |
|---|---|---|
| **Surface Water Quantity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading) | Surface drainage patterns |
| | | Runoff volumes |
| | RoW ditching and backfilling | Surface drainage patterns |
| | Instream ditching and backfilling | Stream channel morphology, stability |
| | Hydrostatic testing (withdrawal and release of hydrostatic test water) | Volume of water withdrawal from and water release to surface waterbodies |
| | Operation of construction camps | Volume of water withdrawal from and water release to surface waterbodies |
| | **Operations** | |
| | Operational footprint of facility sites | Surface drainage patterns and runoff volumes from impermeable surfaces |
| | Operational activities at terminals, pump stations and marine infrastructure | Volume of water withdrawal from and water release to surface waterbodies |
| | Operational footprint of RoW | Surface drainage patterns and runoff volumes from reclaimed RoW |
| **Surface Water Quality** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling | Water quality characteristics of run-off |
| | Instream ditching and backfilling | Water quality characteristics during instream activities |
| | Hydrostatic testing (withdrawal and release of hydrostatic test water) | Water quality characteristics of water releases |
| | Operation of construction camps | Water quality characteristics of water releases |
| | **Operations** | |
| | Operational footprint of facility sites | Water quality characteristics of run-off |
| | Operational activities at terminals, pump stations and marine infrastructure | Interactions between Project emissions and surface water quality |
| | Operational footprint of RoW | Water quality characteristics of run-off |
| **Groundwater Quantity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading), RoW ditching and backfilling, RoW blasting | Shallow groundwater flow patterns |
| | Operation of construction camps | Volume of water withdrawal from and water release to groundwater |
| | **Operations** | |
| | Operational activities at terminals, pump stations and marine infrastructure | Volume of water withdrawal from and water release to groundwater |

## Table B-1 Scope of the Factors to be Considered: Biophysical Elements (cont'd)

| Element | Physical Work or Activity | Potential Assessment Issue |
|---|---|---|
| **Groundwater Quality** | **Construction** | |
| | Operation of construction camps | Water quality characteristics of water releases and potential for percolation into shallow groundwater |
| | **Operations** | |
| | Operational activities at terminals, pump stations and marine infrastructure | Water quality characteristics of water releases, and potential for percolation into shallow groundwater |
| | | Water quality characteristics of run-off and potential for percolation into shallow groundwater |
| **Terrain and Soils** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling; RoW and/or facility site reclamation | Surface and slope integrity |
| | | Topsoil conservation |
| | | Soil capability in agricultural areas |
| | | Soil capability for reclamation in non-agricultural areas |
| | **Operations** | |
| | Operational footprint of RoW | Surface and slope integrity |
| | Operational activities at terminals, pump stations and marine infrastructure | Interactions between Project emissions and soil capability |
| | Marine vessel traffic | Vessel wake characteristics and effects on shoreline stability |
| **Vegetation Species Diversity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW and/or facility site reclamation | Non-native species |
| | | Rare or uncommon plants (including marine vegetation species in vicinity of marine infrastructure) and associated local/regional species diversity |
| | **Operations** | |
| | Routine RoW maintenance activities | Non-native species |
| | Operational activities at terminals, pump stations and marine infrastructure | Interactions between Project emissions and species growth characteristics |

**Table B-1 Scope of the Factors to be Considered: Biophysical Elements (cont'd)**

| Element | Physical Work or Activity | Potential Assessment Issue |
|---|---|---|
| **Vegetation Community and Landscape Diversity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling; RoW and/or facility site reclamation | Rare or uncommon communities (including marine vegetation communities in vicinity of marine infrastructure) |
| | | Local/regional structural diversity, including mature or old growth forest stands |
| | | Wetland integrity and associated local/regional community diversity |
| | | Landscape diversity characteristics, including large core patch areas |
| | **Operations** | |
| | Operational activities at terminals, pump stations and marine infrastructure | Interactions between Project emissions and community characteristics |
| **Wildlife (Terrestrial) Species Abundance and Diversity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling; RoW and/or facility site reclamation, construction traffic | Habitat quality and availability |
| | | Local species abundance and distribution |
| | **Operations** | |
| | Operational activities at terminals, pump stations and marine infrastructure; Routine RoW maintenance activities | Habitat quality and availability |
| | | Local species abundance and distribution |
| | Operational activities at terminals, pump stations and marine infrastructure | Interactions between Project emissions and species growth and health characteristics |
| **Wildlife (Terrestrial) Landscape Diversity and Connectivity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling; construction traffic | Wildlife movement patterns |
| | **Operations** | |
| | Operational activities at terminals, pump stations and marine infrastructure, Operational footprint of RoW, routine RoW maintenance activities | Wildlife movement patterns |
| | | New access potential and associated hunting pressure and availability of core security habitat |

**Table B-1 Scope of the Factors to be Considered: Biophysical Elements (cont'd)**

| Element | Physical Work or Activity | Potential Assessment Issue |
|---|---|---|
| **Freshwater Fish and Fish Habitat Abundance and Diversity** | **Construction** | |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling<br>Temporary and permanent road development | Riparian habitat quality and availability |
| | | Volumes and water quality characteristics of run-off into fish-bearing streams |
| | | Associated instream habitat quality and availability |
| | | Fish distribution and abundance |
| | Instream ditching and backfilling | Instream habitat quality and availability |
| | | Water quality characteristics at and downstream of crossing |
| | | Fish distribution and abundance |
| | **Operations** | |
| | Operational footprint of RoW, facilities and roads | Volumes and water quality characteristics of run-off into fish-bearing streams |
| | | Associated instream habitat quality and availability |
| | | New access potential and associated fishing pressure |
| | Routine RoW maintenance activities (e.g., vegetation management) | Riparian habitat quality and availability |
| **Marine Species Abundance and Diversity** | **Construction** | |
| | Upland facility site preparation (clearing, grading), temporary and permanent road development | Volumes and water quality characteristics of run-off into near-shore habitats |
| | | Associated marine habitat quality and availability |
| | | Marine species distribution and abundance |
| | In-water marine infrastructure site preparation (including dredging and blasting, if necessary) | Water quality characteristics |
| | | Marine habitat quality and availability |
| | | Underwater acoustic levels |
| | | Marine species distribution and abundance |
| | Marine vessel traffic (delivery of construction materials) | Underwater acoustic levels |
| | | Marine species distribution and abundance |

**Table B-1 Scope of the Factors to be Considered: Biophysical Elements (cont'd)**

| Element | Aspect | Potential Assessment Issue |
|---|---|---|
| **Marine Species Abundance and Diversity (cont'd)** | **Operations** | |
| | Operational footprint of facility sites (terminal and marine infrastructure) | Volumes and water quality characteristics of run-off into near-shore habitats; Associated marine habitat quality and availability |
| | Marine vessels | Underwater acoustic levels |
| | | Vessel wake characteristics and shoreline habitat stability |
| | | Marine species distribution and abundance |
| | Tanker ballast/bilge water discharge | Non-native species |
| | | Marine species distribution and abundance |

## Table B-2 Scope of the Factors to be Considered: Human Environment Elements

| Element | Aspect | Potential Assessment Issue | |
|---|---|---|---|
| | | Conditions | Services |
| **Demographics** | **Construction** | | |
| | Influx and outflow of temporary workers and job seekers during construction | Population, community make-up | |
| | **Operations** | | |
| | Employment of workers during operations | Population, community make-up | |
| **Education** | **Construction** | | |
| | Job opportunities requiring trained workforce | Levels of education attainment | School enrolment and associated programs |
| | Possible in-migration of workers and families | | |
| | **Operations** | | |
| | Job opportunities requiring trained workforce | Levels of education attainment | School enrolment and associated programs |
| | Possible in-migration of workers and families | | |
| **Health** | **Construction** | | |
| | Increased employment and income and changed personal and household spending; change in population | Individual, family and community wellness | Medical resources and services |
| | RoW and/or facility site preparation (clearing, grading); RoW ditching and backfilling; reclamation<br>Temporary and permanent road development | Quality and/or quantity of traditionally used country foods; access or availability of foods | |
| | Marine vessel traffic (delivery of construction materials) | Quality and/or quantity of traditionally used country foods | |
| | | Ability to acquire traditionally used country foods | |
| | Operation of construction-support equipment on RoW and at facility sites | Air quality | |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Health (cont'd)** | **Operations** | | |
| | Increased employment and income and changed personal and household spending; change in population | Individual, family and community wellness | Medical resources and services |
| | Operational footprint of RoW, roads and facility sites | Quality and/or quantity of traditionally used country foods; access or availability of foods | |
| | Marine vessel traffic | Quality and/or quantity of traditionally used country foods | |
| | | Ability to acquire traditionally used country foods (as a result of restricted zones) | |
| | Operational activities at terminals, pump stations and marine infrastructure, marine vessel traffic | Air quality | |
| **Social Conditions** | **Construction** | | |
| | Influx and outflow of temporary workers and job seekers during construction | Social interaction between workforce and residents | |
| | Increased employment and income and changed personal and household spending; change in population | Individual, family and community wellness | Social services |
| | **Operations** | | |
| | Increased employment and income and changed personal and household spending; change in population | Individual, family and community wellness | Social services |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Protection Services** | **Construction** | | |
| | Increased employment and income and changed personal and household spending; change in population | Offence rates and public safety | Law enforcement, fire protection, emergency services |
| | **Operations** | | |
| | Increased employment and income and changed personal and household spending; change in population | Offence rates and public safety | Law enforcement, fire protection, emergency services |
| **Infrastructure** | **Construction** | | |
| | Construction activity and presence of temporary workforce | Housing, water supply, sewage treatment, transportation, recreation, tourism, and utilities infrastructure | Community and regional services |
| | Construction access and materials supply | Traffic levels | Transportation services |
| | **Operations** | | |
| | Employment of workers during operations; Change in population | Housing, water supply, sewage treatment, transportation, and utilities infrastructure | Transportation, waste disposal, utilities and energy services, |
| | Operational activities at terminals, pump stations and marine infrastructure | Physical infrastructure (including energy supply, water supply, waste disposal, transportation, communications) | Transportation, waste disposal, utilities and energy services |
| **Labour** | **Construction** | | |
| | Project-related employment opportunities | Available labour supply, (un)employment, skills/training needs, opportunities | Training programs and services |
| | **Operations** | | |
| | Project-related employment opportunities | Available labour supply, (un)employment, skills/training needs, opportunities | Training programs and services |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Income** | **Construction** | | |
| | Project-related employment opportunities and procurement of goods and services | Business, personal and household income levels (and related social and economic effects) | |
| | **Operations** | | |
| | Project-related employment opportunities and procurement of goods and services | Business, personal and household income levels (and related social and economic effects) | |
| **Local and Regional Economy** | **Construction** | | |
| | Contribution to tax base | Municipal/other government finances | |
| | Procurement | Corporate income, industrial diversification and cost of living<br>Local, regional business opportunities | |
| | Employment of workers during construction | Personal/household income and income distribution between social groups<br>Labour force opportunities and experience | |
| | **Operations** | | |
| | Contribution to tax base | Municipal/other government finances | |
| | Procurement | Corporate income and industrial diversification<br>Local, regional business opportunities | |
| | Employment of workers during operations | Personal/household income<br>Labour force opportunities and experience | |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Provincial and National Economy** | **Construction** | | |
| | Contribution to government revenues | Government revenues through direct and indirect taxes and transfers | |
| | Procurement | Gross Domestic Product and imports | |
| | Employment of workers during construction | Employment and labour income | |
| | **Operations** | | |
| | Contribution to government revenues and change in exports | Government revenues through direct and indirect taxes and transfers<br>Balance of payments | |
| | Procurement | Gross Domestic Product | |
| | Employment of workers during operations | Employment and labour income | |
| **Land and Resource Use** | **Construction** | | |
| | Acquisition of land and property rights and easements for construction | Regional land use planning objectives and guidelines | |
| | | Land tenure by federal, provincial, municipal or private owners | |
| | | Surface rights | |
| | RoW and/or facility site preparation (clearing, grading)<br>Temporary and permanent road development | Environmentally significant areas (including designated parks, protected areas, ecological reserves, and designated 'special places') | |
| | Use of aggregate/fill during construction | Existing granular resource supply and demand, existing deposits and associated licenses and dispositions | |
| | RoW and/or facility site preparation (clearing, grading)<br>Temporary and permanent road development | Merchantable timber | |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | **Conditions** | **Services** |
| **Land and Resource Use (cont'd)** | Access and activity restrictions during construction (including terrestrial, freshwater aquatic, and marine) | Ability to pursue timber harvesting activities | |
| | | Ability to pursue mineral resource activities | |
| | | Ability to pursue oil and gas activities | |
| | | Ability to pursue commercial fishing activities | |
| | | Ability to pursue consumptive commercial and recreational activities | |
| | | Ability to pursue agricultural activities | |
| | | Ability to pursue tourism and non-consumptive outdoor recreation activities | |
| | | Ability to pursue marine resource use activities | |
| | All construction activities | Quality of visual or aesthetic resources. | |
| | **Operations** | | |
| | Operational footprint of RoW, facilities and roads | Ability to pursue terrestrial resources use activities | |
| | Marine vessels | Ability to pursue marine resource use activities | |
| | | Regional marine planning objectives and guidelines | |
| | Operational footprint of RoW, facilities and roads | Regional land use planning objectives and guidelines | |
| | | Land base for consumptive resource uses<br>Supply of industrial land | |

## Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Traditional Land and Resource Use** | **Construction** | | |
| | RoW and/or facility site preparation (clearing, grading)<br>Temporary and permanent road development | Ability to pursue traditional land and resource use activities | |
| | Marine vessel traffic (delivery of construction materials) | Ability to pursue traditional resource use activities | |
| | **Operations** | | |
| | Operational footprint of RoW, facilities and roads | Ability to pursue traditional land and resource use activities | |
| | Marine vessels | Ability to pursue traditional resource use activities | |
| **Traditional Culture** | **Construction** | | |
| | All construction activities. | Cultural identity and community well being related to traditional sites, foods, harvesting patterns, health, land and resource use patterns, working conditions, language, and community relationships | |
| | **Operations** | | |
| | Operational footprint of RoW, facilities and roads | Cultural identity and community well being related to traditional land and resource use patterns and population | |

**Table B-2 Scope of the Factors to be Considered: Human Environment Elements (cont'd)**

| Element | Aspect | Potential Effect | |
|---|---|---|---|
| | | Conditions | Services |
| **Historical and Archaeological Resources** | **Construction** | | |
| | RoW and/or facility site preparation (clearing, grading)<br>Temporary and permanent road development | Historical and archaeological artifacts, features and sites and/or palaeontological fossils of ethnic value or local or regional significance | |
| | In-water marine infrastructure site preparation (including dredging and blasting, if necessary) | Historical and archaeological artifacts, features and sites and/or palaeontological fossils of ethnic value or local or regional significance in near-shore and shoreline areas | |
| | Marine vessels (delivery of construction materials) | Historical and archaeological artifacts, features and sites and/or palaeontological fossils of ethnic value or local or regional significance within shoreline areas | |
| | **Operations** | | |
| | Operational footprint of RoW and roads | Historical and archaeological artifacts, features and sites and/or palaeontological fossils of ethnic value or local or regional significance in areas with new access potential | |
| | Marine vessels | Historical, archaeological, and palaeontological artifacts of ethnic value or local or regional significance within shoreline areas | |

# Appendix C Proposed Filing Requirements for Marine Elements

## Table C-1 Marine Regional Context

| Gateway ESA Filing |
|---|
| Will describe qualitatively the overall general marine environment in the Project Effects Assessment Area and the Confined Channel Assessment Area, including:<br>• Douglas Channel, including Caamano Sound and Kitimat Arm<br>• Principe Channel<br>• although not in the Project Effects Assessment Area or Confined Channel Assessment Area, Hecate Strait will be described in the larger regional context<br><br>This will include a general discussion of:<br>• oceanographic and meteorological systems<br>• presence and status of marine mammals, marine birds and marine fish species<br>• species of special concern<br>• fisheries, commercial, subsistence, and guided/recreational; Aboriginal and non-Aboriginal<br>• non-consumptive marine recreation and tourism<br>• vessel traffic |

## Table C-2 Project Effects Assessment Area

| Gateway ESA Filing |
|---|
| The Project Effects Assessment Area for the marine environment is defined as:<br>that geographic area encompassing the physical footprint of the marine infrastructure component of the Kitimat Terminal, restricted zones around the infrastructure, and an area defined by a trajectory analysis of an accidental release of oil caused by a malfunction during loading or offloading of an oil or a condensate tanker moored at the marine terminal.<br><br>The ESA will provide an analysis of the potential environmental effects of the Project on the marine environment, including:<br>• identification of marine VCs<br>• evaluation of the potential environmental effects of the Project on VCs during construction, operations and decommissioning.<br>• the potential effects of accidental events on VCs is covered under Table C-4 |
| **Marine Birds and Marine Mammals** |
| The ESA will identify marine birds or mammals of ecological, economic or human/Aboriginal importance in the Project Effects Assessment Area.<br><br>For the marine resources identified, the ESA will describe:<br>• habitat type<br>• location/range<br>• habitat suitability<br>• diversity<br>• abundance<br>• population status<br>• life cycle<br>• for anadromous species, the seasonal ranges or migration patterns<br>• sensitive periods |

## Table C-2 Project Effects Assessment Area (cont'd)

| Marine Birds and Marine Mammals (cont'd) |
|---|
| The ESA will:<br>• identify any special management areas in or near the Project Effects Assessment Area<br>• describe the current level of disturbance to the marine environment within the Project Effects Assessment Area<br><br>For marine birds, the ESA will:<br>• describe the findings of focused surveys on the marbled murrelet establishing whether suitable habitat and a population exists in the Project Effects Assessment Area<br>• describe habitat and incidental observations of marine birds throughout the Project Effects Assessment Area<br>• quantify habitat in the Project Effects Assessment Area<br><br>For coastal raptors, the ESA will describe the results of coastal habitat surveys, including description of habitat.<br><br>For marine mammals, the ESA will describe the results of dedicated marine mammal surveys, including description of habitat and incidental observations of marine mammals in the Project Effects Assessment Area. |
| **Species of Special Status** |
| For potential environmental effects of the Project on species of special conservation status, the ESA will:<br>• identify the species and their status<br>• identify their habitat, including any critical habitats<br>• identify critical timing windows (e.g., spawning or staging)<br>• identify species-specific recovery plans<br>• follow Guidance as in Table A4 of NEB Filing Manual |
| **Marine Fish and Fish Habitat** |
| The ESA will:<br>• provide, at the location of marine infrastructure, a detailed quantification and classification of marine habitat<br>• provide a detailed description of subtidal and intertidal communities in the area of the marine infrastructure, including quantification of benthos populations and a description of sediment quality<br>• be consistent with Fisheries and Oceans Canada's (DFO) "No Net Loss of Fish Habitat" policy and will provide the basis for a Fish Habitat Compensation Plan (if required)<br>• provide, based on surveys within the Project Effects Assessment Area, a detailed assessment of intertidal habitat<br>• contain a high-level overview of the shoreline with classification of substrate type, vegetation and watercourse outfall<br>• contain detailed underwater mapping of the subtidal benthic habitat near the proposed marine infrastructure site<br>• describe deeper subtidal and benthic invertebrate community information, including species abundance, richness and diversity (gathered through remote sampling) |

## Table C-2 Project Effects Assessment Area (cont'd)

| Marine Fish and Fish Habitat (cont'd) |
|---|
| The ESA will provide a description of fish present in the Project Effects Assessment Area including:<br>• likely fish species present, including forage fish (non-harvested)<br>• seasonal and life cycle movements and sensitive periods<br>• habitat requirements for each life stage<br>• local abundance, distribution and use of habitat types<br>• known sensitive or important habitat types (e.g., spawning, overwintering, refugia, feeding), species and timing of use |
| **Marine Fishery** |
| The ESA will:<br>• describe fishing activities, including Aboriginal and non-Aboriginal, seasonality (four seasons), gear types, commercial license statistics, fishing regulations and fish processing facilities and their economic importance to communities included in the assessment<br>• provide DFO landing statistics, including fish catch by species and value for communities included in the assessment<br>• describe and map fishing areas in the Project Effects Assessment Area<br>• describe fishing areas and their relative importance in a broader regional context (i.e., substitutes and alternatives)<br>• describe types, number, size/capacity of fishing vessels used in the area, their docking/marina locations and existing interactions with shipping (locations, frequency, effects) |
| **Historical and Archaeological Resources** |
| The ESA will:<br>• involve completion of an HRIA/AIA (including palaeontological resources) as per provincial requirements of the proposed disturbance areas within the Project Effects Assessment Area<br>• provide an inventory, description and evaluation of each identified site<br>• provide a potential map of archaeological resources within the Project Effects Assessment Area |
| **Non-Consumptive Marine Recreation and Tourism** |
| The ESA will describe non-consumptive marine recreation and tourism activities in communities included in the assessment from existing data and surveys of/interviews with representatives of businesses serving tourists and recreational clubs/associations. Specifically, the ESA will:<br>• describe marine and foreshore recreational use activities such as scuba-diving, sea-kayaking, canoeing, whale-watching, beach-combing, bird-watching, boating/yachting and the relative importance of these uses/sites in a broader regional context (i.e., substitutes and alternatives)<br>• describe tourism user characteristics: origin, duration, type of use (i.e., guided and other) and its contribution to the local economy<br>• describe seasonality of these uses, the various locations where these activities are favoured/take place<br>• identify businesses and clubs/associations involved in marine recreation activities |

## Table C-3 Confined Channel Assessment Area

| Confined Channel Assessment Area |
|---|
| **Gateway ESA Filing** |
| The Confined Channel Assessment Area is defined as:<br>• the marine area where measurable environmental effects of shipping are most likely to occur, the portion of the shipping route that brings ships near land and other resource uses, and where navigation to and from the Project will be escorted. This is the geographic area that encompasses the preferred shipping route (Douglas Channel through Caamano Sound, headland to headland) or the alternate shipping route (Douglas Channel through Wright Sound through Browning Entrance in Principe Channel).<br><br>The ESA will provide an analysis of the potential environmental effects of shipping and navigation to and from the Project on the marine environment and associated VCs within the Confined Channel Assessment Area and will include:<br>• an assessment of the potential environmental effects on marine VCs (e.g., marine mammals)<br>• an assessment of the potential environmental effects on existing marine vessel traffic<br>• an effects analysis related to shipping elements such as erosion from wake energy, interaction of shipping with marine mammals, and additional acoustic load<br>• a description of the interaction between existing commercial and Aboriginal vessel traffic and vessel traffic to and from the Project<br>• an acoustic analysis to quantify increases in underwater acoustic emissions likely to accompany increases in shipping frequency and ship size<br>• a marine mammal survey<br>• a seabird survey<br>• a potential analysis for archaeological and historic resources<br>• a shoreline classification<br><br>The ESA will provide an analysis of vessel traffic in the Confined Channel Assessment Area, including:<br>• a description of commercial vessel traffic (including tourism) from existing port/terminal data and surveys of/interviews with representatives of shipping companies and port authorities and other informed sources<br>• routes/channels from/to ocean that commercial shipping uses, main hazard areas for other users in relation to shipping and frequency and magnitude of shipping incidents<br>• vessel traffic, including frequency, goods, quantities, shippers, origin/destination and the importance to the local and regional economy<br>• visual and aesthetic characteristics of commercial vessel traffic<br><br>The ESA will provide a detailed outline of the TERMPOL process to be followed, including:<br>• studies required<br>• government role<br>• TERMPOL results to date<br>• recommendations for navigational safety requirements for Douglas and Principe Channels and recommendation as to the responsible party, including the governments, Pilotage Authority, Response Organisation.<br>• description of the typical vessels expected to call on the marine terminal<br>• description of the typical chartering and contract arrangements between the Gateway and vessel operators/owners<br>• description of the tug support in context of the terminal operations<br>• description of a navigational analysis of the preferred and alternate vessel route from a navigational safety perspective<br>• description of Gateway's proposed Vessel Vetting Process |

## Table C-3 Confined Channel Assessment Area (cont'd)

| Non-Consumptive Marine Recreation and Tourism |
|---|
| The ESA will describe non-consumptive marine recreation and tourism activities in communities included in the assessment from existing data and surveys of/interviews with representatives of businesses serving tourists and recreational clubs/associations. Specifically, the ESA will:<br>• describe marine and foreshore recreational use activities such as scuba-diving, sea-kayaking, canoeing, whale-watching, beach-combing, bird-watching, boating/yachting and the relative importance of these uses/sites in a broader regional context (i.e., substitutes and alternatives)<br>• describe tourism user characteristics: origin, duration, type of use (i.e., guided and other) and its contribution to the local economy<br>• describe seasonality of these uses, the various locations where these activities are favoured/take place<br>• identify businesses and clubs/associations involved in marine recreation activities |

## Table C-4 Effects Analysis of an Accidental Oil or Condensate Release into the Marine Environment

| Gateway ESA Filing |
|---|
| The ESA will provide an analysis of the potential environmental effects of an accidental release of oil or condensate on marine VCs within the Project Effects Assessment Area and the Confined Channel Assessment Area, including:<br>• an oil release trajectory model<br>• oil and condensate fate and behaviour analysis in the event of a release<br>• a probability analysis of likelihood of a release of oil and condensate, using world-wide statistics for tankers of the size and configuration proposed for condensate and oil shipment to and from the Project<br>• recommended oil release contingency planning based on oil release trajectory modelling of hypothetical releases for both condensate and oil, at locations identified through a thorough navigational analysis<br>• a sample Oil Pollution Emergency Plan that would be carried onboard each tanker<br>• the Response Organization's role in relation to the tankers<br>• a description of release emergency planning for the terminal, including potential infrastructure and other resources, *Canada Shipping Act* (CSA) requirements and facility designation under CSA<br>• a sample Oil Release Atlas that would be part of CSA requirements<br><br>The ESA will also provide:<br>• a probability analysis of an accidental condensate or oil release within Canadian waters outside the Project Effects Assessment Area and the Confined Channel Assessment Area, including Hecate Strait, using world-wide statistics for tankers of the size and configuration proposed for condensate and oil shipment to and from the Project. |