

MARINE BIRDS

Study geographic boundaries: Marine terminal PDA and CCAA. Because marbled murrelet nesting habitat extends inland and to relatively high elevations, a terrestrial study area was included for murrelets.

Study time boundaries: Construction, operations and decommissioning phases.

Project works and activities considered in the study*:

Kitimat terminal: construction, operations, and decommissioning.
CCAA vessel traffic: construction, operations, and decommissioning.

Study methods: Marbled murrelet, surf scoter and bald eagle are the key indicator resources used to assess environmental effects on marine birds. These species are strong indicators of ecosystem health if breeding and non-breeding populations, relative species abundance and habitat associations are viable. By reducing environmental effects on these species, the health of the marine and terrestrial environments can be monitored and mitigation plans can be developed and adapted based on their responses to mitigation plans.

In 2005/6, vessel and aerial surveys were completed throughout the PDA and CCAA to determine the presence or absence of marine bird species during different seasons. Additional surveys are being completed during 2009. This information was used in conjunction with existing literature to provide an overview of each KIR.

VEC	Key Issues	KIR	Baseline Results	Measurable Parameter	Potential Project Effects**	Proposed Mitigation	Residual Effects	Cumulative Effects
Marine Birds	Habitat loss or alteration during construction. Disturbances and habitat avoidance because of noise and human activities. Possible mortality from collisions with project infrastructure or decreased reproductive success.	Marbled murrelet Surf scoter Bald eagle	Marine birds are generally concentrated in the highly productive estuaries where freshwater meets the sea (such as inlets and sheltered bays) and the shallow waters above the shelf. These areas are particularly important to wintering birds, and to colonial nesting seabirds which forage there to feed their young in the nesting season. Listed as threatened on <i>Schedule 1 of the Species at Risk Act</i> , marbled murrelets are very sensitive to change in marine ecosystems. Using both land and sea habitats, they nest in old growth trees and feed on small fish in the ocean nearby. Taking several years to become mature enough to breed, a pair only produces one egg a year when they do finally nest. As a result, if these birds suffer population declines (from habitat loss, for instance) they require many years for their numbers to increase again. As such, marbled murrelets act as good indicators of ecosystem health. Individuals or pairs of murrelets were observed in protected inlets and bays near Kitimat Terminal and within the CCAA.	Alteration, loss and fragmentation of habitat during construction.	Only small amounts of preferred nesting habitats for marbled murrelet will be lost as a result of the construction of the terminal, although nesting has not been confirmed in this area. Marine foraging habitat for marbled murrelets and surf scoters will be altered around the marine terminal PDA during construction; although better foraging habitat is present in other parts of the CCAA. Operations and decommissioning of the marine terminal are not anticipated to adversely affect bald eagle habitat; however, limited loss, alteration or fragmentation of bald eagle habitat will occur during construction.	Location of the tank terminal has utilized areas already disturbed by recent forestry operations. Site-specific surveys of nests prior to clearing and avoidance of loss of nesting trees wherever possible.	Relatively small numbers of birds will be affected by the activities. Some foraging habitat around the terminal will eventually recover.	Currently being assessed.

*Refer to Figure 3.3 in section 3, *Project description*, for the full list of physical works and activities. **The effects of spills and malfunctions will be included in the update for the supplemental filing.

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Marine Birds	<p>Habitat loss or alteration during construction.</p> <p>Disturbances and habitat avoidance because of noise and human activities.</p> <p>Possible mortality from collisions with project infrastructure or decreased reproductive success.</p>	<p>Marbled murrelet</p> <p>Surf scoter</p> <p>Bald eagle</p>	<p>Surf scoters are on BC's <i>Blue List</i> as special concern. The surf scoter population in BC is facing a slow, but steady decline. The reasons for the decline are not well understood. Thousands of these birds use the marine waters during non-breeding periods (wintering and moulting) when they form huge flocks in shallow coastal waters where they forage and seek shelter. Surf scoters occur in the CCAA during the spring, winter and moulting periods. They are regularly observed in groups of approximately 40 to 50 individuals, but larger groups (from 400 to 800) have been observed in the spring – these are typically associated with herring spawning areas.</p> <p>Bald eagles breed in the area and rely on the marine environment for food throughout the year. This species is the only raptor found throughout the area all year and is a good representative for all raptor species. The bald eagle is a top predator that helps regulate other bird populations, although it has no natural predators of its own. Bald eagles eat fish, small mammals, and marine birds and as such are indicators of wildlife sustainability. Bald eagles are present in the CCAA throughout the year where their abundance is considered high, relative to the rest of the province. In coastal habitats, bald eagles nest on islands, in estuaries and at the mouths of rivers and creeks. During fall and winter, they occur along shorelines and estuarine habitat, but their presence is influenced by food availability and presence of roost sites that provide protection from inclement weather and human disturbance.</p>	<p>Disturbances and habitat avoidance because of noise and human activities.</p>	<p>Construction, blasting, dredging, drilling for piles, and shipping of construction materials may affect marine bird habitat and behaviour by increasing sediment levels in the water, creating noise disturbance, creating physical disturbance and altering habitat.</p> <p>Sediment levels may temporarily affect prey abundance and distribution.</p> <p>Blasting will cause loud and unpredictable noise that could disturb birds, but this will occur in a small area over a short period of time and the birds will soon return to the area. Some birds may have to forage, roost and nest elsewhere. Some birds will likely adapt to noise and human activities related to construction.</p> <p>During the breeding season, marine birds may be disturbed by land clearing and construction activities. Bald eagles are particularly susceptible to disturbance during the nesting season and may abandon nests.</p>	<p>Currently being assessed.</p>	<p>While marine birds are sensitive to human disturbance, they have shown the ability to adapt over time.</p> <p>Once activities have been reduced or ended, bald eagles are expected to return to the area to nest.</p>	<p>Currently being assessed.</p>
				<p>Risk of mortality from collisions with project infrastructure or decreased reproductive success.</p>	<p>Some bird mortality may occur from collisions with equipment because birds are attracted to the lights from vessels and construction night-lighting.</p> <p>Vegetation clearing may increase predator access to nests.</p>	<p>Currently being assessed.</p>	<p>Bird collisions are expected to be rare.</p>	<p>Currently being assessed.</p>