	Standard Operating Procedure – Marine Shipping Wildlife Mitigation and Monitoring	Version 2.0
	Back River Project	September 30, 2019 SOP # ENVIRO – 02

1. PROGRAM DESCRIPTION AND OBJECTIVES

As per the Back River Project's NIRB Project Certificate (No. 007) Conditions #58, #64, and #65, a Marine Shipping Wildlife Mitigation and Monitoring Standard Operating Procedure (SOP) has been developed to guide onboard monitoring for marine mammals and seabirds, and mitigation of shipping operations in response to identified sensitive wildlife areas and wildlife observations. The Conditions state the following:

Condition #58: Sabina will communicate with shipping companies to ensure they adhere to setback distance for colonies and moulting groups of seaducks and waterfowl through Bathurst/Elu Inlet, Lambert Channel, and Eastern Lancaster Sound.

Condition #64: Sabina will determine appropriate ship-based marine mammal monitoring programs and protocols with Fisheries and Oceans Canada, communities, and other interested parties. Initially report annually, then every 2 years once contracts have been set up.

Condition #65: Shipping companies will avoid sensitive wildlife habitat and species, as well as using the appropriate protocols and equipment to reduce the potential of harmful release of a substance into the marine environment. Initially report annually, then every 2 years once contracts have been set up.

This SOP addresses Conditions #58 and #64 in full. It addresses the avoidance of sensitive wildlife habitat and species required in Condition #65. The protocols and equipment to reduce the potential of harmful release of a substance into the marine environment are detailed in the Shipboard Oil Pollution Emergency Plan (SOPEP) Oil Pollution Emergency Plan (OPEP).

The purpose of this SOP is to identify the monitoring and mitigation procedures for shipping companies contracted by Sabina to avoid potential effects to marine mammals and seabirds. This document outlines the following:

- how to avoid or adjust shipping speed near sensitive wildlife habitat along shipping routes;
- how to record observations of marine mammals and seabirds;
- potential mitigation if marine mammals or large groups of seabirds are observed;
- how to record and report mitigation measures taken, if applicable; and
- how to record and report ship strikes of marine mammals or seabirds, if they occur.

Sabina will update this SOP as necessary, in response to feedback from the Inuit Environmental Advisory Committee (IEAC), the Department of Fisheries and Oceans (DFO), Environment and Climate Change Canada (ECCC) or in response to data collected in the field or scientific advances.

2. SHIPPING MITIGATION IN SENSITIVE HABITAT

2.1 Identified Sensitive Habitat Where Mitigation Applies

Sensitive habitat for marine birds has been identified along the Project shipping route in the following areas (ECCC 2016; Figure 2.1-1):

- Prince Leopold Island;

- Bathurst Inlet/Elu Inlet Key Marine Habitat Site;
- Lambert Channel Key Marine Habitat Site; and
- Eastern Lancaster Sound Key Marine Habitat Site.

Sensitive habitat for marine mammals has been identified along the Project shipping route from Lancaster Sound to Franklin Strait (Figure 2.1-2).

2.2 Shipping Setback Distances

Except where the safety of the ship is a concern, ships will adhere to the following setback distances from these sensitive habitats, as identified in the WMMP Plan (ECCC 2016; Latour et al. 2008; Mallory and Fontaine 2004):

- **30 km** from Prince Leopold Island (Figure 2.1-1); and
- **500 m** from marine bird colonies in the Bathurst Inlet/Elu Inlet and Lambert Channel Key Marine Habitat Sites (Figure 2.1-1).

3. MARINE MAMMAL AND SEABIRD MONITORING AND MITIGATION RESPONSE

3.1 Overview

The objectives of the marine mammal and seabird monitoring program are the following:

- record incidental observations of seabirds and marine mammals in the Northwest Passage made by bridge staff;
- document and report measures taken to mitigate impacts to marine mammals and large groups of seabirds; and
- document and report ship strikes of marine mammals or seabirds, if they occur.

3.2 Training

Bridge staff on ships are required to:

- review the Marine Shipping Wildlife Mitigation and Monitoring SOP (this document);
- review marine mammal and seabird identification, including common species detailed in Tables 3.2-1 and 3.2-2;
- know how to estimate distances to animals observed;
- review how to fill out the *Marine Mammal and Seabird Sightings Record* form; and
- For additional information on methodology, review the document which this Marine Shipping Wildlife Mitigation and Monitoring SOP is based: *Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms* (Gjerdrum et al 2012).

Table 3.2-1: General Species Groups and Common Species of Marine Mammals Most Likely Observed along the Shipping Routes

Marine Mammal Group	Species
Whale	Narwhal
	Beluga whale
	Killer whale
	Bowhead whale
Seal	Ringed Seal
	Fur Seal Bearded Seal
Other	Walrus
	Polar bear

Table 3.2-2: Species of Seabirds Most Likely Observed along Shipping Routes in Eastern Canada and the Arctic¹

Bird Family	Species	Bird Family	Species
Common² Offshore³ Species		Common² Inshore³ Species	
Fulmars	Northern Fulmar	Auks, Murres, Puffins	Common Murre
Shearwaters and Petrels	Great Shearwater		Thick-billed Murre
	Manx Shearwater		Razorbill
	Sooty Shearwater		Dovekie
	Wilson's Storm Petrel		Atlantic Puffin
	Leach's Storm Petrel		Black Guillemot
Gannets	Northern Gannet	Loons	Common Loon
Phalaropes	Red Phalarope		Red-throated Loon
	Red-necked Phalarope		Yellow-billed Loon
			Pacific Loon
Jaegers and Skuas	Long-tailed Jaeger	Grebes	Red-necked Grebe
	Parasitic Jaeger		Horned Grebe
	Pomarine Jaeger	Cormorants	Great Cormorant
	Great Skua		Double-crested Cormorant
Gulls and Terns	Herring Gull	Ducks and Geese	Greater Scaup
	Glaucous Gull		Common Eider
	Great Black-backed Gull		King Eider
	Ivory Gull		Harlequin Duck
	Sabine's Gull		Long-tailed Duck
	Iceland Gull		Surf Scoter
	Ross's Gull		Black Scoter
	Arctic Tern		White-winged Scoter
	Black-legged Kittiwake		

Bird Family	Species
	Red-breasted Merganser
	Green-winged Teal
	Northern Shoveler
	Mallard
	Northern Pintail
	Snow Goose
	Brant
	Greater White-fronted Goose
	Canada Goose
	Cackling Goose
	Ross's Goose
Cranes and Swans	Sandhill Crane
	Tundra Swan

Bird Family	Species
Infrequent or Rare Species	
Shearwaters and Petrels	Cory's Shearwater
	Audubon Shearwater
Jaegers and Skuas	South Polar Skua
Gulls and Terns	Bonaparte's Gull
	Black-headed Gull
	Laughing Gull
	Ring-billed Gull
	Lesser Black-backed Gull
	Common Tern
	Roseate Tern

¹ This list of species is based on baseline data collected for the Project and from Gjerdrum et al 2012.

² Species are considered common if indicated by Gjerdrum et al. 2012 or if observed during baseline surveys.

³ Species in the offshore column can also be observed nearshore, and species in the inshore column can also be seen offshore.

3.3 Equipment

Bridge staff participating in wildlife monitoring will require the following:

1. Form: *Marine Mammal and Seabird Sightings Record*;
2. Binoculars for species identification;
3. GPS (only required if unable to get GPS coordinates from the ship); and
4. Clipboard and pencil.

3.4 Monitoring Procedure

As part of their other routine duties during daylight hours, bridge staff will record observations of marine mammals noted within a 180° viewing area (port to starboard) out to the horizon, and record observations of seabirds noted within a 90° viewing area (either port or starboard, depending on the side of the vessel) out to 300 m, including on the ocean surface, sea ice and land, or in the air (Figure 3.4-1 and 3.4-2).

Observations will be done from a high position on the boat (from the bridge) for marine mammals, and close to the edge (either port or starboard side) for seabirds. The observer will record marine mammals, marine birds, vessel-marine bird interactions, and observations of large congregations of birds. Particular attention will be given to any observations that may trigger a mitigation response (see Table 3.5-1 in Section 3.5).

Incidental observations will be recorded whenever they are observed. In addition, the observer will conduct four, 30 minute observations of marine mammals and seabirds per day (total of four hours of survey effort). For all observation periods, a marine observation card will be filled in, regardless of whether a marine mammal or bird is observed.

For each observation period and incidental observation, crew will document information on the ship's location, travelling speed and direction, environmental conditions and the details of the wildlife observation (species, behaviour, distance from ship, etc.) on a *Marine Mammal and Seabird Sightings Record* form (one form per observation).

Table 3.2-1 summarizes general species groups and individual species that are most likely to be observed along the western and eastern shipping routes of the Northwest Passage. Note that recording a general species group identification with high certainty is better than an incorrect species identification.

3.5 Mitigation Triggers and Responses

In the event bridge crew observe marine mammals or groups of seabirds, recommended management response is outlined in Table 3.5-1. Management responses will be documented on the *Marine Mammal and Seabird Sightings Record* for that observation.

Table 3.5-1: Recommended Shipping Mitigation Responses for Seabirds and Marine Mammals

Observation	Management Response
Seabirds	
Any large group (10+) of seabirds on ocean surface while traversing sensitive habitat areas identified in Figure 2.1-1	500 m setback
Any colony of seabirds on land while traversing sensitive habitat areas identified in Figure 2.1-1	500 m setback
Marine Mammals	
Any group of marine mammals observed on the ocean surface, especially in sensitive habitat areas identified in Figure 2.1-2	<p>At the discretion of the ship's operator, the following management responses are recommended:</p> <ol style="list-style-type: none"> 1) As per Marine Mammal Regulations s.7(3), the vessel will maintain a minimum of 100 m from marine mammals at all times. 2) Avoid ship strikes with marine mammals by slowing the vessel and allowing marine mammals to move out of the way. Noise can be reduced by 1.5-2.8 dB for every 1 knot reduction in speed.¹ 3) Change ships heading to avoid groups of marine mammals.

3.6 Documenting Ship Strikes

If bridge crew determine a ship strike of a marine mammal or seabirds has occurred, they will complete *Marine Mammal and Seabird Sightings Record* and indicate that the observation was the result of a ship strike. If the ship strike is a marine mammal the ship's captain is to report the strike to Sabina as soon as practical and within 24 hours.

¹ Port of Vancouver. March, 2018. Enhancing Cetacean Habitat and Observation (ECHO) Program: Slowdown Trial – Interim Findings. Retrieved April 20, 2018, from <https://www.portvancouver.com/environment/water-land-wildlife/marine-mammals/echo-program/vessel-slowdown-trial-in-haro-strait/>

In addition, as per *Marine Mammal Regulations* s.39, the captain must also report a strike to the DFO minister, including the following information:

- the date, time and location of the incident;
- the species of marine mammal involved in the incident;
- the circumstances of the incident;
- the size and type of vehicle and, if applicable, the type of fishing gear involved in the incident;
- the weather and sea conditions at the time of the incident;
- the observed state of the marine mammal after the incident; and
- the direction of travel of the marine mammal after the incident, to the extent that it can be determined.

DFO Contact Information:

- Inuvik: 867-777-7500
- Iqaluit: 867-979-8000

3.7 Reporting Process

Records of incidental observations, mitigation measures taken, and ship strikes will be submitted to the Sabina Environment Team after each shipping trip for collation into a database.

3.8 References and Recommended Guides

- ECCC. 2016. *Environment and Climate Change Canada's input to the Nunavut Planning Commission regarding Key Habitat Sites for Migratory Birds in the Nunavut Settlement Area*. Revised May 2016. 140 pp.
- Gjerdrum et al. 2012. *Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms*.
- Latour, P. B., J. Leger, J. E. Hines, M. L. Mallory, D. L. Mulders, H. G. Gilchrist, P. A. Smith, and D. L. Dickson. 2008. *Key Migratory Bird Terrestrial Habitat Sites in the Northwest Territories and Nunavut*. Canadian Wildlife Service Occasional Paper Number 114. Canadian Wildlife Service: Ottawa, ON.
- Mallory, M. L. and A. J. Fontaine. 2004. *Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories*. Canadian Wildlife Service Occasional Paper Number 109. Canadian Wildlife Service: Ottawa, ON.
- Reeves et al. 2002. *National Audubon Society's Guide to marine Mammals of the World*.
- Sibley. 2016. *Field Guide to the Birds of Eastern North America: Second Edition*.

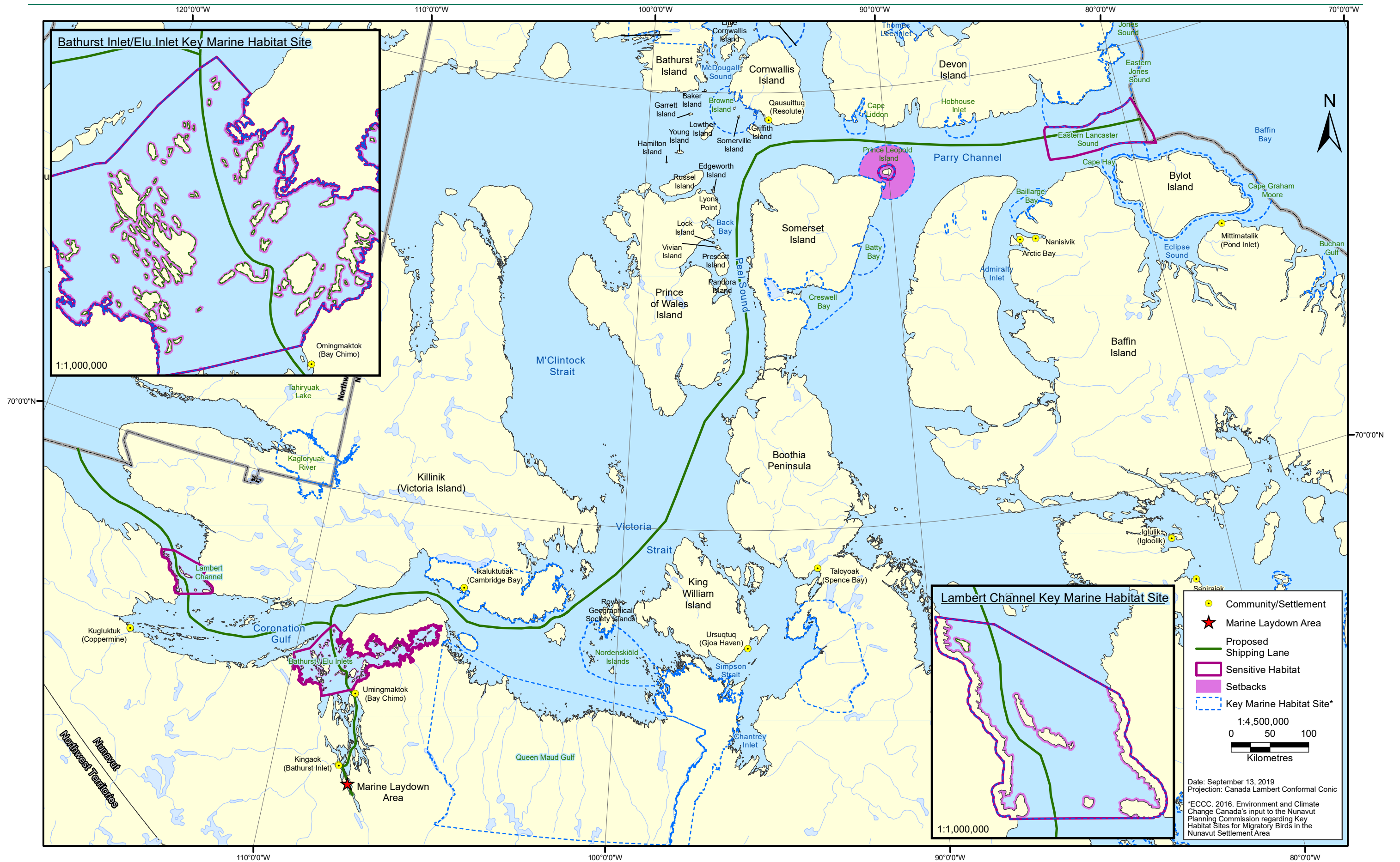


Figure 2.1-1: Sensitive Habitat and Setbacks for Seabirds and Seaducks along the Shipping Route

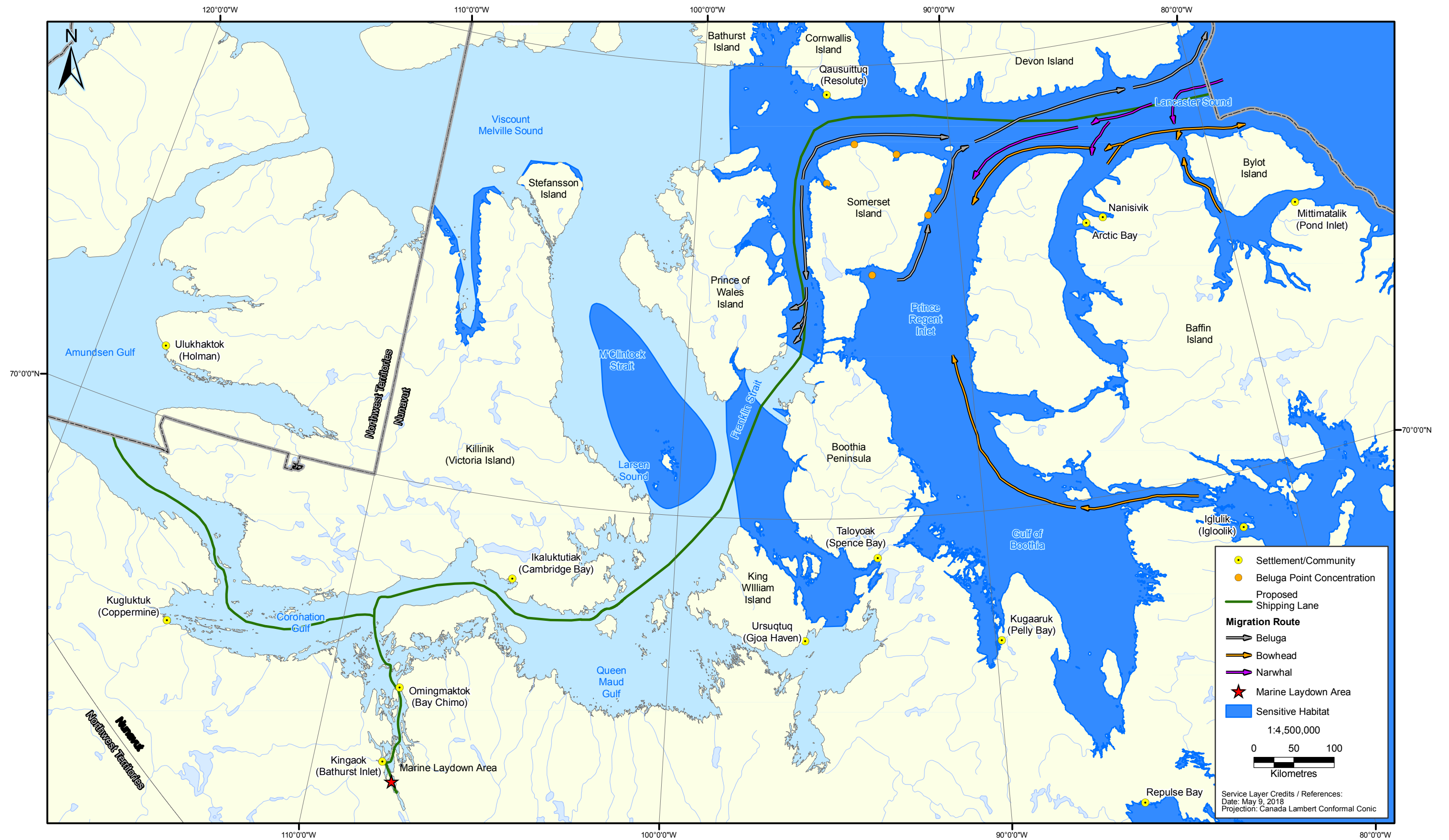
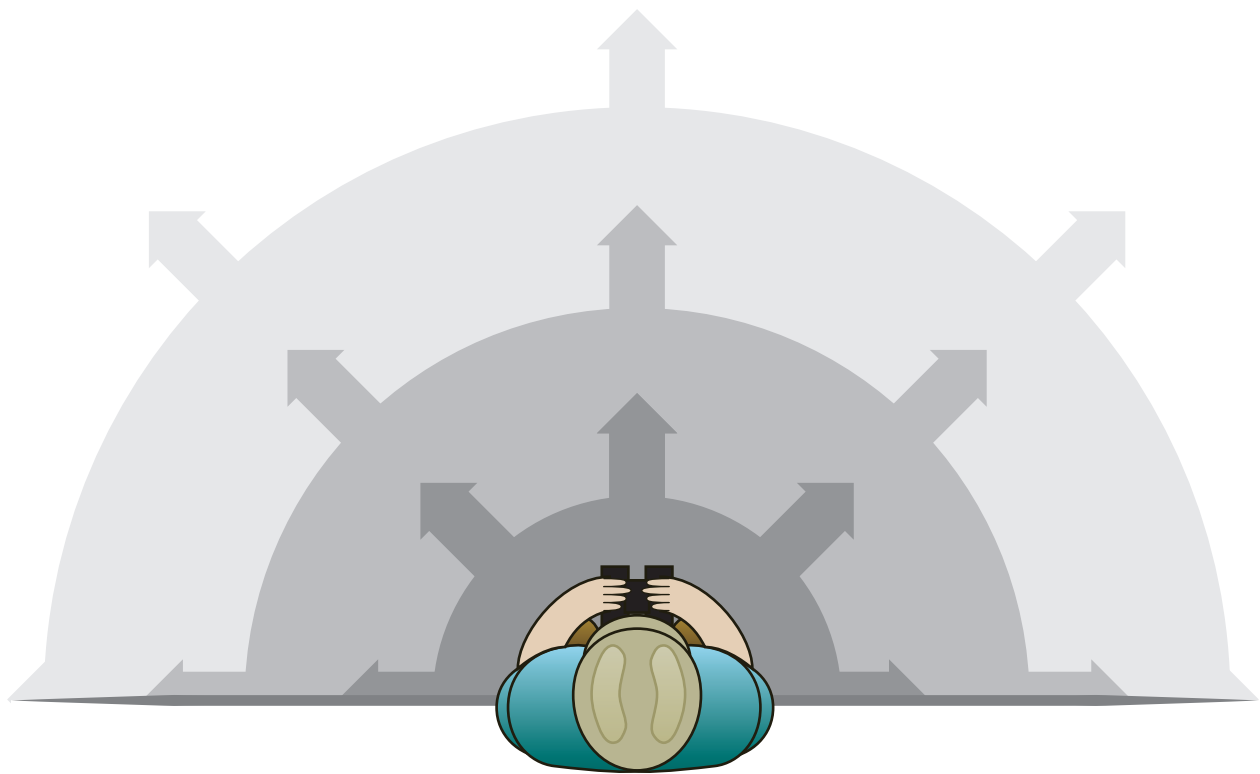
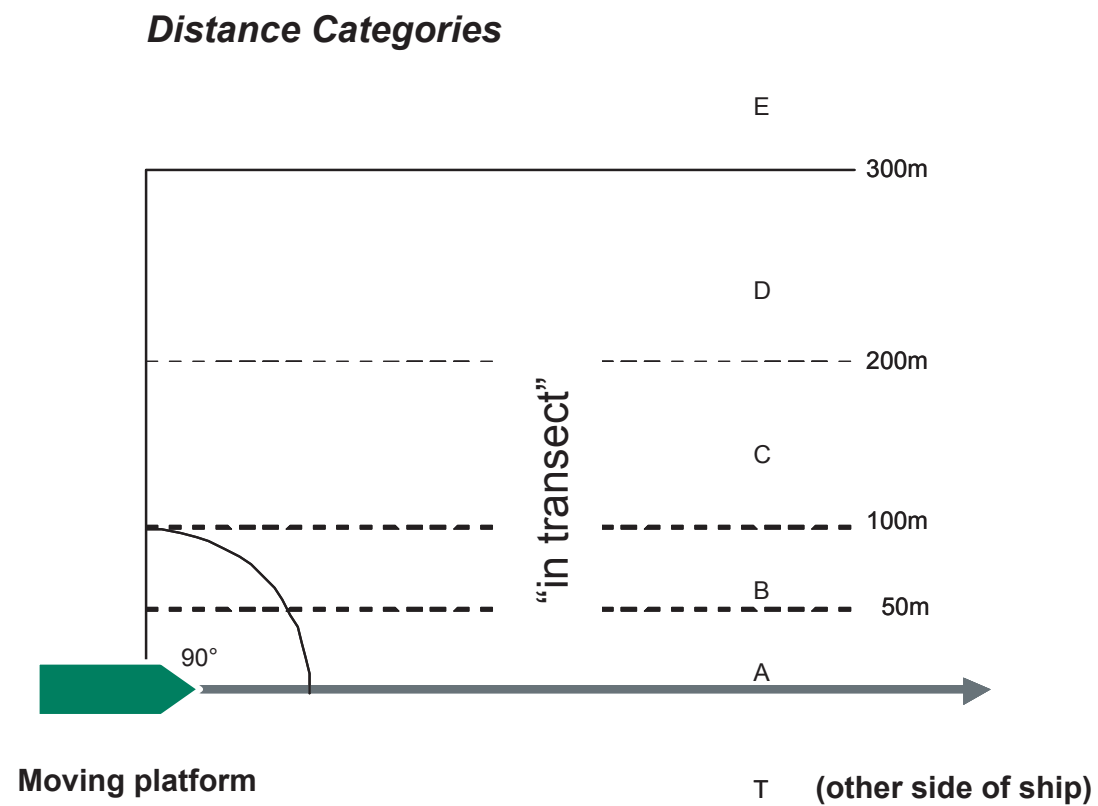


Figure 2.1-2: Sensitive Habitat for Marine Mammals along the Shipping Route



Bridge staff will record observations of marine mammals
noted within a 180° viewing area (port to starboard)
out to the horizon

Figure 3.4-1: Marine Mammal Observations




Extracted from Gjerdrum et al. 2012

Figure 3.4-2: Seabird Observations using a 90° Scan up to 300 m from the Vessel

Marine Mammal and Seabird Sightings Record

(1 form per observation; PLEASE PRINT; circle options provided in *italics* as appropriate)

General Information			
Vessel Name		Date	
Observer Name		Local Time (24 hr)	
Vessel Information			
Ship Speed (kt)		Ship Heading (compass)	
Latitude (decimal degrees)		Longitude (decimal degrees)	
Environmental Information			
Beaufort Wind Force		Visibility (km)	
Wind Direction			
Observation Information			
Species ¹		ID Reliability	<i>Positive / Probable / Maybe</i>
Initial Distance from Vessel (m)		Closest Approach Distance (m)	
Number of Individuals	<i>Best Estimate:</i> OR <i>Maximum/Minimum:</i>		
Behaviour	Mammals: <i>Swimming</i> <i>Diving</i> <i>Blowing</i>		
	<i>Feeding</i> <i>Resting on land</i> <i>Resting on ice</i> <i>Dead</i>		
	Birds: <i>Flying</i> <i>Feeding</i> <i>Resting on ocean surface</i>		
	<i>Resting on land</i> <i>Escape Ship - Flying</i> <i>Escape Ship - Diving</i> <i>Dead</i>		
	Other (describe):		
Other notes (e.g., physical descriptions, distinctive behaviours, drawing)		Position & Travel Relative to Ship [draw arrow]	 OR Variable Travel Directions
Was this observation the result of a SHIP STRIKE?		Yes	No
Fatality?			
Mitigation Action Taken			
Yes No			
If yes, describe mitigation actions (e.g., change in course or speed) and result (e.g., maintained a buffer of x metres from wildlife)		ACTION: RESULT:	
These data were entered into the wildlife database by:		These data were entered into the wildlife database on:	

¹ Refer to list of species in Table 3.2-1 in the SOP

Author:		To Be Reviewed:	As needed
Approved by:		Print Date:	4:28:29 PM27/09/2019