




Government of Nunavut
Qikiqtarjuaq Marine Infrastructure Project
Project No. 22205-00762

Final Terrestrial Baseline Report



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1 Introduction

The Government of Nunavut, Department of Economic Development and Transportation, is proposing to construct a deep-sea port facility in Qikiqtarjuaq, Nunavut (the Project). The primary objective of the Project is to improve the marine infrastructure in Qikiqtarjuaq including the construction of a deep-sea port, to support the needs of northern marine trade corridors, and especially the Davis Strait and Baffin Bay marine traffic.

CBCL Limited (CBCL) was retained by the Government of Nunavut to provide architectural and engineering services for the Project. To support the design and approval processes, CBCL completed environmental baseline studies for the Project to support a screening by Nunavut Impact Review Board (NIRB) and environmental permitting by regulatory agencies. CBCL conducted field programs in July and September 2024 to determine the baseline conditions of the terrestrial environment in proximity to the proposed Project. This baseline report presents the findings of the desktop and field studies and will inform the Project Proposal document that will be submitted to the NIRB for a screening assessment.

1.1 Project Overview

The Project is a coastal infrastructure project that consists of the design and construction of a 75-metre (m) long closed face marginal wharf structure with 10 m depth at low tide, and 15,000 square metres (m²) of laydown space. The Project will also include an approximately 200-m long access road from municipal roads to the facility, a crane to offload cargo, wastewater receiving systems, VHF radio communications station, services to allow for freezer containers, operations and security office, and power distribution.

Construction of the Project will involve land-based (i.e. site preparation, quarrying rock) and marine-based activities (i.e., marine construction, dredging of material from the harbour bottom). Dredged materials may be reused as fill during construction. Rock sourced from quarries will be used during construction. Rock will be hauled from the quarries via existing hamlet roads.

1.2 Project Location

The Project will be located in Qikiqtarjuaq, within the Qikiqtaaluk Region of Nunavut (Figure 1.1, Appendix A). Qikiqtarjuaq is a community on Broughton Island situated on the north shore of

Baffin Island, along Broughton Channel in Davis Strait. Qikiqtarjuaq is a High Arctic community within Canada's continuous permafrost zone. It has a population of approximately 627 people and is accessible year-round by commercial aircraft and seasonally by dry cargo ships from southern Canada (Government of Nunavut, 2024). The community has a tundra climate, with the warmest month averaging around 8 degrees Celsius (°C), and receives 30 millimetres (mm) of rainfall and 173 centimetres (cm) of snowfall annually (ECCC, 2023).

The footprint of the new deep-water port will fall partially within the upland, tidal zone, and seabed area along the shoreline of Davis Strait to the southwest of the Hamlet of Qikiqtarjuaq. The entire Project area—including portion of Broughton Channel between Broughton Island and the mainland of Baffin Island—is designated as municipal lands under the administration of the Hamlet of Qikiqtarjuaq. The deep-water port is proposed to be located approximately one kilometre south of the Qikiqtarjuaq Airport. The four potential quarry locations are located along or in close proximity to the existing road connecting to the hamlet. The Project Study Area includes the proposed port site, the footprint of the four potential quarry locations and within 100 m of either side of the existing access roads connecting the port site to the quarry locations (see Figure 1.1, Appendix A).

1.3 Biophysical Setting

The Project is situated in Ecoregion 5 – Baffin Mountains, within the Arctic Cordillera Ecozone. The following information in this section is a summary from the Ecological Framework of Canada (Natural Resources Canada, 2024). The Baffin Mountains ecoregion in northeastern Baffin Island has a High Arctic ecoclimate, characterized by humid and cold conditions, with a mean annual temperature of approximately -11.5°C. The very short, cold summers support sparse vegetation with low species diversity. The region is underlain by deep, continuous permafrost, and bare bedrock is common. Typically, 75% of the Arctic Cordillera ecozone is covered in bare rock and ice. The most biologically productive areas in the ecoregion are low-elevation stream banks and coastlines, while the high and mid-elevations lack significant plant cover.

Bedrock in the ecoregion is composed predominantly of ancient Precambrian rocks such as granites, gneisses, and schists. The topography is marked by steep, rugged mountains with sharp peaks, deep fjords, and extensive glaciers. Glacial meltwater feeds into rivers and fjords with some glacial lakes and rivers that remain ice-covered for much of the year.

Soils in the Baffin Mountains are thin and rocky, with Turbic Cryosols developed on colluvial, alluvial and moraine deposits. Vegetation is sparse and dominated by cold-tolerant species, including low-growing shrubs, mosses, lichens, sedges and grasses.

Wildlife in the Baffin Mountains includes Arctic foxes, polar bears, caribou, and various small mammals adapted to cold environments. The area is also an important breeding ground for migratory bird species, including seabirds, shorebirds, and raptors. Surrounding marine waters support rich biodiversity, including seals, whales, and fish.

2 Traditional Knowledge Gathering

CBCL completed a series of community meetings to gather community and traditional knowledge (Inuit Qaujimajatuqangit) of wildlife and land use in and around the Project Study Area. The meetings identified important species, habitats and harvesting areas that could be affected by the development of the Project. The following terrestrial species and related activities occurring in and around Project Study Area and Qikiqtarjuaq were identified during the workshops:

- ▶ Berry picking (likely *Vaccinium uliginosum*) occurs in the area near the proposed marine port and has become more common since the access road was built.
- ▶ Gull colonies (likely Glaucous and Iceland Gull) are present on mainland or islands north (1) and south (3) of Qikiqtarjuaq.
- ▶ Caribou - the last caribou harvest on the island was in the early 1950s near the reservoir, but locals reported they are seeing caribou coming back to the area. Tracks were reported on the mainland adjacent to Qikiqtarjuaq.
- ▶ Egg picking (likely Thick-billed Murre and gull species)
- ▶ Foxes are present year-round and can be found anywhere (species not indicated but both Red Fox and Arctic Fox are likely).
- ▶ Rabbits (presumably Arctic Hare) are year-round and can be found anywhere on the island.
- ▶ Wolves are present year-round, and there is a wolf den at the north fjord. Tracks have been observed near the local dump.
- ▶ Ptarmigan (presumably Rock Ptarmigan) are present year-round and can be found anywhere on the island.
- ▶ Eiders are present in September, October, and November and are common (species not indicated but King Eider and Common Eider could both be present).
- ▶ Locals have heard reports of Golden Eagle nests approximately 40 to 50 miles south of the Hamlet.
- ▶ Gyrfalcon are present in the area.
- ▶ Owls (presumably Snowy Owls) are present in the area.
- ▶ A murre colony (likely Thick-billed Murre) is present on an island south of Qikiqtarjuaq.

The results of the traditional knowledge gathering meetings were used to inform the description of baseline biophysical conditions in the Project Study Area.

3 Species at Risk and Conservation Areas

3.1 Species at Risk

This section highlights species evaluated by federal (Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the federal *Species at Risk Act* (SARA)) and territorial authorities (Government of Nunavut Department of Environment). Table 3.1 outlines at-risk species of vegetation and terrestrial wildlife (including marine and migratory birds) that could potentially be found within the Project Study Area, with an estimated likelihood of occurrence for each. The table was created using multiple desktop resources, including traditional knowledge, Species at Risk Registry documents, Land Use Planning documents (NPC, 2021 and NPC, 2023), eBird, and NatureServe Explorer, along with data from field surveys. It includes a brief summary to support the likelihood assessments.

Although species at risk (SAR) may occur in the Project Study Area, habitat values are generally low and are not considered to provide critical habitat for these species. No terrestrial SAR was identified during field surveys.

Table 3.1 Status of Terrestrial Flora and Fauna SAR with the Potential to Occur in the Project Study Area

Common Name	Scientific Name	COSEWIC	SARA	Nunavut Rank	Likelihood of Occurrence	Justification
Vegetation						
Porsild's Bryum	<i>Haplodontium macrocarpum</i>	Threatened	Threatened	S1	Unlikely	In Nunavut, Porsild's Bryum is known to occur only on Ellesmere Island.
Migratory Birds						
Buff-breasted Sandpiper	<i>Calidris subruficollis</i>	Special Concern	Special Concern	S3B	Low	Outside mapped breeding range and is unlikely to breed near the Project area, may be present during migration but observations are not documented locally.
Short-eared Owl	<i>Asio flammeus</i>	Threatened	Special Concern	S3B	Low	Outside mapped breeding range and is unlikely to breed near the Project area; may be present during migration. No documented local observations.
Ivory Gull	<i>Pagophila eburnean</i>	Endangered	Endangered	S1B,S1N	Possible	Outside mapped breeding range and is unlikely to breed near the Project area. Overwinters in Davis Strait. May be present during non-breeding periods. Modern records nearby in the Davis Strait.
Red Knot <i>rufa</i> subspecies	<i>Calidris canutus rufa</i>	Endangered1/ Special Concern2	Endangered3/ Not on Schedule 1: Under consideration for addition4	S2	Possible	Outside mapped breeding range and is unlikely to breed near the Project area, may be present during migration. No documented local observations.
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Special Concern	Special Concern	S3	Possible	Outside mapped breeding range and is unlikely to breed near the Project area, may be present during migration. Modern records nearby in Cape Searle.

Common Name	Scientific Name	COSEWIC	SARA	Nunavut Rank	Likelihood of Occurrence	Justification
Ross's Gull	<i>Rhodostethia rosea</i>	Endangered	Threatened	S1	Low	Outside mapped breeding range and is unlikely to breed near the Project area. Overwinters in Davis Strait and the Labrador Sea. May be present during migration, but observations are rare and not documented locally.
Wildlife						
Wolverine	<i>Gulo gulo</i>	Special Concern	Special Concern	S3	Low	Within mapped range, but a low density, wide-ranging species. Occurrence in the area is likely to be transitory.
Barren-ground Caribou	<i>Rangifer tarandus groenlandicus</i>	Threatened	Not listed (under consideration for addition)	S4	Unlikely	No historical harvest or traditional knowledge records on Broughton Island but harvests occur across the Boughton Channel on Mainland Baffin Island.

¹ Nunavut Territorial Rank: S1=critically imperilled, S2=imperilled, S3=Vulnerable, S4=apparently secure, NR = not ranked

3.2 Protected and Ecologically Significant Areas

No National Parks, Territorial Parks, National Wildlife Areas, or Migratory Bird Sanctuaries occur in Qikiqtarjuaq or the Project site (Environment and Climate Change Canada, (ECCC, 2016)); however, Qikiqtarjuaq is located approximately 20 km north of Auyuittuq National Park, see Figure 3.1, Appendix A.

The closest Territorial Park is Pisuktinu Tunngavik Territorial Park in Pangnirtung. Several important areas for wildlife are located nearby Qikiqtarjuaq. Key habitat sites for migratory birds include the following:

- ▶ Cape Searle Important Bird Area
- ▶ Qaqulluit National Wildlife Area
- ▶ Reid Bay Important Bird Area
- ▶ Akpait National Wildlife Area

Cape Searle Important Bird Area (IBA - NU003) is located on the northeastern tip of Qaqulluit Island southeast of Qikiqtarjuaq. Cape Searle is home to the largest Northern Fulmar (*Fulmarus glacialis*) colony in Canada and is designated as an International Biological Program Site (Region 7, Site 7-6) (Birds Canada, 2024). Additionally, Cape Searle is within the Qaqulluit National Wildlife Area and is designated as a Key Terrestrial Bird Habitat Site (NU Site 27) and a Key Marine Habitat Site (NU Site 21) (ECCC, 2024a).

Reid Bay Important Bird Area (IBA - NU072) is located near Cape Dyer southeast of Qikiqtarjuaq. Reid Bay is a globally significant site for breeding seabirds including Northern Fulmar and Thick-billed Murre. Akpait National Wildlife Area also includes a large portion of the Reid Bay Important Bird Area. Akpait National Wildlife Area contains one of Canada's largest seabird colonies, including Thick-billed Murres (*Uria lomvia*), Northern Fulmars and Black-legged Kittiwakes (*Rissa tridactyla*). The area includes marine waters and cliffs up to 915 meters high overlooking Akpait Fiord. The marine waters are vital feeding grounds for seabirds and migratory marine mammals. This area is also designated as an International Biological Programme Site (Region 7, Site 7-9) (ECCC, 2024b).

4 Vegetation

4.1 Objectives

The objective of the vegetation study was to determine the plant and lichen species, plant communities, and plant SAR occurring or possibly occurring within the Project Study Area. A desktop review was conducted to inform the field program, identify data gaps, and focus efforts on completing a comprehensive baseline study of the Project area's vegetation and habitats. The field survey involved identifying plant and lichen species, as well as characterizing and mapping plant communities and wildlife habitat features.

4.2 Methodology

4.2.1 Desktop and Literature Review

To assess existing vegetation conditions, including the potential for the presence of SAR, a desktop review of literature and databases was conducted to identify species and habitats possibly occurring near the Project. The following sources were reviewed:

- ▶ Ecological Framework of Canada (Natural Resources Canada, 2024)
- ▶ Circumpolar Arctic Bioclimate Subzones (Toolik-Arctic Geobotanical Atlas (TAGA), 2003)
- ▶ Flora of the Canadian Arctic Archipelago (Aiken et al., 2007)
- ▶ New vascular plant records for the Canadian Arctic Archipelago (Gillespie et al., 2015)
- ▶ Arctic Flora of Canada and Alaska (Canadian Museum of Nature, 2024)
- ▶ Annotated Checklist of the Panarctic Flora (PAF) - Vascular plants (Panarctic Flora Project, 2024)
- ▶ Common Plants of Nunavut (Mallory and Aiken, 2012)
- ▶ Species at Risk Public Registry, Species List for Nunavut (Species at Risk Public Registry, 2024)
- ▶ Vascular plant, bryophyte, and lichen biodiversity of Agguttinni Territorial Park, Baffin Island, Nunavut, Canada: an annotated species checklist of a new Arctic protected area (Gillespie et al., 2024)
- ▶ Non-Native and Invasive Species in Nunavut (Government of Nunavut, 2016)
- ▶ American Arctic Lichens: The Macrolichens (Thompson, 1984)
- ▶ Lichens of North America (Brodo et al., 2001)
- ▶ Contributions to the lichen flora of Greenland (Alstrup, 1986)

Prior to conducting the field surveys, maps of existing conditions were reviewed, including aerial imagery to identify habitats and vegetation communities possibly occurring in the

Project Study Area. The documents on the Species at Risk Public Registry were searched for vascular and non-vascular plants with geographic ranges that overlap with the Study Area and available research on species distributions and habitats was also assessed to evaluate the likelihood of their occurrence within the Project Study Area.

4.2.2 Field Surveys

Field surveys were conducted over eight days from July 3 to 11, 2024, within the Project Study Area to characterize vegetation communities and identify vegetation encountered, including vascular and non-vascular species. The surveys involved intuitive meanders and area searches to inventory plants and lichens occurring within the Project Study Area. Attention was given to novel or unique environmental conditions and habitats most likely to host rare species. Species encountered were recorded and identified to the species level, if possible, with voucher samples collected for subsequent identification if needed (mostly lichen species). Nomenclature and authorities for the plant species follows the Flora of the Canadian Arctic Archipelago (Aiken, 2007 and Gillespie, 2015) and for lichen species follows Brodo et al. (2001).

Qualitative data on ecosystems was collected to help classify and map vegetation communities and characterize wildlife habitats within the Project Study Area. Due to the absence of an official vegetation classification system in Nunavut, vegetation communities were grouped into units based on similar characteristics such as species composition, species cover, substrate, moisture regime and topographic position. The vegetation communities were delineated through a combination of field verification and analysis of aerial imagery. To aid in the vegetation community classification, a list of species present in each distinct vegetation community found, was compiled and notes on the soil and substrate characteristics, topographic features and microclimatic conditions were recorded. Photos were taken of representative conditions of each community.

4.3 Results

4.3.1 Desktop Results

4.3.1.1 Existing Vegetation Conditions

The Project is located within bioclimate subzone C as defined by the Circumpolar Arctic Vegetation Map for the North American arctic ecozone (CAVM Team, 2003). Subzone C is characterized by a mean July temperature between 5 and 7°C and a summer warmth index of 9 to 12°C, resulting in a total of 75 to 150 vascular plant species represented in the local flora. The dominant plant growth forms of subzone C are hemi-prostrate dwarf shrubs and sedges. Vegetative cover in this subzone is patchy, with total vascular plant cover ranging from 5% to 50%, and an average plant canopy height of 10 to 20 cm.

The CAVM maps the vegetation of the Project Study Area as Prostrate/hemiprostrate dwarf-shrub tundra (Circumpolar Arctic Vegetation Unit P2). This vegetation unit is described as moist to dry tundra dominated by prostrate and hemiprostrate shrubs <15 cm tall, particularly Arctic Bell-heather (*Cassiope tetragona*).

Dominant Plants of Subzone C are prostrate and hemiprostrate dwarf shrubs including Arctic Bell-heather, Entire-leaved Mountain Avens (*Dryas integrifolia*), willows (*Salix arctica*, *S. polaris*), and mosses such as *Aulacomnium turgidum*, *Tomentypnum nitensn*, *Hylocomium splendens*, *Sanionia uncinata*, and *Polytrichum juniperinum*. Other vegetation includes graminoids such as rushes (*Luzula confusa*, *L. nivalis*), forbs (Mountain-sorrel (*Oxyria digyna*), Alpine Bistort (*Bistorta vivipara*), Moss Campion (*Silene acaulis*)), and lichens (*Peltigera aphosa*, *Cetrariella deliseii*, *Stereocaulon rivulorum*, *Solorina*, *Thamnolia*).

Traditional knowledge gathering identified areas in the Project Study Area near the port infrastructure as being important for berry picking, likely Bog Bilberry (*Vaccinium uliginosum*) as they are common in the dwarf shrub tundra habitats in that area.

4.3.1.2 Species at Risk

The review of the Species at Risk Public Registry found no vascular plant SAR and one non-vascular SAR occurring in Nunavut. Porsild's Bryum (*Haplodontium macrocarpum*) is listed on Schedule 1 of SARA as Threatened. Porsild's Bryum is a moss species with a disjunct distribution across the northern hemisphere, predominantly found in North America, where Canada supports the largest population. It is typically found in microhabitats near waterfalls, sheltered calcareous rock crevices, or seepages. In Nunavut, Porsild's Bryum is known to occur only on Ellesmere Island within Quttinirpaaq National Park. The specificity of the habitat requirements of Porsild's Bryum limits its establishment and contributes to its rarity (COSEWIC, 2017). No historical occurrences of Porsild's Bryum or its habitat have been recorded in the Project Study Area and the Study Area does not appear to contain microhabitats that could support Porsild's Bryum. Therefore, the likelihood of the Project Study Area to support populations of this species is unlikely.

4.3.2 Field Results

During the field survey, a total of 118 vegetation species was observed in the Project Study Area, including 57 vascular and 61 non-vascular species (53 lichens, seven mosses, and one liverwort). All of the species observed are considered naturally occurring (native) and none of the species identified are SAR. A full list of the species observed, and their conservation statuses are provided in Table 4.1. The most commonly encountered vascular species were Arctic Bell-heather, willows (*Salix* spp.), sedges (*Carex* spp.) and Bog Bilberry. The most commonly encountered non-vascular species were rock tripes (*Umbilicaria* spp.), reindeer lichens (*Cladonia* spp.), snow lichens (*Flavocetraria* spp.), and mosses (*Polytrichum* and *Sphagnum* spp.).

Table 4.1 Vegetation Species Identified During Field Survey in the Project Study Area, including Conservation Status and Vegetation Community Association

Common Name	Scientific Name	Nunavut Rank	Habitat Types ¹				
			RSB	DST	URS	UPB	DIS
Alpine Bittercress	<i>Cardamine bellidifolia</i>	S5					
Greenland Scurvygrass	<i>Cochlearia groenlandica</i>	S5	x				
Milky Draba	<i>Draba lactea</i>	S5					
Alpine Chickweed	<i>Cerastium alpinum</i>	S5					
Mountain Stitchwort	<i>Cherleria biflora</i>	S4					
Tufted Pearlwort	<i>Sagina caespitosa</i>	S4					
Snow Pearlwort	<i>Sagina nivalis</i>	S4					
Saltmarsh Starwort	<i>Stellaria humifusa</i>	S4					
Long-stalked Starwort	<i>Stellaria longipes</i>	S5					
Water Sedge	<i>Carex aquatilis</i>	S5		x	x		
Bigelow's Sedge	<i>Carex bigelowii</i>	S5					
Rock Sedge	<i>Carex rupestris</i>	S4					
Russet Sedge	<i>Carex saxatilis</i>	S4					
Simple Kobresia	<i>Carex simpliciuscula</i>	S4					
Narrow-leaved Cottongrass	<i>Eriophorum angustifolium</i>	S5					
Beautiful Cottongrass	<i>Eriophorum callitrix</i>	S4					
Scheuchzer's Cottongrass	<i>Eriophorum scheuchzeri</i>	S5		x	x		
Field Horsetail	<i>Equisetum arvense</i>	S5					
Arctic Bell-heather	<i>Cassiope tetragona</i>	S5		x	x	x	
Moss Heather	<i>Harrimanella hypnoides</i>	S4					
Purple Mountain Heather	<i>Phyllodoce caerulea</i>	S4					
Arctic Pyrola	<i>Pyrola grandiflora</i>	S4					
Northern Labrador Tea	<i>Rhododendron tomentosum</i>	S4		x			
Bog Bilberry	<i>Vaccinium uliginosum</i>	S5		x	x		
Two-glumed Rush	<i>Juncus biglumis</i>	S5					
Northern Woodrush	<i>Luzula confusa</i>	S5		x			
Arctic Woodrush	<i>Luzula nivalis</i>	S5		x			
Woolly Lousewort	<i>Pedicularis lanata</i>	S4		x			
Labrador Poppy	<i>Papaver labradoricum</i>	S4	x				x
Alpine Foxtail	<i>Alopecurus magellanicus</i>	S5					
Alpine Sweetgrass	<i>Anthoxanthum monticola</i>	S5		x			x
Short-leaved Fescue	<i>Festuca brachyphylla</i>	S5					
Spike Trisetum	<i>Koeleria spicata</i>	S5					
Icegrass	<i>Phippisia algida</i>	S5					x

¹ Habitat types: RSB = Rocky and Sandy Beach Shoreline, DST = Dwarf Shrub Tundra, URS = Upland Rocky Slope, UPB = Upland Bedrock, and DIS = Disturbed

Common Name	Scientific Name	Nunavut Rank	Habitat Types ¹				
			RSB	DST	URS	UPB	DIS
Arctic Bluegrass	<i>Poa arctica</i>	S5					
Creeping Alkaligrass	<i>Puccinellia phryganodes</i>	S4	x				
Alpine Bistort	<i>Bistorta vivipara</i>	S5		x	x		
Iceland Purslane	<i>Koenigia islandica</i>	S4	x				x
Mountain-sorrel	<i>Oxyria digyna</i>	S5	x				x
Snow Buttercup	<i>Ranunculus nivalis</i>	S4					
Pygmy Buttercup	<i>Ranunculus pygmaeus</i>	S4					
Sulphur Buttercup	<i>Ranunculus sulphureus</i>	S5					
Entire-leaved Mountain Avens	<i>Dryas integrifolia</i>	S5					
Arctic Cinquefoil	<i>Potentilla hyparctica</i>	S5					
Arctic Willow	<i>Salix arctica</i>	S5					
Snowbed Willow	<i>Salix herbacea</i>	S5		x	x		
Leafy Saxifrage	<i>Micranthes foliolosa</i>	S5					
Nodding Saxifrage	<i>Saxifraga cernua</i>	S5					
Tufted Saxifrage	<i>Saxifraga cespitosa</i>	S5					
Pygmy Saxifrage	<i>Saxifraga hyperborea</i>	S4					
Purple Mountain Saxifrage	<i>Saxifraga oppositifolia</i>	S5					
Alpine Brook Saxifrage	<i>Saxifraga rivularis</i>	S4					
Alpine Firmoss	<i>Huperzia continentalis</i>	S4					
Northern Firmoss	<i>Huperzia selago</i>	S4					
Dwarf Fireweed	<i>Chamaenerion latifolium</i>	S4					x
Sea Sandwort	<i>Honckenya peploides</i>	S4					
Moss Campion	<i>Silene acaulis</i>	S5					
Green Witch's-hair Lichen	<i>Alectoria ochroleuca</i>	S3S5		x			
Greater Rockgrub Lichen	<i>Allantoparmelia alpicola</i>	S3S5					
Andrejev's Grizzly Lichen	<i>Arctocetraria andrejevii</i>	S3S5					
Concentric Ring Lichen	<i>Arctoparmelia centrifuga</i>	S3S5			x		
Finger Ring Lichen	<i>Arctoparmelia incurva</i>	S3S5			x		
Spiny Iceland Lichen	<i>Cetraria aculeata</i>	S3S5		x			
Heathland Iceland Lichen	<i>Cetraria ericetorum</i>	S3S5		x			
True Iceland Lichen	<i>Cetraria islandica</i>	S3S5					
Snowbed Northern Lichen	<i>Cetrariella delisei</i>	S3S5					
Shrubby Cup Lichen	<i>Cladonia arbuscula</i>	S3S5		x			
Toy Soldiers Cup Lichen	<i>Cladonia bellidiflora</i>	S3S5		x			
Boreal Cup Lichen	<i>Cladonia borealis</i>	S3S5					
Mealy Cup Lichen	<i>Cladonia chlorophaea</i>	S3S5					
Bighorn Cup Lichen	<i>Cladonia cornuta</i>	S3S5					
Smooth Cup Lichen	<i>Cladonia gracilis</i>	S3S5					
Pebbled Cup Lichen	<i>Cladonia pyxidata</i>	S3S5					
Reindeer Cup Lichen	<i>Cladonia rangiferina</i>	S3S5		x			

Common Name	Scientific Name	Nunavut Rank	Habitat Types ¹				
			RSB	DST	URS	UPB	DIS
A Reindeer Lichen	<i>Cladonia</i> sp.	-					
Greater Sulphur Cup Lichen	<i>Cladonia sulphurina</i>	S3S4					
Thorn Cup Lichen	<i>Cladonia uncialis</i>	S3S5					
Arctic Finger Lichen	<i>Dactylina arctica</i>	S3S5		x			
Curled Snow Lichen	<i>Flavocetraria cucullata</i>	S3S5		x			
Crinkled Snow Lichen	<i>Flavocetraria nivalis</i>	S3S5		x			
Finger Wart Lichen	<i>Lepra dactylina</i>	SU					
Alpine Camouflage Lichen	<i>Melanelia stygia</i>	S3S5					
Mealy Narrow-lobed Lichen	<i>Montanelia disjuncta</i>	S3S4				x	
Arctic Kidney Lichen	<i>Nephroma arctica</i>	S3S5					
Arctic Saucer Lichen	<i>Ochrolechia frigida</i>	S3S5					
Common Freckle Pelt Lichen	<i>Peltigera aphthosa</i>	S3S5					
Ruffled Freckle Pelt Lichen	<i>Peltigera leucophlebia</i>	S3S5					
Scabby Pelt Lichen	<i>Peltigera scabrosa</i>	S3S5					
A crustose Lichen	<i>Porpidia flavicunda</i>	SU					
A crustose Lichen	<i>Porpidia melinodes</i>	SU					
Fine Rockwool Lichen	<i>Pseudephebe pubescens</i>	S3S5		x	x		
Green Shingle Lichen	<i>Psoroma hypnorum</i>	S3S5					
Map Lichen	<i>Rhizocarpon geographicum</i>	S4S5			x	x	
Map Lichen	<i>Rhizocarpon</i> sp.	-					
Orange Rim Lichen	<i>Rhizoplaca chrysoleuca</i>	SU					
Orange Socket Lichen	<i>Solorina crocea</i>	S3S5		x			
Fragile Coral Lichen	<i>Sphaerophorus fragilis</i>	S3S5					
Alpine Foam Lichen	<i>Stereocaulon alpinum</i>	S3S5		x	x	x	
Shore Foam Lichen	<i>Stereocaulon rivulorum</i>	S3S5					
A Foam Lichen	<i>Stereocaulon</i> sp.	-					
Blue Blister Lichen	<i>Thalloidima sedifolium</i>	no rank					
Awl-shaped Pink Earth Lichen	<i>Thamnolia subuliformis</i>	SU					
Arctic Rocktripe Lichen	<i>Umbilicaria arctica</i>	S3S5		x	x		
Fringed Rocktripe Lichen	<i>Umbilicaria cylindrica</i>	S3S5					
Peppered Rocktripe Lichen	<i>Umbilicaria deusta</i>	S2S4					
Ragged Rocktripe Lichen	<i>Umbilicaria havaasii</i>	SU					
Blistered Rocktripe Lichen	<i>Umbilicaria hyperborea</i>	S3S5		x			
Smooth Rocktripe Lichen	<i>Umbilicaria mammulata</i>	S1S2					
Wrinkled Rocktripe Lichen	<i>Umbilicaria proboscidea</i>	S3S5					
Punctured Rocktripe Lichen	<i>Umbilicaria torrefacta</i>	S3S5					
Fleecy Rocktripe Lichen	<i>Umbilicaria vellea</i>	S3S4					
Racomitrium Moss	<i>Racomitrium lanuginosum</i>	S4		x			
Turgid Aulacomnium Moss	<i>Aulacomnium turgidum</i>	S4					
Juniper Polytrichum	<i>Polytrichum juniperinum</i>	S4		x			

Common Name	Scientific Name	Nunavut Rank	Habitat Types ¹				
			RSB	DST	URS	UPB	DIS
Wolverine Moss	<i>Psilopilum</i> sp.	-					
Jagged Notchwort	<i>Schistochilopsis incisa</i>	SU					
A Peat Moss	<i>Sphagnum</i> sp.	-		x			
Golden Fuzzy Fen Moss	<i>Tomentypnum nitens</i>	S4					

During the field assessment an ecological land classification survey was carried out to categorize and map the various vegetation community units present in the Project Study Area. Five unique vegetation communities were encountered within the Project Study Area:

- ▶ Rocky and Sandy Beach Shoreline (RSB)
- ▶ Dwarf Shrub Tundra (DST)
- ▶ Upland Rocky Slope (URS)
- ▶ Upland Bedrock (UPB)
- ▶ Disturbed (DIS)

A habitat map showing the location of the vegetation communities within the Project Study Area is presented in Figure 4.1 (Appendix A). Detailed descriptions for each community are provided in the following sections. Key vegetation species representative of each of the unique vegetation communities is indicated in Table 4.1.

4.3.2.1 Rocky and Sandy Beach Shoreline (RSB)

Rocky and sandy beach shoreline (RSB) is characterized by sand or coarse gravel substrate with occasional larger rocks and limited vegetation cover. The vegetation in this community is a sparse due to harsh conditions including salt spray and ice scour. Species within the RSB include Creeping Alkaligrass (*Puccinellia phryganodes*), Mountain-sorrel (*Oxyria digyna*), Water Sedge (*Carex aquatilis*), Greenland Scurvygrass (*Cochlearia groenlandica*), and Icegrass (*Phippisia algida*). Lichens in this habit were limited to mainly crustose species growing on boulders or exposed bedrock and were quite limited due to ice scour.



Photo 1 Rocky and Sandy Beach Shoreline (RSB) Habitat

4.3.2.2 Dwarf Shrub Tundra (DST)

The Dwarf Shrub Tundra (DST) vegetation unit is characterized by a hummocky imperfectly drained dwarf shrub dominated community with ample moss-lichen associated vegetation community. Dominant prostrate/hemiprostrate shrubs included white Arctic Bell-heather, Arctic Willow, Snowbed Willow, and Bog Bilberry. Forbs included Woolly Lousewort, Pygmy Saxifrage, and Northern Firmoss. Graminoids included Alpine Sweetgrass and Northern Woodrushes (*Luzula* sp.). Bryophytes predominantly included Racomitrium Moss and Juniper Polytrichum, while lichen cover predominantly consisted of Witch's Hair Lichen, snow lichens (*Cetraria*, *Cetrariella*, and *Flavocetraria* spp.) and several small pixie cup (*Cladonia*) species. Awl-shaped Pink Earth Lichen and Arctic Finger Lichen were also common. Arctic Saucer Lichen was often noted growing on the stems of Arctic Bell Heather. The vegetation was within a matrix of rocky outcrops area colonized by lichens including several rock tripe species, (*Umbilicaria arctica*, *U. cylindrica*, *U. hyperborea*, *U. proboscidea*), Fine Rockwool Lichen, ring lichens (*Arctoparmelia centrifuga*, *A. incurva*), and map lichen.

Graminoid-cryptogam dominated wet meadow areas were patchily distributed within this community along snow melt creeks, braided streams, and significant areas of seepage. These areas had moderate to complete cover of very low-growing plants, including Northern Woodrush, Arctic Woodrush, Two-glumed Rush, and cushion mosses. Lichens in these wetter areas included Orange Socket Lichen, several pelt lichens (*Peltigera apthosa*, *P. scabrosa*), Green Shingle Lichen, Arctic Kidney Lichen, and Andrejev's Grizzly Lichen was also observed in such habitats. Sphagnum moss was more common within this habitat.

Unidentified soil-binding microlichens and soil crusts were also abundant in unvegetated areas of tundra.



Photo 2 Dwarf Shrub Tundra (DST) Habitat

4.3.2.3 Upland Rocky Slope (URS)

The upland rock slope community dominates the base of higher elevation areas on gentle slopes, boulder-cobble fields beneath upland bedrock areas and talus slopes. This stony/rocky terrain is sparsely vegetated with patches or stripes of lichen-encrusted stony ground with dwarf shrub tundra between. Plant cover is less than 5 to 40%, and mostly restricted to the sheltered stony patches with Arctic Bell-heather, lichens and moss dominating. Lichen species assemblages were similar to those observed at lower elevations on exposed rock (primarily rock tripe and ring lichens, though specimens tend to be less common and smaller in size). Fine Rockwool Lichen and crustose lichen species such as *Porpidia flavicunda* and Mealy Narrow-lobed Lichen were also noted. Mosses included scant patches of Turgid Aulacomnium Moss and haircap mosses (*Polytrichum* spp.) in sheltered nooks.



Photo 3 Upland Rocky Slope (URS) Habitat

4.3.2.4 Upland Bedrock (UB)

This cryptogam barren complex includes areas with extensive exposed bedrock and stony ground covered in lichens, with lichen-covered rocky ground with occasional vascular plant species between areas of bedrock. The bedrock fields are mostly devoid of vascular vegetation with Arctic Bell-heather, Milky Draba, and moss in the most sheltered rocky-ground areas. Lichen species noted in this environment included Fine Rockwool, *Porpidia flavocunda*, and Mealy Narrow-lobed Lichen, as well as various microlichens that were not easily identifiable in the field.



Photo 4 Upland Bedrock (UB) Habitat

4.3.2.5 Disturbed (DIS)

The human-caused Disturbed community occurs where little vegetation cover or disturbance-tolerant vegetation is present. These habitats are present along the edges of quarries and roadsides. Species present in these Disturbed communities included Labrador Poppy, Iceland Purslane, and Dwarf Fireweed. Lichens and bryophytes were virtually absent from this community.



Photo 5 Disturbed (DIS) Habitat

5 Birds

5.1 Objectives

The objective of the bird study (migratory and marine bird species) was to determine the presence of bird species and their habitats within the Project Study Area, including migratory birds and terrestrial-nesting marine birds. A desktop review was conducted to inform the field program, identify data gaps, and guide efforts to complete a baseline study of the region's avian wildlife and habitats. The field survey focused on identifying bird species as well as documenting signs of their presence and habitat features within the Project Study Area.

5.2 Methodology

5.2.1 Desktop and Literature Review

A desktop review of literature and databases was conducted to assess existing conditions for birds and their habitats, including the potential for SAR. The objective was to identify bird species and habitats likely to occur within the Project Study Area. This information was used to design the field program and guide efforts to address any data gaps. The review focused on publicly available observation datasets, species databases, and environmental reports from similar projects in the region. The following sources were reviewed:

- ▶ Publicly available observation datasets:
 - inaturalist.ca
 - eBird
- ▶ Species at Risk Public Registry, Species List for Nunavut (Species at Risk Public Registry, 2024)
- ▶ Territorial Government reports and databases:
 - Nunavut Wildlife Harvest Study (Priest and Usher, 2004)
 - Recommended Nunavut Land Use Plan (NPC, 2023)
 - Draft Nunavut Land Use Plan (NPC, 2021)
- ▶ Environmental reports for other development projects:
 - Clyde River Small Craft Harbour Development (CBCL, 2021)
 - Government of Nunavut Iqaluit Marine Infrastructure (Advisian, 2018)

Information from protected areas, such as Migratory Bird Sanctuaries, and high-value habitats, like Important Bird Areas, near the Project Study Area were also reviewed (see section 3.2). In addition to identifying historical occurrences, the desktop review generated a list of bird species that could possibly occupy the Project Study Area by comparing available habitat (analyzed using aerial imagery) with habitat requirements for species with overlapping ranges. Range maps and habitat information were derived from field guides, peer-reviewed literature, and other authoritative sources (e.g. Billerman et al., 2022).

5.2.2 Field Surveys

Two rounds of bird surveys were conducted within the Project Study Area and in the surrounding marine and terrestrial areas. The first round of bird surveys was conducted between July 3 and 11, 2024, concurrent with the vegetation surveys. The timing of this survey coincides with the peak of the regional nesting period for migratory birds in the Arctic Plains and Mountains Nesting Zone, which occurs from late May to mid-August (ECCC, 2018). Area searches were conducted within the Project Study Area and five marine bird observation points were surveyed to capture distant birds and those in the marine environment (see Figure 5.1, Appendix A). A second round of bird surveys was conducted concurrent with the marine environment surveys, which occurred on September 31 to November 4, 2024. During this round, an area search was conducted within the Project Study Area and all five marine observation survey locations were re-visited. Additional searches were conducted during the marine environment surveys via boat.

During both rounds of surveys, all birds heard or observed were recorded and individuals were monitored for the duration of the surveys in order to limit double counting. Binoculars and a spotting scope were used to aid the detection and identification of distant birds.

5.3 Results

5.3.1 Desktop Results

5.3.1.1 Migratory, Marine, and Other Birds Likely to be Present

In total, at least 86 bird species have the potential to be present in the region, with 13 species identified as likely to nest within or near the Project Study Area based on suitable habitat and breeding season patterns, see Table 5.1 in Appendix B. The possible breeding species include American Pipit (*Anthus rubescens*), Arctic Tern (*Sterna paradisaea*), Baird's Sandpiper (*Calidris bairdii*), Common Raven (*Corvus corax*), Common Redpoll (*Acanthis flammea*), Hoary Redpoll (*Acanthis hornemanni*), Horned Lark (*Eremophila alpestris*), Lapland Longspur (*Calcarius lapponicus*), Northern Wheatear (*Oenanthe Oenanthe*), Purple Sandpiper (*Calidris maritima*), Rock Ptarmigan (*Lagopus muta*), Ruddy Turnstone (*Arenaria interpres*), and Snow Bunting (*Plectrophenax nivalis*).

Traditional knowledge information about birds indicates that areas near Qikiqtarjuaq support nesting for gulls (*Larus* spp.) and murre, likely referring to Thick-billed Murre (*Uria lomvia*).

5.3.1.2 Species at Risk

The review of the Species at Risk Public Registry found six bird SAR occurring in Nunavut. A summary of the SAR and their federal and territorial statuses is provided in section 3.1.

Bird SAR that may be found near Qikiqtarjuaq and the Project site include Buff-breasted Sandpiper (*Calidris subruficollis*), Short-eared Owl (*Asio flammeus*), Ivory Gull (*Pagophila eburnean*), Red Knot *rufa* subspecies (*Calidris canutus rufa*), Red-necked Phalarope (*Phalaropus lobatus*), and Ross's Gull (*Rhodostethia rosea*). While these species might be present during migration or outside the breeding season, they are unlikely to nest within or near the Project Study Areas, suggesting that this area does not provide suitable habitat to sustain their populations. Further explanation for this assessment is provided below.

The Buff-breasted Sandpiper breeds in the dry, open tundra of the high Arctic, primarily in the western parts of Canada. It prefers grassy areas with sparse vegetation, often near wet meadows but is not known to breed on Baffin Island (COSEWIC, 2012). During migration, it travels through the central flyway of North and South America. It is possible the species may stop over in or near the Project Study Area to forage during migration.

In Canada, Short-eared Owl breeds in open grasslands, tundra, and marshes. It nests on the ground, favoring areas with tall grasses or low vegetation that provide cover. On Baffin Island, it is known to breed only in the northwest part of the island near Bylot Island (COSEWIC, 2021a). During migration and winter, it moves to more temperate regions of southern Canada to Mexico. It is possible the species may forage for small mammal prey in or near the Project Study Area during dispersal and migration.

The Red Knot breeds in the high Arctic tundra nesting on dry, barren habitats often near wetlands. The Project Study Area is outside of its current known breeding range and the species has not been recorded breeding near Broughton Island or on the Cumberland Peninsula (COSEWIC, 2020). It is possible that the Project Study Area could support breeding as one of its preferred nesting habitats (prostrate dwarf-shrub tundra) is present. It is also possible that the species may stop over in or near the Project Study Area to forage during migration as it relies on coastal areas as stopover sites.

The Red-necked Phalarope breeds in the Arctic and sub-Arctic tundra, preferring wet habitats such as ponds, lakes, and marshy meadows where it nests on the ground near water. The Project Study area and the entire Cumberland Peninsula is outside of its known breeding range, and it is thought that this species is uncommon to rare breeder in the Canadian Arctic Archipelago (COSEWIC, 2014). It is possible that the species may stop over in or near the coastal waters of the Project Study Area during migration.

Ross's Gull has a limited breeding range in the high Arctic, with only one to three known breeding colonies of less than 20 mature individuals in Canada (COSEWIC, 2021b). It is not known to breed on Baffin Island. After breeding, it migrates to sea, wintering in the open waters of the Davis Strait and Labrador Sea favoring regions with sea ice. It is possible the species may stop over in or near the coastal waters of the Project Study Area during migration.

5.3.2 Field Results

Sixteen bird species were observed during the two rounds of surveys, including Common Raven, Glaucous Gull (*Larus hyperboreus*), Iceland Gull (*Larus glaucoides*), Snow Bunting, Horned Lark, American Pipit, Red-throated Loon (*Gavia stellata*), Canada Goose (*Branta canadensis*), Great Black-backed Gull (*Larus marinus*), Lapland Longspur, Purple Sandpiper, Peregrine Falcon (*Falco peregrinus*), Black Guillemot (*Cephus grille*), Black-legged Kittiwake (*Rissa tridactyla*), Snowy Owl (*Bubo scandiacus*) detected via a moulted feather, and ptarmigan (likely Rock Ptarmigan, based on species range) detected via scat and possibly an egg (see Table 5.1).

During the first round of surveys breeding behaviour was observed for three species in Qikiqtarjuaq and the Project Study Area: Horned Lark, American Pipit, and Snow Bunting. A pair of Horned Lark was observed carrying food on July 4 in the area near the deep-water port, see Figure 5.1 (Appendix A). Effort was made to locate a nest or young following the observation of Horned Lark carrying food. No nests or young were observed within the Project Study Area, but it is likely that the birds nested within it or nearby. American Pipit and Snow Bunting were observed singing in possible breeding habitat at various locations in the Project Study Area and in the surrounding terrestrial areas including within the Hamlet of Qikiqtarjuaq.

A Snowy Owl feather was also found on the tundra within the Project Study Area, indicating the presence of this species.

Table 5.1 Bird Species Observed During the Two Rounds of Surveys in 2024.

Common Name	Scientific Name	Nunavut Rank	Breeding evidence
Horned Lark	<i>Eremophila alpestris</i>	S4B	Carrying food
American Pipit	<i>Anthus rubescens</i>	S5B	Singing
Glaucous Gull	<i>Larus hyperboreus</i>	S4B,SUN	
Snow Bunting	<i>Plectrophenax nivalis</i>	S3S4B	Singing
Common Raven	<i>Corvus corax</i>	S5	
Red-throated Loon	<i>Gavia stellata</i>	S4B	
Rock Ptarmigan	<i>Lagopus muta</i>	S5	
Canada Goose	<i>Branta canadensis</i>	S5B	
Great Black-backed Gull	<i>Larus marinus</i>	SUB	
Iceland Gull	<i>Larus glaucoides</i>	S5B,SUN	

Common Name	Scientific Name	Nunavut Rank	Breeding evidence
Lapland Longspur	<i>Calcarius lapponicus</i>	S5B	
Purple Sandpiper	<i>Calidris maritima</i>	S3B	
Peregrine Falcon	<i>Falco peregrinus</i>	S4B	
Black Guillemot	<i>Cephus grille</i>	S5B,S5N	
Black-legged Kittiwake	<i>Rissa tridactyla</i>	S5B	
Snowy Owl	<i>Bubo scandiacus</i>	S4	

6 Terrestrial Fauna

6.1 Objectives

The objective of the terrestrial fauna study was to determine the presence of terrestrial wildlife species and their habitat occurring or possibly occurring within the Project Study Area. A desktop review was conducted to inform the field program, identify data gaps, and focus efforts on completing a comprehensive baseline study of the Project area's wildlife and habitats. The field survey focused on identifying terrestrial wildlife species, as well as their habitat features within the Project Study Area. Polar Bears primarily inhabit sea ice and depend significantly on marine environments for their food; therefore, this species is discussed in the Marine Environmental Baseline report (CBCL, 2024).

6.2 Methodology

6.2.1 Desktop and Literature Review

A desktop review of literature and databases was conducted to identify species and habitats with historical occurrences near the Project site. A list of species potentially occupying the Project Study Area was developed by comparing available habitat using with habitat requirements for species whose ranges overlap with the Project site. Range maps and habitat data were sourced from publicly available data, peer-reviewed literature, and other reports including:

- ▶ Publicly available observation datasets:
 - inaturalist.ca
- ▶ Species at Risk Public Registry, Species List for Nunavut (Species at Risk Public Registry, 2024).
- ▶ Territorial Government reports and databases:
 - Nunavut Wildlife Harvest Study (Priest and Usher, 2004)
 - Recommended Nunavut Land Use Plan (NPC, 2023)
 - Draft Nunavut Land Use Plan (NPC, 2021)
- ▶ Environmental reports for other development projects:
 - Clyde River Small Craft Harbour Development (CBCL, 2021)
 - Government of Nunavut Iqaluit Marine Infrastructure (Advisian, 2018)

Terrestrial wildlife occurrences were based primarily on Priest and Usher (2004), range maps, habitat needs, traditional knowledge information and habitat mapping.

6.2.2 Field Surveys

Surveys for terrestrial wildlife and their habitat was conducted in two rounds concurrent with terrestrial and marine environment surveys in July and September. Habitats within the Project Study Area and in the surrounding marine and terrestrial areas. Area searches were conducted within the Project Study Area. Additional searches were conducted during the marine environment surveys via boat. Surveys methodology included actively searching for signs of wildlife activity including scat, browse, tracks, and remains.

6.3 Results

6.3.1 Desktop and Literature Review

Nine terrestrial mammal species are known to occur or possibly occur in the Project Study Area (Table 6.1). Species identified that may occur at include Brown Lemming (*Lemmus trimucronatus*), Peary Land Collared Lemming (*Dicrostonyx groenlandicus*), Arctic Hare (*Lepus arcticus*), Arctic Fox (*Alopex lagopus*), Red Fox or Coloured Fox (*Vulpes vulpes*), Wolf (*Canis lupus*), Wolverine (*Gulo gulo*), and Barren-ground Caribou (*Rangifer tarandus groenlandicus*).

Table 6.1 Terrestrial Wildlife that may Occur in the Project Study Area. Asterisk (*) denotes SAR.

Common Name	Scientific Name	Habitat
Wolverine*	<i>Gulo gulo</i>	Inhabits remote alpine tundra and boreal forests, where they require large territories for hunting and denning
Barren-ground Caribou*	<i>Rangifer tarandus groenlandicus</i>	Open tundra ecosystems with abundant lichen and moss, including areas with ridges that remain snow-free and provide shelter.
Brown Lemming	<i>Lemmus trimucronatus</i>	Prefers wet tundra habitats with dense grasses and sedges.
Peary Land Collared Lemming	<i>Dicrostonyx groenlandicus</i>	Dry tundra with low vegetation cover and abundant rocky terrain
Arctic Hare	<i>Lepus arcticus</i>	Favours areas with low shrubs, willows, and dense snow cover for protection from predators and foraging
Arctic Fox	<i>Alopex lagopus</i>	Various tundra habitats from coastal regions to the interior. Dens are made in the ground or under snow for breeding and shelter.
Red Fox or Coloured Fox	<i>Vulpes</i>	Inhabits tundra and coastal areas. They are opportunistic feeders and can thrive in diverse habitats, including areas impacted by human activity.
Wolf	<i>Canis lupus</i>	They require expansive territories to find sufficient food forming packs and hunting large herbivores like caribou.

Common Name	Scientific Name	Habitat
Ermine	<i>Mustela ermine</i>	Inhabits tundra and forest edges dependant on prey availability

Two SAR have ranges that overlap with the Project site. A summary of the SAR and their conservation statuses is provided in Table 3.1.

Based on the desktop review, vegetation surveys and traditional knowledge gathering, the species that are likely to occur within the Project Study Area include lemming species (*Lemmus trimucronatus* or *Dicrostonyx groenlandicus*), Arctic Hare, and Ermine (*Mustela ermine*). It is possible that the area could support one pair or family unit of either Red Fox (*Vulpes vulpes*) or Arctic Fox (*Vulpes lagopus*). The occurrence of Wolverine is unlikely, and if present, would likely be transient. The historical range for Barren-ground Caribou may have overlapped with the Project Study Area; the current core Baffin Island subpopulation of this species lies approximately 200 km to the south of Broughton Island (COSEWIC, 2016). In addition, it was indicated from local community members and during the traditional knowledge meetings that caribou harvests have been made across Broughton Channel but not from Qikiqtarjuaq or within the Project site.

6.3.2 Field Results

No direct observations of terrestrial wildlife were observed during either round of field surveys. Signs of wildlife identified or detected during the survey rounds included lemming species, Arctic Hare, and possibly Ermine, all detected via scat, see Figure 6.1 and 6.2 (Appendix A).

Signs of use of the Project Study Area by hunters was observed including a whale carcass and a caribou jawbone. The Project site is likely used as a hauling in site for hunters coming in off the water of the Broughton Channel where game is processed on shore.

A number of terrestrial invertebrates were observed in the Project Study Area during the field surveys including spiders, flies (including a crane fly), and a butterfly (likely Melissa Arctic, *Oeneis melissa*).

7 Baseline Noise Assessment

7.1 Objectives

The objective of the baseline noise assessment was to obtain preliminary data on existing baseline noise levels within the hamlet of Qikiqtarjuaq and in the Project Study Area.

7.2 Methodology

7.2.1 Desktop Review

Airborne noise is generated by both natural and anthropogenic sources. Natural sources include wind, waves, ice movements (e.g., cracking and grinding), mammals, and birds. Noise levels in Qikiqtarjuaq are presumed to be typical of a small remote hamlet as there are no major continuous industrial operations that generate noise. One exception is the local airport, where departing and arriving aircraft produce considerable noise periodically. Anthropogenic sources include vehicles (e.g., trucks, all terrain vehicles, snowmobiles), boats, construction, non-industrial machinery, aircraft, and blasting/excavation at the quarry. Given the size and remoteness of the hamlet, the most dominant source of airborne noise would be from natural sources, particularly during stormy or excessively windy days. Noise during summer months when the Bay is mostly ice free is expected to be louder than winter months, as ice tends to reduce the sounds generated from waves, though few studies have been conducted to validate this impression.

Noise data specific to the Project Area was not available. However, a Strategic Environmental Assessment document prepared for the Baffin Bay/Davis Strait area indicated that typical airborne noise measurements are 20 A-weighted decibels (dBA) in wilderness areas where there is minimal noise, to between 50 and 70 dBA in townsites during the day, to greater than 120 dBA close to an aircraft during take off (Nunami Stantec, 2018).

7.2.2 Field Surveys

A handheld noise meter was used to record baseline noise levels at various locations around the hamlet and in the Project Study Area during the terrestrial survey visit from July 4 to 11, 2024. The surveys aimed to collect three monitoring periods a day, each three to five minutes long, however this was not always possible when construction noise was present. A Larson Davis LxT1 handheld noise monitor was used, which was calibrated

before each monitoring period. Sound levels were measured at several locations within the hamlet, though most were measured at the Tulagak Inn, as it was a central location and fairly representative of the baseline noise activity of the hamlet.

7.3 Results

Due to a technical issue, no data was recorded on July 4. Three monitoring sessions a day were not often possible due to frequent construction activities along the road. Table 7.1 provides the results of the monitoring sessions.

Table 7.1 Noise Monitoring Results from July 4 to 11, 2024 in Qikiqtarjuaq

Location	Date	Start Time	Duration	LAeq (dB)	LASmax (dB)	LASmin (dB)	Sounds noted
Tulagak Inn	2024-07-04	<i>NO FILES-TECHNICAL ISSUE</i>					NA
Tulagak Inn	2024-07-05	9:02:30 AM	03:02.1	47.4	53.5	45.1	Dogs, kids
Town Dump	2024-07-05	9:52:43 AM	03:06.6	48	45.3	48	Ravens,
Picnic Table along Dump Road	2024-07-05	10:21:01 AM	03:07.1	42.2	44.3	41.2	Flowing water, wind, people
Cemetery	2024-07-05	10:42:10 AM	03:03.6	37.4	51.2	33.4	Traffic, wind
Gravel pad along access road	2024-07-05	10:58:48 AM	03:02.5	61.4	71.6	47	
Quarry	2024-07-06	3:10:54 PM	03:04.9	43.4	62.1	39.6	Watercourse, people
Tulagak Inn	2024-07-06	3:50:13 PM	03:03.6	52.1	68.5	41.3	
Tulagak Inn	2024-07-06	7:10:46 PM	05:05.1	46.4	61.9	43.2	
Fuel storage Tank	2024-07-07	9:27:40 AM	05:02.2	48.3	66.2	31.6	
Tulagak Inn	2024-07-08	9:03:32 AM	05:01.8	51.8	58.6	35.1	Dogs, truck
Tulagak Inn	2024-07-08	6:26:29 PM	05:27.3	54.1	70.8	38.1	
Tulagak Inn	2024-07-09	9:18:12 AM	05:19.2	44.5	61.8	37.4	Restaurant, traffic, kids
Tulagak Inn	2024-07-09	4:15:12 PM	05:04.7	50.8	73.7	35.1	
Tulagak Inn	2024-07-09	7:29:56 PM	05:07.0	54.2	67.4	39.9	Loud excited dogs, wind, waves

Location	Date	Start Time	Duration	LAeq (dB)	LASmax (dB)	LASmin (dB)	Sounds noted
Tulugak Inn	2024-07-10	9:36:40 AM	05:09.6	50.8	72.4	36.8	Delivery truck, dogs, breeze, traffic
Tulugak Inn	2024-07-10	1:51:37 PM	05:07.1	50.1	65.9	40.9	Dogs, traffic
Tulugak Inn	2024-07-11	8:00:44 AM	05:08.7	41.8	47.5	37.6	Construction noise, dogs, vehicles

LASmax : A-weighted, slow response, maximum, sound level

LASmin : A-weighted, slow response, minimum, sound level

As shown in Table 7.1, the sound levels recorded generally fall within the range stated by Nunami Stantec (2018) for a town within the Baffin Bay/Davis Strait area.

8 Summary of Key Findings

8.1 SAR

Nine terrestrial SAR have the potential to be present in the Project Study Area, but the likelihood of occurrence for these species is quite low. It is possible that three of the six bird SAR could be present in the Project Study Area or the Project site during migration or non-breeding periods. No SAR was identified during field surveys and habitat values are generally low, especially for the Project site to provide breeding habitat for these species.

8.2 Vegetation

The field study of the Project Study Area identified typical, common vegetation communities of bioclimate subzone C of the Baffin Island Coastal Lowland Ecoregion in the Arctic Cordillera Ecozone. The area contained regionally common plant species and has low potential for rare plant habitat. The vegetation community classification identified four communities within the Project Study Area: Rocky and Sandy Beach Shoreline (RSB), Dwarf Shrub Tundra (DST), Upland Rocky Slope (URS), Upland Bedrock (UPB), Disturbed (DIS), with the most common being the DST and DIS communities.

The Project Study Area, particularly the area near the port infrastructure, is an area of traditional use including berry picking. The DST community contained the most berry producing plants used plants, including blueberry.

Porsild's Bryum was the only at-risk plant identified in the Species at Risk Public Registry, though no individuals or suitable habitats were found during field surveys.

8.3 Birds

The Project Study Area offers limited habitat value for most breeding migratory and marine birds. The upland dwarf shrub and rocky slope habitats may support nesting for species like Snow Buntings, Lapland Longspurs, and American Pipit. A pair of Lapland Longspurs carrying food indicate that this species breeds in or near the Project Study Area. Other migratory birds may use the Project site for foraging during migration or as a stop over site.

Marine birds are unlikely to nest near the Project site, as most prefer remote cliffs and islands. A number of marine bird species could use intertidal and nearshore habitats near the Project and nearby waters for foraging, during migration and other ice-free periods.

8.4 Terrestrial Fauna

Habitat within the Project Study Area offers some value for smaller terrestrial wildlife such as lemmings, Arctic Hare, and Ermine. In particular the dwarf shrub and rocky slope habitats provide foraging and cover for these small mammals.

For larger mammals, including SAR (Wolverine and caribou) habitat quality is low and it is unlikely the Project study Area provides much suitable habitat for these species.

8.5 Noise

Existing sound levels recorded during the July 2023 site visit generally fall within the range predicted by Nunami Stantec (2018) for a town within the Baffin Bay/Davis Strait area.

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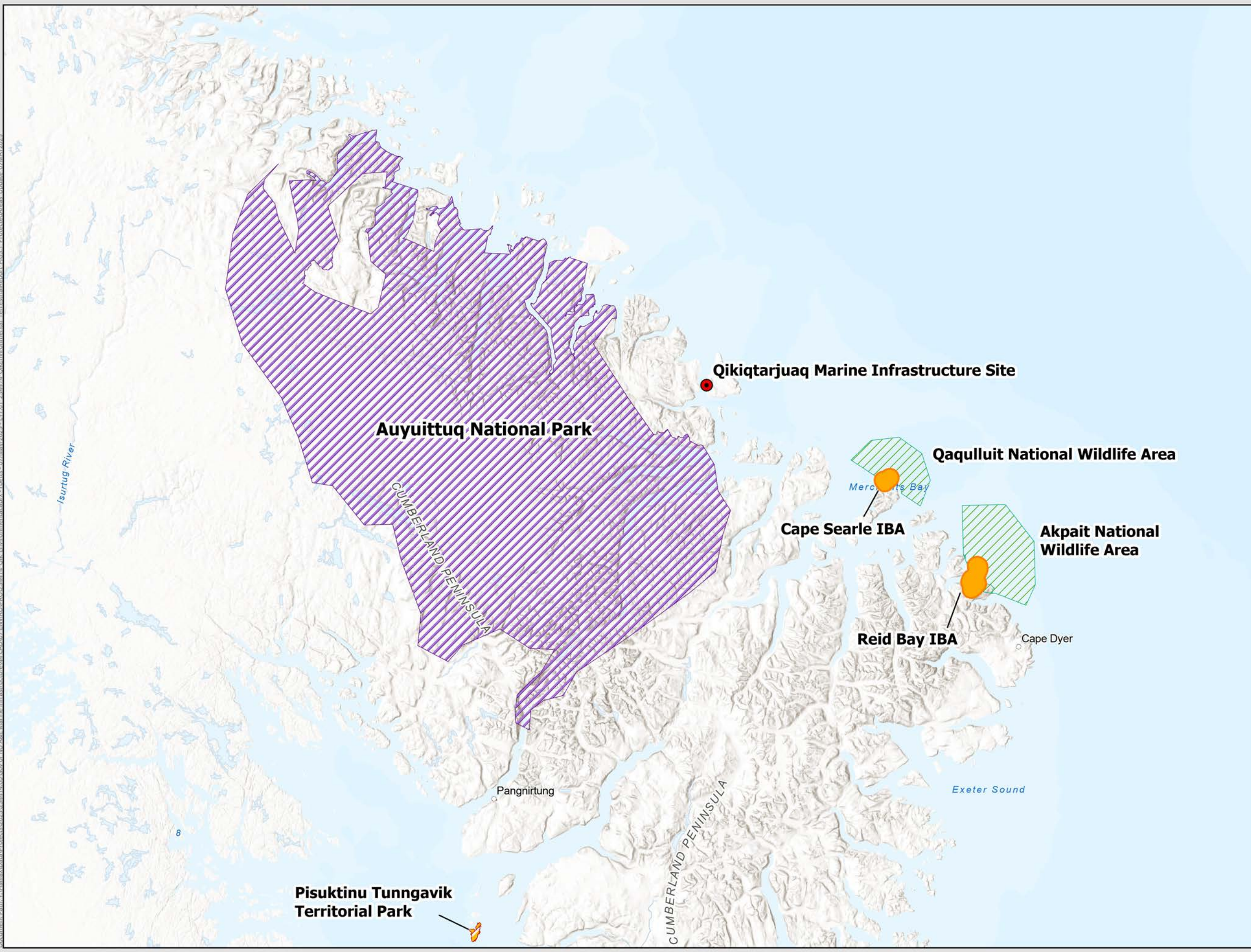
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Appendix A

Figures

Document Path: \\HalifaxData\Projects\2023\234414.00_Gov of NU\A&E Marine Infrastructure\44 CAD\07 ENVI\PROJ\234414_OH_Environmental\acx-rbctts-07\Map\2025-1\VT\01_234414_OH_Environmental_TerritorialReport_FIG3.1_ProtectedAreas_Update_07MAY2025



- LEGEND**
- Qikiqtarjuaq Marine Infrastructure Site
 - Important Bird Area
 - National Park
 - Territorial Park
 - Other Protected Area

NOTES:



**QIKIQTARJUAQ
MARINE INFRASTRUCTURE**

**Protected and Ecologically
Important Areas**

DATE: 2025-05-07	PROJ N°: 234414.00	FIGURE 3.1
DRAWN BY: SF	CHECKED BY: BC/SR	APPROVED: LH
SCALE: 1:1,330,000 Units: Metre		Coordinate System: NAD 1983 UTM Zone 20N
0 12,500 25,000 50,000 m		

Document Path: \\HalifaxData\Projects\2023\234414.00 Gov of NU & E Marine Infrastructure\44 CAD\07 ENVI\BRO\234414_01_Environmental\arx - fbctis - 07May2025 - 1\VT\01_234414_01\Environmental_Terrestrial\Report_FIG6.2_WildlifeObservations_Undrte_07MAY2025



- LEGEND**
- ■ ■ Access Road
 - Project Study Area
 - Marine Terminal
- Wildlife Observations**
- American Pipit singing
 - Arctic Hare scat
 - Caribou jawbone
 - Ermine scat
 - Goose scat
 - Horned Lark carrying food
 - Horned Lark pair
 - Lemming scat
 - Ptarmigan scat
 - Snow Bunting singing
 - Snowy Owl feather
 - Whale bones
 - Whale carcass

NOTES:



**QIKIQTARJUAQ
MARINE INFRASTRUCTURE**

Wildlife Observations

DATE: 2025-05-07	PROJ N°: 234414.00	FIGURE 6.2
DRAWN BY: SF/RB	CHECKED BY: SR	APPROVED: LH
SCALE: 1:2,200 Units: Metres		Coordinate System: NAD 1983 UTM Zone 20N
0 25 50 100 m		

Appendix B

Avian Species Likely to Occur

Table 1. Migratory, Marine, and Other Birds with Possibility to Occur

Common Name	Scientific Name	NU Rank	Likelihood of Occurrence	Justification
American Pipit	<i>Anthus rubescens</i>	S5B	Likley - Breeding and Migration	Breeds in dry tundra and grassy meadows
Arctic Tern	<i>Sterna paradisaea</i>	S4B	Likley - Breeding and Migration	Breeds in coastal and tundra areas, often near water.
Baird's Sandpiper	<i>Calidris bairdii</i>	S5B	Likley - Breeding and Migration	Breeds on dry, stony tundra.
Common Redpoll	<i>Acanthis flammea</i>	S5B	Likley - Breeding and Migration	Breeds on dry heaths and rocky slopes
Hoary Redpoll	<i>Acanthis hornemanni</i>	S3	Likley - Breeding and Migration	Breeds on dry heaths and rocky slopes
Horned Lark	<i>Eremophila alpestris</i>	S4B	Likley - Breeding and Migration	Breeds on sparsely vegetated areas
Lapland Longspur	<i>Calcarius lapponicus</i>	S5B	Likley - Breeding and Migration	Breeds in wet meadows and hummocky ground
Northern Wheatear	<i>Oenanthe oenanthe</i>	S4B	Likley - Breeding and Migration	Breeds in dry tundra with rocky outcrops
Purple Sandpiper	<i>Calidris maritima</i>	S3B	Likley - Breeding and Migration	Breeds on low tundra and gravel-sand beaches of rivers
Ruddy Turnstone	<i>Arenaria interpres</i>	S3B	Likley - Breeding and Migration	Breeds on marshy slopes and flats in lowlands and foothills
Snow Bunting	<i>Plectrophenax nivalis</i>	S3S4B	Likley - Breeding and Migration	Nests in rock cavities, cracks and fissures in boulder scree near vegetated tundra
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	S5B	Likley - Breeding and Migration	Breeds on low tundra often near water
Black-bellied Plover	<i>Pluvialis squatarola</i>	S3S4B	Likley - Breeding and Migration	Prefers dry, open tundra for breeding.
Iceland Gull	<i>Larus glaucooides</i>	S5B,SUN	Likley - Breeding and Migration	Breeds on coastal cliffs, not likley to breed in Project Area
King Eider	<i>Somateria spectabilis</i>	S3S4B,SUN	Likley - Breeding and Migration	Breeds in vegetated tundra often close to ponds, not likley to breed in Project Area
Long-tailed Duck	<i>Clangula hyemalis</i>	S4B,SUN	Likley - Breeding and Migration	Breeds in tundra wetlands close to freshwater, not likley to breed near Project but could be present in coastal waters during breeding and migration periods
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	S5B	Likley - Breeding and Migration	Breeds on tundra far from coastal water, not likley to breed near Project but could be present in coastal waters during breeding and migration periods
Northern Fulmar	<i>Fulmarus glacialis</i>	S4B	Likley - Breeding and Migration	Breeds on coastal cliffs, not likley to breed near Project but could be present in coastal waters during breeding and migration periods
Peregrine Falcon	<i>Falco peregrinus</i>	S4B	Likley - Breeding and Migration	Nests on cliffs and ledges, not likley to breed in Project Area
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	S4B	Likley - Breeding and Migration	Nests on wet costal tundra with marhy areas and small lakes, not likley to breed in Project Area
Red-breasted Merganser	<i>Mergus serrator</i>	S5B	Likley - Breeding and Migration	Nests in wetlands with sheltered bays, typically not far from a seacoast, not likley to breed in Project Area
Common Eider	<i>Somateria mollissima</i>	S3B,S3N	Likley - Breeding and Migration	Breeds on small coastal islands. Possible breeding on small islands near Project.
Ross's Goose	<i>Anser rossii</i>	S5B	Likley - Breeding and Migration	Breeds in low tundra with lots of grasses and sedges. No historical records near Project.
Sandhill Crane	<i>Antigone canadensis</i>	S5B	Likley - Breeding and Migration	In the arctic can breed in tundra habitats, no records near the Project
Semipalmated Plover	<i>Charadrius semipalmatus</i>	S5B	Likley - Breeding and Migration	Nests in well-drained, gravel or shale areas, not likley to breed in the Project Area
Red-throated Loon	<i>Gavia stellata</i>	S4B	Likley - Breeding and Migration	Breeds in low lying wetlands, not likley to breed in the Project Area
Snowy Owl	<i>Bubo scandiacus</i>	S4B,SUN	Likley - Breeding and Migration	Breeds in wide-open expanses of tundra, not likley to breed in the Project Area
Thick-billed Murre	<i>Uria lomvia</i>	S4S5B,S4S5N	Likley - Breeding and Migration	Breeds on cliffs and ledges, not likley to breed in the Project Area
Common Raven	<i>Corvus corax</i>	S5	Likley - Breeding and Year Round	Nests in cliffs and rocky areas.
Rock Ptarmigan	<i>Lagopus muta</i>	S5	Likley - Breeding and Year Round	Breeds in dry and rocky tundra
Glaucous Gull	<i>Larus hyperboreus</i>	S4B,SUN	Likley - Breeding and Year Round	Breeds on cliff ledges or islands in lakes and rivers, not likley to breed in Project Area

Table 1. Migratory, Marine, and Other Birds with Possibility to Occur

Common Name	Scientific Name	NU Rank	Likelihood of Occurrence	Justification
Gyr Falcon	<i>Falco rusticolus</i>	S4	Likely - Breeding and Year Round	Nests on cliffs and ledges, not likely to breed in Project Area
Black Guillemot	<i>Cephus grylle</i>	S5B,S5N	Likely - Breeding, Migration and Overwinter	Breeds on rocky coastlines and islands. Unlikely to breed near the Project, may be present in open ocean during non-breeding periods.
Common Ringed Plover	<i>Charadrius hiaticula</i>	S4B	Likely - Migration	Outside mapped breeding range, may be present in open tundra and coastal areas during migration.
Dovekie	<i>Alle alle</i>	S3B,S4M	Likely - Migration	Outside mapped breeding range, may be present in coastal waters during migration.
Black-legged Kittiwake	<i>Rissa tridactyla</i>	S5B	Likely - Migration	Colonies on cliff ledges of off-shore islands or inaccessible mainland. Unlikely to breed near the Project, may be present in open ocean during non-breeding periods.
Ivory Gull	<i>Pagophila eburnea</i>	S1B,S1N	Likely - Non-breeding	Outside mapped breeding range, may be present in non-breeding periods.
Common Nighthawk	<i>Chordeiles minor</i>	S2B	Unlikely	Outside mapped breeding range.
Eskimo Curlew	<i>Numenius borealis</i>	S1B	Unlikely	Outside of known breeding range, sightings are extremely rare.
American Golden-Plover	<i>Pluvialis dominica</i>	S3S4B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal areas during migration.
Atlantic Puffin	<i>Fratercula arctica</i>	S3B	Unlikely - Migration	Outside mapped breeding range and is unlikely to breed near the Project, may be present in open ocean during non-breeding periods.
Brant	<i>Branta bernicla</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal areas during migration.
Buff-breasted Sandpiper	<i>Calidris subruficollis</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present in open tundra and coastal areas during migration.
Cackling Goose	<i>Branta hutchinsii</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in open tundra during migration.
Canada Goose	<i>Branta canadensis</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in open tundra during migration.
Common Loon	<i>Gavia immer</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in open waters during migration.
Common Merganser	<i>Mergus merganser</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in open waters during migration.
Dark-eyed Junco	<i>Junco hyemalis</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Dunlin	<i>Calidris alpina</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Greater Scaup	<i>Aythya marila</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in open water during migration.
Greater White-fronted Goose	<i>Anser albifrons</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Green-winged Teal	<i>Anas crecca</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Harlequin Duck	<i>Histrionicus histrionicus</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present in open water during migration.
Sabine's Gull	<i>Xema sabini</i>	S4S5B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal waters during migration.
Sanderling	<i>Calidris alba</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present in open vegetated or coastal areas during migration.
Pacific Loon	<i>Gavia pacifica</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in marine waters near Project during breeding and migration.
Harris's Sparrow	<i>Zonotrichia querula</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Herring Gull	<i>Larus argentatus</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.

Table 1. Migratory, Marine, and Other Birds with Possibility to Occur

Common Name	Scientific Name	NU Rank	Likelihood of Occurrence	Justification
Least Sandpiper	<i>Calidris minutilla</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Lesser Yellowlegs	<i>Tringa flavipes</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Mallard	<i>Anas platyrhynchos</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Northern Pintail	<i>Anas acuta</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Pectoral Sandpiper	<i>Calidris melanotos</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Red Knot	<i>Calidris canutus</i>	S2B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Red Phalarope	<i>Phalaropus fulicarius</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal waters during migration.
Red-necked Phalarope	<i>Phalaropus lobatus</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal waters during migration.
Ross's Gull	<i>Rhodostethia rosea</i>	S1B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Rough-legged Hawk	<i>Buteo lagopus</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Semipalmated Sandpiper	<i>Calidris pusilla</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Short-eared Owl	<i>Asio flammeus</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Snow Goose	<i>Anser caerulescens</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Stilt Sandpiper	<i>Calidris himantopus</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Tundra Swan	<i>Cygnus columbianus</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Whimbrel	<i>Numenius phaeopus</i>	S3B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
White-winged Scoter	<i>Melanitta deglandi</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present in coastal waters during migration.
Willow Ptarmigan	<i>Lagopus lagopus</i>	S5	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Wilson's Snipe	<i>Gallinago delicata</i>	S5B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Yellow Rail	<i>Coturnicops noveboracensis</i>	S3B	Unlikely - Migration	Outside mapped breeding range, unlikely during migration.
Yellow Warbler	<i>Setophaga petechia</i>	S5B	Unlikely - Migration	Outside mapped breeding range, unlikely during migration.
Yellow-billed Loon	<i>Gavia adamsii</i>	S4B	Unlikely - Migration	Outside mapped breeding range, may be present during migration.
Hudsonian Godwit	<i>Limosa haemastica</i>	S3B	Unlikley	Outside mapped breeding range, no records for Baffin Island
Northern Harrier	<i>Circus hudsonius</i>	S5B	Unlikley	Outside mapped breeding range, no records for Baffin Island