Appendix 17A

Birds Baseline Report

Grays Bay Road and Port Project
Birds Baseline Report

Prepared for:

West Kitikmeot Resources Corp
PO Box 6, 30B Mitik Street
Cambridge Bay, NU X0B 0C0

Prepared by:

EDI Environmental Dynamics Inc.
2195 – 2nd Avenue
Whitehorse, YT Y1A 3T8

March 2026

Project No. 24Y0376

WEST KITIKMEOT RESOURCES CORP

Sign-off

This Report titled Grays Bay Road and Port Project: Birds Baseline Report was prepared and reviewed by the following:

Prepared by: Eveling Tavera Fernandez
Signature

Eveling Tavera Fernandez, PhD, RPBio
EDI Environmental Dynamics Inc.
Printed Name

Reviewed by: Denis Dean
Signature

Denis Dean, BSc, P. Biol., RPBio
EDI Environmental Dynamics Inc.
Printed Name

Kim Poole
Signature

Kim Poole (AWR), M.Sc., RPBio, CWB
Printed Name

M Setterington
Signature

Mike Setterington, MSc, RPBio, CWB
EDI Environmental Dynamics Inc.
Printed Name

Table of Contents

List of Tables

List of Figures

List of Photos

Abbreviations

ARU ..... automated recording unit
asl ..... above sea level
CBC ..... Christmas Bird Count
COSEWIC ..... Committee on the Status of Endangered Wildlife in Canada
CWS ..... Canadian Wildlife Service
DDT ..... Dichlorodiphenyltrichloroethane
DEIS ..... Draft Environmental Impact Statement
ECCC ..... Environment and Climate Change Canada
ECCC-CWS ..... Environment and Climate Change Canada, Canadian Wildlife Service
ELC ..... Ecological Land Classification
GIS ..... Geographic Information System
GN ..... Government of Nunavut
GN-DOE ..... Government of Nunavut, Department of Environment
GNWT ..... Government of Northwest Territories
GNWT-ENR ..... Government of Northwest Territories, Environment and Natural Resources
GOC ..... Government of Canada
GPS ..... global positioning system
HTO ..... Hunters and Trapper's Organization
IAG ..... Inuit Advisory Group
LSA ..... Local Study Area
NT ..... Northwest Territories
NTKP ..... Naonaiyaotit Traditional Knowledge Project
NU ..... Nunavut
PDA ..... Project Development Area
PRISM ..... Program for Regional and International Shorebird Monitoring
Project, the ..... Grays Bay Road and Port Project
RSA ..... Regional Study Area
SARA ..... *Species at Risk Act*

SD .....standard deviation

SE..... standard error

WKR .....West Kitikmeot Resources Corp.

Symbols and Units of Measure

% ..... percent

< .....less than

> .....greater than

± .....plus or minus

≥ .....greater than or equal to

°C ..... degree Celsius

cm..... centimetre

ha ..... hectare

km..... kilometre

km/hr ..... kilometre per hour

km^2 ..... square kilometre

m ..... metre

Glossary

Term	Definition
Anthropogenic	Human-related refers to an activity, development, or disturbance on the landscape.
Brood	Young hatched from a single clutch of eggs.
Clutch	All the eggs within a single nest over a single incubation period.
Confidence interval (CI)	A range of values defined so that there is a specified probability that a given parameter falls within that range; used to indicate the reliability of an estimate.
Cover class	A description of vegetation and site physiography used in habitat cover mapping.
Dabbling Ducks	A group of freshwater ducks that typically feed in shallow waters by “dabbling” along the water's surface or by tipping headfirst into the water.
Diving Ducks	A group of ducks typically feeds by diving underwater for food.
Esker	Linear surface land structures of loose sand and gravel formed by glacial rivers.
Fledge/Fledgling	The stage in a young bird’s development where feather and muscle development are sufficient to allow the bird to make its first flight. A young bird that has made its first flight from the nest but is not yet independent of its parents.
Glaciofluvial deposit	Material, often sand and small rocks but ranging in size from clay particles to boulders, has been transported, sorted, and deposited by meltwater from glaciers or inland ice sheets. Generally, eskers or terraces.
Graminoid	All grasses and grass-like plants, including sedges and rushes.
High Lake area	General geographic area between and surrounding the High Lake mine and Grays Bay.
Incubation	The process during which adult birds sit on the nest to maintain adequate temperatures for the embryos (in the eggs) to develop and hatch.
Indicated (Species/Density)	An estimate of the number of birds present on a survey assumes that female birds are sitting on nests and may not be visible to surveyors.

Term	Definition
Izok area	General geographic area between and surrounding the Izok and Lupin mines.
Local Study Area (LSA)	Only developed for marine studies—encompasses Grays Bay and the surrounding waters.
Marine Birds	A generic reference to birds that habitually frequent marine environments and may include seabirds, waterfowl, waterbirds, and shorebird species.
Moulting	The process by which a bird replaces all or some of its feathers.
Nestling	A bird that is too young to leave its nest.
Occupancy	Territorial birds present in and defending a breeding territory (in this case, it applies to raptors).
Occupied Site	A nest site where a single or pair of adults displaying territorial behaviour during the nesting season was observed, or where eggs or young were observed.
Pack ice	Any sea ice area that is not landfast (the latter being ice adjacent to land).
Passerines	The group of birds belonging to the order Passeriformes, sometimes referred to as perching birds, or less accurately, as songbirds.
Pelagic	Of or relating to the open sea, beyond the influence of either the mainland or the ocean bottom. Pelagic birds prefer marine habitats beyond the coastal areas and only visit land to breed.
Production	The total number of young fledged or raised to an advanced stage of development from all productive sites.
Productive Site	A nest site where at least one nestling reaches an advanced stage of development (>25 days of age) and was known or assumed to have fledged.
Productivity	The mean number of known or assumed fledged young per occupied site.
Project footprint	Immediate area of direct physical disturbance associated with the construction and operation of the Project.
Project region	A general term referring to the broader geographic area surrounding the Project.

Term	Definition
Raptors	The group of birds referred to as birds of prey includes hawks, eagles, falcons, and their relatives. For this report, ravens are grouped as 'functional raptors' because they nest on cliffs, interact with raptors to establish nesting territories, and build stick nests that raptors can use for nesting.
Regional Study Area (RSA)	A geographic area within which field surveys were completed.
Sample size (n)	The number of observations or samples (e.g., counts, individuals) in a study.
SARA Schedule 1	Under the federal *Species at Risk Act (*SARA), Canada's official list of species at risk includes species that are Extirpated, Endangered, Threatened, or of Special Concern.
Seabirds	Birds that occupy saltwater environments during large portions of their annual cycle; includes pelagic birds and sea ducks.
Sea ducks	A group of diving ducks that live in marine environments for most of the year but may nest in inland habitats.
Shorebirds	A group of bird species frequently (but not always) associated with shorelines and/or shallow waters; includes members of the Scolopacidae and Charadriidae families.
Staging Area	A resting and feeding location along a migration route; birds will stay in a staging area briefly to rest and refuel before continuing migration.
Standard deviation (SD)	A measure of the spread or dispersion of a set of data, calculated by taking the square root of the variance (average of squared differences from the mean).
Standard error (SE)	A measure of the statistical accuracy of an estimate, calculated as the standard deviation divided by the square root of the number of observations.
Terrestrial Birds	For this report, a generic reference to birds that frequent environments within the terrestrial RSA may include raptors, waterfowl, upland game birds, passerine, and shorebird species.
Territory	An area used by a pair of breeding birds containing one or more nest sites used by a single pair of birds, in which the pair will defend against other members of the same species.
The Project	Grays Bay Road and Port Project.

Term	Definition
Treeline	The edge of the habitat at which trees are capable of growing. In the Arctic, the treeline is a transitional zone.
Tundra Breeding Birds	A term referring to birds that nest on the Arctic tundra, not including raptors, waterfowl, or waterbirds. Passerines are typical of this category; however, shorebirds and upland game birds are also included. Except for some ptarmigan, birds in this group are seasonal migrants. Sometimes referred to as upland breeding birds.
Upland Game Birds	In this report, any bird hunted for sport or food refers to gallinaceous birds (e.g., grouse, sandhill crane).
Waterbirds	A generic reference to birds that habitually frequent fresh or salt water, this report refers to species associated with water but not in the category of waterfowl or shorebirds; specifically, loons, gulls, terns, jaegers, and cranes.
Waterfowl	A group of birds that includes members of the family Anatidae: ducks, geese, and swans (but not loons).

1 Introduction

West Kitikmeot Resources Corp. (WKR) is an Inuit-owned, Inuit-led company focused on the advancement of the Grays Bay Road and Port Project (the Project) in the Kitikmeot Region of Nunavut (NU). WKR's largest shareholder is a wholly owned subsidiary of the Kitikmeot Inuit Association. The Project is proposed as a multi-user, multi-use transportation infrastructure to be located on a combination of Inuit-owned land and Crown land in the Kitikmeot Region of western NU. Subject to approval, the Project would establish the first deep water port in the Canadian Central Arctic at Grays Bay (*Kogloktoakyok*) and a 230-kilometre (km) all-season controlled access road between Grays Bay and Jericho station near Contwoyto Lake (*Tahikyoak*). The Project will connect to the approved Tibbitt to Contwoyto Winter Road. The multi-user, multi-use Project would allow for the establishment of shared infrastructure with many potential users, including federal and territorial governments, communities, community members, resource companies, and defence agencies.

1.1 Study Purpose and Objectives

This report, henceforth referred to as a baseline study, characterizes the status of the marine and terrestrial bird (*kopanoak*) populations that potentially interact with the Project. Specific objectives of this baseline study include:

- Determine species' occurrence, distribution, and abundance.
- Document the presence of any species at risk.
- Determine the seasonal occurrence and habitat requirements of migrating and breeding species.

1.2 Overview of Ecological Conditions in the Project Region

The Project is in a region classified as the Low Arctic tundra within the Takijua Lake Upland Ecoregion of the Southern Arctic Ecozone. This site lies above the treeline, with elevations ranging from sea level to over 700 metres (m) above sea level (asl) at Contwoyto Lake. The lowlands are dominated by numerous lakes, rivers, and streams, which are surrounded by broad, sloping uplands and plateaus, interspersed with bedrock outcrops and rugged ridges. The terrain becomes increasingly rugged in the north, approaching the Coronation Gulf and the Arctic Ocean. Vegetation throughout the area is characterized by shrub tundra, consisting of dwarf birch (*Betula nana*), willow (*Salix arctica*), northern Labrador tea (*Rhododendron tomentosum*), lichens, *Dryas* spp., and *Vaccinium* spp. (Government of Canada (GOC) 2024).

The granitic bedrock underlying the region is part of the northern edge of the Bear Slave Upland on the Canadian Shield. Glaciation by the Wisconsinan Laurentide Ice Sheet was the major influence in forming the characteristic rugged terrain typical of well-glaciated shield topography. The Project also lies within the zone of continuous permafrost, meaning the ground is permanently frozen throughout the year. The permafrost is estimated to extend to a depth of 500 m below the surface. During the warmer summer months, the uppermost layer of sediment thaws, resulting in an active layer varying in depth from less than 1.5 m in clay sediments to over 2.0 m in sand and gravel deposits.

Vegetation in the area is adapted to survive long, cold, and dry winters and a short growing season of about four months. Cold, nutrient-poor soils and the thin active layer restrict plant growth. Willows, dwarf birch, heaths, sedges, cotton grasses, mosses, and lichens are prominent and well-adapted to this environment. Dominant vegetation types on drier sites include bedrock exposures with high lichen cover and heath tundra of low evergreen shrubs. Lichens proliferate on glacio-fluvial outwash surfaces. In lower areas, where water collects and flows on top of the permafrost boundary, tussock sedge tundra and low shrublands occur. Wet sedge meadows and tall riparian shrublands grow when water levels are at the surface.

Marine habitats associated with the Project are located within the Arctic Archipelago Marine Ecozone. This region encompasses a patchwork of interconnecting bays, fjords, channels, straits, sounds, and gulfs. Typical water depths within this Ecozone are 150 m to 500 m (Environment and Climate Change Canada (ECCC) 2013). Coastlines vary considerably from steep fjords and cliffs to flat or rolling coastal plains. In winter, sea ice forms a solid ice sheet over the Ecozone, except in localized areas where currents and upwellings create pockets of open water, known as polynyas. In the summer, sea ice will break up and either melt or drift away; however, some ice can persist throughout the year, particularly in the northwestern parts of this Ecozone (ECCC 2013).

The climate in this region consists of long, cold, and dark winters and short, cool summers with continuous daylight. The mean monthly air temperatures range from approximately -30 degree Celsius (°C) in January and February to 10°C in July (ECCC 2013). Weather and seasonal timing vary, but snow melt typically begins around mid-May. Ice-free conditions usually occur in early June for small lakes and in late June or early July for larger lakes. Along the Arctic coast, landfast ice generally begins to break up and melt in June (High Lake Draft Environmental Impact Statement [DEIS], Volume 5). The mean monthly air temperatures are usually above freezing for June, July, August, and early September. By late September or October, the ice begins to form again.

1.3 Study Areas

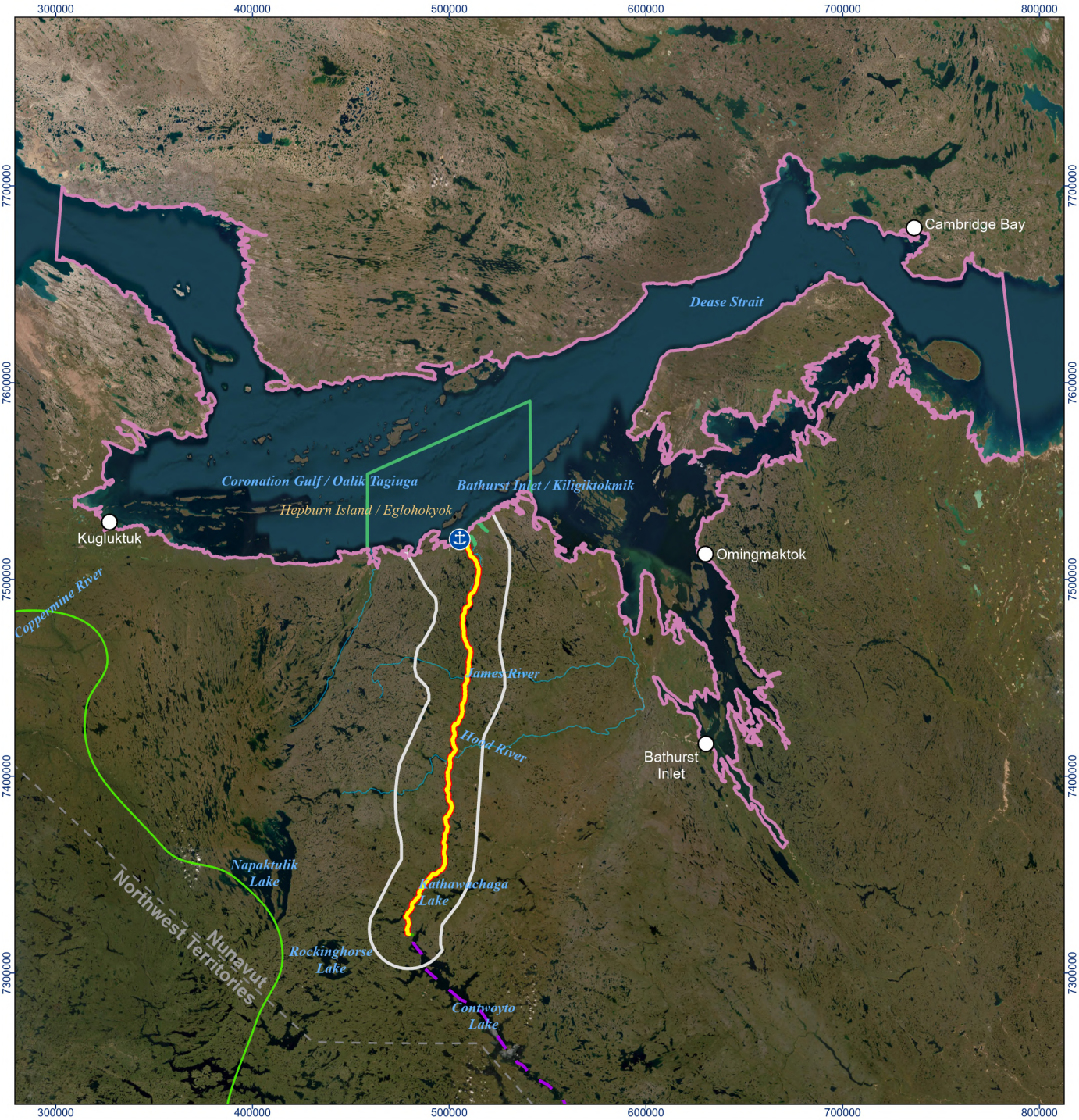
Due to the inherent differences in studying terrestrial and marine birds, separate study areas were delineated for terrestrial and marine bird studies. Where available, Inuit place names and terms are provided in brackets the first time they occur in the report.

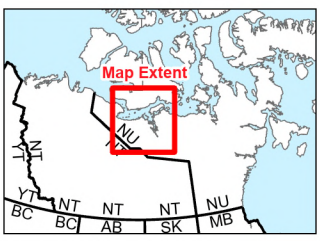
1.3.1 Terrestrial

The terrestrial Regional Study Area (RSA) for birds is where terrestrial bird baseline studies were completed. The extension of this area was based on the expected scope of potential effects that the Project might have on terrestrial bird species, including areas beyond any zones of expected effects. The terrestrial RSA was altered several times since studies began in 2004 to accommodate changes in the Project's goals. The terrestrial RSA is 8,757 square kilometres (km²) and includes the Project Development Area (PDA) and a 20 km buffer (see Figure 1.1). The extent of the terrestrial RSA for birds is different than the RSA used for other terrestrial disciplines (e.g., wildlife and vegetation). Therefore, some baseline field surveys were restricted to a smaller area within the RSA.

1.3.2 Marine

Baseline field surveys for marine birds were completed at two scales: the marine Local Study Area (LSA) and the marine RSA. The marine LSA is 3,900 km²; it includes marine habitats within approximately 50 km of the Grays Bay Port (see Figure 1.1), and it was used for more intensive surveys near Grays Bay Port. For contextual purposes, a marine RSA (43,991 km²) is also shown in Figure 1.1 and encompasses a broader area within the Coronation Gulf (*Oalik Tagiuga*), Bathurst Inlet (*Kiligiktokmik*), Dease Strait, and southern sections of the Dolphin and Union Strait.





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N

2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Grays Bay Winter Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)
- Marine Local Study Area (LSA)
- Marine Regional Study Area (RSA)

0 40 80 Kilometres

(At original document size of 8.5x11) 1:3,000,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376

West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
1.1

Title
Grays Bay Road and Port Project Study Areas for Birds

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig1-1_StudyAreaOverview_20260218; Revised: 2026-02-18 By: OliviaLeblanc

2 Data Sources and Methods

The development of this baseline report involved collecting and collating information from several data sources, including Inuit Knowledge, species accounts, regional surveys and other regional literature, discussions with regional biologists, field surveys, and habitat classification and modelling for select species.

Previous Studies

Since the early 2000s, the Project has been examined by former proponents under two separate project descriptions: the High Lake Project and the Izok (Corridor) Project. The High Lake area was the focus from 2004 to 2008, while studies that included the Izok Project area were initiated in 2007. The current Project focuses only on developing the Grays Bay Road and Port. However, baseline data incorporated into this report includes both Project-specific Inuit Knowledge collection and field survey data and reflects the bird baseline studies completed intermittently since 2004. Some previous studies included areas outside the current Project RSA. Therefore, for this report, data outside of the current RSA were removed from Project-focused data summaries; however, as this information is valuable, regional-level details are included throughout this document, where applicable, for contextual purposes.

An inquiry was made to Environment and Climate Change Canada (ECCC) for any supplemental information or programs for analyzing automated recording unit (ARU) data from Arctic birds. The ECCC did not have any additional information or specific programs for analyzing ARU data (Rausch 2025).

2.1 Selection of Indicator Species

The Project Terrestrial and Marine RSAs contain many bird species that occupy a wide range of habitats. These species are categorized and grouped based on their behavioural and habitat use characteristics. Species groups referenced in this report include:

- Seabirds, waterfowl, and waterbirds (see Section 4) — includes bird species that habitually frequent fresh or saltwater habitats. Seabirds refer to bird species that occupy saltwater environments for large portions of the year and include both pelagic birds (i.e., birds that frequent the deep waters of the open ocean and only visit land to nest) and sea ducks (i.e., waterfowl that live in marine environments for most of the year but may nest in inland habitats; includes eiders, scoters, goldeneyes, bufflehead [*aahanngiq*; *Bucephala albeola*], long-tailed duck [*ahangik*; *Calangula hyemalis*], and mergansers). Waterfowl refers to members of the family Anatidae and includes ducks, geese, and swans; some of these species are associated with saltwater environments for most of the year, while others can be associated with either fresh or saltwater habitats. Waterbirds are birds associated with water but not grouped as either waterfowl or shorebirds; they include gulls, terns, jaegers, loons, and cranes. Given the overlapping habitat requirements, most species are expected in the terrestrial and marine study areas, and some of the pelagic species are likely found in open ocean outside of the RSA.

- Raptors (see Section 5) — generally called birds of prey; includes hawks, eagles, falcons, owls, and their relatives. Discussion of raptors within this report further divides the species group into cliff-nesting raptors and ground-nesting raptors based on their nesting characteristics. Raptors were studied within the terrestrial RSA.
- Tundra breeding birds (see Section 6) — refers to birds that nest on the Arctic tundra; includes passerines (i.e., songbirds), shorebirds, and upland game birds (i.e., ptarmigan) and does not include raptors, seabirds, waterfowl, or waterbirds. Baseline studies for tundra breeding birds focused on the terrestrial RSA, although some species, particularly shorebird species, may also interact with marine habitats.

This baseline report also identified certain species as indicator species, anticipating the Project's requirements for an Impact Statement. Indicator species were selected based on conservation status, input from Inuit Knowledge studies, regional biologists, field observations, and the professional judgment of Project biologists. While all species found are described in this report, the indicator species are discussed in greater detail, with some used for habitat suitability modelling. The indicator species and a brief description of the rationale for their selection are provided in Table 2.1.

Table 2.1 Indicator Species and Rationale for Selection for the Project Bird Baseline Characterization

Indicator Species	Species Group	Rationale for Selection
Long-tailed duck (*ahangik*)	Waterfowl (in the terrestrial RSA)	• Listed as a 'Sensitive' species within Nunavut (Canadian Endangered Species Conservation Council 2011). • The most detected waterfowl/waterbird species within the terrestrial RSA.
Shorebirds	Shorebirds (Tundra Breeding Birds)	• As a group, shorebirds are a source of conservation concern due to accelerating population declines (Smith et al. 2023). • High-value shorebird habitat (i.e., wetlands) is limited in the terrestrial RSA.
Lapland longspur (*nahaoliit*/*nahaolik; Calcarius lapponicus*)	Passerines (Tundra Breeding Birds)	• One of the most detected songbird species during field studies. • Species was a key indicator in other environmental assessments within Nunavut.
Common eider (*amaolik*/*hogluktuk*; *Somateria mollissima*)	Seabirds (in the marine RSA)	• Although not listed under COSEWIC or SARA, the common eider is considered a 'Sensitive' species within Nunavut (Canadian Endangered Species Conservation Council 2011) and is a species of regional concern due to significant population declines between the mid-1970s and mid-1990s (Suydam et al. 2000). • Species are well-studied within the western Arctic, and detailed ecological information for the region is available.

2.2 Inuit Knowledge, Indigenous Knowledge, and Community Knowledge

A review of published and publicly available Inuit Knowledge was completed. The main sources include:

- Nunavut Atlas (Riewe 1992)
- Inuit Land Use and Occupancy Project (Freeman 1976)
- The Nunavut Wildlife Harvest Study (Priest and Usher 2004)
- Naonaiyaotit Traditional Knowledge Project (NTKP) 2018. Cartographic material, transcripts, quotes, placenames, and photos. Proprietary ArcGIS 10.5 Geodatabase and associated textual and photographic databases. Kitikmeot Inuit Association, Kugluktuk, NU (NTKP 2018)
- Kitikmiut Knowledge of the Proposed Kogloktoakyok (Grays Bay) Port and Road Project – final Report (Banci and Spicker 2024)

In addition to the published Inuit Knowledge and Traditional Knowledge sources, Community Knowledge was also collected to support the Project. Wildlife and birds Community Knowledge was collected during the following meetings, workshops, and interviews:

- Preliminary meetings about the Izok Corridor and High Lake projects with board and staff members of the Kitikmeot Inuit Association and with a land's representative of the Tłı̨chǫ government — November 2007
- Meetings with the Kugluktuk Hunters and Trapper's Organization (HTO) and the Government of Nunavut Department of Environment (GN-DOE) regarding field programs for both Izok Corridor and High Lake projects — January 2008
- Meetings in Kugluktuk, including the economic development officer, junior staff at the HTO and Kitikmeot Inuit Association, the Elder Centre, and the school principal — August 2011
- Regular update meetings with the mayor of Kugluktuk and Cambridge Bay and with the HTOs in the Kitikmeot Region
- Site visit by the Kugluktuk HTO — August 2012
- Meeting with the Cambridge Bay HTO board and Elders in Cambridge Bay — September 2012
- Meetings with staff of the institutes of public government, the Government of Nunavut (GN), the Government of Northwest Territories (GNWT), and other stakeholder groups in the Northwest Territories (NT) — September and October 2012
- Community visits, open houses, and interactions with high school students in five communities in the Kitikmeot Region (Kugluktuk, Cambridge Bay, Taloyoak, Gjoa Haven, and Kugaaruk) — September and October 2012
- Meeting and Inuit Knowledge workshop with Elders and community members in Gjoa Haven and from surrounding eastern Kitikmeot communities
- Project engagement with NT outfitters, Government of Northwest Territories-Environment and Natural Resources (GNWT-ENR), Yellowknives Dene First Nation, and Tłı̨chǫ Kwe Beh Working Group in Yellowknife — January 2013

- Meeting and Inuit Knowledge workshop with Elders and community members from Inuvialuit Settlement Region communities (Aklavik, Inuvik, Sachs Harbour, Paulatuk, Ulukhaktok), Kugluktuk HTO and Cambridge Bay HTO in Cambridge Bay — March 2013 (Thorpe Consulting Services Ltd. 2014)
- Grays Bay Engineering & Environmental Consultants (GBEEC). Grays Bay Road and Port Project Inuit Knowledge Workshop #1: March 2018
- Grays Bay Road and Port Project What We Heard Report - Inuit Advisory Group Workshop #1 Summary (Inuit Advisory Group March (IAG) 2025) (IAG 2025)
- Grays Bay Road and Port Project 2024-2025 Engagement
- Site visit by the Kugluktuk HTO — August 2025
- Grays Bay Road and Port Project What We Heard Report - Inuit Advisory Group Workshop #2 Summary (Inuit Advisory Group September 2025)
- Public Scoping and Impact Statement Guidelines Meetings Summary Report (Nunavut Impact Review Board 2025a, 2025b)

2.3 Literature Review

The literature review focused on bird studies in the West Kitikmeot Region. This included regional-level studies completed by government organizations such as ECCC, Canadian Wildlife Service (ECCC-CWS), the U.S. Fish and Wildlife Service, GN-DOE, GNWT-ENR, and other research bodies and academic institutions. Species-specific reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) are available online. Regional biologists from the GN and ECCC-CWS assisted in designing field studies and compiling baseline information.

2.4 Field Studies

Project-specific bird surveys were completed to provide information on the presence and absence of species and habitat use within the terrestrial and marine RSAs.

Bird species are diverse and occupy a wide range of habitats. Therefore, field studies typically focus on specific species groups (see Section 2.1). Field studies in the terrestrial RSA included aerial and ground-based surveys for seabirds, waterfowl, waterbirds, raptors, and tundra breeding birds (see Table 2.2). Field studies within the marine RSA focused on seabird species and included aerial and ground-based surveys (see Table 2.3).

Table 2.2 Terrestrial Bird Field Surveys

Year	Dates	Target Species Group	Survey Type	Location in Terrestrial RSA
2004	July 10–21	Cliff-nesting raptors	Aerial occupancy	Northern half of the RSA[1]
	July 10–21	Tundra breeding birds	Transect	Northern half of the RSA
	July 10–21	Inland waterfowl	Informal waterfowl	Northern half of the RSA
2005	June 12–13	Cliff-nesting raptors	Aerial occupancy	Northern half of the RSA[2]
2006	June 12–13	Cliff-nesting raptors	Aerial occupancy	Northern half of the RSA[3]
	August 1–4	Cliff-nesting raptors	Aerial productivity	Northern half of the RSA[3]
2007	August 5–6	Cliff-nesting raptors	Aerial productivity	Southern half of the RSA[4]
2008	June 6–13	Cliff-nesting raptors	Aerial occupancy	Entire RSA[5]
	June 18–July 1	Tundra breeding birds	Survey plots	Entire RSA
	July 9–11	Inland waterfowl	Aerial waterfowl	Southern half of the RSA
	August 1–5	Cliff-nesting raptors	Aerial productivity	Entire RSA[5]
2012	June 7–8, 13–14	Cliff-nesting raptors	Aerial occupancy	Entire RSA[6]
	June 22–July 9	Tundra breeding birds	PRISM plots	Entire RSA
	June 28–30	Inland waterfowl	Aerial waterfowl	Entire RSA
	July 2–3*	Seabirds and shorebirds	Ground nest	Northern RSA (shoreline only)
	July 26–29	Cliff-nesting raptors	Aerial productivity	Entire RSA
2025	April–August	Tundra breeding birds, shorebirds	ARUs	Entire RSA (mainly along the road route)
2025	June 11–18	Shorebirds, seabirds, and waterfowl	Ground transects	Grays Bay Port site and aerodrome

Notes:

ARU = automated recording unit; PRISM = Program for Regional and International Shorebird Monitoring; RSA = regional study area

* Both marine and terrestrial surveys

1 Raptor surveys in 2004 covered a 2,400 km² study area in the north,
2 Raptor surveys in 2005 covered a 1,000 km² study area in the north,
3 Raptor surveys in 2006 covered a 2,500 km² area, between Grays Bay and Ulu in the north.
4 Raptor surveys in 2007 covered 110 km² south of Jericho
5 Raptor surveys in 2008 covered ~4,500 km² the entire length of the terrestrial RSA
6 Raptor surveys in 2012 covered ~4,250 km² the entire length of the terrestrial RSA.

Table 2.3 Marine Bird Field Surveys

Year	Dates	Target Species Group	Survey Type	Location in Marine RSA
2004	July 16–17	Seabirds and waterfowl	Aerial shoreline	Grays Bay coastline
	July	Seabirds and waterfowl	Scan	At each of four potential dock sites being considered in 2004
2008	June 28–30	Seabirds – particularly common eider	Aerial seabird (open lead)	Marine areas within 30 km of Grays Bay Port
	July 12–14	Seabirds – particularly common eider	Ground nest	Islands within 30 km of Grays Bay Port
	August 12–14	Seabirds	Aerial seabird (moulting)	Marine areas within 30 km Grays Bay Port
2012	July 2–3*	Seabirds and shorebirds	Ground nest	Grays Bay Port shoreline
	September 8–10, 12	Seabirds	Aerial seabird (fall staging)	Coronation Gulf and Dease Strait
2025	June 11-18	Seabirds, shorebirds, and waterfowl	Shoreline survey	Grays Bay Port and aerodrome shoreline

Notes:
RSA = regional study area
* Both marine and terrestrial surveys

2.4.1 Raptor Surveys

Raptor surveys were completed in the terrestrial RSA from 2004 to 2008 and in 2012 to document the distribution and characteristics of active breeding territories for cliff-nesting raptors. These typically consisted of two aerial surveys: one in early to mid-June to document nest site occupancy and another survey in late July or early August to document nest productivity. By early August, peregrine falcon (*kilgaviit*, *Falco peregrinus*) nestlings are three to four weeks of age and are assumed to fledge the nest (Steenhoff and Newton 2007). The phenology of breeding differs among species (Poole and Bromley 1988a), making the timing of the survey for other species not as accurate; for example, some gyrfalcon (*kiligavikpak*, *Falco rusticolus*) nestlings may have already fledged by late July, therefore, productivity for these species was assumed based on evidence at the nest. Occupancy surveys were completed in 2004, 2005, 2006, and 2012, and productivity surveys were completed in 2006, 2007, 2008, and 2012. Selected gyrfalcon sites were visited in April 2012, along with other field work to document early site occupancy.

Surveys were completed by helicopter within a 10 to 15-km-wide corridor surrounding the road alignment. Wider corridors were surveyed in the Grays Bay to High Lake area. The helicopter flew within 20 to 40 m of cliff faces and rock outcroppings at 50 to 100 kilometres per hour (km/hr). Three observers and the pilot looked for signs of nesting, including adults flushed from cliffs, nest platforms, whitewash, and orange lichen (*Xanthoria elegans*) growth on rocks. All nest sites that were located during previous surveys, historical nesting locations obtained from the GN raptor database, and all potential nesting cliffs in the survey area were also visited. Locations of any active nests or birds displaying territorial behaviour were recorded using a global positioning system (GPS) unit and given a unique nest identification. The nest and visit information verified for existing sites and recorded for new sites included: species in

attendance, type of nest structure (Poole and Bromley 1988a), height of nest above ground, height of cliff, aspect, overhang, number of adults present, content of nest (eggs or chicks), and estimated age of nestlings (CWS, unpubl. photos; K. Poole, unpubl. data). Photos were taken of selected sites. Additionally, the track file of the helicopter flight path was recorded to document the search area.

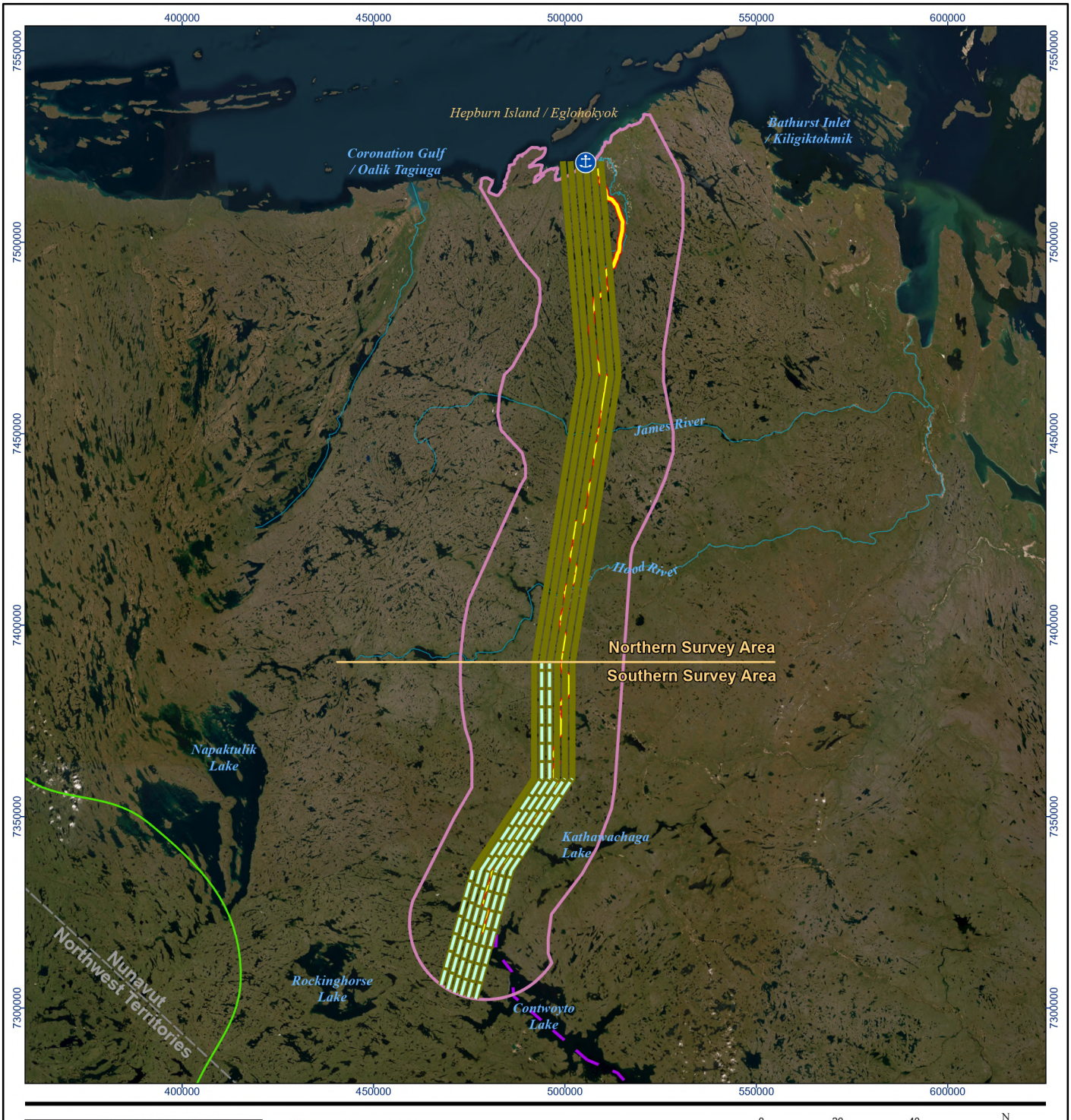
Raptor nesting success and productivity are discussed in the following terms (Poole and Bromley 1988a; Steenhoff and Newton 2007):

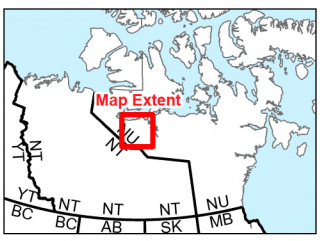
- ***Occupied site*** — a nest site where a single or pair of adults observed having territorial behaviour during the nesting season, or where eggs or chicks were observed.
- ***Territory*** — an area containing one or more nest sites within the range of a pair of breeders.
- ***Productive site*** — a nest site where at least one nestling was raised to an advanced stage of development (>25 days of age) and was known or assumed to have fledged.
- ***Nesting success*** — the proportion of occupied sites that were productive.
- ***Production*** — the total number of chicks fledged or raised to an advanced stage of development from all productive sites.
- ***Productivity*** — the mean number of known or assumed fledged chicks per occupied site.
- ***Brood Size*** — the number of chicks per productive site.
- ***Mean brood size*** — the mean number of nestlings among nest sites where complete counts occurred.

After the productivity survey, raptor sites and observations were classified and summarized by species and status.

2.4.2 Inland Waterfowl Surveys

Aerial surveys for inland waterfowl and other waterbirds were completed in 2008 and 2012 to document the abundance and breeding distribution of these groups of birds within the terrestrial RSA (see Table 2.4). The surveys consisted of a helicopter flying 45 m above ground along systematic transects spaced in 2 km intervals and covering an 8 km to 10 km corridor. The ground speeds ranged from 80 km/hr to 100 km/hr. All waterfowl observed within 200 m on either side of the helicopter were recorded. Information was collected on the species, age, sex, group size, and habitat type, and the location was documented with a GPS waypoint. Any waterfowl observed farther than 200 m from the helicopter and other wildlife species seen during the survey were noted as incidental observations. The 2008 survey was completed in mid-July and overlapped only the southernmost extent of the terrestrial RSA, whereas the 2012 survey took place in late June and encompassed the entire RSA. Figure 2.1 shows the location of the 2008 and 2012 inland waterfowl survey transects. Additionally, in 2004, informal aerial surveys were completed in the High Lake area (i.e., northern RSA) while crews were moving between survey locations during raptor and tundra breeding bird surveys.





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- 2008 Waterfowl Aerial Transect
- 2012 Waterfowl Aerial Transect
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

0 20 40 Kilometres
(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
2.1

Title
Aerial Inland Waterfowl Survey Transects in the Terrestrial RSA for the years 2008 and 2012

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig2-1_WaterfowlSeabirdSurveys_20260218; Revised: 2026-02-18 By: OliviaLeblanc

Table 2.4 Aerial Inland Waterfowl Survey Effort — 2008 and 2012

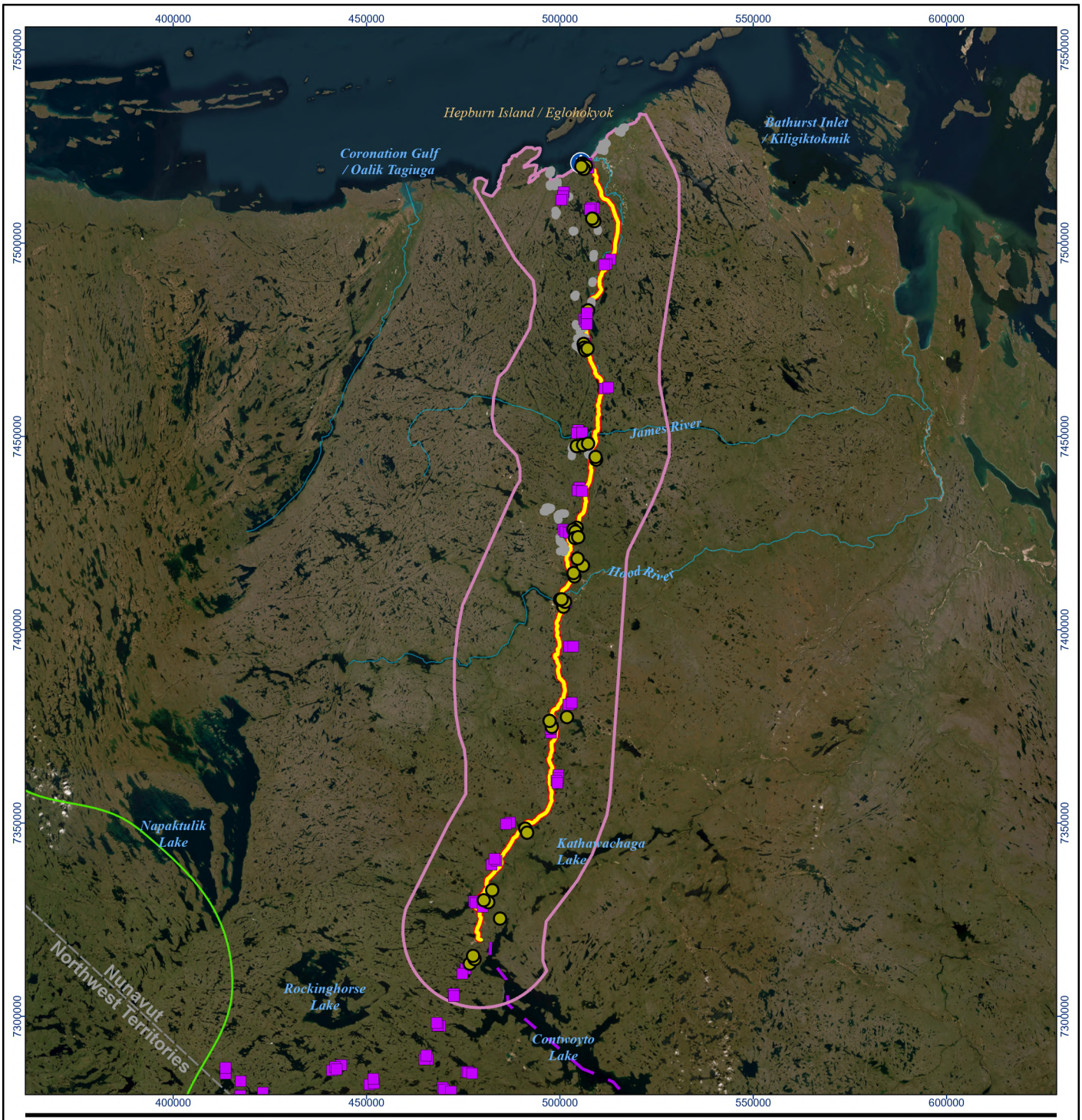
Year	Dates	Area Surveyed (transect length/total area)	Area Surveyed in Northern portion of the RSA (transect length/total area)	Area Surveyed in Southern portion of the RSA (transect length/total area)
2008	July 9–11	404 km / 161 km²	0	404 km / 161 km²
2012	June 28–30	1,346 km / 539 km²	612 km / 245 km²	734 km / 294 km²

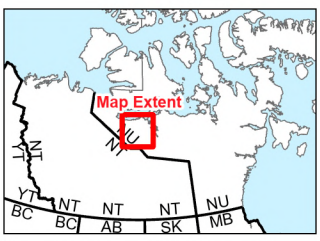
2.4.3 Tundra Breeding Bird Surveys

Tundra breeding bird surveys were completed in 2004, 2008, and 2012 to document abundance, distribution, and habitat use within the terrestrial RSA, especially of passerine, shorebird and upland game species. The 2004 surveys were restricted to High Lake and other northern parts of the terrestrial RSA, whereas the 2008 and 2012 surveys were completed along the length of the PDA. Figure 2.2 shows the location of the 2004, 2008, and 2012 tundra breeding bird surveys. Additional breeding bird surveys were completed in 2025 that focused primarily on the Port PDA and Aerodrome PDA, with some surveys along the Road PDA. As well, ARUs were deployed in 2025 to further document species occurrence, abundance, distribution, and habitat use within the terrestrial RSA; ARUs were deployed in the Port PDA, near the Aerodrome PDA, and along the Road PDA (see Figure 2.3).

2004 Field Surveys

The 2004 tundra breeding bird surveys employed belt transects as the methodology, which was adapted from Johnson et al. (2000) and Bibby et al. (1992). Two observers, 50 m apart, walked side by side and recorded all observed birds within the transect (25 m on either side of each observer) for a linear distance of 400 m. Birds observed outside of the transects were recorded separately as incidental observations. Habitat survey data were collected along each transect to survey various habitat types. A total of 134 transects were surveyed during July 2004 with the following distribution of transects: Grays Bay (34), Grays Bay to High Lake (28), High Lake mine site (33), High Lake to Ulu (6), and Ulu (31).





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- 2008/2012 PRISM Plots
- 2008 Breeding Bird Plot
- 2004 Tundra Breeding Bird Transects (groups)
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

0 20 40 Kilometres
(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

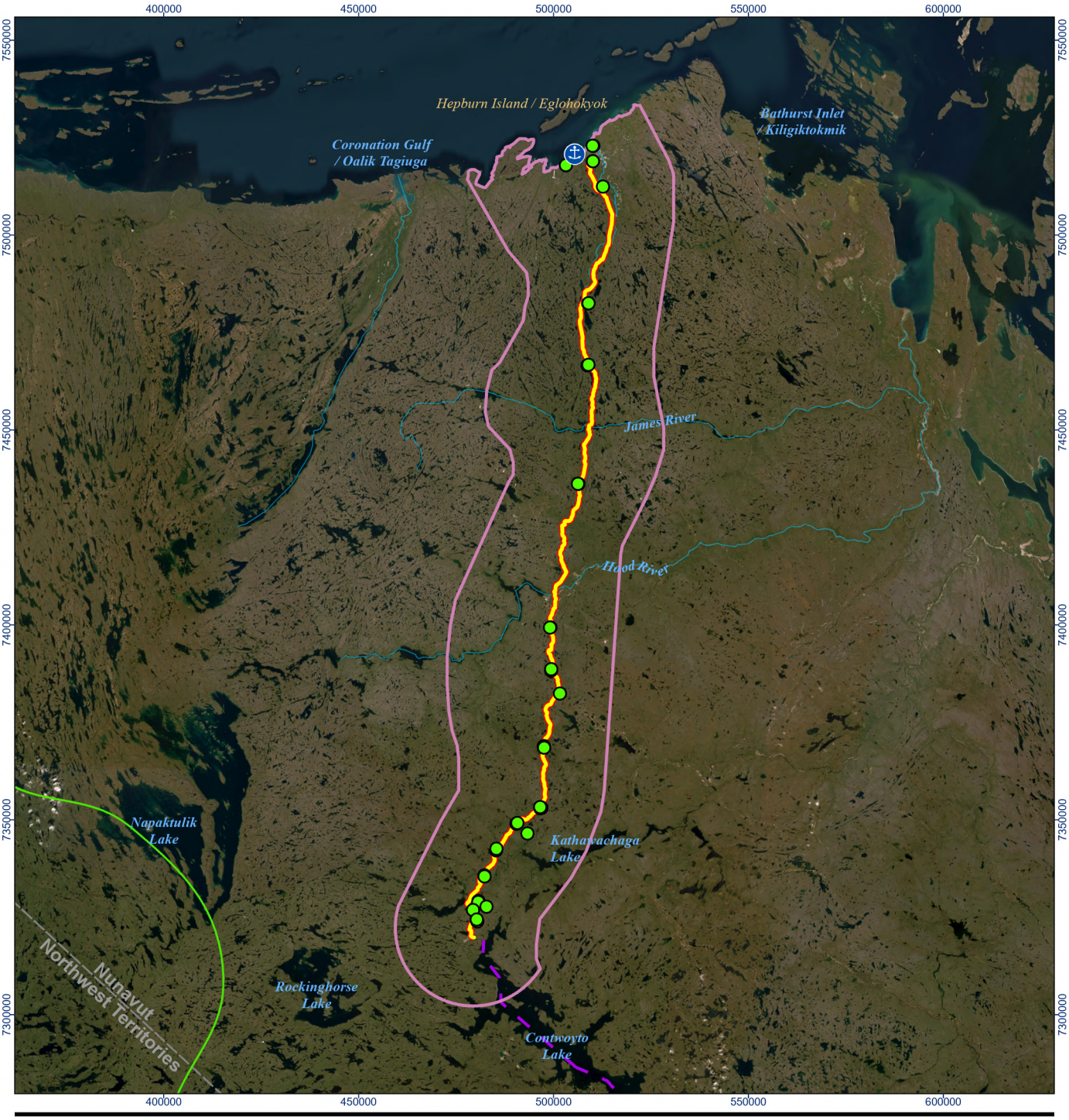
Prepared by OliviaLeblanc on 2026-02-18

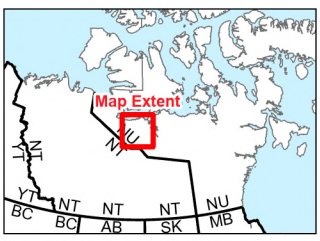
Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
2.2

Title
Tundra Breeding Bird Survey Locations in the RSA for the years 2004, 2008 and 2012

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig2-2_TundraBreedingBirdSurveyLocations_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- ARU Locations (2025)
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

0 20 40 Kilometres
(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
2.3

Title
Location of Automated Recording Units (ARUs) Deployed in the RSA in 2025

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig2-3_ARULocations_2025_20260218; Revised: 2026-02-18 By: OliviaLeblanc

2008 Field Surveys

The 2008 field surveys were a mixture of survey plots, ECCC-CWS Rapid Program for Regional and International Shorebird Monitoring (PRISM) plots, and transects. This involved completing survey plots and running transect surveys during walks between plots. Survey sites were selected to cover all the different habitat types present within the terrestrial RSA. A total of 21 plots and 7 transects were completed between mid-June and early July. Two PRISM plots were completed in 2008, following the same methods used for the 2012 field surveys.

The 2008 field survey plots followed a protocol developed by J. Obst (Arctic Ecology and Development Consulting) used at the Tundra Ecosystem Research Station in Daring Lake, NT. Survey plots were 400 m x 400 m (16 hectares [ha]) in size and were surveyed by two people, taking approximately 45 minutes. The assistant observer walked three sides of the boundary and marked plot corners and the 200 m mark (midpoint) of each plot side, while the primary observer walked to the 200 m mark of the fourth side, flagged it, and then walked to the centre of the plot. The primary observer spent 25 minutes at the plot centre, observing and recording all terrestrial birds. The primary observer then walked a 100 m radius around the plot centre. All terrestrial birds observed inside and outside the plot borders were marked on a plot diagram as pairs, singles, male or female, and flyovers. The primary and the assistant observers recorded all birds seen. At the end of the day, all the observations were compared to confirm the accuracy of data by the primary observer. The estimated distribution and proportions of habitat types or ecosystem units were also sketched on a plot diagram using standardized habitat grouping.

Transect surveys were completed when the observers travelled between plots. Transects varied between 400 m to 800 m long. The survey area covered approximately 100 m on each side of the transect. All birds observed were recorded and marked as inside or outside the transect.

2012 Field Surveys

The 2012 field survey methods for tundra breeding birds were modified due to ECCC-CWS concerns that the incidence of uncommon shorebird species potentially present in the RSA were not being captured sufficiently by the 2008 survey methods. Therefore, the 2012 field surveys were based on the Rapid Plot PRISM method (Canadian Wildlife Service 2008). PRISM is a comprehensive program for monitoring shorebirds in Canada and the United States. PRISM was designed to document and monitor the size of shorebird populations and describe the distribution, abundance, and habitat relationships of shorebird species (Canadian Wildlife Service 2008). Although developed for shorebirds, the PRISM method has proven to be an effective survey method for nearly all breeding bird species in tundra environments, including passerine and upland game birds.

A total of 81 PRISM plots were surveyed between June 22 and July 9, 2012. Plot locations were selected before field surveys based on available vegetation mapping for the RSA. Vegetation units were classed as high, moderate, or low potential for shorebird species based on CWS habitat suitability, and plots were then selected to make sure sampling covered each of the vegetation units and habitat classes present.

The PRISM surveys covered the entire RSA and areas outside it, including the Izok Corridor Project to the southwest. Of the 81 PRISM plots, 53 were located within the RSA, and 28 were located outside the RSA. The data gathered from the 28 plots located outside the RSA were retained to assist in determining additional species that may be found within the RSA and to describe bird densities within the region. Each 12 ha plot (400 m x 300 m) was surveyed transect-style with transects spaced every 25 m (see Figure 2.4, adapted from Canadian Wildlife Service 2008) during approximately 1.5 hours. All birds observed were documented on a plot map, along with the boundaries of any habitat types. Each observation was recorded as a pair (P), a male (M), a female (F), an individual of unknown sex (U), a probable nest (PN), or a nest (N). The total number of individuals on the plot was determined using the following formula, where T_{plot} equals the total number of individuals present on the plot:

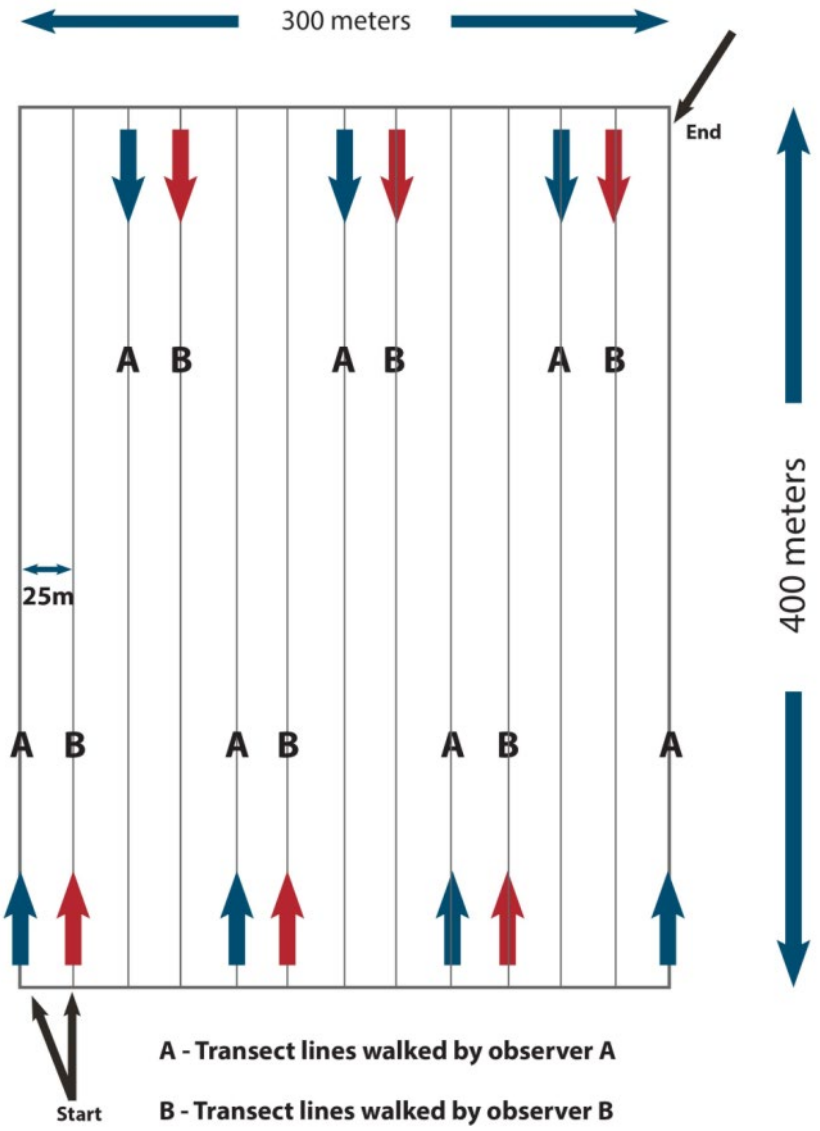
$$T_{plot} = [(N + PN + P) X 2] + [M + F + U]$$

Birds were not recorded in the plot when they were associated with a flock of more than five birds of one species (e.g., a feeding flock); these were recorded as incidentals. Birds heard or seen outside the plot and birds flying over the plot were recorded as incidental observations. The level of breeding evidence was recorded for each species observed and classified as possible, probable, or confirmed using the criteria outlined in Table 2.5. When nests were discovered, the distance at which the adult bird flushed from the nest and basic site characteristics were recorded. Habitat information was recorded on the Habitat Data Sheet created by ECCC-CWS for the PRISM program, and GPS coordinates were collected at each plot corner. Photos were taken for each plot.

Table 2.5 Breeding Evidence Criteria Used for the Tundra Breeding Bird Surveys

Breeding Evidence	Criteria
Possible	Observed in suitable habitat during the breeding season.
Probable	Singing male proclaiming a territorial song within suitable breeding habitat, pair observed in suitable nesting habitat, courtship display, agitated behaviour, or anxiety calls of an adult.
Confirmed	Distraction display or injury feigning, recently fledged young, adult carrying food for young, nest containing eggs, nest with young seen or heard.

Figure 2.4 PRISM Rapid Plot Survey Method



2025 Field Surveys

The June 2025 transect field survey collected data on passerines, shorebirds, and raptors during the breeding season. The survey area included the Port PDA and Aerodrome PDA. Surveys were conducted on foot along transects that covered portions of the area. Each transect was divided into 500 m segments and transects were spaced 50 m apart. Two observers walked parallel to each other along each transect, surveying an area 25 m wide on either side of their transect. All birds identified along the transects within the surveyed area were recorded, along with the habitat they were observed within and any other attributes with the observation (e.g., active nest, courtship display, flyover).

ARUs (Song Meter SM4, Wildlife Acoustics Inc.) were deployed to 54 sites within the LSA (see Figure 2.3) in 2025 to assess breeding bird presence. ARUs were deployed in clusters of 2 or 3 and spaced at least 250 m apart. Sites were selected in the field to represent different habitats, and ARUs were mounted on tripods at approximately 1 m to maximize acoustic coverage. ARUs were programmed to record during the first 5 minutes of every 30-minute interval, 24 hours a day, from May 15 to August 15, 2025 (i.e., the main breeding bird season plus a one-month buffer before and after). The acoustic recordings were subsequently processed and analyzed to quantify breeding bird presence across sites.

Data was analyzed using a subset of 30 ARUs, 14 in the northern portion and 16 in the southern portion of the LSA. For each ARU analyzed, spectrograms of the 5-minute recordings were initially visually assessed for excessive noise (e.g., wind) using Audacity 3.7.5 (Audacity Team). Three recordings from separate days that did not contain excessive noise were selected for acoustic and visual examination. Each recording analyzed was made during the morning between 3:00 a.m. to 8:00 a.m. Further analysis of all the ARU data is anticipated in 2026.

2.4.4 Seabird Surveys

Seabird surveys were completed in 2004, 2008, and 2012 in different areas of the marine LSA and RSA to assess the abundance, distribution, and habitat use during spring migration, breeding, moulting, and fall staging (see Figure 2.5). The surveys included aerial and ground-based surveys designed to detect common eider. The 2004 and 2008 surveys were completed within 30 km of the Grays Bay Port, whereas the 2012 aerial survey was extended to encompass most of the marine RSA, including the Coronation Gulf and Dease Strait.

2004 Field Surveys

The 2004 seabird surveys comprised aerial surveys along the Grays Bay coastline and scan surveys from port locations. Aerial surveys for seabirds, other waterfowl, and waterbirds were completed along the shores of Grays Bay on July 16 and 17. All the shoreline within the study area was surveyed to about 3 km offshore (see Figure 2.5). Species, numbers, and locations of all birds encountered were recorded. Offshore seabirds and waterfowl were also recorded during ground surveys at the four locations.

2008 Field Surveys

The 2008 seabird surveys included two aerial surveys: an open lead survey and a seabird moulting survey. A ground survey was also completed for nesting seabirds on islands. These surveys focused on documenting breeding seabirds, particularly common eider, and other waterfowl and waterbirds, within 30 km of the Port PDA.

The open lead aerial survey was completed from June 28 to June 30, 2008, to identify potential common eider and other seabird nesting sites. The survey was based on a methodology described by Hines et al. (2006) and was scheduled to coincide with the early nest initiation days for common eider. This survey consisted of a reconnaissance flight of the shoreline, offshore islands, and any open leads in the ice. It was completed using a Bell 206B Jet Ranger equipped with pontoons, at approximately 50 m asl, at speeds ranging from 50 to 80 km/hr. Two observers were located on the helicopter's left side, which was flown to be oriented towards any open water. All observed seabird, waterfowl, and waterbird species were recorded, along with age, sex, group size, location, habitat characteristics (e.g., shoreline, ocean, lead, on ice), and any behaviour data (e.g., flying, feeding, swimming).

Ground nest searches were completed from July 12 to July 14, 2008, using a helicopter equipped with floats. An initial aerial reconnaissance survey was completed to identify islands that showed potential nesting sites for common eiders and other seabirds. Then, ground searches were completed on 13 islands identified as potential nesting habitats. Large islands were searched by placing transect lines in promising locations based on prior aerial observations, and small islands were entirely and systematically searched for nests. The peninsula at the port was also surveyed, and all observations of birds, wildlife sign, and nests were recorded.

An aerial seabird moulting survey was completed from August 12 to August 14, 2008, via a Bell 206B Jet Ranger on pontoons. The survey consisted of flying a series of transects at approximately 45 m asl and speeds of about 80 km/hr and documenting the occurrence of seabirds. Transects were spaced 2 km apart with 200 m strip width on each side of the aircraft, resulting in 20 percent (%) area coverage. Twenty-two transects were completed for a combined total of 850 km of transect, resulting in a surveyed area of 340 km² (see Figure 2.5). In addition, a shoreline survey was completed on foot to document seabird occurrence. The shoreline survey was completed along the coastline, 30 km east and west of the Port.

2012 Field Surveys

The 2012 seabird surveys involved a ground survey for nesting seabirds along the Grays Bay shoreline, and aerial surveys within the marine LSA and RSA during the staging season in fall.

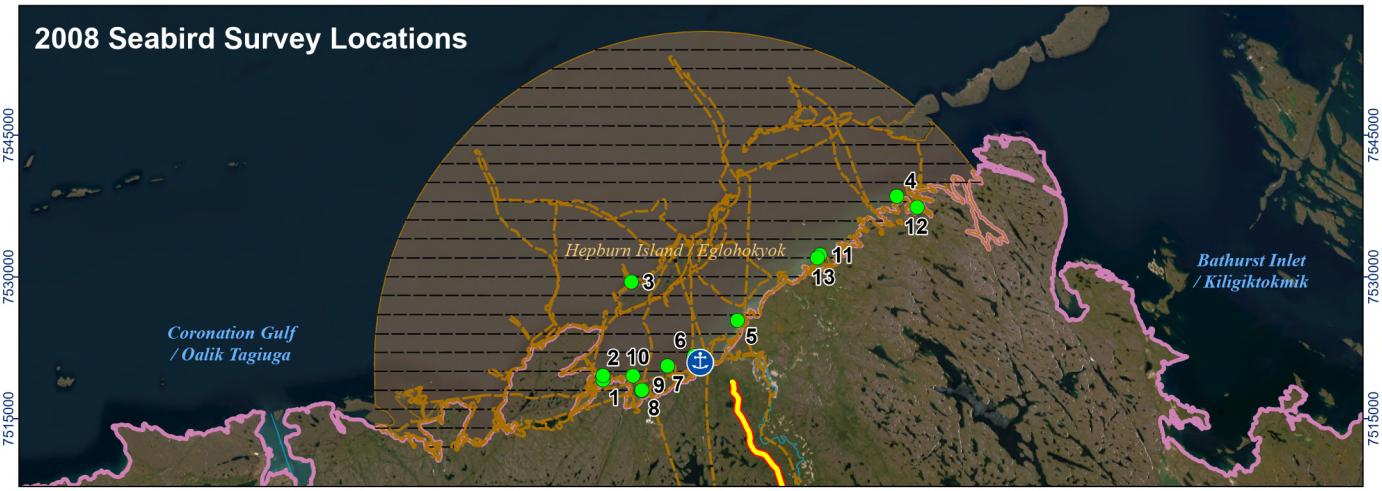
A ground nest search was completed on July 2 and 3, 2012, to document breeding seabirds, shorebirds, and other species along the port site and the adjacent shoreline. The survey consisted of five people completing a shoreline transect over two days. Surveyors walked 25 m apart, with the first person walking along the high tide line and the rest spaced inland, so 100 to 125 m of the strip was covered. The survey was centred on the port and extended approximately 5 km linearly on either side of the port. However, due to the abundance of inlet and headlands the total transect length was approximately 20 km.

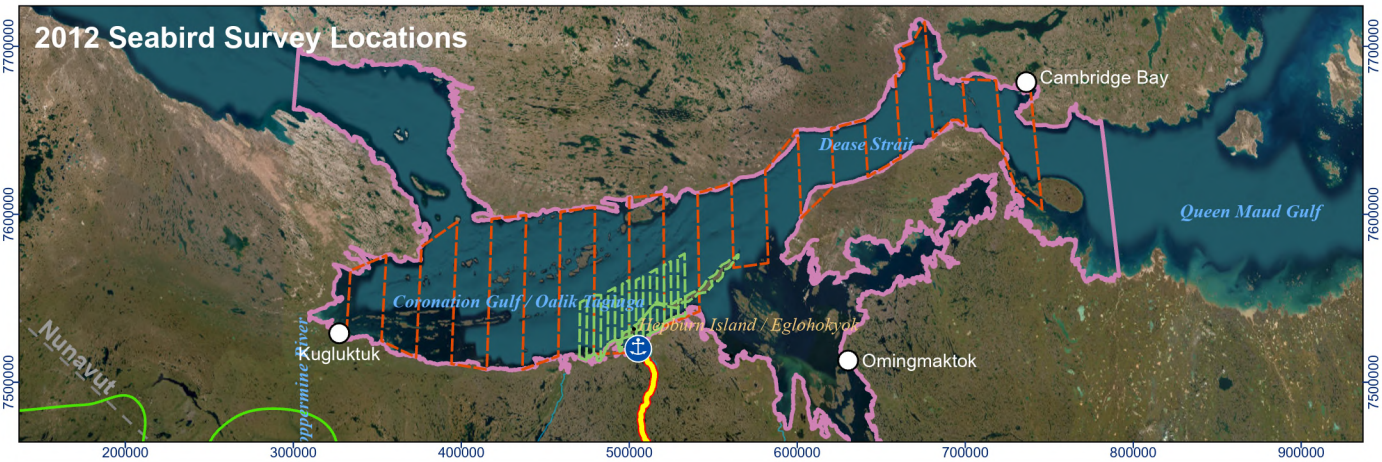
The transect was divided into 500 m segments, and all bird observations made within a segment were tallied. Figure 2.2 shows the location of the 2012 ground nest search.

Aerial marine bird surveys were completed with the marine mammal surveys on September 8, 9, 10, and 12, 2012. An extensive aerial survey was flown across most of the marine RSA, including the Coronation Gulf and Dease Strait, using 21 transects spaced approximately 26 km apart, for a total of 1,829 km (including distance between transects; see Figure 2.5). Additionally, an intensive survey was flown within the marine LSA in two parts: (1) an aerial survey using 16 transects spaced approximately 4 km apart, for a total of 670 km (including the distance between transects), and (2) a shoreline survey of the port area and nearby island shoreline. The transects and most of the shoreline were each flown twice as replicates to explore short-term seabird distribution variation. All seabirds observed during surveys were recorded, along with the age, sex, group size, and sight angle. Due to survey height and speed, observations were generalized to groupings of birds (e.g., ducks, geese, gulls), and only when the species identification was reliable. The sight angle was measured using an inclinometer to later determine horizontal distance from the transect centreline.

2025 Field Surveys

Shoreline transect surveys were completed for the Port PDA and Aerodrome PDA in June 2025 to record seabirds, ducks, and waterbirds with the marine LSA. Surveyors walked along the shoreline at a safe and effective distance where a view of the marine LSA was possible and used binoculars and/or a spotting scope to survey and identify birds within 1 km of the shoreline. All birds observed were recorded, along with sex and group size.





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Territorial Boundary
- Treeline
- Watercourse
- Marine Regional Study Area (RSA)

2004 Seabird Surveys
- 2004 Aerial Survey Area
- 2004 Scan Survey Location

2008 Seabird Surveys
- 2008 Seabird Ground Nest Survey (July)
- 2008 Moulting Aerial Survey Transects (August)
- 2008 Seabird Ground Nest Survey (July)
- 2008 Marine Study Area

2012 Seabird Surveys
- Seabird Ground Nesting Transect
- 2012 Extensive Aerial Survey Transect (September)
- 2012 Intensive Aerial Survey Transect (September)

0 10 20 Kilometres
(At original document size of 8.5x11) 1:800,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project
24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
2.5

Title
Seabird Survey Locations Within the Marine Regional Study Area for the years 2004, 2008 and 2012

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig2-5_SeabirdSurveyAreas_20260218; Revised: 2026-02-18 By: OliviaLeblanc

2.5 Habitat Ratings

Habitat ratings were completed as a component of the baseline studies for select bird species within the terrestrial RSA. Habitat ratings identify areas on a landscape that provide life requisites for a species (Government of British Columbia 2021). Habitat ratings were completed for peregrine falcon and shorebirds and created based on the ecological land classification (ELC) developed for the Izok Corridor Project that was adapted for use in support of this Project (Caslys Consulting 2013). Table 2.6 provides habitat suitability ratings for peregrine falcon and shorebirds for each vegetation unit.

Additionally, a map of observed passerine densities was created based on the results of the 2012 PRISM surveys as future aid for habitat availability assessment for tundra breeding birds.

2.5.1 Peregrine Falcon

Habitat ratings for raptors are a function of nesting habitat and foraging areas (Newton 1979). Breeding density is set by nest site availability and food supply (Newton 1979; Poole and Bromley 1988a). Foraging areas for raptors may occur at great distances from nest sites (up to 15–43 km from nest sites for peregrine falcons; White and Nelson 1991; White et al. 2024), and areas distant from suitable nesting habitat may also be used by non-breeders and fledglings, and during migration. Therefore, habitat ratings for peregrine falcon were a function of both foraging habitat and distance from known nesting sites.

Peregrine falcons feed primarily on other birds, for which passerines make up a large portion of their diet (Poole and Bromley 1988b). Passerine densities documented during the 2012 PRISM surveys were used to classify vegetation units according to their value for foraging peregrine falcons. All habitats that contained either a high or moderate density of passerine species were rated as moderate-quality habitat for peregrine falcons (see Table 2.6). In addition, habitats were classified according to the distance from the nearest active peregrine falcon nest. Most of the activity associated with raptor nest sites occurs within 1 to 2 km of the sites—this includes perching, caching, and defence behaviours (Poole and Bromley 1988a, 1988b; Booms et al. 2020; White et al. 2024). Therefore, habitats within 2 km of all known peregrine falcon nests identified during baseline studies were classified as highly suitable. Surveys for nest sites within the RSA were restricted to areas within 10 to 15 km of the Project PDA (i.e., the Road PDA and Port PDA), resulting in an underestimate of the amount of high-quality habitat within the broader RSA.

2.5.2 Shorebirds

The PRISM program used to survey shorebirds was designed based on stratified random sampling, and habitats were classified as wetland, moist, or upland types (high, moderate, and low habitat suitability for shorebirds, respectively). To facilitate comparison of the 2012 Project PRISM survey data with other data sets collected throughout the Arctic, ECCC-CWS staff assisted in rating the 2012 plots and Project ELC vegetation units according to the regionally defined strata. These habitat ratings were used to analyze the 2012 PRISM data sets. Table 2.6 provides the shorebird habitat ratings.

Table 2.6 Habitat Suitability Ratings for Peregrine Falcon and Shorebirds

ELC Unit	Description	Peregrine Falcon Habitat Suitability	Shorebird Habitat Suitability
Water	Non-vegetated	Nil	Nil
Cloud	No data	Nil	Nil
Shadow	No data	Nil	Nil
Mine sites	Anthropogenic sites – human development (aerodrome, mines, etc.).	Low	Low
Exposed gravel / cobble	Non-vegetated – areas of exposed cobbles and coarse gravel. Typically occurs in river valleys.	Low	Low
Exposed silt / sand	Non-vegetated – areas of exposed silt, sand, and gravel; <20% vegetation cover.	Low	Low
Boulder / Bedrock	>80% cover of bedrock or boulders.	Low	Low
Lichen veneer	Found on relatively level, dry, well-drained substrates. Characterized by a low, thin plant cover including a high percentage of ground lichens. Mountain avens and a variety of other woody species or forbs are common.	Low	Low
Heath rock	Exposed bedrock or boulders make up 30–80% of the ground surface, with heath tundra present on patches of finer substrates around the rock.	Low	Low
Heath tundra	Characterized by a 30–60% cover of heaths and prostrate to low shrub cover (<20 cm tall). Herbaceous species also contribute 30-50% of cover; graminoid species present but vary in abundance. Typically located on mid-slope to crest positions.	Moderate	Low
Heath cryoturbated	Ground cover is dominated by heaths and prostrate to low shrub cover (<20 cm tall); lichens, mosses, and graminoids are also present in lesser amounts. Cryoturbation results in frost mounds or hummocks.	Moderate	Moderate
Heath graminoid	Graminoids are the predominant ground cover, although heaths and prostrate to low shrub cover (<20 cm tall) make up a significant component. Forbs, mosses, and lichens make up only a small portion of the ground cover.	Moderate	Moderate
Tussock sedge	Located on shallow, water receiving lower slopes and basins, where sub-surface flow of water occurs on top of the permafrost boundary. Sheathed cotton-grass is the most prominent species; hummocky peat mounds developed through cryoturbation are common. Shrub and heath vegetation grows on and between the mounds and provides about 20–40% cover.	Moderate	High

ELC Unit	Description	Peregrine Falcon Habitat Suitability	Shorebird Habitat Suitability
Non-tussock sedge	Typically occurs on the edges of lakes and streams and is associated with standing or slow waters. Vegetation consists of a sparse to dense growth of emergent sedges and other rooted aquatic vegetation.	Moderate	High
Riparian shrub	Tall (>1–1.5 m) birch, willow or alder associated with standing or flowing water at or below the surface where water is on bedrock or the permafrost boundary.	Moderate	Moderate
Low shrub	Prostrate or low (0.2–1.5 m in height) birch and willows on shaded lee slopes, seeps, and lower slope positions or flat open areas where water collects beneath the surface on the permanent boundary saturating the active layer.	Moderate	Low
Tall shrub	A transition zone shrub community that replaces heath tundra on upland sites closer to the tree line. Shrub cover (mostly birch and willow) and height increases on warm sites and with proximity to treeline.	Moderate	Low
Conifer open	Open stands of white spruce with shrub understory.	Moderate	Low

2.5.3 Passerines

Habitat ratings were not completed for passerine species. However, to assess habitat availability for passerine birds, a map of passerine habitats was created based on observed densities within the different vegetation types (i.e., ELC units). The analysis of the 2012 PRISM data produced a table of passerine densities by vegetation type, with observed densities ranging from 129.6 to 260.0 birds/km² (see Section 6.2.2). Observed densities were grouped into one of four classes: High (>220 birds/km²), Moderate (160 to 220 birds/km²), Low (10 to 160 birds/km²), and Nil (<10 birds/km²), and applied to the ELC map coverage.

3 Regional Overview

Breeding birds within the Kitikmeot Region consist of both migratory and resident species. Longer periods of daylight and seasonally abundant food supply from May through August support the breeding and rearing periods for most species. Few species are present outside the breeding period because of long, cold winters and restricted food availability that limit populations. Those species that remain include gyrfalcon, ptarmigan, and common raven (*tulugakyoak*; *Corvus corax*). According to recorded Inuit Knowledge (NTKP 2018), ptarmigan and common ravens are the most common winter residents. Snow buntings (*amaolikak*; *Plectrophenax nivalis*) and snowy owls (*okpik*; *Bumo scandiacus*) are found during winter in some areas, and well as hawks, falcons, and eagles are occasionally seen as well. Redpolls (*haghagiak*; *Carduelis flammea*) are sometimes observed near the treeline during winter.

> C3-61 "*The ptarmigan are always around during the winter, just like the ravens. I think that snowy owls stay during the winter… but the ptarmigan and ravens are the main ones that stay (Perry River and Cape Colborne areas) …*" (NTKP 2018).
>
> C21 "*The ravens and snowy owls don't migrate south. They spend all winter long around Killinik (Victoria Island) and here (coastal area by Kolgayok (Tingmeak River) and Kunayok (Ellice River)). Those are the main two among the birds that don't leave. There are also ptarmigan that stay year round …*(NTKP 2018).
>
> *All the land has ptarmigans, ravens and snowy owls, rough-legged hawks and peregrines. These are the ones that are around Kingaok (also north end, south shore of Beechey Lake and mouth of Hivogahik (Hood River)), they don't leave during the winter … All the lands (north central-east Tahikyoak) have those types of birds that don't leave. They don't leave Killinik shores (mouth of Ekalivik and islands south of Koyapik [Stromness Bay]) at all, also at Kolgayok (mouth of Kugakyoak) …*" (NTKP 2018).
>
> C34-64 "*The snowy owls eat hares, even ptarmigan. Also the gyrfalcons don't leave during the winter*" (NTKP 2018).
>
> C25-61 "*… The snow buntings and ravens and eagles winter around this land (Elu Inlet near Kent Peninsula isthmus). Sometimes the rough-legged hawks winter and the snowy owls stay around here too. Snowy owls, snow buntings, eagles and ravens winter around here*" (NTKP 2018).
>
> C25-60 *"… Those snow buntings seem to not really leave this area (Kent Peninsula – Elu Inlet). Sometimes the birds that we call the snow buntings are seen flying around during the winter following the warm weather patterns…*" (NTKP 2018).
>
> C42-61 "*Sometimes during the winter there are different birds around. Now most birds stay around where there are trees and willows. The ones that are called common redpoll are found around the trees during the winter*" (NTKP 2018).

Migrant bird species occupy wintering areas extending from the Canadian boreal forest to the southern extent of South America. Many of these species migrate vast distances between breeding and non-breeding habitats, so some populations can be affected by various factors occurring far beyond the breeding range. However, environmental factors within the breeding range are undoubtedly a key component for the survival of all these species breeding within the region.

Birds are prominent in Inuit culture (Priest and Usher 2004). The arrival and departure of the birds was once how Inuit knew what time of the year it was (NTKP 2018). Birds also have considerable importance to Inuit as food, and several species, including ducks, geese, and ptarmigan, are regularly hunted (Priest and Usher 2004). Birds are particularly important as food for coastal Inuit because of the large concentrations of nesting waterfowl along the Arctic coast, on coastal islands, and along Bathurst Inlet. Coastal Inuit collected eggs during the nesting season and hunted waterfowl during the spring and fall migrations and the summer moulting season (NTKP 2018). The abundance of breeding waterfowl was less on the mainland, and inland Inuit did not depend on waterfowl as much for food; however, they did hunt some species, particularly when caribou (*tuktuk; Rangifer tarandus*) were absent during summer (NTKP 2018).

> *"Birds in this area [Period II (1916-1955) in the Tree River Area] were usually hunted along the shoreline and among the islands. Ducks of various kinds were common, and there were also geese, loons, cranes and gulls"* (NTKP 2018). *Ducks of various kinds were common, and there were also geese, loons, cranes and gulls."*
>
> *"This area [Period II (1920-1955) in the Bathurst Inlet – Old Area] was also good for bird hunting. In early spring, Canada geese were abundant along Burnside and Western rivers and, during summer and fall, the Gordon Bay and Hiuktak area was good for duck hunting. Eider ducks were known to nest on a few small islands, south of Quadyuk Island, east of Tinny Hills, and north of Manning Point, and their eggs were considered a great delicacy. During summer, the whole of Bathurst Inlet was rich in ducks and other waterfowl"* (NTKP 2018).
>
> *"Eider and other ducks were hunted along the coast. They hunted geese inland, especially up Hood River" [Period II (1920-1955) in the Arctic Sound and Daniel Moore Bay Area]* (NTKP 2018).
>
> *"Bird hunting was seasonally important. Huge flocks of ducks and geese descended on the inlets, islands and inland lakes in spring and summer, providing a plentiful supply of eggs and meat. The Perry River area in the east offered still better waterfowl hunting" [Period II (1920-1955) in the Elu Inlet and Kent Peninsula Area]* (NTKP 2018).
>
> *"Most of the birds taken were trapped during their summer moult. Not many birds were shot in these inland locations" [Period II (1916-1955) in the Contwoyto Lake Area]* (NTKP 2018).
>
> C13-29 "*I've hunted ducks, loons and geese by the lakes (inland), because in the month of July sometimes there are no caribou around*" (NTKP 2018).

Birds were not a focal topic in most of the workshops held for the Project and there is limited existing Inuit Knowledge on birds. Several placenames documented by the Kitikmeot Heritage Society and Tuktu and Nogak Project (Thorpe et al. 2001) speak to birds, particularly throughout Bathurst Inlet. The available Inuit Knowledge information is incorporated into this report's relevant sections, including observations about bird behaviour, nesting habitat and locations, and migration timing.

According to Inuit Knowledge holders, ducks and loons follow the open water north during the spring migration. Similarly, in the fall, they will remain on the ocean, waiting for the ice to form before they leave, and will follow the freezing ice, looking for open water on their migration south.

> C19 "*That point (Aoulativikyoak or Whitebear Point) is very shallow so the ice melts quickly. There are animals and birds like the long-tailed ducks and eider ducks that wait there for the rest of the ice to melt…Waterfowl like that area because they like to be in the water. When there are no other places to land or that are clear of ice, they land there…*" (NTKP 2018).

> C3 "*Every fall Eiders, long-tailed Ducks, red-throated loons and seagulls are the last birds to leave (Cape Colborne area). I don't know which of these birds leave first because they all wait for ice to form on the ocean before they leave*" (NTKP 2018).

Studies at the Daring Lake Research Station, which is located approximately 100 km southeast of Jericho Station, in the NT, have found that spring weather conditions heavily influence the first annual sightings of migratory birds and that the timing of snow melt and ice breakup in this region can vary up to three or four weeks (Obst 2011). According to recorded Inuit Knowledge, the arrival of the Lapland longspur indicated the start of spring melt (NTKP 2018).

> C21-58 "*Long ago the elders went by these birds (as indicators). They let them know that (the snow and ice) was finally going to start to melt. The seagulls and snow buntings are (always) around… They are the first birds to arrive at Keetlinik (Victoria Island). The last bird to arrive, the Lapland longspur, tells them it's going to melt. That is what they used to say*" (NTKP 2018).

Most bird migratory species generally arrive in the region between mid-May and mid-June, although some species can arrive as early as the end of March or April (Obst 2011). Inuit Knowledge holders have stated that Canada geese (*oloagolik*; *Branta canadensis*), cranes, and eider ducks can start arriving in the area in late April (Jimmy Oniak [050219] in High Lake DEIS).

> C32-58 "*The birds start to arrive around May. The first ones to arrive are the snow buntings in April …*" (NTKP 2018).

> C23-58 "*The first ducks start to arrive around the end of April. We start looking for them… around the month of April. The geese and the eider ducks arrive last when the ice cracks are wide. That is the time they start to arrive, so that they can use the ice cracks. The eider ducks are the last to arrive*" (NTKP 2018).

> C3 "*The sandhill cranes arrive first too at our land. The swans and sandhill cranes are first to be seen in the spring. Those snow, Canada, white-fronted and brant geese all arrive at the same time. They are like that here and at our land (Kugyoak)*" (NTKP 2018).

C5-58 "*The sandhill cranes arrive first before the ducks; the swans are next… then the ducks, followed by the geese a few days later. You see the sandhill cranes and swans first. Long after the geese have arrived the small birds start to arrive, maybe ten days later after all the geese have come in. The small birds arrive last but the snow buntings arrive first before the other small birds, even before the sandhill cranes or swans*" (NTKP 2018).

C25 "*The sandhill cranes and swans are the first birds to be seen. The seagull is the first bird to arrive, before the sandhill crane. You see the seagull before the sandhill crane. The jaegers arrive next after the sandhill cranes and the swans arrive after the sandhill cranes. The geese start to arrive soon after the sandhill cranes*" (NTKP 2018).

Nesting for most bird species begins in June and continues through July, although ravens and some raptors will start nesting earlier, often in April.

C5-27 "*During summer around here (Elu Inlet) ducks have nests around the islands (a number of locations in Elu Inlet and islands in Campbell Bay west of the mouth of Kunayok or Ellice River). They also molt there. That is why it's our bird sanctuary (Queen Maud Bird Sanctuary). There are lots of geese molting and birds of different species that nest and molt there, like the Canada geese, snow geese and regular ducks. There are all different kinds of ducks there. Canada and snow geese also nest and have eggs at these islands. These are major molting and nesting areas*" (NTKP 2018).

C5-28 *"… There are lots of wetlands there (large area on west Kent Peninsula; and large area encompassing coast and inland from the isthmus east to the mouth of Kunayok or Perry River). These are major nesting and molting areas*" (NTKP 2018).

C29 "*There are wetlands … near Etibliakyok (Kilingoyak isthmus) and near Kugyoak (Perry River) … There are wetlands just above Etibliakyok (at Parry Bay) and part of Katimanak (an area further east on Banks Peninsula and an area at the mouth of Ekalivik (Footprint River)). These areas are used for nesting by Canada geese, white-fronted geese, and brants. These ducks pretty well all nest together where it's wet and grassy* " (NTKP 2018).

C26-28 "*(Important wetlands for waterfowl are found) around Perry Island (Hinakhakvik; he mapped the mainland across from the island) Ellice River (Kunayok mouth), Kugyoak (Perry River) and around here (Bathurst Inlet coast from Omingmaktok south to Huikitak …*" (NTKP 2018).

C3-59 "*All types of ducks can be seen during the summer, such as snow and Canada geese. There are others like the red-throated loon, eider and long-tailed ducks*" (NTKP 2018).

C15-59 "*Arctic loon, yellow-billed loon, and sandpiper (higyagiak) (are commonly seen in the summer)*" (NTKP 2018).

Bird fall migration begins in mid-July and extends until mid-September (Obst 2011), although waterfowl and seabirds may be present in open water areas along the coast until freeze up.

> C15-59 "*Arctic loon, yellow-billed loon, and sandpiper (higyagiak) (are commonly seen in the summer)*".
>
> C30-60 "*Ducks like the brants, snow geese, white-fronted geese, eider ducks, long-tailed ducks, loons and even the swans start to gather together around September when they are going to start heading south. When they are going to start heading south they gather in large groups. They can be found around here anywhere (two areas south of Aoulativikyoak or Whitebear Point and one area west of Kugyoak or Perry River)*" (NTKP 2018).
>
> C36-60 "*Birds like Lapland longspur, horned larks, killdeers, common redpoll and taakauhaut (American robin) (leave first in the fall) … They start to leave here around September. When the geese start heading south then all the rest of the small birds start to migrate*" (NTKP 2018).
>
> C25-60 "*Among all the other small birds these snow buntings are the last to be seen leaving this area (Kent Peninsula). The loons and the snow buntings are the last birds to leave, even the eider ducks. These loons and even the eider ducks don't leave right away but go further west where there is open water or leads that stay open during the winter. Sometimes the loons just about winter up here. When the water freezes, then they are gone*" (NTKP 2018).
>
> C29-60 "*The birds that arrive first… leave first, like the Canada geese. I know this lake because I used to travel around there. It's called Tahialok (mapsheet 77A). The birds come from their land and then return in the fall. The birds that arrive first leave first from around Etibliakyok (on Kent Peninsula isthmus, including Tahialok), Kunayok (Ellice River) and from near Naoyak (Parry Bay) and Omingmaktok*" (NTKP 2018).
>
> C34-60 "*The sandhill cranes leave first for the south because they are the first to arrive in the spring. The geese follow soon after because those ducks are the first to arrive in the spring*" (NTKP 2018).
>
> C4O-60 "*Canada geese and white-fronted geese leave first in the fall*" (NTKP 2018).

A summary of bird harvesting areas and habitat identified from Inuit and Community Knowledge in relation to the terrestrial and marine study areas are presented in Table 3.1.

Table 3.1 Bird Harvesting and Habitat Areas Identified from Inuit and Community Knowledge

Location	Inuinnaqtun Name	Harvesting/Habitat Type	Terrestrial RSA	Marine RSA
Community of Bathurst Inlet	*Kingaok*	abundance of birds; geese and eider ducks		
Bathurst Inlet (eastern side)	*Kokiviayok* or east *Kiligiktokmik*	major coastal raptor nesting		
Bay Chimo	*Omingmaktok*	waterfowl; geese and eider ducks; major coastal raptor nesting		
Cambridge Bay		geese and eider ducks; snow geese, Ross' geese, brant geese, king duck, eider duck, ptarmigan, and bird eggs harvesting		
Ellice River	*Kunayok*	waterfowl; major coastal raptor nesting		
Elu Inlet islands		major coastal raptor nesting		
Grays Bay	*Kogloktoakyok*	greater white-fronted goose, snow goose, Ross's goose, brants, and swans hunting		X
Hepburn Island	*Eglohokyok*	greater white-fronted goose, snow goose, Ross's goose, brants, and swans hunting		X
Hood River	*Higogakhik*	short-eared owls	X	
Katimanak	*Katimanak*	waterfowl		
Kennarctic River (mouth of)	*Kogloktoakyok*	greater white-fronted goose, snow goose, Ross's goose, brants, and swans hunting	X	
Kent Peninsula (south coast)	*Kilingoyak*	major coastal raptor nesting		
Kent Peninsula isthmus	*Etibliakyok*	waterfowl		
Marcheson River		snow geese harvesting		
Queen Maud Gulf		abundance of birds		
Parry Bay	*Naoyak*	waterfowl		
Perry River	*Kugyoak*	waterfowl; major coastal raptor nesting		
Tingmeak River (mouth of)	*Kolgayok*	major coastal raptor nesting		
Victoria Island	*Killinik*	greater white-fronted goose, snow goose, Ross's goose, brants, and swans hunting		

Location Sources: Banci and Spicker (2024); Priest and Usher (2004)

3.1 Species Present

Based on the results of Inuit Knowledge, Project field surveys, other studies within the region, a review of regional literature, and documented species ranges until March 2025, a total of 92 species were observed or have the potential to occur in the marine and terrestrial study areas (see Table 3.2). Twenty-four bird species were confirmed to be present in the marine LSA during Project field surveys.

Within the terrestrial RSA, 84 species have the potential to occur: 59 species were documented either during Project field surveys or during studies conducted at Jericho Mine or the Ulu property of which 28 species were confirmed to breed. An additional 25 species may potentially occur in the terrestrial RSA.

Birds are important to the Inuit for provided sustenance from the harvesting of birds for meat as well as their eggs, their down was used for insulation, and the arrival and departure of bird was how Inuit kept track of their yearly calendar (NTKP 2018). Inuit Knowledge identified that waterfowl are known to occur along the coastline, as well as in areas between Napaktolik Lake and Contwoyto Lake which the south portion of the road traverses through (see Figure 3.1). Inuit Knowledge also identifies an area north of the Hood River (*Hivogahik*) where short-eared owl (*nipaingaktak*; *Asio flammeus*) are known to nest. Raptor nesting was also identified at the southern tip of the road on some cliffs along the northwest shoreline of Contwoyto Lake. Further details on Inuit Knowledge for different birds can be found in Sections 4 to 6 of this report.

3.1.1 Species at Risk

Wildlife populations in NU are assessed by the GN-DOE (Canadian Endangered Species Conservation Council 2022) and COSEWIC and have been assigned a status based on their abundance, population trends, known and suspected risk to their populations, and level of confidence in species' knowledge. Following status assessments and recommendations by COSEWIC, some species are listed under Schedule 1 (species that are classified as Extirpated, Endangered, Threatened, and of Special Concern), Schedule 2 (species that had been designated as Endangered or Threatened and have yet to be re-assessed by COSEWIC using revised criteria), or Schedule 3 (species that had been designated as Special Concern, and have yet to be re-assessed by COSEWIC using revised criteria) under the federal *Species at Risk Act* (SARA).

Eight species, confirmed or potentially present in the terrestrial and marine study areas, are federally listed as Endangered, Threatened, or Special Concern under the SARA (see Table 3.2), including:

- Short-eared owl
- Ivory gull (*naujavaaq*; *Pagophila eburnea*)
- Ross's gull (*nasaruvaalik*; *Rhodostethia rosea*)
- Red knot *rufa* subspecies (*maamaati*; *Calidris canutus rufa*)
- Buff-breasted sandpiper (*qursuqtaq siqjariarjuk*; *Calidris subruficollis*)
- Red-necked phalarope (*qalunguq*; *Phalaropus lobatus*)
- Barn swallow (*uummuq*; *Hirundo rustica*)
- Harris sparrow (*qupanuarjuk*; *Zonotrichia querula*)

Additionally, 21 species are identified as either critically imperiled, imperiled, or vulnerable by the GN (see Table 3.2). Most of the species are designated as vulnerable due to perceived small populations on the periphery of natural ranges, although some show declining population trends (Canadian Endangered Species Conservation Council 2022).

Figure 3.1 Kitikmiut Knowledge of Kopanoak (Birds) in the Kogloktoakyok (Grays Bay) Project Area (reproduced from Banci and Spicker [2024])

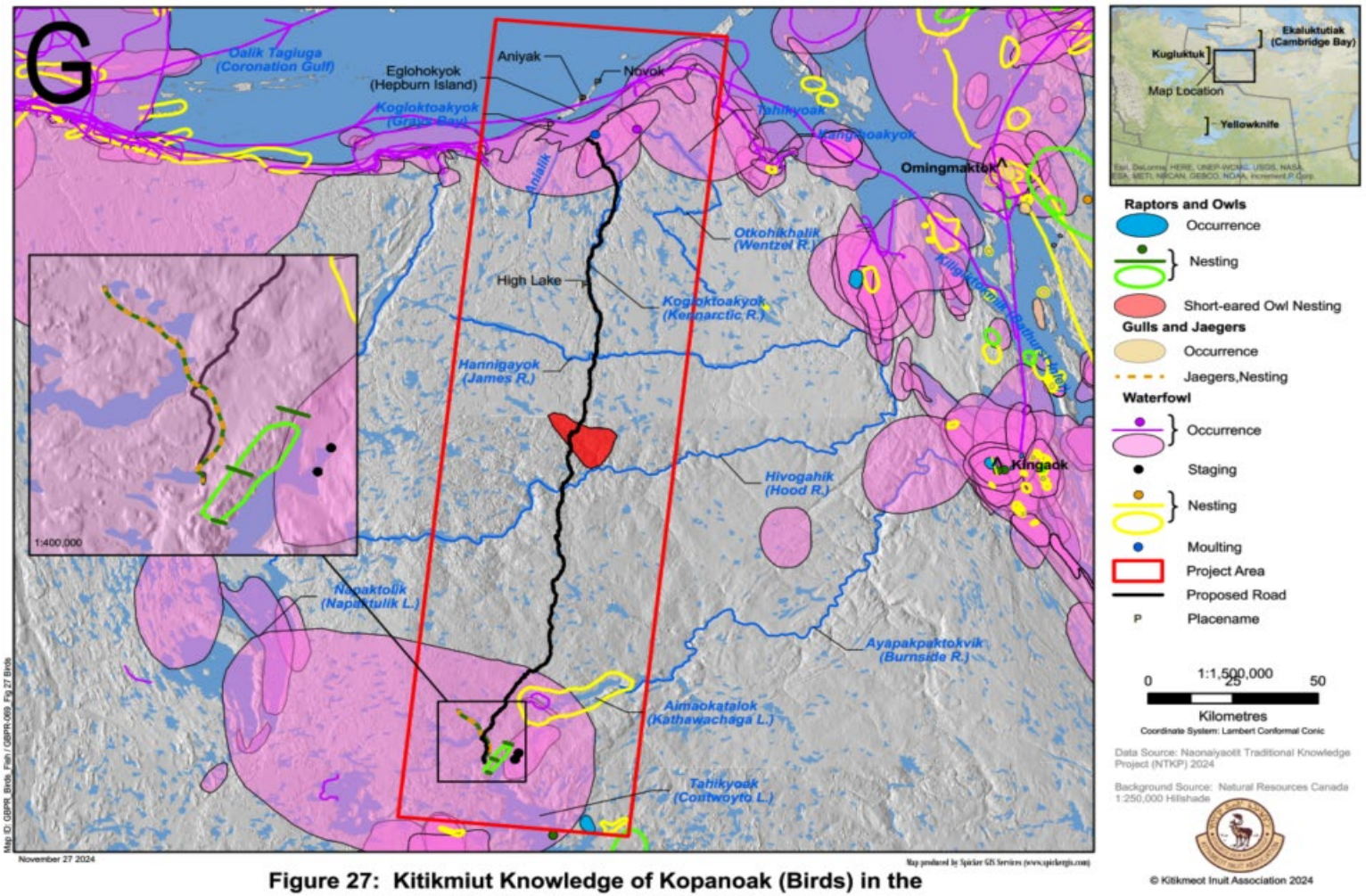


Figure 27: Kitikmiut Knowledge of Kopanoak (Birds) in the Kogloktoakyok (Grays Bay) Project Area

Table 3.2 Status of Bird Species Confirmed or Potentially Present in the Terrestrial Study Area

Species[1]	Scientific Name	Status				
		SARA[1]	COSEWIC[2]	NU[3]	NT[4]	Present in Terrestrial RSA[5,6]
Red knot (*rufa* subspecies)	*Calidris canutus rufa*	Schedule 1, Endangered	Endangered	Imperiled	Critically Imperiled	X
Ivory gull	*Pagophila eburnea*	Schedule 1, Endangered	Endangered	Critically Imperiled	Critically Imperiled	X
Ross's gull	*Rhodostethia rosea*	Schedule 1, Threatened	Endangered	Critically Imperiled	Undetermined	X
Barn swallow	*Hirundo rustica*	Schedule 1, Threatened	Special Concern	--	Vulnerable	X
Buff-breasted sandpiper	*Calidris subruficollis*	Schedule 1, Special Concern	Special Concern	Vulnerable	Vulnerable	X
Red-necked phalarope	*Phalaropus lobatus*	Schedule 1, Special Concern	Special Concern	Vulnerable	Vulnerable	S
Short-eared owl	*Asio flammeus*	Schedule 1, Special Concern	Threatened	Vulnerable	Vulnerable	S
Harris's sparrow	*Zonotrichia querula*	Schedule 1, Special Concern	Special Concern	Apparently Secure	Vulnerable	S
Lesser yellowlegs	*Tringa flavipes*	--	Threatened	Vulnerable	Vulnerable	X
Peregrine falcon	*Falco peregrinus anatum/tundrius*	--	--	Apparently Secure	Vulnerable	B
Common loon	*Gavia immer*	--	Not at Risk	Secure	Secure	X
Bald eagle	*Haliaeetus leucocephalus*	--	Not at Risk	Secure	Secure	S
Northern harrier	*Circus cyaneus*	--	Not at Risk	Secure	Apparently Secure	S
Yellow-billed loon	*Gavia adamsii*	--	Not at Risk	Apparently Secure	Vulnerable	S
King eider	*Somateria spectabilis*	--	--	Vulnerable	Vulnerable	S (LSA)
Common eider	*Somateria mollissima*	--	--	Vulnerable	Vulnerable	S (LSA)
Surf scoter	*Melanitta perspicillata*	--	--	Unrankable	Vulnerable	X
Golden eagle	*Aquila chrysaetos*	--	--	Vulnerable	Apparently Secure	B
Black-bellied plover	*Pluvialis squatarola*	--	--	Vulnerable	Imperiled	X

Species[1]	Scientific Name	Status				
		SARA[1]	COSEWIC[2]	NU[3]	NT[4]	Present in Terrestrial RSA[5,6]
American golden-plover	*Pluvialis dominica*	--	--	Vulnerable	Vulnerable	B
Ruddy turnstone	*Arenaria interpres*	--	--	Vulnerable	Vulnerable	S
Sanderling	*Calidris alba*	--	--	Vulnerable	Vulnerable	X
Semipalmated sandpiper	*Calidris pusilla*	--	--	Vulnerable	Apparently Secure	S
Pectoral sandpiper	*Calidris melanotos*	--	--	Apparently Secure	Vulnerable	S
Snow bunting	*Plectrophenax nivalis*	--	--	Vulnerable	Apparently Secure	S
American tree sparrow	*Spizella arborea*	--	--	Apparently Secure	Vulnerable	B
Hoary redpoll	*Acanthis hornemanni*	--	--	Vulnerable	Apparently Secure	B
White-winged scoter	*Melanitta fusca*	--	--	Apparently Secure	Vulnerable	S
Black scoter	*Melanitta americana*	--	--	Apparently Secure	Vulnerable	S
Long-tailed duck	*Clangula hyemalis*	--	--	Apparently Secure	Vulnerable	B
Red-throated loon	*Gavia stellata*	--	--	Apparently Secure	Apparently Secure	B
Northern fulmar	*Fulmarus glacialis*	--	--	Apparently Secure	Undetermined	X
Gyrfalcon	*Falco rusticolus*	--	--	Apparently Secure	Apparently Secure	B
Dunlin	*Calidris alpina*	--	--	Apparently Secure	Vulnerable	X
Stilt sandpiper	*Calidris himantopus*	--	--	Apparently Secure	Apparently Secure	S
Sabine’s gull	*Xema sabini*	--	--	Apparently Secure	Apparently Secure	X
Herring gull	*Larus argentatus*	--	--	Apparently Secure	Apparently Secure	B
Glaucous gull	*Larus hyperboreus*	--	--	Apparently Secure	Apparently Secure	S (LSA)
Arctic tern	*Sterna paradisaea*	--	--	Apparently Secure	Secure	S
Pomarine jaeger	*Stercorarius pomarinus*	--	--	Apparently Secure	Secure	X
Thick-billed murre	*Uria lomvia*	--	--	Apparently Secure	Imperiled	X
Snowy owl	*Bubo scandiacus*	--	--	Apparently Secure	Vulnerable	S

Species[1]	Scientific Name	Status				
		SARA[1]	COSEWIC[2]	NU[3]	NT[4]	Present in Terrestrial RSA[5,6]
Horned lark	*Eremophila alpestris*	--	--	Apparently Secure	Apparently Secure	B
Greater white-fronted goose	*Anser albifrons*	--	--	Secure	Secure	B
Snow goose	*Chen caerulescens*	--	--	Secure	Secure	S
Ross's goose	*Chen rossii*	--	--	Secure	Secure	X
Brant	*Branta bernicla*	--	--	Secure	Vulnerable	X
Canada goose[7]	*Branta canadensis*	--	--	Secure	Secure	S
Cackling goose[7]	*Branta hutchinsii*	--	--	Secure	Apparently Secure	S
Tundra swan	*Cygnus columbianus*	--	--	Secure	Secure	B
Mallard	*Anas platyrhynchos*	--	--	Secure	Secure	S
Northern pintail	*Anas acuta*	--	--	Secure	Vulnerable	B
Green-winged teal	*Anas crecca*	--	--	Secure	Secure	S
Greater scaup	*Aythya marila*	--	--	Secure	Secure	S
Common merganser	*Mergus merganser*	--	--	Secure	Secure	S
Red-breasted merganser	*Mergus serrator*	--	--	Secure	Secure	S
Willow ptarmigan	*Lagopus lagopus*	--	--	Secure	Secure	B
Rock ptarmigan	*Lagopus muta*	--	--	Secure	Secure	B
Pacific loon	*Gavia pacifica*	--	--	Secure	Secure	B
Rough-legged hawk	*Buteo lagopus*	--	--	Secure	Apparently Secure	B
Sandhill crane	*Grus canadensis*	--	--	Secure	Secure	S
Semipalmated plover	*Charadrius semipalmatus*	--	--	Secure	Secure	B
Least sandpiper	*Calidris minutilla*	--	--	Secure	Secure	B
White-rumped sandpiper	*Calidris fuscicollis*	--	--	Secure	Secure	S

Species[1]	Scientific Name	Status				
		SARA[1]	COSEWIC[2]	NU[3]	NT[4]	Present in Terrestrial RSA[5,6]
Baird's sandpiper	*Calidris bairdii*	--	--	Secure	Secure	S
Wilson's snipe	*Gallinago delicata*	--	--	Secure	Secure	S
Red phalarope	*Phalaropus fulicarius*	--	--	Secure	Secure	X
Black-legged kittiwake	*Rissa tridactyla*	--	--	Secure	Undetermined	X
Iceland gull	*Larus glaucoides*	--	--	Secure	Vulnerable	X
Parasitic jaeger	*Stercorarius parasiticus*	--	--	Secure	Apparently Secure	S
Long-tailed jaeger	*Stercorarius longicaudus*	--	--	Secure	Secure	B
Black guillemot	*Cepphus grille*	--	--	Secure	Undetermined	X
Common raven	*Corvus corax*	--	--	Secure	Secure	B
American robin	*Turdus migratorius*	--	--	Secure	Secure	S
American pipit	*Anthus rubescens*	--	--	Secure	Undetermined	S
Lapland longspur	*Calcarius lapponicus*	--	--	Secure	Secure	B
Yellow warbler	*Setophaga petechia*	--	--	Secure	Secure	S
Chipping sparrow	*Spizella passerina*	--	--	Secure	Secure	S
Savannah sparrow	*Passerculus sandwichensis*	--	--	Secure	Apparently Secure	B
White-crowned sparrow	*Zonotrichia leucophrys*	--	--	Secure	Secure	B
Common redpoll	*Acanthis flammea*	--	--	Secure	Secure	B
Lesser scaup	*Aythya affinis*	--	--	Undetermined	Vulnerable	X
Cliff swallow	*Petrochelidon pyrrhonota*	--	--	Undetermined	Apparently Secure	B
Canvasback	*Aythya valisineria*	--	--	--	Apparently Secure	X
American wigeon	*Anas americana*	--	--	Undetermined	Secure	B
Common goldeneye	*Bucephala clangula*	--	--	Undetermined	Secure	S (LSA)

Species[1]	Scientific Name	Status				
		SARA[1]	COSEWIC[2]	NU[3]	NT[4]	Present in Terrestrial RSA[5,6]
Barrow's goldeneye	*Bucephala islandica*	--	--	Undetermined	Undetermined	S (LSA)
Northern shrike	*Lanius excubitor*	--	--	Undetermined	Secure	X
Gray-cheeked thrush	*Catharus minimus*	--	--	Undetermined	Secure	B
Blackpoll warbler	*Setophaga striata*	--	--	Undetermined	Secure	X
Yellow-rumped warbler	*Setophaga coronata*	--	--	Undetermined	Secure	X
Northern wheatear	*Oenanthe oenanthe*	--	--	Undetermined	Undetermined	X
Smith’s longspur	*Calcarius pictus*	--	--	Undetermined	Undetermined	X

Notes:

COSEWIC = Committee on the Status of Endangered Wildlife in Canada; LSA = local study area; NU = Nunavut; NT = Northwest Territories; RSA = regional study area; SARA = *Species at Risk Act*

X = potentially present; S (LSA) = confirmed present in the marine LSA; S = confirmed present; B = confirmed breeding

[1] ECCC (2025)

[2] COSEWIC (2023a)

[3] Canadian Endangered Species Conservation Council (2022)

[4] Several species were described by Inuit Knowledge as being present within the Kitikmeot Region including trumpeter swan *(uquerpak*; *Cygnus buccinator)*, American black duck (*Qairngaaq*; *Anas rubripes)*, gadwall (*uqsuqaq*; *Mareca strepera)*, killdeer (*tuullik*; *Charadrius vociferus)*, long-billed curlew (*n/a*; *Numenius americanus)*, long-billed dowitcher (*n/a*; *Limnodromus scolopaceus)*, and little gull (*n/a*; *Hydrocoloeus minutus)*. These species are not expected to be regularly found in the marine or terrestrial study areas as they may occasionally occur within the region, therefore they are considered accidental records.

[5] Potential presence of species in the marine RSA is based on Mallory and Fontaine (2004), Groves and Mallek (2011a, 2011b), and species ranges. Presence within the marine LSA is based on Project field surveys.

[6] Presence in the terrestrial RSA is based on Project field surveys (2004, 2008, 2012, and 2025) and observations from Ulu (Canamera Geological Ltd. 1996) and Jericho mine (Hubert and Associates Ltd. 2002a); observations followed by an asterisk (*) denote species only observed at Ulu or Jericho. Species noted as potentially present were determined based on Inuit Knowledge, other regional studies from Ekati Diamond Mine (Smith et al. 2010), Daring Lake Research Station (Obst 2011), Doris North Project (Hubert and Associates Ltd. 2002b, Rescan Environmental Services Ltd. 2011), and notes from Bathurst Inlet Lodge (Canamera Geological Ltd. 1996), and an assessment of the potential habitat present.

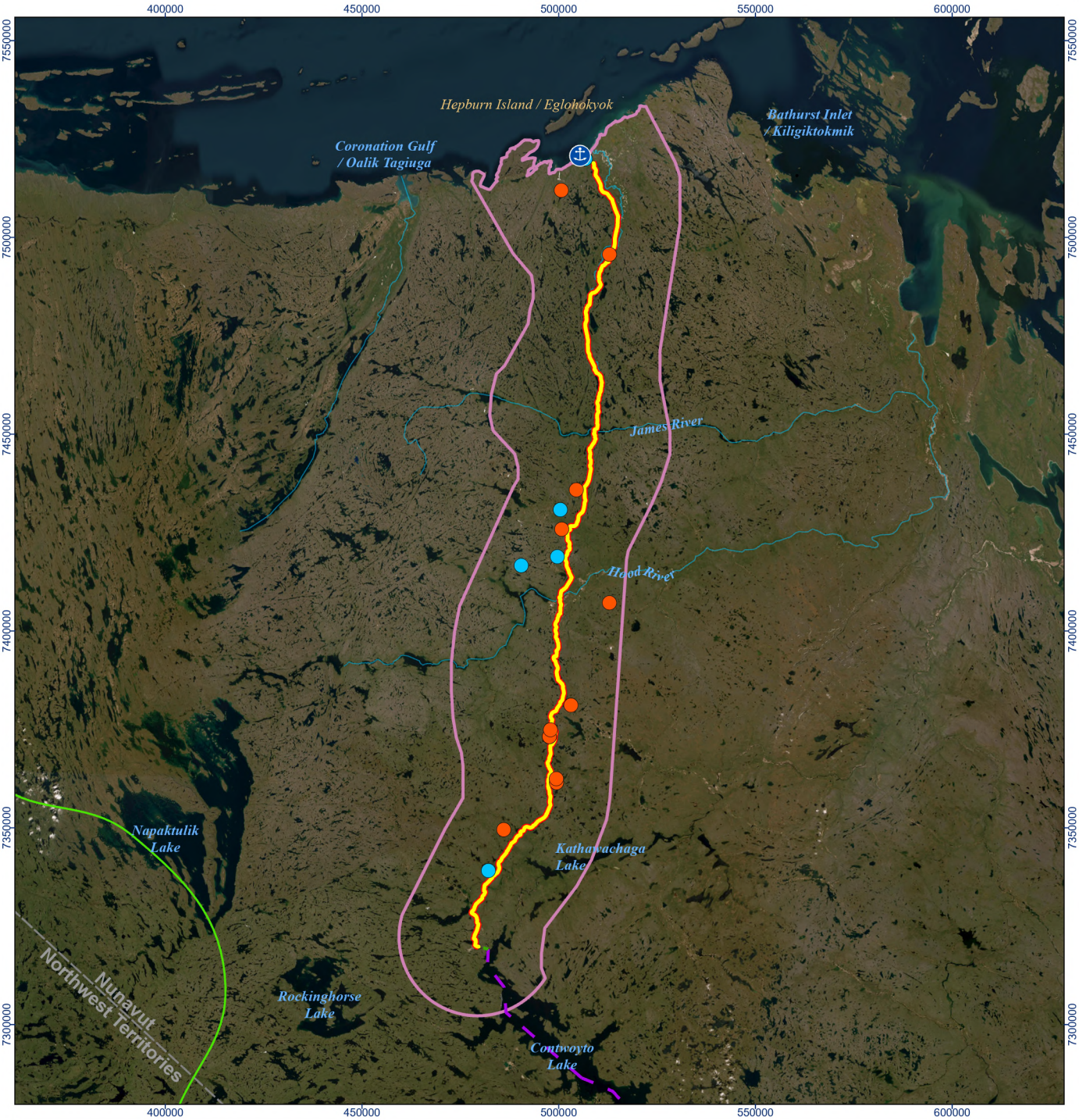
[7] What was once termed Canada goose was divided into two separate species by the American Ornithologists’ Union in 2004 (Banks et al. 2004). Canada goose (*Branta canadensis*) now refers to the large-bodied, interior and southern-breeding geese, while smaller-bodied tundra breeding birds are now referred to as cackling geese (*Branta hutchinsii*). Based on work by Groves and Mallek (2011a, 2011b), both Canada and cackling geese are present within the Kitikmeot Region; however, Canada goose is restricted to the Queen Maud Gulf region. Consequently, this report refers to geese observed within the terrestrial RSA as cackling geese (earlier studies did not always distinguish between the two species).

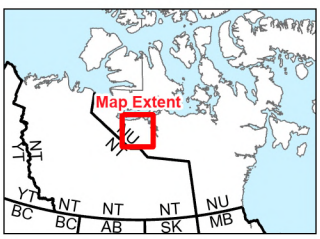
Short-eared Owl

Short-eared owls are widely distributed throughout North and South America, Asia, and Europe, although their distribution is often patchy (Wiggins et al. 2006). This species is found throughout most of Canada, except parts of the High Arctic (Wiggins et al. 2006; COSEWIC 2021a). They typically inhabit open habitats such as grasslands, tundra, bogs, marshes, and agricultural areas, and feed primarily on small mammals (*avingak*) (Wiggins et al. 2006; COSEWIC 2021a). In NU, short-eared owls primarily occur in NU's mainland (Richards and Gaston 2018); however, this species can be found in coastal tundra areas during years of lemming outbreaks (COSEWIC 2021a; Sinclair et al. 2003). The number of mature individuals in NU is estimated to be 11,720 (COSEWIC 2021a); however, population status is difficult to assess because of the insufficient data for this species. Long-term declines in numbers have been detected by Breeding Bird Surveys and Christmas Bird Counts (CBC) throughout Canada (Kirk and Hyslop 1998; Wiggins et al. 2006; COSEWIC 2021a). Breeding Bird Survey data indicates population declines of -70% between 1970 and 2019, while CBC trends for Canada show similar declines of -79% between 1970 and 2019, and -27% over the past three generations (COSEWIC 2021a). Threats to short-eared owl populations are natural system modifications, climate change, and severe weather (COSEWIC 2021a). Short-eared owls were identified during baseline studies between 2004 and 2012 (see Figure 3.2) and were also captured on remote cameras deployed in 2024 and 2025. More information on short-eared owls and observations within the RSA is presented in Section 5.

Ivory Gull

The ivory gull breeds in small colonies scattered sporadically across all the High Arctic regions. In Canada, ivory gull is found exclusively in northern NU where breeding has been confirmed on Ellesmere, Devon, Cornwallis, and Seymour islands, and on the Brodeur Peninsula on north Baffin Island (Mallory et al. 2020; COSEWIC 2023b). Ivory gull colonies are found on nunataks (exposed rock outcrops surrounded by extensive snow or ice) in very remote areas far from shore (Mallory et al. 2020; COSEWIC 2023b). They also need polynyas (persistent areas of open water in the sea ice) for foraging on marine prey which are critical during early breeding season (Mallory et al. 2020; COSEWIC 2023b). Their nesting habitat is typically terrestrial areas free from mammalian predators and close (100–200 km) to open water during May and early June (COSEWIC 2006). The ivory gull remains close to the edge of the sea ice during migration and in winter, when it uses polynyas and leads in the pack ice (Mallory et al. 2020). There is evidence of natal philopatry with some tracking studies confirming that adults often return to the same colony over consecutive years (Spencer et al. 2014). The minimum estimate for the current Canadian ivory gull breeding assemblage is 1956 mature individuals (COSEWIC 2023b). Although all colonies known from the 1970s have virtually disappeared, the overall number of ivory gulls counted in recent years is higher than historically reported and mostly concentrated in eastern Ellesmere Island (COSEWIC 2023b). The size of the Canadian ivory gull breeding assemblage does not fluctuate widely, but the number of breeding individuals may vary in any given year, likely in response to predation risk or adverse sea-ice weather conditions during the breeding season (Mallory et al. 2020). Ivory gulls have been documented within the marine RSA at Cambridge Bay and Kugluktuk (Cornell Lab of Ornithology 2024).





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
   Publication Date: Unknown
   Downloaded: September 7, 2021
   Last Checked: September 7, 2021

- Grays Bay Port
- Red-necked Phalarope
- Short-eared Owl
- Grays Bay Road
- Grays Bay Winter Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

0 20 40 Kilometres

(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
3.2

Title
Species at Risk Observations in the Terrestrial Regional Study Area for the years 2004 and 2012

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig3-2_SAR_Birds_20260218; Revised: 2026-02-18 By: OliviaLeblanc

Ross's Gull

Ross's gull is one of the rarest breeding gulls in North America (COSEWIC 2021b). Very little is known about this species. Ross's gulls have been recorded nesting in a few locations in Canada: the Cheyne Islands, several islands in Queen's Channel, an island in Penny Strait, and Prince Charles Island within NU; and at Churchill, Manitoba (Maftei et al. 2012). An unnamed island in Penny Strait, near Cornwallis Island, documented several birds and four nests in 2005 (Mallory et al. 2006). Their nesting habitat is typically found on small islands near polynyas or consistent leads in the sea ice, and nests are often found near Arctic tern (*takatakiaq*; *Sterna paradisaea*) colonies and on near-level ground, usually in mossier areas (Burger et al. 2020). Outside of the breeding season, this species' distribution is poorly understood. The birds are believed to be largely pelagic and associated with the edge of pack ice (COSEWIC 2021b). In the fall, approximately >20,000 individuals congregate on feeding grounds in the Beaufort Sea for about a month (COSEWIC 2021b), and there is some indication that in some years, they may overwinter along the offshore leads of the Amundsen Gulf and Cape Bathurst Polynya (Mallory and Fontaine 2004). The worldwide population of Ross's gull is estimated at 50,000 individuals. However, the Canadian and Greenland populations are very small (perhaps no more than five pairs) (Burger et al. 2020). All known Canadian colonies have contained fewer than six pairs, and the entire North American population may not be permanent (Burger et al. 2020; COSEWIC 2021b). According to some, the primary threat to Ross's gull populations includes oil developments within the Beaufort and Chukchi seas, the effects of climate change on ice regimes and marine ecosystems, and predation on chicks by gulls, skuas, and peregrine falcons (Burger et al. 2020; COSEWIC 2021b). Ross's gull have been documented in the Cambridge Bay area (Cornell Lab of Ornithology 2024).

Red Knot

Red knots were not detected during baseline surveys; however, they have been identified in the marine RSA previously. The red knot has three different subspecies in Canada, but only the *rufa* subspecies could be found within the terrestrial RSA. The *rufa* subspecies breeds across the central Canadian low and middle Arctic and has three distinct non-breeding populations, with some birds migrating over 15,000 km to Tierra del Fuego in the Patagonian region of Chile (Baker et al. 2020). Modelling red knot nesting habitats within the Canadian Arctic does not identify any potential habitat within the terrestrial RSA. Still, it does highlight mainland areas northwest of Kugluktuk, southern Victoria Island, and Jenny Lind Island as breeding areas. Breeding habitat for *rufa* red knots typically consists of barren areas (often with less than 5% vegetation cover) such as windswept ridges, slopes or plateaus, generally at elevations less than 150 m above sea level and less than 50 m from the coast. However, they will forage in damp or barren habitats up to 10 km from the nest site (Baker et al. 2004). Breeding habitat loss due to climatic changes and frequent severe weather, such as storms and hurricanes, may affect migration performance and survival. Red knot has been identified in the Cambridge Bay area (Cornell Lab of Ornithology 2024)

Buff-breasted Sandpiper

The buff-breasted sandpiper breeds sporadically along Arctic coasts from the mainland coast of Yukon, NU, and NT to the High Arctic (Lanctot and Laredo 1994; McCarty et al. 2020). They are the only shorebird species in North America that display the lek mating system, where males aggregate to display for females (COSEWIC 2012). Their nesting habitat generally consists of sedge-dominated habitats, often near a pond, lake or wetland, but drier upland habitats are also important for lek displays, foraging, and nesting (COSEWIC 2012; McCarty et al. 2020). The worldwide population is estimated to be 56,000, of which about 75% breed in Canada (COSEWIC 2012; McCarty et al. 2020). In the last century, numbers have rebounded from near extinction caused by overhunting in the 1800s and 1900s. However, buff-breasted sandpiper population estimates are still much lower than pre-hunting levels, and there is evidence of population declines in recent decades (COSEWIC 2012). Currently, the most significant threats to this species are the loss and degradation of grassland habitats on their non-breeding ground and along migration routes (COSEWIC 2012; McCarty et al. 2020). Buff-breasted sandpipers were not detected during Project baseline studies; however, they have been documented in Kugluktuk, Cambridge Bay, and Walker Bay within the marine RSA (Cornell Lab of Ornithology 2024).

Red-necked Phalarope

Red-necked phalaropes are a circumpolar species that breed in the Arctic. Notable declines have been observed at a key staging ground in eastern Canada and on Arctic breeding grounds (COSEWIC 2014). Although its breeding ecology has been studied since the early twentieth century, very little is known about the species migrations and non-breeding period ecology (Bart and Smith 2012; Rubega et al. 2020). The primary threats for this species include the effects of climate change on breeding habitats and the degradation of stopover or non-breeding habitats (COSEWIC 2014; Rubega et al. 2020). Red-necked phalaropes have been identified within the terrestrial RSA in wetland, pond, and shallow lake habitats (see Figure 3.2). Breeding was not confirmed within the terrestrial RSA but is considered probable. Further details on the red-necked phalarope observations during baseline studies can be found in Section 6.

Barn Swallow

Barn swallows are aerial insectivores, feeding on flying insects they catch in flight. Barn swallows typically forage over various open habitats (e.g., meadows, wetlands, open water) and their nests are associated almost exclusively with artificial structures (Brown and Brown 1999). This species is one of the world's most widespread and abundant swallows; however, like many other aerial insectivores, barn swallow populations have declined greatly in the last couple of decades (Brown and Brown 2020). The cause of this decline may be related to decreases in insect populations, changes in the seasonal timing of insect emergence, or the availability of nesting habitats (North American Bird Conservation Initiative Canada 2024). The terrestrial RSA is outside of the range of barn swallow within Canada; however, southwest of the terrestrial RSA, a single bird was observed flying in the Izok area in June 2008. Barn swallows have also been documented as a rare summer resident at Kugluktuk and Cambridge Bay that are located within the marine RSA (Cornell Lab of Ornithology 2024).

3.2 Protected Areas and Key Habitat Sites

No protected areas or key habitat sites for birds are located within the terrestrial RSA.

3.3 Important Habitat Features

The Arctic contains habitat features that are important to terrestrial and marine bird species. The features described here highlight selected important habitat features for birds.

Polynyas

Polynyas are areas of open water in the ocean surrounded by sea ice, often caused by currents and upwellings. They occur in the same areas each year and are used as migratory resting and feeding areas for waterfowl, especially eiders (Alexander et al. 1997; Mallory and Fontaine 2004; Dickson et al. 2009). The closest polynya to the Grays Bay Port is in the Lambert Channel, a narrow stretch of water between Dolphin and Union Strait and Coronation Gulf, north of Kugluktuk. The polynya appears at various times between February and June each year, and for birds is a critical feeding area prior to nest initiation.

Wetlands

According to Inuit Knowledge holders, coastal areas and wetlands are the most important habitats for waterfowl nesting and feeding (Richard et al. 2023). The areas are high in nutrients, which produce crustaceans, insects, fishes, and other small prey important to waterfowl and shorebirds. As noted in Section 4, extensive wetlands and coastal areas are limited in abundance and extent within the terrestrial RSA.

Cliffs and Precipices

Inuit Knowledge and baseline field studies both confirm the importance of cliff habitats for raptors in the RSA. Four species of raptors (peregrine falcon, gyrfalcon, golden eagle, and rough-legged hawk [*qirliq*; *Buteo lagopus*]) breed on ledges of steep rocky cliffs in the Kitikmeot Region. The landscape, particularly in the northern and southern portions of the terrestrial RSA, features prominent cliffs and precipices that provide suitable nesting sites for cliff-nesting raptors (see Section 5). Given the preponderance of cliffs available, the availability of nest sites does not appear to be limiting in the terrestrial RSA.

4 Seabirds, Waterfowl, and Waterbirds

4.1 General Information

Some birds rely on marine habitats for breeding, migration, staging, moulting, and over-wintering. Seabirds occupy saltwater environments during large portions of their annual cycle; these may include pelagic birds (i.e., those characteristic of offshore waters) or sea ducks (i.e., ducks that live primarily at sea when not on their breeding grounds). Other waterfowl (i.e., ducks, geese and swans) and waterbirds (i.e., loons, and larids like jaegers, gulls, terns) may also be found in marine habitats, particularly during migration and moulting. Many of these species, particularly waterfowl, loon, and larid species, can be found breeding within the terrestrial RSA.

The Arctic is renowned for providing suitable habitats for many seabirds, waterfowl, and other aquatic birds, many of which migrate to the region to nest and raise their young. Despite the high numbers of these birds, the density and productivity are highly variable both temporally and spatially. High densities are found in relatively small areas, but much of the region supports low bird densities. Large congregations of birds can occur at specific staging, breeding, or moulting sites; for example, the Mackenzie Delta in the NT and the Queen Maud Gulf in NU are areas that support high densities of breeding waterfowl due to the presence of extensive wetland habitats.

The review of seabirds and waterfowl focused on long-tailed ducks and common eider. These species were selected due to conservation concerns, anticipated interactions with the Project, and their relative abundance among conspecifics. In Arctic coastal areas, the common eider is a common seabird that is important to communities, is one of the more common seabirds within the marine RSA, and could interact with development at the Port PDA. While inland waterfowl densities were comparatively low, long-tailed ducks were the most abundant species observed during field work within the terrestrial RSA.

4.1.1 Populations

The status and population trends of Arctic birds is not well understood, particularly for those species that breed exclusively within the Arctic. Due to the large, remote and almost inaccessible areas, information for many species relies on counts made during migration or on non-breeding grounds (North American Bird Conservation Initiative Canada 2024). Arctic waterfowl are increasing in numbers; however, this is biased by a large population increase in geese and swans, partly due to food availability in agricultural areas during winter and along migration routes (North American Bird Conservation Initiative Canada 2024). For example, populations of lesser snow goose have experienced exponential growth in recent years, reaching millions (Mowbray et al. 2000). However, some species of Arctic waterfowl are currently declining, like the common eider population that nests in the central and western Arctic, which has declined by more than 50% between 1976 and 1996 (Suydam et al. 2000). Population trends among Canadian Arctic seabirds are also variable, with some species showing evidence of decline but with no strongly negative trends overall (Gaston et al. 2012).

4.1.2 Threats, Mortality, and Harvest

Migratory seabirds and waterfowl are sensitive to disturbance during all the stages of their life cycle: nesting, brood-rearing, moulting, and migration (Latour et al. 2008). Threats to marine bird populations in Arctic Canada include a variety of issues, such as habitat loss or modification, predation, climate change, periodic severe ice conditions, declining food supplies in shared non-breeding areas, overharvesting, and entanglement in fishing nets. Habitat loss is a particular concern at migration stopover sites and non-breeding areas, as well as within the breeding range. Industrial, urban or recreational developments, disturbance from coastal developments and increased shipping traffic, habitat degradation via the release of contaminants, overexploitation of food resources, or degradation of open water leads can have a detrimental effect on marine bird populations (Dickson and Gilchrist 2002; Mallory and Fontaine 2004; Hoover et al. 2010; Dickson 2012). Oil spills are of particular concern to sea ducks and other marine birds as they tend to congregate in large flocks at sea when they are feeding or resting, therefore even a small oil spill can affect a significant number of birds (Dickson and Gilchrist 2002; Dickson 2012). Migrating seabirds also depend on open water leads for feeding and resting. If these open water leads are degraded in any way, significant negative impacts to migrating seabird populations may occur (Mallory and Fontaine 2004). Additionally, climate change is occurring faster in the Arctic than in other regions of the world, affecting seabirds and waterfowl habitats, insect population availability, and increasing the frequency of weather events (North American Bird Conservation Initiative Canada 2024).

Most species of waterfowl are hunted throughout their distribution range, but most of the harvest is targeted at individuals during fall migration. For some species which are highly sought after, overharvest is considered a threat to their populations. For example, numbers of greater white-fronted goose (*niglinak*; *Anser albifrons*) are controlled by harvest, therefore, spikes in population numbers have been evident following restrictions on bag limits (Ely and Dzubin 1994). Dabbling ducks such as mallard (*paenahic*; *Anas platyrhynchos*), northern pintail, and green-winged teal (*Anas carolinensis*) are also highly sought-after species by hunters; while diving ducks like scaup and scoters are harvested in small numbers compared to geese and dabbling ducks.

Residents of the West Kitikmeot harvest a variety of duck, geese, and waterbird species and their eggs. Spring and fall are important times for coastal Inuit to hunt the large aggregations of migrating waterfowl, and in the summer, they collect eggs and hunt moulting waterfowl (NTKP 2018). Inland Inuit hunt migrating geese during the spring, and nesting geese and ducks on lakes are hunted during the summer moulting season (NTKP 2018). Coastal and inland Inuit also hunt ptarmigan when caribou are absent (NTKP 2018).

> C35-29 "*I never saw geese being hunting long ago inland. Inuit hunted geese around the coast and close to the rivers and in other areas such as at the lakes and close to the lakes*" (NTKP 2018).
>
> C51 "*Sometimes we hunt at the wetlands but I use the rivers more at my place (Nonatoklik). There are several rivers where I usually go to harvest some geese*" (NTKP 2018).
>
> C30-3 *"… We hunted molting ducks around the rivers. It was fun. That's how we hunted ducks when we wanted to have them, when the ducks were molting. The Inuit also would look for eggs*" (NTKP 2018).

C28 "*That's where we'd collect eggs (island in Daniel Moore Bay). I don't know how many summers we'd spend there and move, when we want to go elsewhere we'd move, lots of fun*" (NTKP 2018).

C35 "*… We would always go to Nolahokyok (Bernard Harbour), Lady Franklin Point and Kikiktanayok to hunt ducks and geese. We used to gather eggs in the spring around there … When we had not children, when we were hunting seals in the spring we would go by Lady Franklin Point to Otekvik hunting ducks and gathering eggs*" (NTKP 2018).

C43 "*… Around July we go there to pick up duck eggs (Kikiktanayok (Read Island) area). There are lots of eggs on these islands, on this one little island, and there is another one here and this one. Sometimes we collected three boxes of eggs, big boxes …*" (NTKP 2018).

C23-13 "*The Inuit hunted small wildlife like ptarmigan during the summer …*" (NTKP 2018).

C44-65 "*During winter Inuit eat small animals like ptarmigan, when there are no caribou around, because the meat is tasty …*" (NTKP 2018).

Summarizing data between 1996 and 2001, birds and eggs from goose species were harvested to the greatest extent, followed by eider ducks and other duck species (Priest and Usher 2004). Smaller numbers of loons, tundra swans, and sandhill cranes (*tatilgak*; *Antigone canadensis*) were also harvested. The subsistence harvest of common eiders in Canada and Alaska is estimated to be <3% for common eiders (Canadian Wildlife Service Waterfowl Committee 2013).

C19-29 "*I've hunted white-fronted geese, Canada geese, long-tailed ducks, common eiders and brants, all of those. I've hunted part of Kingakyok (Cape Colborne) when all kinds of ducks arrive there, all over that area …*" (NTKP 2018).

C30-29 *"(I hunt) snow geese, white-fronted geese, Canada geese and brants; also northern pintails and long-tailed ducks (coastal hunting area west of Kugyoak or Perry River) … There are also loons*" (NTKP 2018).

C3-29 *"… Sandhill cranes were hunted when they first arrived because (at that time) they are nice and fat. During mid-summer they are not hunted because usually they are skinny. They are hunted only when they first arrive, while they still have fat. I have eaten them and they taste good because they eat vegetation. When they are fat they are good and can be eaten*" (NTKP 2018).

4.2 Occurrence in the Marine RSA and LSA

Twenty-seven sea duck, waterfowl, and other waterbird species were documented in the marine LSA (see Table 4.1). None of these species are federally listed as species at risk under SARA, although several are considered vulnerable in NU (see Table 3.2).

Table 4.1 Seabird, Waterfowl, and Waterbird Species Documented Within the Marine LSA

Species	Spring Migration (June)[1]	Breeding (June/July)[2]	Summer/Moulting (July/August)[3]	Fall Staging (September)[4]
Greater white-fronted goose			X	
Snow goose	X			
Canada\cackling goose	X		X	A (2012)
Tundra swan	X		X	X
Mallard	X			
Northern pintail	X		X	
Green-winged teal	X		X	
Greater scaup*	X		X	
King eider	X			
Common eider	A (1996, 2008)	X	A (2004, 2008)	X
Surf scoter	X		X	
White-winged scoter	X		A (2004, 2012)	
Common goldeneye	X			
Barrow's goldeneye	X			
Long-tailed duck	A (1996, 2008)		A (2004, 2012)	A (2012)
Common merganser	A (2008)		A (2008, 2012)	A (2012)
Red-breasted merganser	A (1996, 2008)		A (2004)	X
Red-throated loon	X	X	X	
Pacific loon	X		X	
Yellow-billed loon	X		X	X
Northern fulmar				X
Herring gull			X	
Thayer's gull	X	X	A (2008, 2012)	X
Glaucous gull	X	X	A (2008, 2012)	A (2012)
Arctic tern			X	
Pomarine jaeger			X	
Jaeger spp.				X

Notes:
LSA = local study area
X = present
A = species noted to be relatively abundant during surveys

[1] Based on 1996 CWS survey (Dickson 2006, pers. comm.), June 2008 Project survey (aerial), and 2025 ground-based surveys.

[2] Based on aerial and ground-based Project surveys in 2008 and 2012.

[3] Based on several aerial and ground-based Project surveys in 2004, 2008, and 2012.

[4] Based on Project aerial survey in September 2012; note that due to survey height and speed, many observations were generalized to groupings of birds (e.g., ducks, geese, gulls), and identification of specific species was limited.

4.2.1 Spring Migration

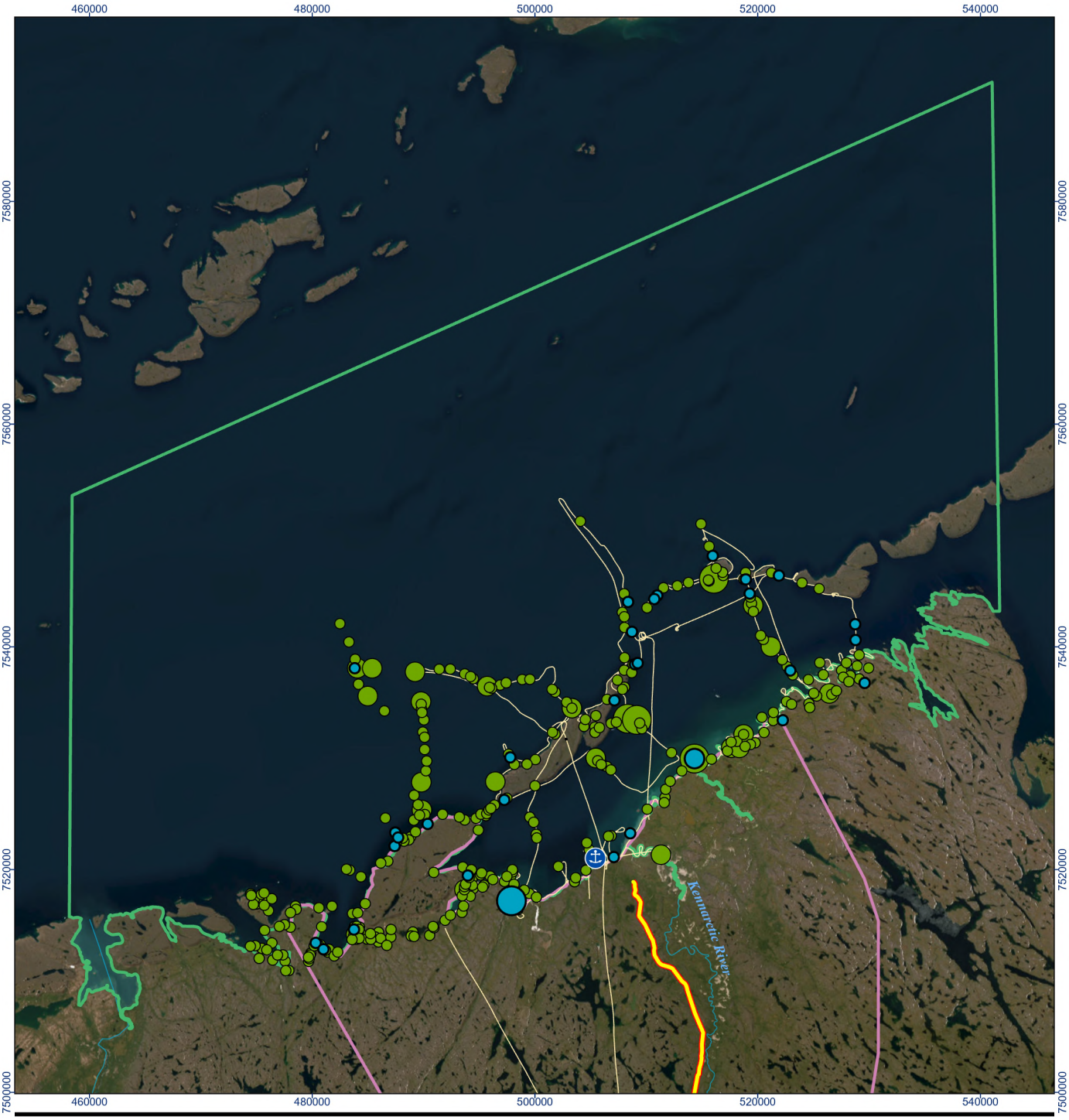
Inuit Knowledge acknowledged that waterfowl are some of the first birds to arrive in the Kitikmeot region:

> *C29 "The ducks that are first to arrive are the Canada Geese, Brants and Swans. The Sandhill Cranes are also first to arrive and the other ducks arrive after these ducks. The Snow Buntings are always the very first ones before the ducks arrive... They arrive around here at Kugyoak (Perry River) and Kunayok (Ellice River). Before they arrive here, they're in all that area around Naoyak (Parry Bay), Omingmaktok and Katimanak." The birds that arrive first leave first, like the Canada Geese. The birds come from their land and then return in the fall. The birds that arrive first leave first from around Etibliakyok (Kent Peninsula isthmus), Kunayok (Ellice River) and from near Naoyak (Parry Bay) and Omingmaktok."* (Banci and Spicker 2024)

An aerial survey of seabirds and waterfowl along the southern shoreline of the Coronation Gulf completed by the CWS in June 1995 found that numbers were generally low in this area, and that Grays Bay harboured a greater concentration than elsewhere, consisting mainly of common eider, long-tailed duck, and red-breasted merganser (*nujaralik*; *Mergus serrator*). The greater concentration was likely due to open water appearing earlier in the spring between Hepburn Island (*Eglohokyok*) and the mainland compared to elsewhere (Dickson 2006, pers. comm.).

During an aerial survey of the marine LSA in June 2008, 1,655 birds were observed belonging to 19 different species of seabirds, waterfowl, and other waterbirds along open water leads, shorelines, and offshore islands within 30 km of the Grays Bay Port (see Figure 4.1). The long-tailed duck was the most frequently observed species, with 733 individuals recorded. Other frequent species were common merganser (*nuyagalik*; *Mergus merganser*) with 173 individuals, 171 red-breasted mergansers, and 157 common eiders. One of the main goals of the survey was to identify potential common eider nesting sites; therefore, the survey was timed to coincide with the early stages of nest initiation for common eider. Survey timing was optimal, with large numbers of common eiders still on the water and a limited number and width of leads, increasing survey efficiency. Common eiders were scattered along coastal shorelines and islands within the marine LSA, with large groups at only two locations along the mainland coast (see Figure 4.1). Other waterfowl and gulls were similarly grouped, with some concentrations along the mainland coast, on islands, and along ocean leads.

A ground-based shoreline survey of the port and aerodrome was completed in June 2025 resulting in the observation of 10 species of seabirds, waterfowl, and other waterbirds. The two most abundant species were Pacific loon (*Gavia pacifica*) with 12 individuals, and the long-tailed duck with 8 individuals. Two species not previously observed were the common goldeneye (*Bucephala clangula*) and barrow's goldeneye (*Bucephala islandica)*, with two individuals of each species.



Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
   Publication Date: Unknown
   Downloaded: September 7, 2021
   Last Checked: September 7, 2021

- Grays Bay Port
- Seabird Survey Route
- Grays Bay Road
- Watercourse
- Marine Local Study Area (LSA)
- Terrestrial Regional Study Area (RSA)

Other Seabird, Waterfowl and Waterbird Species

- 0 - 10
- 11 - 25
- 26 - 70

Common Eider

- 1 - 10
- 11 - 25
- 26 - 50

0 7.5 15 Kilometres

(At original document size of 8.5x11) 1:525,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

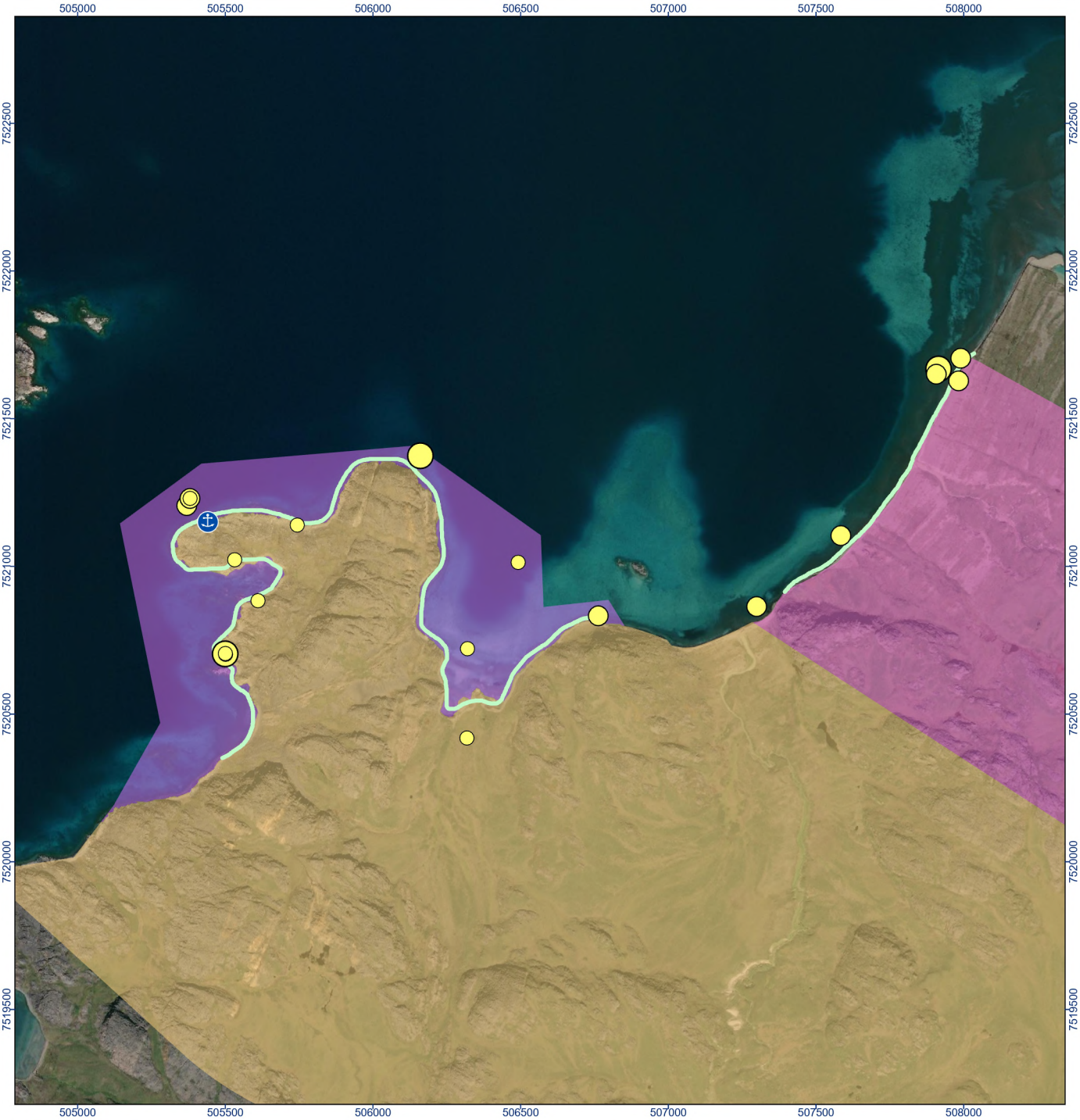
Prepared by OliviaLeblanc on 2026-02-18

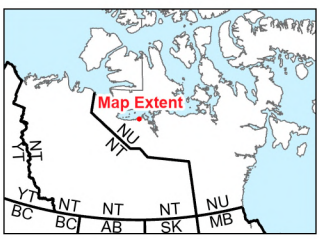
Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
4.1

Title
Seabird Aerial Survey Results within the Marine Local Study Area in June 2008

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig4-1_SeabirdAerialSurvey_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N

2. Data Sources: Government of Canada, Stantec, Downloaded by David Spry (Stantec GIS) in mid-December 2016 from ftp://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/fgdb/Hydro/ Last Modified 08-Nov-2016, Vantor

Grays Bay Port

Shoreline Survey Transects

Project Development Area (PDA)

Aerodrome

Port (Landside Infrastructure)

Port (Marine-based Infrastructure)

Shoreline Bird Survey Locations

Waterbirds Observed

1

2 - 3

4 +

0 0.25 0.5 Kilometres

(At original document size of 8.5x11) 1:20,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project
24Y0376

West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
4.2

Title
Shoreline Transect Survey Locations in 2025

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx Layout: 24Y0376_BirdBaseline_Fig4-2_BirdSurveyTransects_ShorelineResults_20260218 Revised: 2026-02-18 By: OliviaLeblanc

Table 4.2 Seabird and Waterfowl Densities Based on 2025 Shoreline Transects

Species	Number Observed	Density (Individuals/km²)
Barrow's goldeneye	2	0.43
Common eider	3	0.65
Common goldeneye	2	0.43
Common merganser	6	1.29
Glaucous gull	4	0.86
King eider	1	0.22
Long-tailed duck	8	1.72
Northern pintail	3	0.65
Pacific loon	12	2.58
Red-breasted merganser	4	0.86
Total	**45**	**9.68**

4.2.2 Breeding

In general, Project surveys have indicated that, except for a couple of isolated gull colonies, the marine LSA does not support a large nesting population of seabirds.

A survey for nesting seabirds within the marine LSA was completed in July 2008. It consisted of an initial aerial reconnaissance survey of all islands within a 30 km radius of the Grays Bay Port, ground searches of 13 islands and the peninsula at the Grays Bay Port to identify potential common eider and other seabird nesting sites (see Figure 2.5 – 2008 Seabird Survey Locations inset). Overall, the marine LSA provides minimal eider and waterfowl nesting sites. Nests of common eider, Thayer's gull (*Larus glaucoides thayeri)*, glaucous gull (*nauvavik*; *Larus hyperboreus)*, and red-throated loon were (*kakhauk*; *Gavia stellata)* identified. Common eider nests were located on four of the surveyed islands (Island 7, 9, 11, and 13); only one active nest was observed (Island 7), along with five recently predated nests. Fourteen old nests (either eider or gull) from previous years were also located. Two colonies of Thayer's gulls were observed nesting on cliffs in the study area, one colony with 100 to 150 gulls was located on an island in the northeast side of the study area, and another colony with 70 to 100 gulls was located on a peninsula in the west side of the study area. Glaucous gulls were also noted at each of the Thayer's gull nesting colonies, with approximately 20 individuals at each site. Additionally, glaucous gull nests were located on Island 7 (one active nest) and Island 11 (two nest, both predated). Only one red-throated loon nest was located during the surveys (Island 3), but there were indications they were also possibly nesting on Island 1.

In early July 2012, a ground search for nesting seabirds and shorebirds was completed along 20 km of the mainland coast adjacent to the Grays Bay Port. No nesting seabirds or waterfowl were located. Only one observation of common eider was made, and this was a group of two males off a small island approximately 750 m from the port. A few days later, a fisheries crew working in the area reported that

they flushed a female common eider from a nest on this island. The Grays Bay Port and much of the adjacent shoreline are dominated by exposed bedrock with little vegetation (see Photo 4.1), which makes these sites unappealing for nesting by many species of seabirds and waterfowl. To the southwest of the PDA, the coastline is a combination of rocky outcrops interspersed with pockets of herbaceous and/or wet tundra (see Photo 4.2). Closer to the port, the coastline gets increasingly rugged and is dominated by bedrock outcrops and rocky headlands. Northeast of the port site lies a rocky headland with steep rocky cliffs. East of this, the coastline levels out into herbaceous tundra with a generally small, sandy shoreline closer to the mouth of the Kennarctic River (*Kogloktoakyok*) (see Photo 4.3).

Photo 4.1 Grays Bay Port (looking southeast)

Photo 4.2 Coastline Southwest of Grays Bay Port (looking northeast)

Photo 4.3 Coastline East of Grays Bay Port (looking northeast towards the mouth of the Kennarctic River)

4.2.3 Summer/Moulting

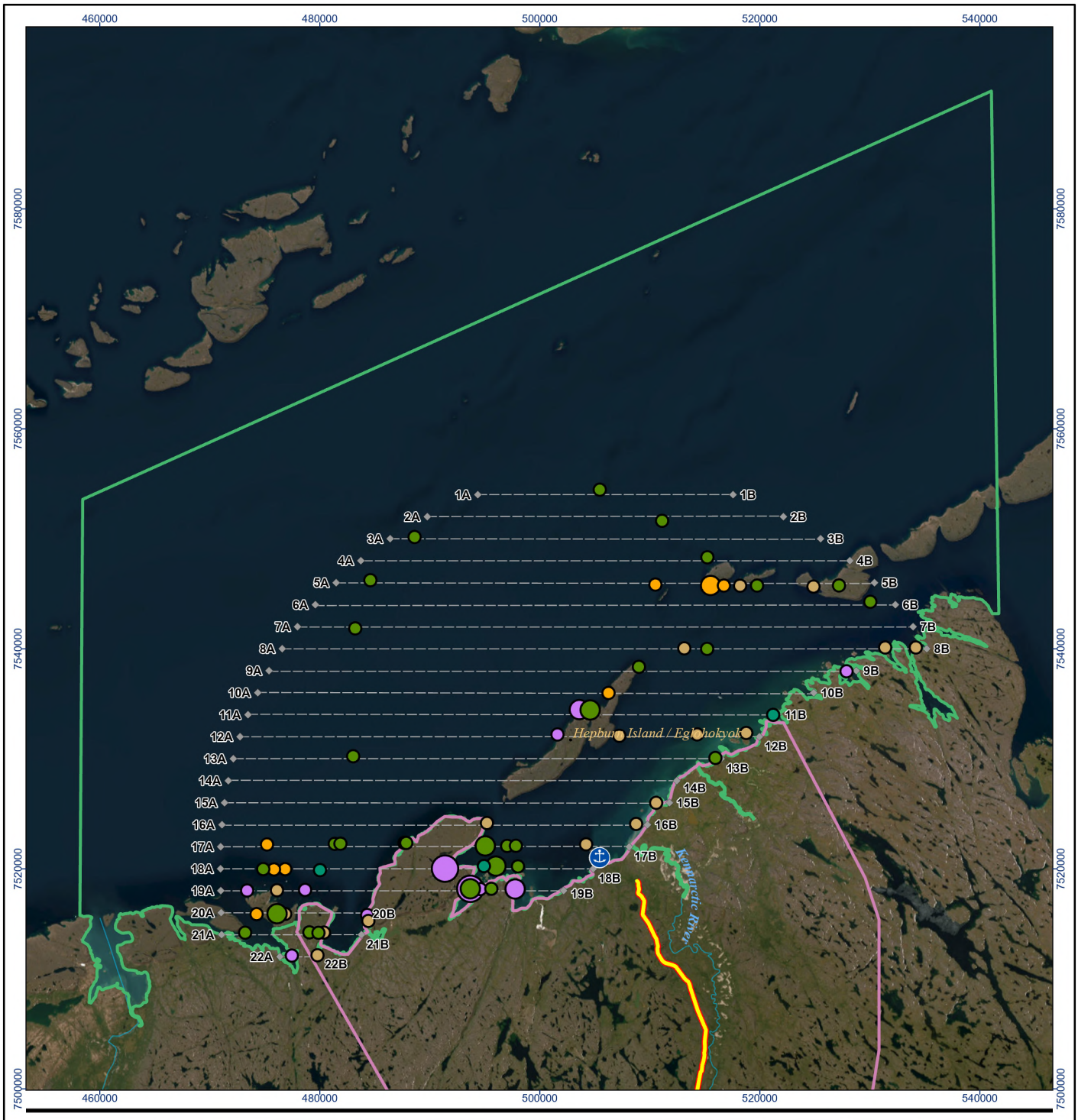
Summer observations of seabirds and waterfowl within the LSA were collected during several surveys. The most common species documented were long-tailed duck, white-winged scoter (*Melanitta deglandi)*, greater scaup (*qimmiq*; *Aythya marila*), common eider, common merganser, red-breasted merganser, glaucous gull, and Thayer's gull. Birds are typically concentrated along shoreline areas during summer.

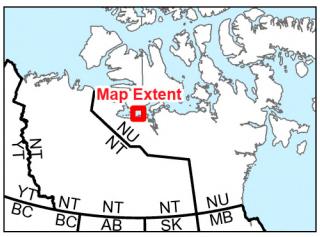
Aerial and ground-based surveys completed in July 2004 found concentrations of seabirds and waterfowl present along the Grays Bay coastline, most of which were believed to be using the area for moulting and staging. The most common species detected in these surveys were red-breasted merganser, white-winged scoter, greater scaup, common eider, long-tailed duck, and common merganser.

In 2008, observations made during the ground nest searches in July documented 16 species of seabirds and waterfowl, including gulls, terns, eiders, ducks, mergansers, loons, geese, swans, and other waterbirds in Grays Bay. The most detected species were common eider with 89 individuals (most of them female) and 56 individuals of glaucous gull.

During an aerial moulting survey in August 2008, 13 species were recorded, consisting of gulls, terns, jaegers, eiders, ducks, mergansers, loons, geese, and swans (see Figure 4.3). Mergansers were the most detected species with 253 common mergansers and 156 unidentified mergansers. Other species commonly identified included Thayer's gull (n=62), glaucous gull (n=44), and common eider (n=10). The average density of seabirds, waterfowl, and waterbirds observed within aerial transects was 1.16 birds/km² (SD = 2.57). The highest densities were observed at the west end of Grays Bay and on the north side of Hepburn Island. The shoreline survey also recorded nine species of gulls, eiders, ducks, mergansers, loons, geese, and swans. A total of 116 common mergansers were observed during the survey, including one female with four young, approximately 10 days old. Notably, 44 common eiders were recorded during the shoreline survey compared to only 10 during the systematic transect survey, and most of these were found relatively close to the mainland shore, often in inlets. One common eider female was observed with two ducklings, approximately 10 days old, near a group of small islets in an inlet west of the port site. Forty pairs of Thayer's gulls and 12 pairs of glaucous gulls were counted at the previously identified colony west of the port site.

The ground nest survey along the coastline of Grays Bay in July 2012 found no nesting seabirds or other waterfowl but did document 89 seabirds and waterfowl foraging, swimming in, or flying over Grays Bay. Of these, the common merganser was the most observed species, followed by the white-winged scoter and the long-tailed duck. Seventy percent of the birds observed were male, 13% were female, and 17% were not identifiable to sex. Only one observation of common eider was made: a group of two males off a small island approximately 750 m from the port. Thayer's gull and glaucous gull were also documented during the ground nest surveys. Most of those birds were observed flying along the ocean, with approximately 1.5 gulls observed per kilometre of transect.





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Transect Start/ End Point
- Moulting Survey Transect
- Grays Bay Road
- Watercourse
- Terrestrial Regional Study Area (RSA)
- Marine Local Study Area (LSA)

Common Eider
- 1 - 10
- 10 - 40
- >40

Other Waterfowl and Waterbirds
- 1 - 10
- 11 - 40
- >40

Thayer's Gull
- 1 -10
- 11 - 40
- >40

Glaucous Gull
- 1 - 10
- 10 - 40
- >40

Common Merganser
- 1 - 10
- 10 - 40
- >40

0 7.5 15 Kilometres

(At original document size of 8.5x11) 1:525,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

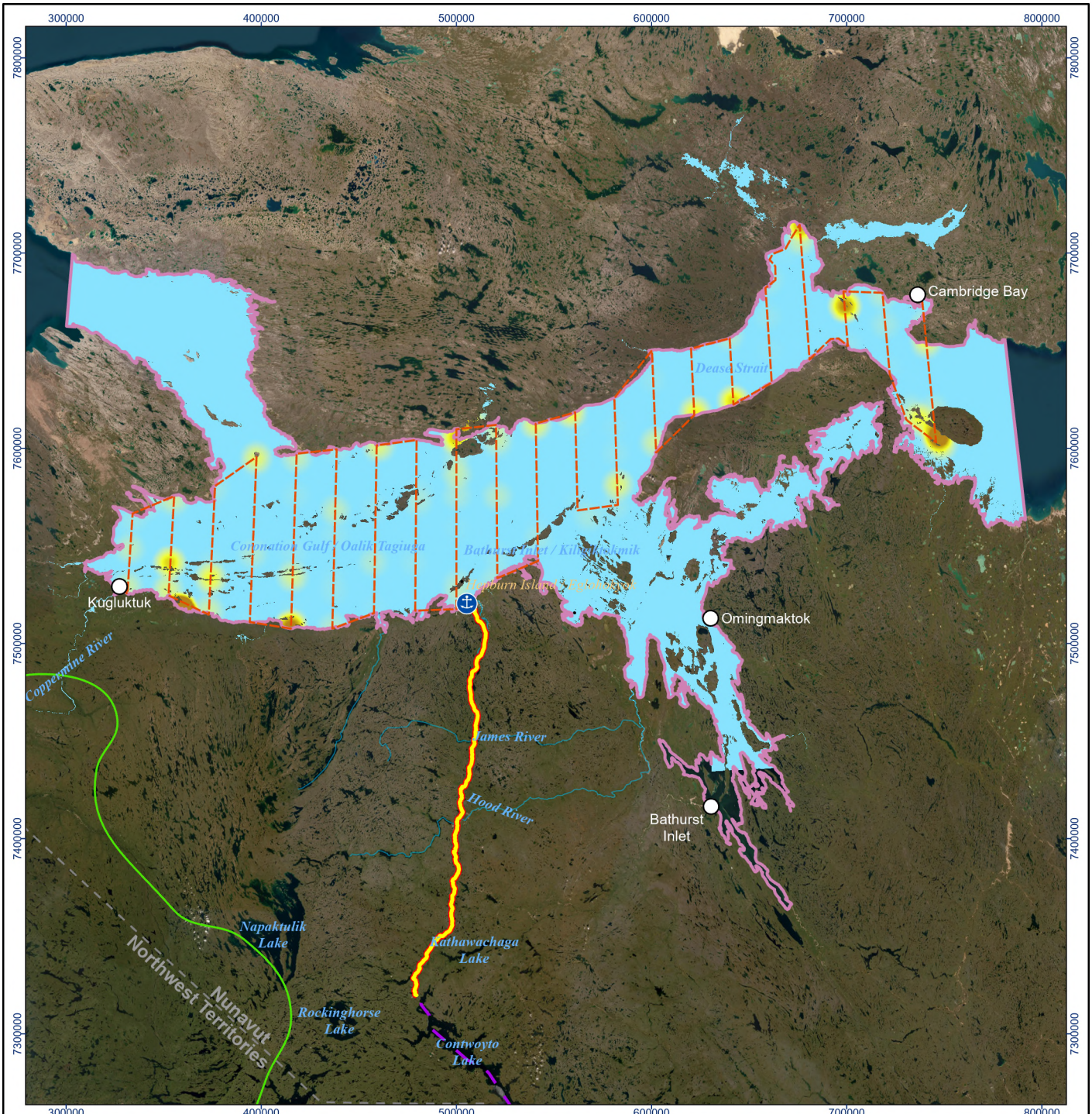
Figure No.
4.3

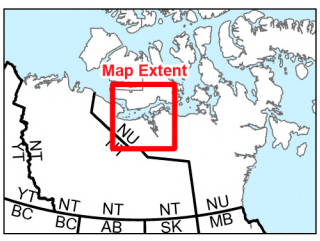
Title
Seabird Moulting Survey Results within the Marine Local Study Area in August 2008

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig4-3_SeabirdMoultingSurvey_20260218; Revised: 2026-02-18 By: OliviaLeblanc

4.2.4 Fall Staging

An aerial survey was conducted in September 2012 to examine fall staging and migration in the marine RSA (see Figure 4.4) and a more intensive aerial survey in the marine LSA (see Figure 4.5). A total of 1,355 birds were observed over the 1,829 km surveyed. Seabird observations were limited to areas near the shorelines, with few observations in the open waters of the Coronation Gulf. Due to the survey height and speed, many observations were generalized to groupings of birds (e.g., ducks, geese, gulls), and identification of specific species was limited; however, the species observed were a mix of Arctic seabirds, waterfowl, and waterbirds consisting of gulls (glaucous and Thayer's positively identified), ducks (red-breasted merganser, common eider, long-tailed duck), geese (Canada, snow, greater white-fronted) and loons. Large concentrations of seabirds were not observed in the marine LSA or RSA, and most observations were of single birds (163 of 315 observations). Larger group observations of 20 to 110 individuals consisted of geese or ducks, such as common eider or long-tailed duck.





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Marine Regional Study Area (RSA)
- 2012 Extensive Aerial Survey Transect (September)

Seabird Concentration

1.608

0.000

0 40 80 Kilometres

(At original document size of 8.5x11) 1:3,000,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

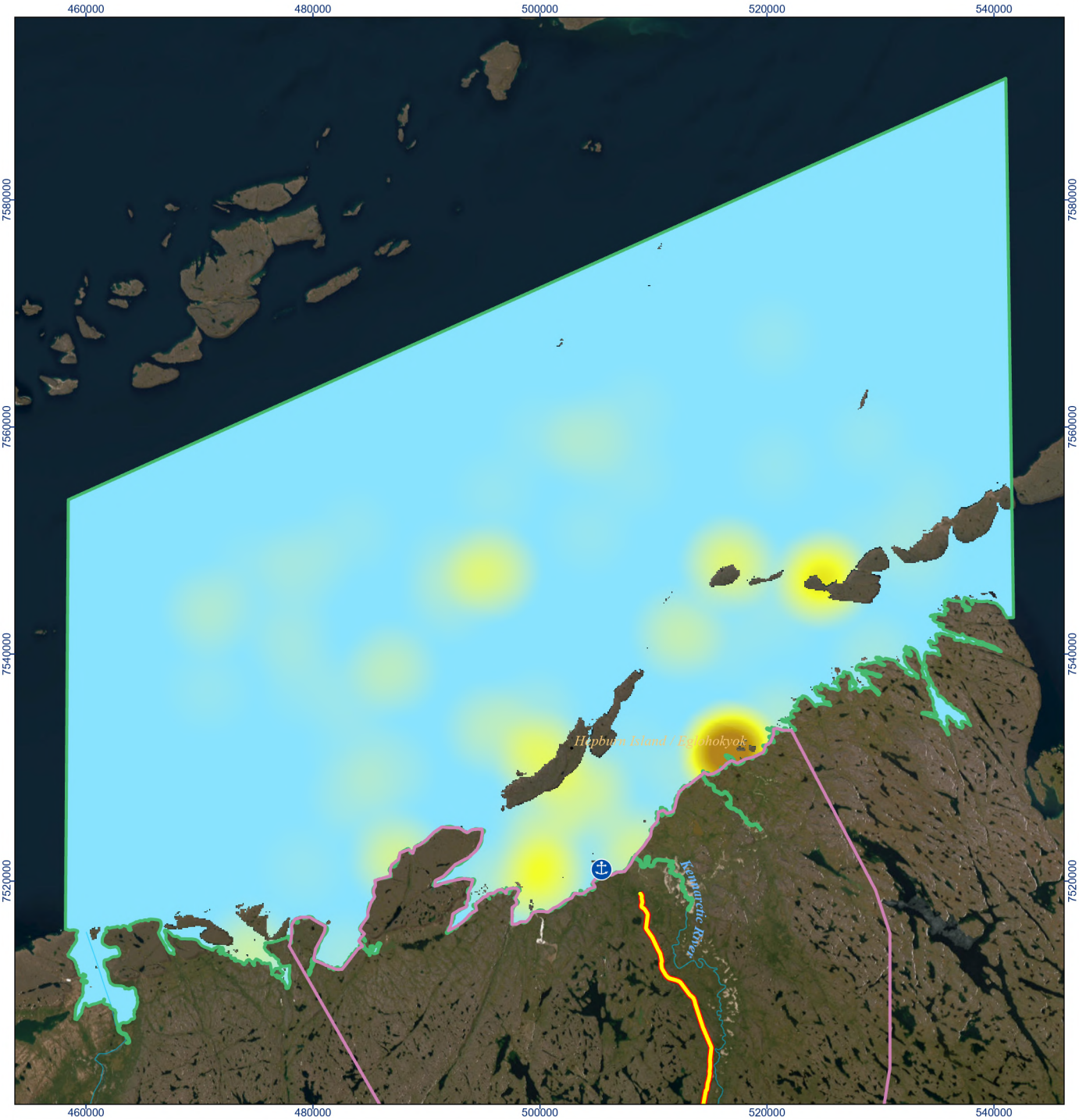
Prepared by OliviaLeblanc on 2026-02-18

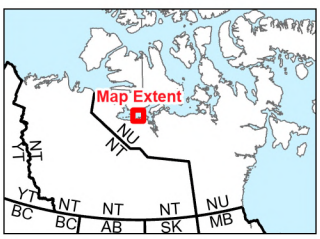
Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
4.4

Title
Seabird Concentrations Observed in the Marine Regional Study Area During the Extensive Aerial Survey Transects in September 2012

Path: L:\PROJECTS\2024\WHI\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig4-4_SeabirdDensity_RSA_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes
1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Watercourse
- Marine Local Study Area (LSA)
- Terrestrial Regional Study Area (RSA)

Seabird Densities
- High Density
- Low Density

0 7.5 15 Kilometres
(At original document size of 8.5x11) 1:520,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
4.5

Title
Seabird Concentrations Observed in the Marine Local Study Area During the Intensive Aerial Survey Transects in September 2012

Path: L:\PROJECTS\2024\WHI\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig4-5_Seabird_MarineLSA_20260218; Revised: 2026-02-18 By: OliviaLeblanc

4.3 Occurrence in the Terrestrial RSA

Prior to 2008, systematic waterfowl surveys had not been completed within the terrestrial RSA. However, informal aerial surveys were completed in the High Lake area (i.e., northern RSA) in 2004 while crews were being transported between other survey sites, and waterfowl observations were noted during baseline surveys near Jericho and Ulu. Systematic aerial surveys for inland waterfowl and waterbirds were completed within the terrestrial RSA in 2008 (southern portions of RSA only) and 2012 (entire RSA; see Section 2.4.2 for survey methods). Ground-based transects were additionally conducted in 2025 to collect occurrence data. Additionally, incidental observations were collected whenever waterfowl were encountered during other survey work.

Based on a variety of regional sources, there are 35 different waterfowl (geese, swans, and ducks) and other waterbird species (loons, cranes, gulls, and jaegers) that may be present within the terrestrial RSA. To date, 13 waterfowl and 9 waterbird species have been documented within terrestrial RSA and breeding has been confirmed for 8 of these species (see Table 4.3). The waterfowl species observed within the terrestrial RSA are dominated by Arctic breeding species such as long-tailed duck. However, several waterfowl species typically associated with the boreal forest reach the northern extent of their breeding range within the terrestrial RSA. These may include mallard, northern pintail, green-winged teal, greater/lesser scaup (*qimmiq*; *Aythya affinis*), common merganser, and red-breasted merganser. Waterbird species observed within the terrestrial RSA included an assemblage of species typical of mainland tundra areas. To date, neither common eider or king eider have been observed within the terrestrial RSA although both species have been observed during marine bird surveys and are known to breed in the region. Common eider and king eider are considered possible breeders within the inland portion of the terrestrial RSA, but since they have not been observed in any of the field surveys to date, if they are present, they are expected to be uncommon.

According to recorded Inuit Knowledge (NTKP 2018), waterfowl nest less inland compared to along the coast. Geese and ducks that nest inland prefer islands in rivers and lakes for nesting. Wetlands provide important feeding areas for inland waterfowl.

> C36-29 "*When I was growing up I don't remember hunting ducks like geese and eider ducks. I remember shooting at long-tailed ducks at small lakes; it used to be lots of fun. During the summer inland you don't often see geese or eider ducks, only during the fall sometimes. It's not like here (on the coast). There are hardly any eider ducks inland*" (NTKP 2018).
>
> C21-28 "*In the land where I used to live (inland), by those large lakes, there aren't many places where the ducks nest (although he did map one location on central-east Contwoyto). There are (more) nesting sites at the rivers*" (NTKP 2018).
>
> *There are no eider ducks at these places further inland. Snow, Canada and white-fronted geese nest at these sites by the rivers, on small islands, so they are hard to find… I don't know of any nesting sites on the lakes, only on the rivers at the small islands (north of Beechey Lake and small islands northeast of Koagyok on mapsheet 76O)*" (NTKP 2018).
>
> C13 "*There are always ducks on the flats in the spring south of Aallik (Concession Lake)*" (NTKP 2018).

C13-28 "*The animals (all wildlife including waterfowl) graze these areas (wetlands), including the lakeshores south of Concession Lake*" (NTKP 2018).

C13 "*There are always ducks on the flats in the spring south of Aallik (Concession Lake)*".

C37-27 "*The wetlands (where geese and ducks nested) stretched far. It took a long time to walk across. It was wet, and tiring because of lots of water. (This is where) Inuit used to live. Some of these wetlands are in the Kikleetkavik area (mapsheet 86I)." She also mapped Kathawachaga Lake as a waterfowl nesting area*" (NTKP 2018).

C51-27 "*The grassy wetlands, in the valleys, are used a lot by geese for feeding, as are some rivers. There are some rivers in my area (Pellatt Lake) that don't' freeze year round, even at minus forty degree weather… These rivers have ducks and geese …*" (NTKP 2018).

Table 4.3 Inland Waterfowl and Waterbirds Documented in the Terrestrial RSA

Species	Breeding Status in RSA[1]	Species Detections (by year of survey)						Comments
		2025	2012	2008	2004	1999–2000[2]	1990, 1996[3]	
Waterfowl								
Tundra swan	Confirmed		X		X	X	X	Uncommon; confirmed breeding in 2012.
Greater white-fronted goose	Confirmed	X	X	X		X		Uncommon; documented breeding in the RSA in both 2008 and 2012.
Snow goose	Possible		X				X	Rare within the RSA.
Cackling goose	Probable	X	X	X		X	X	Uncommon; documented breeding south of the RSA in 2008.
Mallard	Possible				X			Rare within the RSA.
Northern pintail	Confirmed	X	X	X		X		Confirmed breeding during 2012 surveys.
American wigeon	Confirmed	X						Uncommon within the RSA.
Green-winged teal	Possible	X	X					Uncommon in terrestrial RSA.
Greater / Lesser scaup	Probable	X	X	X				Greater scaup confirmed within the RSA; it is possible that lesser scaup is also present, but species differentiation during aerial surveys is almost impossible.
Long-tailed duck	Confirmed		X	X	X	X	X	Most common waterfowl species in the terrestrial RSA.
Black scoter	Unlikely					X		In addition to the observation at Jericho (1999–2000), a single adult male was observed south of the RSA in 2012. The RSA is well outside the documented breeding range of this species.
White-winged scoter	Possible		X			X		Uncommon in terrestrial RSA.
Common merganser	Probable		X	X	X	X		Uncommon in terrestrial RSA.
Red-breasted merganser	Probable		X					Uncommon in terrestrial RSA.

Species	Breeding Status in RSA[1]	Species Detections (by year of survey)						Comments
		2025	2012	2008	2004	1999–2000[2]	1990, 1996[3]	
Waterbird								
Red-throated loon	Confirmed		X	X	X	X		Uncommon; confirmed breeding during 2008 surveys.
Pacific loon	Confirmed		X	X	X	X		Uncommon; confirmed breeding during 2004 surveys.
Yellow-billed loon	Probable		X	X	X	X		The most observed loon on inland waterbodies.
Sandhill crane	Probable		X		X			Uncommon; limited marsh habitat present in the RSA to provide good habitat for this species.
Herring gull	Confirmed		X	X	X	X	X	Most common gull in inland regions of the RSA; recorded nesting in several locations (single nests only, no colonies) in 2012.
Glaucous gull	Unlikely			X	X		X	Fairly common along Grays Bay coast; uncommon inland.
Arctic tern	Possible		X	X				Uncommon within the RSA.
Parasitic jaeger	Probable		X	X		X	X	Documented nesting south of the RSA in 2008 and 2012. Uncommon in the RSA.
Long-tailed jaeger	Confirmed			X		X		Rare within the RSA.

Notes:
RSA = regional study area
[1] Based on field surveys within the terrestrial RSA
[2] Hubert and Associates Ltd. (2002a)
[3] Canamera Geological Ltd. (1996)

Within Arctic environments, waterfowl productivity is highly variable temporally and spatially, with breeding concentrated in coastal lowland habitats with extensive wetlands. Lakes on the Precambrian Shield are oligotrophic, nutrient poor and often acidic, and far less productive for vegetation and invertebrates than lakes on sedimentary-based soil and rock. Although the landscape inland from Grays Bay contains many small inland lakes and ponds for potential breeding and feeding sites for waterfowl, the 2004 field surveys indicated that the productivity and bird density were relatively low. Evidence of loons or waterfowl was not detected in over 90% of inland water bodies. The conclusion was that a variety of site conditions, including elevation, latitude, a lack of wetlands, and oligotrophic lake conditions, contributed to making inland areas largely unproductive for waterfowl. Hubert and Associates Ltd. (2002a) also found waterfowl to be uncommon on the lakes in similar habitats near the Jericho area.

The 2012 aerial inland waterfowl survey observed 219 individuals of 10 species within the survey area. The overall density of waterfowl observed was 0.41 birds/km² (see Table 4.4). Waterfowl were not distributed evenly across the landscape, and densities were notably higher in the southern regions of the RSA than the northern regions of the RSA. This was consistent with the 2004 observations indicating low waterfowl densities in the High Lake area. The most common waterfowl species observed during the 2012 survey was long-tailed duck, followed by cackling goose (*Branta hutchinsii*), greater white-fronted goose, greater scaup, and common merganser.

Table 4.4 Densities of Inland Waterfowl Observed during 2012 Aerial Surveys

Species	Total Individuals Observed	Density (birds/km²)		
		Northern Sections	Southern Sections	Entire Survey
Tundra swan	3	0.008	0.003	0.006
Greater white-fronted goose	19	0.000	0.065	0.035
Cackling goose	60	0.029	0.180	0.111
Northern pintail	1	0.004	0.000	0.002
Green-winged teal	1	0.004	0.000	0.002
Greater / Lesser scaup	17	0.057	0.010	0.032
Long-tailed duck	79	0.123	0.167	0.147
White-winged scoter	3	0.008	0.003	0.006
Common merganser	15	0.033	0.024	0.028
Red-breasted merganser	3	0.008	0.003	0.006
Unidentified merganser	8	0.012	0.017	0.015
Unidentified duck	10	0.000	0.034	0.019
All Waterfowl	**219**	**0.286**	**0.507**	**0.407**

The 2012 aerial survey also found a total of 48 waterbirds of 7 species. The most common waterbird species observed during the survey were yellow-billed loon (*tuullik*; *Gavia adamsii)*, herring gull (*nauyak*; *Larus smithsonianus*) and Pacific loon. Overall, the density of waterbirds was relatively low throughout the study area, with an average of 0.09 waterbirds/km² (see Table 4.5).

Table 4.5 Regional Densities of Waterbirds Observed during 2012 Aerial Surveys

Species	Total Individuals Observed	Density (birds/km²)		
		Northern Sections	Southern Sections	Entire Survey
Red-throated loon	2	0.000	0.007	0.004
Pacific loon	9	0.037	0.000	0.017
Yellow-billed loon	16	0.025	0.034	0.030
Unidentified loon	1	0.000	0.003	0.002
Sandhill crane	3	0.000	0.010	0.006
Herring gull	12	0.012	0.031	0.022
Arctic tern	3	0.000	0.010	0.006
Parasitic jaeger	2	0.000	0.007	0.004
All Waterbirds	**48**	**0.074**	**0.102**	**0.089**

The 2008 inland waterfowl survey was focused just to the south of the Project area (in the Izok and Lupin areas) and overlapped only the southern extent of the terrestrial RSA. The species observed within the RSA during the 2008 survey were generally consistent with those observed in 2012, although several species not seen in the smaller 2008 survey were observed in low numbers in 2012. No additional species were observed in the 2008 inland waterfowl survey as compared to the 2012 survey. The 2008 survey observed an overall density of waterfowl of 0.25 birds/km², which includes areas within and outside of the current terrestrial RSA, which is lower than the 2012 densities in this area. The reasons for the lower overall density during 2008 are likely related to the number of long-tailed ducks observed and are believed to be the result of the survey timing. The 2008 surveys were completed in the second week of July, which may have been too late for some species; however, the 2012 surveys were completed in the last week of June, which was an optimal timing for most species.

The density of waterfowl observed within the RSA during 2012 was relatively low compared to other Arctic areas. For the more common species, comparing the densities within the terrestrial RSA to other studies in the Canadian Arctic is possible. For example, the density of long-tailed ducks during the 2012 survey was 0.15 birds/km², but when this was corrected for birds present but not detected by the survey, the density was 0.20 birds/km². It is apparent that the densities in the terrestrial RSA are very low when compared to the findings of waterfowl surveys within other areas of the Canadian Arctic (see Table 4.6). Another example is the long-tailed duck densities in the Queen Maud Gulf and Adelaide Peninsula, which are nearly 10 times those observed within the terrestrial RSA (Groves and Mallek 2011a), although densities within the terrestrial RSA are comparable to portions of Banks Island (Groves and Mallek 2011b).

Geese were observed infrequently during 2012 aerial surveys, and their overall density was 0.035 birds/km² for greater white-fronted and 0.111 birds/km² for cackling goose. After correction, the densities were 0.04 and 0.12 birds/km², respectively. When the density of indicated geese is compared between this study and other areas in the Canadian Arctic (see Table 4.6), it is apparent that the densities recorded in the terrestrial RSA are very low in comparison to nearby areas in the region (e.g., Kugluktuk:

1.15 and 1.70 birds/km², Kent Peninsula: 1.68 and 1.54 birds/km², and Queen Maud Gulf: 2.34 and over 2.29 birds/km², for greater white-fronted and cackling geese, respectively; Groves and Mallek 2011a). Densities within the terrestrial RSA are, however, comparable to portions of Banks Island (Groves and Mallek 2011b).

Among the waterbird species observed within the Project region, the yellow-billed loon is the most characteristic species associated with tundra habitats and was the most common waterbird species observed in 2012. The density of yellow-billed loon during the 2012 survey was 0.030 birds/km², which is a similar density across its range. In comparison to other studies in the Canadian Arctic (see Table 4.6). The 2012 observed density within the terrestrial RSA is comparable to other areas; it is close to the average of 0.030 birds/km² but substantially more than the median density of 0.016 birds/km².

Table 4.6 Densities of Long-Tailed Ducks, Greater White-Fronted Geese, Cackling Geese, and Yellow-Billed Loons in Terrestrial RSA

Survey Area	Densities (birds/km²)				Reference
	Long-tailed Ducks	Greater White-fronted Goose	Cackling Goose	Yellow-billed Loon	
Terrestrial RSA	0.200[1]	0.037[1]	0.122[1]	0.030	2012 Aerial Survey
Banks Island – west	0.219	0.035	0.058	0.015	(Groves and Mallek 2011b)
Banks Island – inland	0.173	0.029	0.235	0.015	(Groves and Mallek 2011b)
Banks Island – east	0.066	0.000	0.674	0.062	(Groves and Mallek 2011b)
Banks Island – northeast	0.365	0.032	0.344	0.032	(Groves and Mallek 2011b)
Tuktoyaktuk Peninsula	1.510	3.434	0.642	0.000	(Groves and Mallek 2011b)
Kugluktuk	0.777	1.153	1.701	0.033	(Groves and Mallek 2011a)
Byron Bay	0.695	0.712	2.577	0.031	(Groves and Mallek 2011a)
Central Victoria Island	1.042	0.431	2.013	0.126	(Groves and Mallek 2011a)
Southeast Victoria Island	0.793	1.373	3.435	0.010	(Groves and Mallek 2011a)
Southeast Victoria Island – interior	0.736	0.791	1.546	0.110	(Groves and Mallek 2011a)
East Victoria Island	0.291	1.182	4.809	0.017	(Groves and Mallek 2011a)
Kent Peninsula	1.081	1.683	1.541	0.000	(Groves and Mallek 2011a)
Queen Maud Gulf	1.953	2.344	2.292	0.002	(Groves and Mallek 2011a)
Adelaide Peninsula	1.933	1.616	3.979	0.012	(Groves and Mallek 2011a)
King William Island	0.321	0.990	3.080	0.018	(Groves and Mallek 2011a)
Rasmussen Lowlands	0.559	4.649	1.809	0.000	(Groves and Mallek 2011a)

Notes:

RSA = regional study area

[1] For long-tailed duck, greater white-fronted goose, and cackling goose, the observed density was converted to a number of indicated individuals to allow for comparisons to the other studies. For long-tailed ducks, this was done using the following formula: 2*(drakes ≤ 4 + pairs) + grouped birds; for geese this was done by multiplying the number of singles and pairs by two and adding the number of grouped birds. For yellow-billed loon, the observed density was used.

The ground-based transects through the LSA observed waterbirds at a density of 14.9 individuals/km². The most abundant species was cackling geese with a density of 11.3 individuals/km², followed by green-winged teal, with 2.3 individuals/km². One American wigeon (*Anas americana*) nest was encountered in riparian shrubs during the transect surveys.

4.4 Summary

Twenty-seven species of seabirds, waterfowl, and other waterbirds were identified within the Grays Bay area during baseline studies. The most common species found include long-tailed duck, white-winged scoter, greater scaup, common eider, common merganser, red-breasted merganser, glaucous gull, and Thayer's gull. In general, Project surveys have indicated that, except for a couple of isolated gull colonies, the marine LSA does not support a large nesting population of seabirds, waterfowl, or waterbirds; however, the area is used by moulting and staging seabirds and waterfowl, mostly concentrated along shoreline areas.

The terrestrial RSA supports low densities of waterfowl and other waterbirds due to the limited availability of wetland habitats and the presence of nutrient-poor lakes that make inland areas unproductive for these species. The species present are a mixture of Arctic breeding species typically associated with the boreal forest that reach the northern extent of their breeding range within the study area.

5 Raptors

Nine raptor species occur within the RSA. Six species are cliff-nesting raptors that are common and breed and occupy nests on cliffs in the region: golden eagle, bald eagle (*kunakpik*; *Haliaeetus leucocephalus*), gyrfalcon, peregrine falcon, rough-legged hawk, and common raven (*tulugaq*; *Corvus corax*). Although true passerines, common ravens are considered 'functional raptors' (Poole and Bromley 1988b) because they nest on cliffs, where they interact with raptors for nesting territories, and build stick nests which can be used by raptors for nesting. Bald eagle is at the edge of their established range, and although some individuals have been observed occasionally, no nest sites have been located. The other three raptor species are ground-nesting raptors consisting of short-eared owl, snowy owl, and northern harrier (*uilaq*; *Circus hudsonius*).

The field survey program focused on peregrine falcons and other cliff-nesting raptors, with incidental observations of bald eagles and ground-nesting raptors. Studies have focused on peregrine falcons as a representative of cliff-nesting raptor species due to their abundance.

Inuit Knowledge and field studies confirm the importance of cliff habitats for raptors in the RSA. Cliffs provide nesting raptors protection from mammalian predators and shelter from the environment. The territories of cliff-nesting raptors are limited by the availability of suitable nesting ledges and sufficient prey biomass (Newton 1979). Much of the terrestrial RSA, especially within the northern RSA, contains many prominent rock outcroppings that form ridges, mesas and canyons, primarily composed of granitic outcrops and diabase dykes and sills. Many outcrops have steep, broken faces that provide suitable nesting sites for raptors. Given the abundance of cliffs, the availability of nest sites does not appear to be limiting in most of the terrestrial RSA, except for the expanse of flatter, rocky terrain between Jericho and Ulu.

According to recorded Inuit Knowledge (NTKP 2018), important raptor nesting areas are located on cliffs on south Victoria Island and on the south coast of Kent Peninsula, including on the islands in Elu Inlet. Important raptor nesting areas are also located on the mainland coast near the mouths of the Tingmeak River (*Kolgayok*), Perry River (*Kugyoak*), and Ellice River (*Kunayok*), in east Bathurst Inlet (*Kokiviayok*), and near the communities of Bay Chimo (*Omingmaktok*) and Bathurst Inlet (*Kingaok*). Fewer raptor nesting areas are located inland and include north Beechey Lake (*Hanningayuk*) and the east shore of Contwoyto Lake.

> C25-26 "*All this area (central Kent Peninsula coast and inland) has nice cliffs … There are many eagle, rough-legged hawk and even gyrfalcon nests because these birds use the same nesting sites… The swallows have mud houses on the cliffs. The ravens too have houses on the cliffs…*
>
> *I don't often see the snowy owls at the cliffs but only around the wetlands where they hunt the mice. They nest on the ground close to where they hunt the mice… "* (NTKP 2018).
>
> C35 "*There are cliffs anywhere on the land around Kugyoak (Perry River). There is a large cliff inland. Also by the river at Ekalokpilik (Kent Peninsula isthmus) there is a cliff. There are cliffs around the rivers. These rough-legged hawks and gyrfalcons are found at these cliffs…*

The snowy owls don't often stay at the cliffs but are found around small knolls. They nest at these knolls not at cliffs. Sometimes they nest on small islands on lakes" (NTKP 2018).

C26-26 "*There are some cliffs around here (Kolgayok or Tingmeak River) and there (Kunayok or Ellice River and Kugyoak or Perry River). Sometimes falcons nest at places where there are no cliffs… The eagles nest anywhere, it doesn't have to be at the cliffs. They will even nest on an island. The hawks have to be in the cliffs.*

The snowy owls nest in the cliffs and on the land too, on the ground" (NTKP 2018).

C4Oming-26 "*Gyrfalcons use these cliffs for nesting. Wildlife officers have studied use of these cliffs (near Omingmaktok) by raptors like the eagles, hawks and gyrfalcons, even by seagulls. They nest on the cliffs*" (NTKP 2018).

C4Kug-26 "*During the summer cliffs are used by birds like the rough-legged hawks, gyrfalcons, peregrines and eagles. They can be found nesting anywhere along all these cliffs inland*" (NTKP 2018).

C21 "*Those large cliffs to the south (central-east Tahikyoak) are used for nesting. There are cliffs over here (north Beechey Lake) where birds like rough-legged hawks and peregrine falcons nest. They nest near Kingoak too, all along the cliffs…*" (NTKP 2018).

Short-eared owls are widely distributed throughout North and South America, Asia, and Europe, although distribution is often patchy (Wiggins et al. 2006). Short-eared owls prey primarily on small mammals, and less frequently on small birds. Its local or regional abundance is likely linked to prey abundance. Among Nearctic populations of short-eared owls, their primary prey item is meadow voles (Holt 1993). Their preferred habitats that occur in the terrestrial RSA are open tundra, coastal grasslands, and heathlands (Wiggins et al. 2006). Short-eared owl nests are usually located on dry sites with some concealing vegetation and may occur on slight ridges or mounds (Wiggins et al. 2006). They can be difficult to locate as females are reluctant to flush from the nest until humans or predators' approach within a few metres. Populations of short-eared owl in northern Canada and Alaska are more stable than those in northeastern United States, but although population status is difficult to assess because individuals are nomadic and prone to annual fluctuations in numbers, overall long-term declines in abundance in North America have been detected (Wiggins et al. 2006; Booms et al. 2014).

Short-eared owls occur within the terrestrial RSA, but rarely and only four observations have been recorded:

- A helicopter pilot reported an observation of a short-eared owl near the Frayed Knots River, approximately 35 km south of High Lake in 2004.
- One individual was observed near Ulu in mid-June 2006.
- The remains of a short-eared owl were discovered approximately 1.5 km inland from the Port PDA site at Grays Bay during the 2008 tundra breeding bird surveys.
- A short-eared owl was observed 10 km west of Ulu in early June 2012, and a single owl was observed foraging during tundra breeding bird surveys in late June 2012 approximately 7 km north of the Hood River.

On the other hand, snowy owls may be found in the terrestrial RSA at any time during the year. Snowy owls in the Arctic prey primarily on lemmings, but they will also prey on waterfowl and other birds in marshy areas (Parmelee 1992). Snowy owls prefer high rolling tundra with numerous promontories which serve as perches and nest sites, but in low-Arctic habitats, dense, hummocky dwarf shrub meadows are often used for nesting habitat (Parmelee 1992). Snowy owls also use lowland salt grass meadows and poorly drained freshwater wet meadows, especially for hunting. Specific nest sites are typically a windswept prominence, such as hummocks or frost-heaved polygons, but may also include nests atop large boulders (Parmelee 1992). The species abundance varies with cyclical prey abundance; for example, an estimate of owls on Banks Island was as high as 15,000 to 20,000 individuals during a population high, but only 2,000 during a population low (Manning et al. 1956). Snowy owls have only been detected twice during field surveys: once when a helicopter pilot reported one near the coast in early July 2004, and the second time, the weathered remains of an owl were observed during seabird ground surveys along Grays Bay in 2012.

Northern harriers are widely distributed across North America, frequenting upland grasslands and freshwater and saltwater marshes (Smith et al. 2011). They prefer to prey on small- and medium-sized mammals, and their annual breeding numbers and productivity are highly influenced by spring prey availability. Their nest site locations vary widely, but most are built within patches of dense vegetation. Northern harrier population trends vary across North America (Smith et al. 2011) but appear to be generally stable within Canada (Kirk and Hyslop 1998); however, Arctic-specific population trend data are lacking. Northern harrier sightings during baseline studies have been limited. One individual was observed in a suitable breeding habitat near the confluence of the James and Frayed Knot rivers in mid-July 2004, two individuals were observed during the inland waterfowl surveys in June 2012, and one individual was observed during an early summer aerial seabird survey in September 2012, and

Bald eagles are large birds of prey that occur across Canada, but their Canadian northern distribution is generally limited to the treeline (Buehler 2000). Bald eagles nest in trees and rarely choose cliff faces or bare ground in treeless areas as nest sites. Bald eagles are opportunistic foragers that generally prefer fish but will scavenge prey items and pirate food from other species, as well as capture its own prey. Bald eagle populations across North America have generally increased since the 1980s because of reduced persecution by humans and higher productivity due to the reduced use of Dichlorodiphenyltrichloroethane (DDT), although data from northern areas are limited (Kirk and Hyslop 1998; Buehler 2000). Adult and immature bald eagles have been observed during field work, with most observations occurring in the broader Izok to Lupin area, but with individual sightings along the Hood River, just south of High Lake, and on and near Grays Bay.

5.1 General Information

5.1.1 Population

Overall trends in populations of cliff-nesting raptors are limited to long-term monitoring datasets. Numbers of tundra peregrine falcons in the Canadian Arctic have increased from DDT-induced lows during the 1970s, and likely are approaching maximum occupancy (Shank et al. 1993; Carrière et al. 2003). There is no current evidence of long-term population changes in North American gyrfalcon populations (Booms et al. 2008). Gyrfalcon numbers within their core range are likely relatively stable over the long term (Poole and Bromley 1988b; Shank and Poole 1994; Swem and Matz 2011), but are strongly influenced by weather during incubation and the downy young stage, and by the abundance of food, especially ptarmigan, which are the main diet during nest initiation and early incubation in many Arctic regions (Poole and Boag 1988). Long-term trends in both golden eagles and rough-legged hawk populations appear to be stable (Kirk and Hyslop 1998; Bechard et al. 2020; Kochert and Steenhof 2002), although local numbers of breeding pairs of rough-legged hawks' cycle dramatically with numbers of their main prey, lemmings and voles (Poole and Bromley 1988b; Whitaker et al. 1996). Common raven populations are considered stable to increasing in most areas (Boarman and Heinrich 1999).

5.1.2 Threats and Mortality

Hunters do not harvest birds of prey in Arctic areas. Starvation and disease likely affect a small number of adults, and adult mortality does occur from territorial rivalry (White et al. 2024). Most species with breeding sites that are accessible from the ground are prone to nest predation by mammalian predators (Swem 1996) and by golden eagles on nestlings. Most mortality takes place during the egg stage and early nestling period, primarily a result of predation and weather events (Court et al. 1988; Poole and Bromley 1988a; Kochert et al. 2002; White et al. 2024; Anctil et al. 2014). Infanticide has been documented in peregrine falcons and golden eagles (Korňan and Macek 2011; Franke and Galipeau 2013). Siblicide is common in golden eagle broods, particularly when food is limited. Typically, two golden eagle nestlings hatch asynchronously up to three to four days apart, and the older nestling will attack the younger individual and cause starvation or being forced from the nest (Kochert et al. 2002).

Weather events can cause direct mortality to nestlings or cause entire clutch or brood abandonment (Poole and Bromley 1988b; Bradley et al. 1997; Anctil et al. 2014). Arctic peregrine falcon clutch size was negatively correlated with snowfall and rainfall during the pre-laying period, and nestling mortality was positively correlated with precipitation during storms (Bradley et al. 1997). Overall, 38% of peregrine falcon nestling deaths were caused by the direct effect of rainfall (Anctil et al. 2014). Climate change may affect local weather patterns and may be causing reduced reproductive success in some Arctic peregrine populations (Franke et al. 2010). Gyrfalcon productivity was negatively correlated with the number of days that snow fell and with total precipitation, but not with mean temperature (Poole and Bromley 1988b).

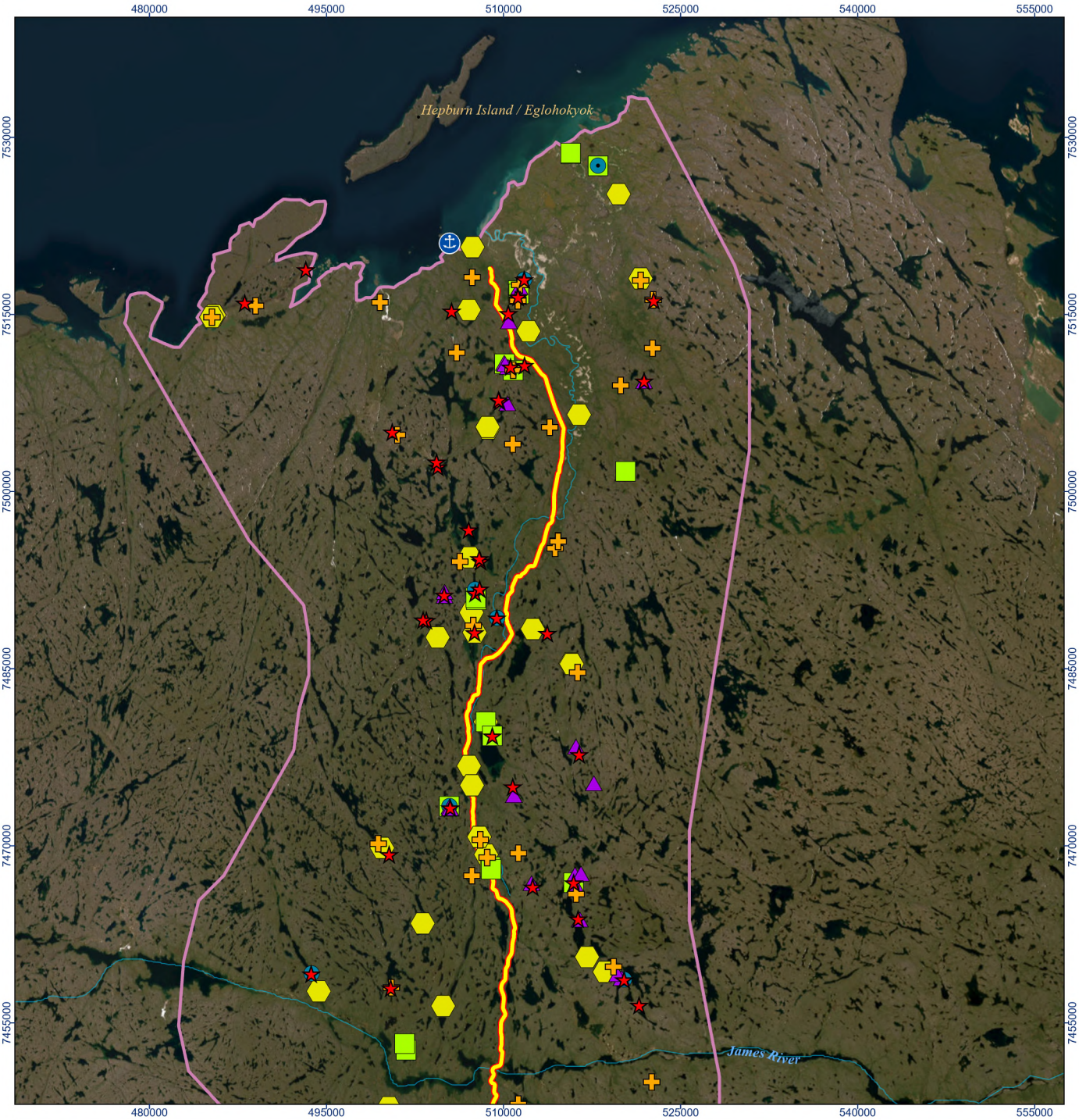
5.2 Occurrence in the Terrestrial RSA

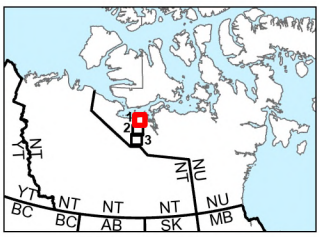
Cliff-nesting raptors nest on most cliffs that occur within the terrestrial RSA (see Figure 5.1 to Figure 5.3). Metrics used to track raptor nesting success included the number of occupied sites, the number of productive sites (also reported as a percentage of occupied sites), mean brood size of nests (where the number of near-fledged chicks could be counted), and productivity (the number of chicks fledged or assumed to have fledged per occupied nest site). The number of occupied nest sites observed varied from 29 in 2004 to 101 in 2012. Changes in the number of occupied raptor sites were, in large part, a result of changes in survey area, increased survey intensity, cumulative nest site knowledge, and increased familiarity with the study area. Peregrine falcons were the most common of the raptors observed, with 34 to 38 occupied territories observed during 2008 and 2012, and most suitable nesting cliffs occupied. Gyrfalcons, golden eagles, and rough-legged hawks were less common, but still relatively abundant. The greatest number of occupied and productive gyrfalcon sites to date were documented within the survey area in 2012. The proportion of occupied sites that were productive varied among years for all species, with wide differences for peregrine falcons (24–82%) and gyrfalcons (14–91%) and less variability for golden eagles (47–62%; see Table 5.1). Mean brood size showed less variability among years, being on average highest for peregrine falcons, moderate for rough-legged hawks, and lowest for golden eagles. Productivity varied widely among years for peregrine falcons and rough-legged hawks, with lower annual variability for golden eagles.

The highest occurrence of raptor nest sites was from Grays Bay to south of Ulu and in the cliffs around the north end of Contwoyto Lake (see Figure 5.1 to Figure 5.3). The density of peregrine falcons within the entire survey area in 2008 and 2012 was 1 pair/120–125 km². Densities in other regions of the mainland NT and NU in the early 1980s ranged from 1 pair/97–320 km² (Bromley 1988). Peregrine falcon densities within the terrestrial RSA therefore compare favourably to other high-density areas. For example, the Rankin Inlet area in the Kivalliq region is unique in having one of the highest densities in the tundra biome at 1 pair/15 km² (Franke et al. 2010).

The density of gyrfalcons within the Project survey area in 2012 was 1 pair/250 km², like other high-density areas. For instance, Shank and Poole (1994) estimated gyrfalcon densities between 1 pair/175–875 km² for the mainland coast NT/NU, and up to 1 pair/2,000 km² for the mainland interior. Nesting density in Alaska ranged from 1 pair/200–1,000 km² (Swem et al. 1994).

Golden eagle nesting density averaged 1 pair/165 km² within the Project survey area in 2012. However, much higher densities occur in other tundra areas, like in Denali National Park in Alaska where nesting density is 1 pair/28 km² (McIntyre and Adams 1999). Densities of rough-legged hawks vary widely with prey population cycles; thus, a range of densities of occupied sites were observed within the terrestrial RSA during 2004 to 2012 (1 pair/190–480 km²). For comparison, in a different study east of Bathurst Inlet, rough-legged hawk densities over a 4-year span ranged from 1 pair/50–180 km² (Poole and Bromley 1988b).





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
   Publication Date: Unknown
   Downloaded: September 7, 2021
   Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Watercourse
- Terrestrial Regional Study Area (RSA)

Raptor Nests (by species)

- Golden Eagle
- Gyrfalcon
- Peregrine Falcon
- Raven
- Rough-legged Hawk
- Unoccupied

0 7.5 15 Kilometres

(At original document size of 8.5x11) 1:500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

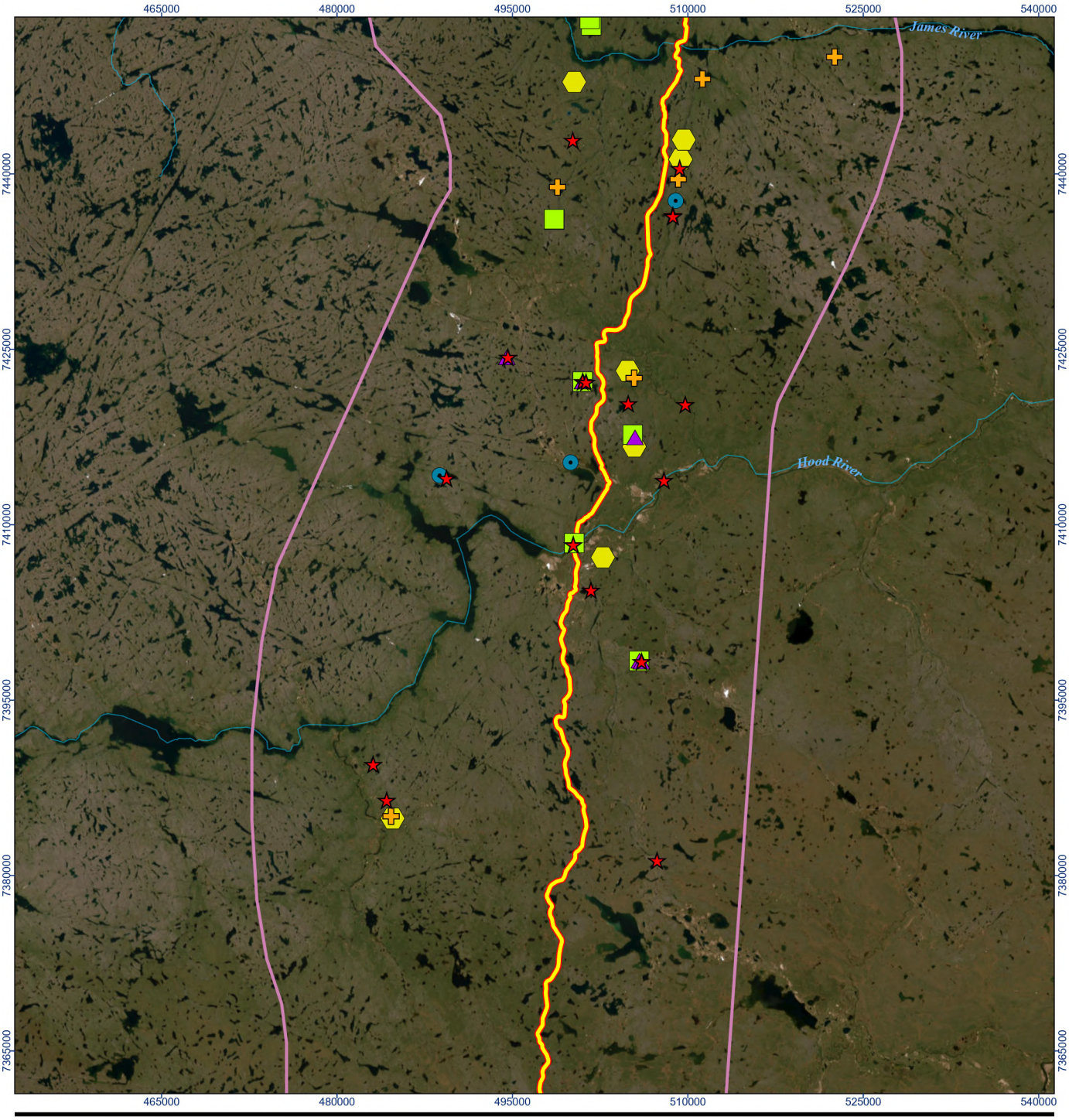
Prepared by OliviaLeblanc on 2026-02-18

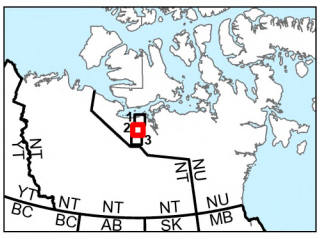
Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
5.1

Title
Raptor Nest Sites in the Terrestrial Regional Study Area in 2004, 2008 and 2012 (Map 1 of 3)

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig5-X_RaptorNests_TerrestrialRSA_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Downloaded by David Spry (Stantec GIS) in mid-December 2016 from ftp://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/fgdb/Hydro/ Last Modified 08-Nov-2016, Earthstar Geographics

- Grays Bay Road
- Watercourse
- Terrestrial Regional Study Area (RSA)

Raptor Nests (by species)

- Golden Eagle
- Gyrfalcon
- Peregrine Falcon
- Raven
- Rough-legged Hawk
- Unoccupied

0 7.5 15 Kilometres

(At original document size of 8.5x11) 1:500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

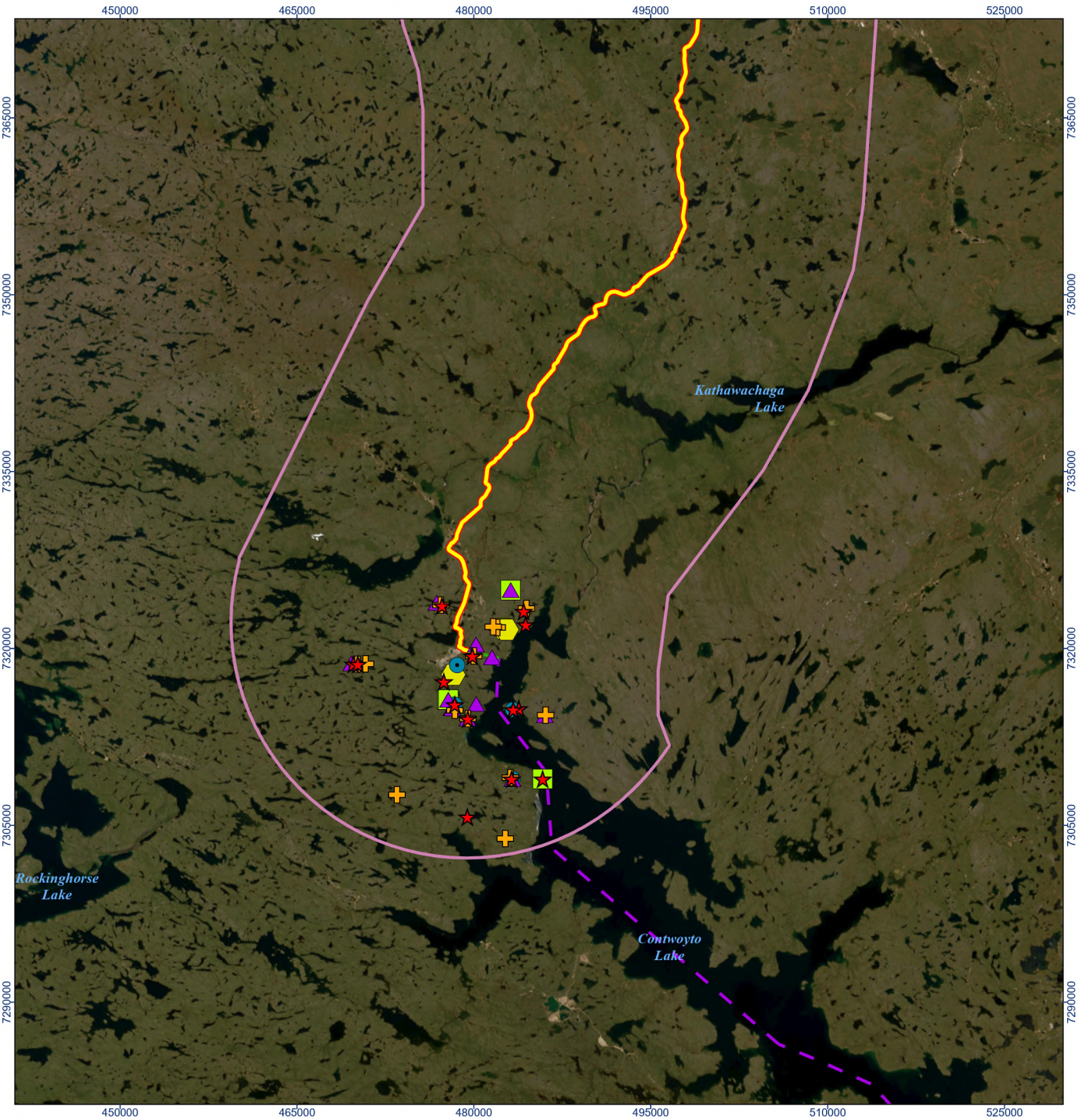
Client/Project
24Y0376

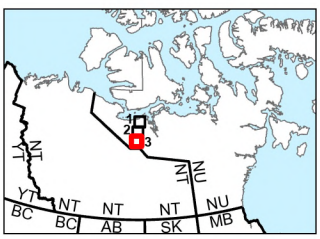
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
5.2

Title
Raptor Nest Sites in the Terrestrial Regional Study Area in 2004, 2008 and 2012 (Map 2 of 3)

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig5-X_RaptorNests_TerrestrialRSA_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources, Government of Canada (http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/fgdb/Transport)
canvec_1M_CA_Transport.gdb
Publication Date: 2019-11-8
Downloaded: December 12, 2019

- Grays Bay Road
- Grays Bay Winter Road
- Tibbitt to Contwoyto Winter Road
- Terrestrial Regional Study Area (RSA)

Raptor Nests (by species)

- Golden Eagle
- Gyrfalcon
- Peregrine Falcon
- Raven
- Rough-legged Hawk
- Unoccupied

0 7.5 15 Kilometres

(At original document size of 8.5x11) 1:500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
5.3

Title
Raptor Nest Sites in the Terrestrial Regional Study Area in 2004, 2008 and 2012 (Map 3 of 3)

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig5-X_RaptorNests_TerrestrialRSA_20260218; Revised: 2026-02-18 By: OliviaLeblanc

Table 5.1 Cliff-nesting Raptor Nesting Success — 2004 to 2012

Species	Year[1,2]	Number of Occupied Sites	Number of Productive Sites (% of Occupied Sites)	Mean Brood Size (*n*)	Productivity
Peregrine falcon	2004	11	-	-	-
	2005	15	-	-	-
	2006	22	15 (68)	2.86 (14)	1.90
	2008	38	9 (24)	3.00 (9)	0.71
	2012	34	28 (82)	2.77 (26)	2.25
Gyrfalcon[3]	2004	6	-	-	-
	2005	7	-	-	-
	2006	7	1 (14)	3.00 (1)	-
	2008	11	10 (91)	3.00 (1)	-
	2012	17	13 (76)	-	-
Golden eagle	2004	5	-	-	-
	2005	8	-	-	-
	2006	12	6 (50)	1.17 (6)	0.58
	2008	15	7 (47)	1.00 (7)	0.47
	2012	26	16 (62)	1.20 (15)	0.72
Rough-legged hawk	2004	5	-	-	-
	2005	5	-	-	-
	2006	11	4 (36)	2.25 (4)	0.82
	2008	24	15 (63)	2.20 (15)	1.38
	2012	16	5 (31)	1.80 (5)	0.56
Common raven[3]	2004	2	-	-	-
	2005	2	-	-	-
	2006	1	1	3 (1)	3.00
	2008	3	3 (100)	-	-
	2012	8	7 (88)	-	-
Non-active nests[4]	2004	4 UU	-	-	-
	2005	15 UU	-	-	-
	2006	61 UU	-	-	-
	2008	99 UU	-	-	-
	2012	124 UU	-	-	-

Notes:

[1] Only occupancy surveys were completed in 2004 and 2005, and both survey types were completed in 2008 and 2012.

[2] Surveys in 2004 covered a 2,400 km² study area, in 2005 a 1,000 km² study area, and in 2006 a 2,500 km² area, between Grays Bay and Ulu and to varying widths. In 2007, the survey covered only 110 km² south of Jericho, and within that area detected only one occupied rough-legged hawk nest and five unoccupied nests. Surveys in 2008 (~4,500 km²) and 2012 (~4,250 km²) covered the entire length of the terrestrial RSA.

[3] Note that gyrfalcons and common ravens fledge prior to productivity surveys; production was observed at some sites (fledglings observed) and assumed at others (nest structure well used).

[4] UU indicates Unoccupied and Unproductive nest sites that had been used at some point in the past.

5.2.1 Reproduction

Nest site characteristics differ among cliff-nesting species. Gyrfalcon and common raven predominantly select larger cliffs with greater protection, as does golden eagle sometimes (Poole and Bromley 1988b). Peregrine falcons and rough-legged hawks mainly use south-facing cliffs (Poole and Bromley 1988b). Peregrine falcons do not build stick nests and will use rock ledges, grassy ledges, or usurp stick nests built by other species. A breeding pair will not tolerate another nesting pair of the same species in close range, but nests of different raptor species can occur in proximity. The exception is that all species tend to avoid occupied golden eagle nest sites (Poole and Bromley 1988b). One pair of raptors may have several alternative nests within their territories that are used in different years. For example, gyrfalcons were found to have an average of 1.7 nests per territory during 4 years of study in the Hope Bay (*Kapihiliktok*) area (Poole and Boag 1988). In Alaska, only 22% of gyrfalcons returned to the same nest site the following year while alternative nest sites averaged 750 m apart (Booms et al. 2011).

Raptor nesting success is affected by numerous factors, including weather and prey availability (Newton 1979). The often harsh and unpredictable weather in Arctic regions results in greater annual variations in breeding success (Poole and Bromley 1988a; Bradley et al. 1997; Carrière et al. 2003; Anctil et al. 2014). For example, spring weather can affect nesting by delaying the arrival of migratory prey species or the availability of hibernating species, causing abandonment of nesting attempts or the mortality of nestlings.

The onset of laying for each raptor is closely related to the arrival or emergence of major prey species. Ravens and gyrfalcons are likely year-round residents or at least are on territory by mid-winter (Poole and Bromley 1988b). Golden eagles arrive early and begin egg-laying in April. Peregrine falcons and rough-legged hawks arrive in early to mid-May and begin egg-laying in late May and early June. Migratory populations of peregrine falcons and rough-legged hawks, as well as newly fledged gyrfalcons and golden eagles, depart by mid- to late-fall.

Nests can sometimes collapse, spilling young. Sometimes they will survive (Swem 1996) but most will perish (Poole and Bromley 1988b). If the first nest fails and clutches are lost early in the incubation period, re-nesting may occur in some species, like gyrfalcons and peregrine falcons (Poole 1988). To illustrate this, at one occupied peregrine falcon site in June 2012, the stick nest they were using had collapsed, and in late July there was one 3-day old chick and one egg that was presumably not addled (dead) when all other peregrine chicks were approximately 3 weeks old. This suggested a re-nest by the adults in response to a lost clutch early in the nesting period.

Although survey area and timing have been inconsistent since 2004, the overall data gathered revealed clear patterns for some raptor species. For example, raptor nesting success and productivity varied among years, likely influenced by weather events and spring prey abundance. Peregrine falcon nesting success and productivity were roughly twice as high in 2012 compared with 2008 (see Table 5.1). Weather was likely the main driver of reduced peregrine falcon nesting success in 2008 where a blizzard on June 17, 2008, at High Lake may have resulted in a few peregrine falcons and rough-legged hawks abandoning their nest sites. Surveyors observed abandoned eggs at six peregrine falcon, two rough-legged hawk, and one gyrfalcon nest. Rough-legged hawk productivity and number of nestlings observed in 2012 were low, suggesting that lemmings and voles were experiencing cyclic declines during spring and summer 2012. Abandoned eggs were observed at two peregrine falcon, one gyrfalcon, and six rough-legged hawk nests in 2012.

Differences in nesting phenology (the timing of laying, brooding, and fledging) and nest site selection among species also affected nesting success. Gyrfalcons begin nesting far earlier than peregrine falcons and select nest sites with a greater degree of protection (Poole and Bromley 1988b). Late spring storms would have less impact on older gyrfalcon nestlings in more protected nest sites. However, despite the mid-June 2008 blizzard, gyrfalcon nesting success that year remained high (82%).

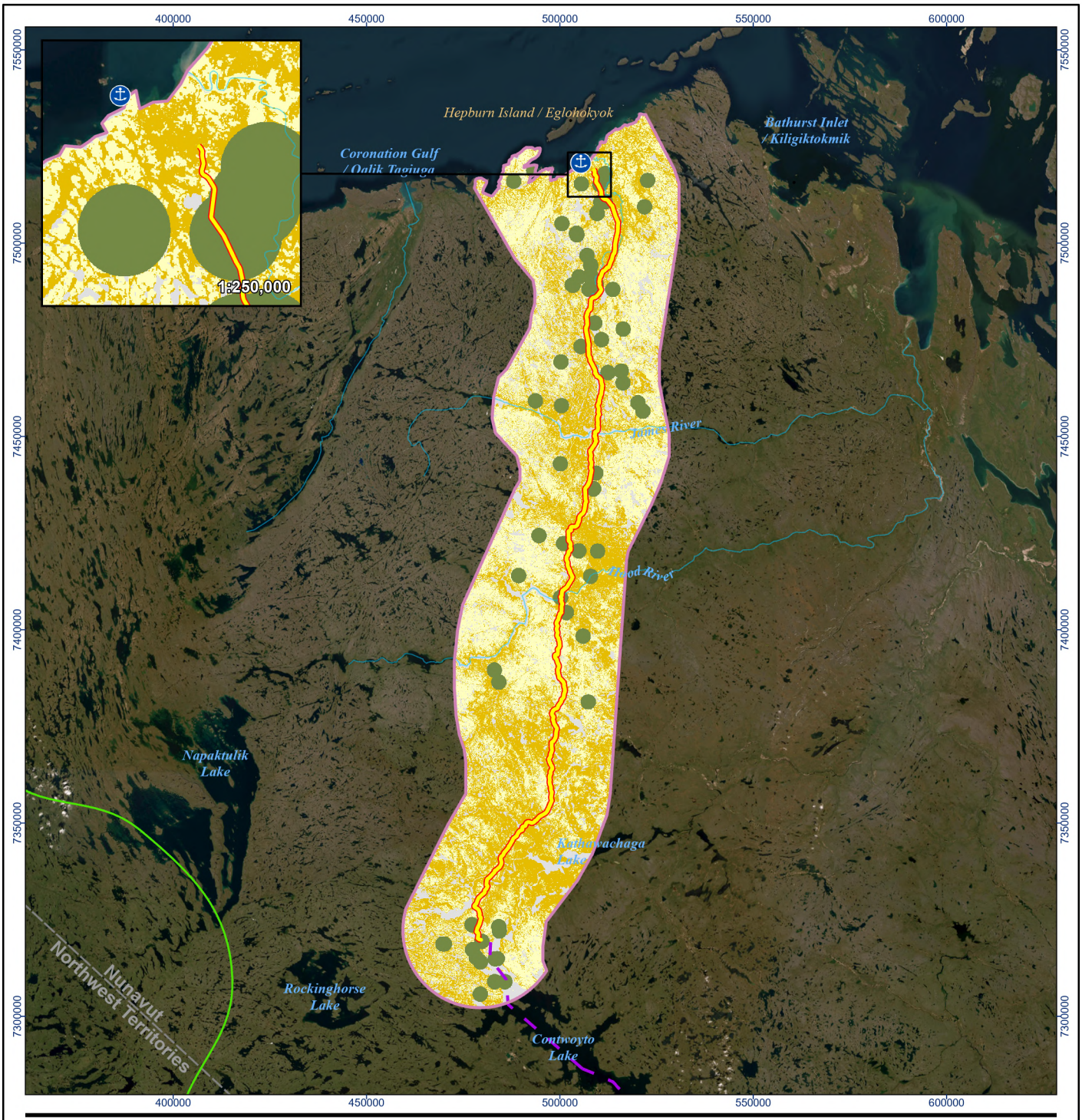
5.2.2 Habitat Use and Diet

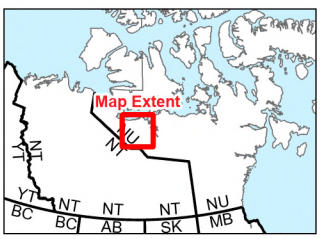
Partitioning of food occurs in northern cliff-nesting raptor assemblages, for instance, the small-bodied peregrine falcon and rough-legged hawk take smaller prey than large-bodied golden eagles and gyrfalcons (Poole and Bromley 1988b). Peregrine falcons prey primarily on passerines, although ducks, ptarmigan, and shorebirds can also contribute to their diet (Poole and Bromley 1988b). At Hope Bay, east of Bathurst Inlet, rock ptarmigan (*nikhaktok*; *Lagopus muta*), Arctic ground squirrels (*hikhik*; *Spermophilus parryi*) and Arctic hares (*okalik*; *Lepus arcticus*) constituted 97% of total prey biomass consumed by gyrfalcons during the breeding season (Poole and Boag 1988). Ground squirrels, hares, waterfowl, and ptarmigan formed most of the prey of golden eagles (Poole and Bromley 1988b). Microtines (e.g., voles and lemmings) and, to a lesser extent, passerines form the bulk of the diet of rough-legged hawks. Common ravens are food generalists, commonly associated with carrion, but will kill their own prey and eat anything (Boarman and Heinrich 1999). Remains of microtines, ptarmigan, weasel, caribou, and seal were observed in some raven nests at Hope Bay, and raiding by ravens of food cached near nests of gyrfalcons has also been observed (Poole and Bromley 1988b). Open tundra habitats are used for foraging, but particular foraging habitat requirements vary with prey species selection. Microtines reach highest densities in heath habitats, and small passerines preferentially occur in heath tundra, sedge/tussock, and shrub habitats.

Habitat suitability modelling for peregrine falcons was completed for the RSA based on land cover mapping for the Project (see Section 2.5.1). Cover classes were rated using a four-class system (Nil, Low, Moderate, and High) according to their perceived value to passerines, their main prey. For peregrine falcons, the highest quality habitat was assumed to be a 2 km radius around nest sites (see Section 2.5.1), and thus other habitats were rated to a maximum of Moderate. The amount of available habitat within each of the suitability classes was then summed for the entire RSA. Most of the RSA is classified as moderate and low-quality habitats (see Table 5.2 and Figure 5.4). In general, the more southern sections of the RSA are dominated by moderate-quality habitats, while the areas closer to the coast are characterized by more low-quality habitats. Some unmapped nest sites occur along the periphery of the RSA, resulting in greater amounts of high-quality habitat than depicted within the RSA.

Table 5.2 Habitat Suitability Modelling Results for Peregrine Falcon

	High	Moderate	Low	Nil
Area (km²)	688.6	3,364.6	3,503.0	1,201.2
Percent of Terrestrial RSA	7.9	38.4	40.0	13.7





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

Peregrine Falcon Habitat Suitability Classes

- Nil
- Low Suitability
- Moderate Suitability
- High Suitability

0 20 40 Kilometres

(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project
24Y0376

West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
5.4

Title
Peregrine Falcon Habitat Suitability in the Terrestrial Regional Study Area

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig5-4_PEFA_HabSuitability_20260218; Revised: 2026-02-18 By: OliviaLeblanc

5.3 Summary

The Project terrestrial RSA supports many raptors, with peregrine falcons being the most abundant species. Nesting occurs wherever suitable cliff structures occur. Species density is governed by the simultaneous presence of suitable nesting locations and sufficient prey biomass. Natural variability in the number of occupied sites and productivity will be expected over time, mainly because of weather events and natural changes in prey abundance.

6 Tundra Breeding Birds

Tundra breeding birds refers to migratory birds that are not raptors, waterfowl, seabirds, or waterbirds. Passerines (i.e., songbirds) are typical of this category; however, for the purpose of this report, shorebirds (e.g., plovers and sandpipers) and upland game birds (ptarmigan) are also considered. Tundra breeding birds are a diverse group which occupy a wide range of habitats and are thought of as good indicators of environmental conditions and quality (Smith et al. 2010). Birds in this group are seasonal migrants, except some ptarmigan species, and like raptor and waterfowl populations, passerines may be affected by limiting factors beyond the breeding grounds. The breeding season for most species begins in early to mid-June and runs through August, when migrants will be getting ready to travel south.

Passerine assemblages are not as diverse in the Arctic as more southerly locations; however, several species breed only in the Arctic, including Harris's sparrow (*qupanuarjuk*; *Zonotrichia querula*), Lapland longspur, snow bunting, and redpoll. Within the region, there is a unique mixture of Arctic breeding species and more southerly species which reach the northern extent of their breeding range; examples of such species include gray-cheeked thrush (*itti-pornipi-ok*; *Catharus minimus*), American robin (*nagakiik*/*nagajiit*; *Turdus migratorius*) and yellow warbler (*n/a*; *Setophaga petechia*). Most passerines found within the region are considered short-distance migrants which winter in southern Canada and the contiguous United States. Exceptions include gray-cheeked thrush and yellow warbler which migrate to Central and South America during the winter. Previous studies have indicated that Lapland longspur, horned lark (*kopanoakpagyuk*; *Eremophila alpestris*), redpolls, Savannah sparrow (*n/a*; *Passerculus sandwichensis*), and American tree sparrow (*misapsak*; *Spizelloides arborea*)are among the most common species in the broader region (Miramar Hope Bay Ltd. 2005; Smith et al. 2010) and that habitats with greater shrub density appear to have a higher density of songbirds present (Hubert and Associates Ltd. 2002b).

Willow and rock ptarmigan are likely year-round residents within the terrestrial RSA, although some populations of willow ptarmigan (*akilgivik*; *Lagopus lagopus*) may migrate to wintering grounds south of the tundra (Hannon et al. 1998). Rock ptarmigan may only withdraw from the northern extent of the breeding range during winter. Populations of ptarmigan fluctuate seasonally with cyclic peaks in numbers of breeding individuals ranging from 8 to 11 years in northern Canada (Hannon et al. 1998). Ptarmigans are a key prey item for some raptors (especially gyrfalcon) and carnivores.

Most shorebirds are long-distance migrants that travel south to their non-breeding areas, relying on specific stopover sites during migration. In recent decades, shorebird populations have become a greater concern in the NT and NU because of persistent negative population trends. Globally, 44% of the estimated population trends for Arctic breeding shorebirds are declining (Gratto-Trevor et al. 2011; North American Bird Conservation Initiative Canada 2024). As mentioned in Section 3.1, 18 shorebird species have been assessed to be potentially present within the terrestrial RSA, including three species at risk: red knot *rufa* subspecies, buff-breasted sandpiper, and red-necked phalarope. Red-necked phalarope is confirmed to be present within the RSA (see Table 3.2).

According to recorded Inuit Knowledge (NTKP 2018), several species of passerines, shorebirds, and upland game birds breed throughout the West Kitikmeot Region of mainland NU.

> C3 "*The snow buntings are always the first seen in the spring around here (Kugyoak (Perry River) mouth and off of Cape Colborne). They are first to arrive. We don't eat those birds*" (NTKP 2018).
>
> C4Kug-59 "*Snow buntings, Lapland longspurs, horned larks, sandpipers, golden plovers, red phalaropes and other ducks that arrive in the spring (can be seen here at Kugluktuk) in the summer)*" (NTKP 2018).
>
> C1-59 "… *All kinds of birds can be seen during the summer. There's the horned lark, killdeer, golden plover, snow bunting, sandpipers and common redpoll* …" (NTKP 2018).
>
> C9-59 "*Sparrows and all different kinds (of birds are seen in the summer)* …" (NTKP 2018).
>
> C13-60 "*The horned larks and Lapland longspurs migrate south first*" (NTKP 2018).
>
> C28-60 "*Sandpipers and killdeers return south first. They disappear right away*" (NTKP 2018).

6.1 General Information

6.1.1 Populations

Long-term population trends of Arctic breeding birds are not well known due to the remoteness of the breeding areas and challenging survey conditions in the Arctic. Arctic passerines show decreasing population trends, although they are not as substantial as the declines observed in shorebirds. Most of the Arctic passerines are short-distance migrants and are therefore effectively monitored by the CBC in southern Canada and the United States. Species in the region with the most drastic population declines include redpoll, American tree sparrow, and Harris's sparrow, with long-term declines of 2 to 5% per year since the 1960s (Downes et al. 2011; North American Bird Conservation Initiative Canada 2024). Trend data for Lapland longspur indicate that this species' population is stable or slightly increasing in North America. Little information on population trends of Arctic ptarmigan populations is available; however, it is known that populations are cyclical and typically follow a cycle of 8 to 11 years (Hannon et al. 1998). Similar to Arctic passerines, Arctic shorebird species are showing drastic population declines, with 44% of total shorebird species declining (Morrison et al. 2001). Overall, Arctic shorebirds are decreasing at a rate of 1.9% per year (Bart et al. 2007). Among the shorebird species documented within the region, American golden-plover (*Pluvialis dominica*), semipalmated sandpiper (*Calidris pusilla*), and red-necked phalarope show some of the highest level of conservation concern due to their decreasing trends (Morrison et al. 2001). Baird's sandpiper (*mihakpakyuk*; *Calidris bairdii*) and pectoral sandpiper (*Calidris melanotus)* also show declining trends but are less certain as the declines are either not statistically significant or show conflicting trends between data sources.

6.1.2 Threats and Mortality

The decreasing trends currently observed for Arctic passerines and shorebirds are likely due to several factors, including mortality risk, reduced body condition during migration, loss of quality habitat, and climate change.

Most Arctic passerines are short-distance to medium-distance migratory species. Unlike migratory shorebirds, passerines do not concentrate at stopover sites during migration and therefore are not as vulnerable to migration habitat changes. However, many passerines are nocturnal migrants and during migration are prone to collisions with buildings, communication towers, or any handmade structure that is covered in windows. Additionally, climate change is likely a major threat to Arctic passerines; although it is not yet well understood, it has been proposed that changes to vegetation communities may result in less suitable habitat for some species. For example, Downes et al. (2011) proposed that earlier thawing of the tundra and subsequent encroachment of shrubs could lead to population declines in species, such as snow bunting, that require open areas for nesting. The concern of the timing of hatch in relation to insect abundance is also relevant to passerines, as most species rely on insect prey for chick survival.

Shorebirds are long-distance migrants, and many species rely on specific stopover sites during migration. The terrestrial RSA is not likely an important stopover site for shorebirds, but the loss or modification of critical stopover sites in other areas is a primary threat to shorebird populations in the Arctic. Migrants rely on these sites to provide sufficient nutrients to allow for long-distance migrations and modification of these stopover sites has the potential to decrease survival and result in a lower reproductive output (Morrison et al. 2001; Baker et al. 2004). Gratto-Trevor et al. (2011) suggested that the loss of one or two of these stopover sites could have a major impact on shorebird populations. Habitat changes in the Arctic due to climate change also have the potential to worsen the declines already observed for many Arctic breeding species (Gratto-Trevor et al. 2011). Potential habitat changes include changes to wetlands/ponds, encroachment of shrubs, and the timing of chick hatch relative to peak insect emergence (Gratto-Trevor et al. 2011). And given that insect hatch timing is strongly influenced by weather patterns, climate change has the potential to cause shorebird chicks to hatch at an inadequate time for food availability for survival, reducing the reproductive output of many Arctic breeding species.

6.2 Occurrence in the Terrestrial RSA

Field surveys for tundra breeding birds were completed in the terrestrial RSA in 2004, 2008, and 2012 (see Section 2.4.3). In addition, baseline surveys for Jericho and Ulu were completed in 1999 to 2000 and 1996. To date, 14 passerine species, 11 shorebird species, and 2 ptarmigan species have been documented within the terrestrial RSA (see Table 6.1). A barn swallow, designated as Special Concern (COSEWIC 2021c), was observed once in June 2008 just south of the terrestrial RSA (near Izok area). The terrestrial RSA is considered to be outside of the range of barn swallows, and the species is rare within the region (for more information, see Section 3.1.1). Also, red-necked phalarope is listed as a species of Special Concern under the SARA (GOC 2025), was observed within the terrestrial RSA.

Table 6.1 Tundra Breeding Birds Documented in the Terrestrial RSA

Species	Breeding Status in Terrestrial RSA	Species Documented						Observations
		2025	2012	2008	2004	1999–2000[1]	1990, 1996[2]	
Shorebirds								
American golden-plover	Confirmed		X	X		X	X	Common breeder within the RSA, typically found in upland tundra habitats.
Semipalmated plover	Confirmed		X	X	X	X	X	Common breeder, most common in bare or sparsely vegetated areas such as shorelines and eskers.
Ruddy turnstone*	Possible						X	Rare visitor, only documented during baseline surveys at Ulu.
Semipalmated sandpiper	Probable		X	X	X	X		Uncommon species, found in or adjacent to sedge wetlands.
Least sandpiper	Confirmed	X	X	X	X	X		Most abundant shorebird in the RSA, usually associated with sedge wetlands or shorelines (of lakes, ponds, creeks).
White-rumped sandpiper*	Possible					X		Rare visitor, only documented during baseline surveys at Jericho.
Baird's sandpiper	Possible					X		Rare visitor, documented twice in the RSA.
Pectoral sandpiper	Probable		X		X			Uncommon, usually found in or adjacent to sedge wetlands.
Stilt sandpiper	Probable		X	X				Uncommon, typically found in or adjacent to sedge wetlands.
Wilson's snipe	Possible	X	X		X			Uncommon, usually found in or adjacent to sedge wetlands.
Red-necked phalarope	Probable	X	X	X	X	X		Common species found around wetlands, ponds or lakes.
Upland Gamebirds								
Rock ptarmigan	Confirmed		X	X		X	X	Uncommon breeder, typically found in rocky uplands.
Willow ptarmigan	Confirmed	X	X	X	X	X	X	Common breeder, most common in lowland shrub habitats.
Passerines								
Horned lark	Confirmed	X	X	X	X	X	X	Common species on tundra, usually associated with rock outcrops or boulders.
Cliff swallow	Confirmed				X	X		Uncommon breeder, colony with 6–8 gourd-shaped mud nests present at a cliff site northeast of High Lake in June 2006.

Species	Breeding Status in Terrestrial RSA	Species Documented						Observations
		2025	2012	2008	2004	1999–2000[1]	1990, 1996[2]	
Gray-cheeked thrush	Confirmed		X	X	X	X		Uncommon breeder, only encountered in or near tall shrub thickets.
American robin	Probable	X	X	X		X	X	Uncommon, usually associated with riparian habitats.
American pipit	Probable	X	X	X	X	X		Common passerine occurs on tundra with rock; usually near water.
Lapland longspur	Confirmed	X	X	X	X		X	Common and widespread, most abundant in heath tundra habitats.
Snow bunting	Probable	X	X				X	Uncommon, usually associated with rocky outcrops or boulders.
Yellow warbler	Probable	X	X	X	X	X		Uncommon, associated exclusively with tall shrub thickets.
American tree sparrow	Confirmed	X	X	X	X	X		Common breeder, most abundant in habitats with a significant shrub component.
Chipping sparrow	Possible						X	Rare visitor, only documented during baseline surveys at Ulu.
Savannah sparrow	Confirmed	X	X	X	X	X		Common and widespread species, particularly where there is a high percentage of vegetation cover (graminoid or shrub).
Harris's sparrow	Probable		X	X	X	X		Common passerine, most often observed in upland tundra with rocky outcrops or boulders.
White-crowned sparrow	Confirmed	X	X	X	X	X		Fairly common, appears to prefer habitats with a significant shrub component.
Redpoll[3]	Confirmed	X	X	X	X	X	X	Common breeder, most abundant in habitats with a significant shrub component.

Notes:

RSA = regional study area

[1] Hubert and Associates Ltd. (2002a)

[2] Canamera Geological Ltd. (1996)

[3] common and hoary redpoll (and lesser redpoll) lumped by the American Ornithologist Society in 2024 to redpoll (*Acanthis flammea*)

After a comparison between the field survey results and the list of potential species (see Table 3.2), an additional seven shorebird species and seven passerine species may occasionally be found within the terrestrial RSA based on their presence in nearby regions (Bathurst Inlet, Hope Bay). However, given that these species have not yet been detected within the terrestrial RSA, if present, they may be very unusual breeders or just pass through the area during migration. One of these seven species was a sighting of a northern wheatear (*tikmiakpauruk*; *Oenanthe oenanthe*) during the 2012 field surveys; it was an incidental observation during the seabird ground survey which could not be confirmed.

Arctic passerine species assemblages are not as diverse as in more southerly locations; however, the terrestrial RSA has a relatively high diversity of passerines species compared to other Arctic regions. This is due to the presence of several southerly species which are nearing the northern extent of their breeding range. The most common species observed in the terrestrial RSA were savannah sparrow, Lapland longspur, American tree sparrow, redpoll, and horned lark. These five species accounted for more than 90% of all individuals observed in 2012. Work completed at Ekati Diamond Mine between 1996 and 2003 found a similar species assemblage, with Lapland longspur, savannah sparrow, American tree sparrow, Harris's sparrow, and horned lark as the five most common passerine species detected there (Smith et al. 2010).

The diversity of shorebirds observed within the terrestrial RSA is not high relative to other locations in the Arctic. Compared to the higher Arctic, the species assemblage is unique due to the proximity to the treeline. For example, species such as least sandpiper (*livalivaurak*; *Calidris minutilla*) and Wilson's snipe (*kilyaktalik*; *Gallinago delicata*) are typically associated with the boreal forest but were also found in tundra habitats within the study area. The most common shorebird species within the terrestrial RSA was least sandpiper, but the American golden-plover, semipalmated plover, and red-necked phalarope were also relatively common. The species assemblage observed is similar to those reported for other areas near the treeline and tundra boundary including studies at Ekati Diamond Mine (located approximately 150 km southeast of Izok; Smith et al. 2010).

Species diversity of tundra breeding birds was calculated using the results of the 2012 tundra breeding bird surveys (Rapid PRISM plot method). Vegetation cover classes were grouped into broad habitat categories and PRISM plots assigned to a broad habitat category based on the dominant vegetation types within the plot. A description of each category is provided in the list below (detailed descriptions of vegetation cover classes are provided in Table 2.6, Section 2.5):

- Heath – dominated by heath habitats, this includes heath tundra, heath cryoturbated, and heath graminoid.
- Sparse Vegetation – dominated by areas with minimal, low vegetation; this includes exposed gravel/cobble, exposed sand/silt, bedrock/boulder, lichen veneer, and heath rock.
- Shrub – dominated by shrubby habitats, this includes riparian shrub and low shrub.
- Sedge – dominated by sedge habitats, this includes tussock sedge and non-tussock sedge.
- Heath/Shrub – dominant vegetation is a combination of heath and shrub habitats described above.
- Heath/Sedge – dominant vegetation is a combination of heath and sedge habitats described above.

- Heath/Sparse Vegetation – dominant vegetation is a combination of heath and low vegetation habitats described above.
- Mixture – no dominant vegetation type, at least three broad habitat categories present.

Species diversity is a measure of the variety and abundance of species within a dataset, and it includes two components: species richness which is the number of different species in a community and species evenness which is the relative abundance of each species within the community. Species richness was assessed based on the range and mean number of species detected at plots within each of the broad habitat categories. Species evenness was assessed with the calculation of Simpson's Inverse Index.

Species diversity was determined for each broad habitat category, and all plots were combined. Overall, the number of species detected per plot ranged from 2 to 10 ($\overline{x}$ = 5.8; see Table 6.2). The analysis suggested that species richness may be greatest in shrub and heath/sedge habitats but there was a relatively large range of variability (i.e., large standard error) and therefore the results were not conclusive. The assessment of species evenness also showed a high degree of variability within each of the broad habitat types. During the 2012 PRISM surveys, biologists attempted to locate plots within homogenous habitat types but found that in many cases it was difficult to situate the entire 12-hectare plots within a single vegetation cover class. This likely accounts for much of the variability detected during the analysis of species diversity (e.g., in some cases a 'heath' plot was located entirely within heath tundra habitats, while another 'heath' plot may be dominated by heath tundra habitats but also contain small amounts of riparian shrub or tussock sedge). The total combined value for the Simpson's Inverse Index was 4.37 (see Table 6.2), and this is comparable to findings at Ekati Diamond Mine where 4.31 was the mean value documented at control sites around the mine between 1996 and 2003 (Smith et al. 2010).

Table 6.2 Species Diversity of Tundra Breeding Birds within the Project Region Based on 2012 PRISM Survey Results

Broad Habitat Type	Species Richness[1]		Simpson's Inverse Index[1] (± 2 SE)
	Mean ± SE	Range	
Heath (n=23)	5.9 ± 0.5	3 to 10	3.9 ± 1.0
Sparsely Vegetated (n=9)	4.7 ± 0.9	2 to 9	4.9 ± 1.3
Shrub (n=3)	6.3 ± 1.8	3 to 9	4.2 ± 2.3
Heath/Shrub (n=10)	5.7 ± 0.4	4 to 8	3.7 ± 0.9
Heath/Sedge (n=4)	7.3 ± 0.8	5 to 8	5.0 ± 1.4
Heath/Sparsely Vegetated (n=18)	5.4 ± 0.3	3 to 10	4.9 ± 1.5
Mixture of ≥3 Habitat Types (n=14)	6.1 ± 0.5	3 to 10	4.3 ± 1.1
ALL COMBINED	5.8 ± 0.2	2 to 10	4.4 ± 0.5

Note: SE = standard error

[1] Values represent combined estimates from the 2012 PRISM surveys. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).

6.2.1 Shorebirds

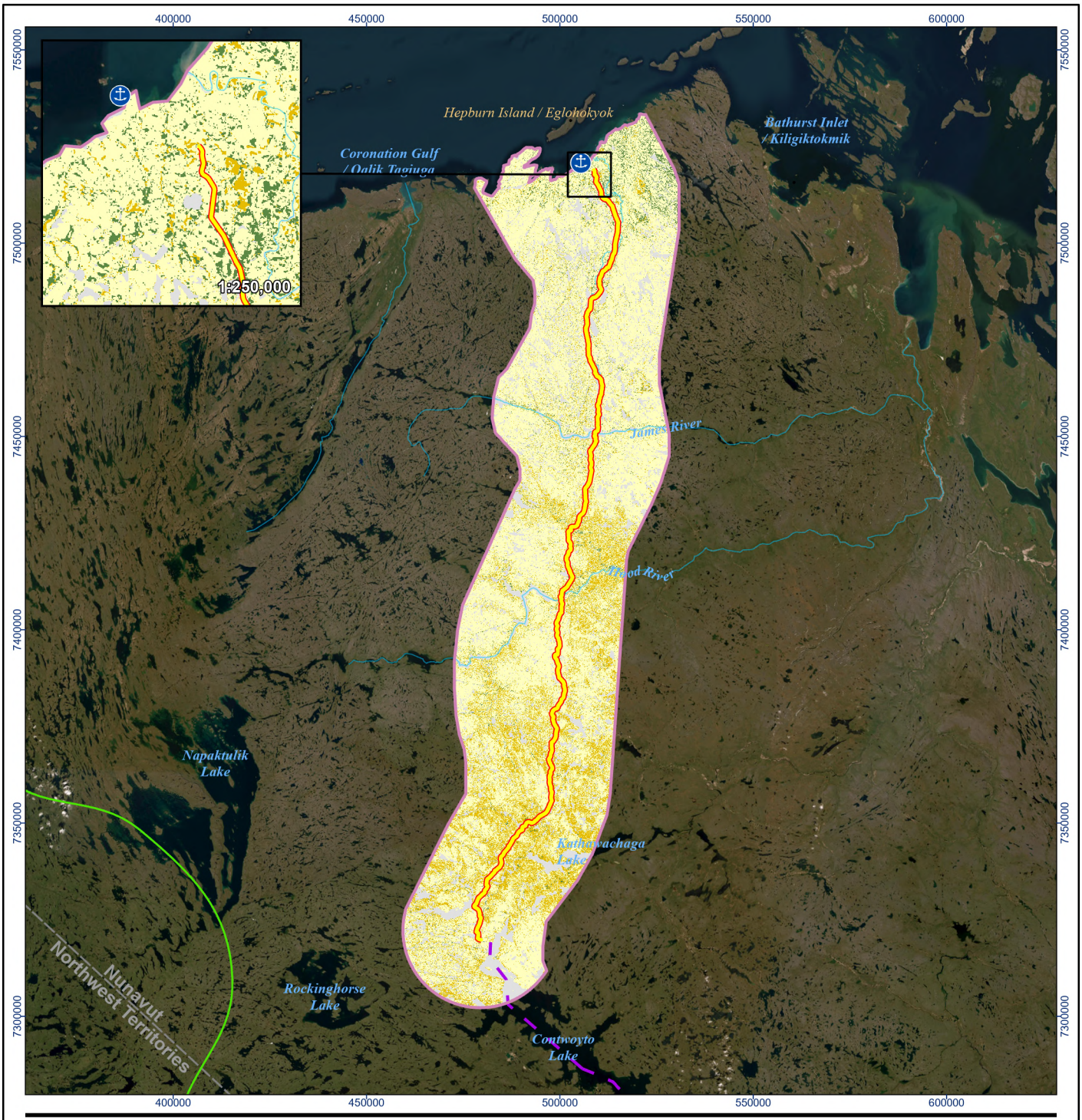
In general, the terrestrial RSA does not contain extensive marsh or wetland habitats typically associated with high densities of shorebirds. As a part of the 2012 PRISM surveys, habitats within the region were classified as high (sedge wetlands), moderate (a variety of moist sites) and low (typically drier upland sites) quality shorebird habitat based on regionally defined strata (rankings done by Jennie Rausch, Shorebird Biologist, CWS; see Section 2.5.2). To assess the distribution of shorebird habitat, these rankings were then applied to vegetation classes to create a habitat suitability map. The habitat suitability map demonstrated that high-quality habitats were limited and generally scattered in small pockets throughout the terrestrial RSA, while most of the study area consisted of moderate- and low-quality shorebird habitat (see Table 6.3, Figure 6.1). While many shorebird species would be expected to be most abundant within habitats rated as high quality, some species typically breed in dry upland tundra with sparse or low vegetation (e.g., American golden-plover; O'Brien 2006), habitats which are rated as moderate or low quality.

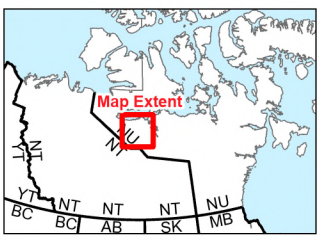
Table 6.3 Habitat Suitability Modelling Results for Shorebirds

	High	Moderate	Low	Nil
Area (km²)	261.7	1309.6	5858.4	1327.5
Percent of Terrestrial RSA	2.98	14.95	66.89	15.15

The 2012 PRISM surveys were also used to calculate densities for shorebird species within the region (i.e., the terrestrial RSA and the Izok area, outside of the RSA). The overall regional density of shorebirds was highest in the plots classified as high habitat (30.6 birds/km²), followed by moderate (21.5 birds/km²) and low (18.0 birds/km²; see Table 6.4). This result is despite a low sample size of plots in high habitats (n = 3) as compared to the moderate (n = 24) and low (n = 55) habitats. The overall shorebird densities were below average when compared to PRISM surveys across the Arctic (average densities within the Arctic: high = 84 birds/km², moderate = 56 birds/km², and low =25 birds/km²; Bart and Smith 2012), although these averages are skewed by a small number of areas with very high densities, including the Yukon Delta and the National Petroleum Reserve in northern Alaska. PRISM data from the Queen Maud Gulf region can provide additional regional context to the calculated shorebird densities reported in this study. The average shorebird densities for Queen Maud Gulf are very similar to the calculated densities within the Project region: high = 27 birds/km², moderate = 20 birds/km², and low = 18 birds/km² (Bart and Smith 2012).

Efforts were made to locate plots within homogenous habitat types, but there were often irregularities in the survey plots. For example, a plot classified as 'poor suitability' may have been dominated by poor habitats with small areas of moderate and good habitat within. This results in some irregularities within the calculated densities, such as wetland-oriented species being found within plots and classified as having poor suitability overall.





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

Shorebird Habitat Suitability Classes

- Nil
- Low Suitability
- Moderate Suitability
- High Suitability

0 20 40 Kilometres

(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

24Y0376

Figure No.
6.1

Title
Shorebird Habitat Ratings in the Terrestrial Regional Study Area

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig6-1_Shorebird_HabSuitability_20260218; Revised: 2026-02-18 By: OliviaLeblanc

Table 6.4 Regional Densities of Shorebirds by PRISM Habitat Categories during 2012 Field Surveys

Species	High (wetlands; *n* = 3)		Moderate (moist areas; *n* = 24)		Low (dry uplands; *n* = 54)	
	No. of Birds Observed	Birds/km² ± SE[1]	No. of Birds Observed	Birds/km² ± SE[1]	No. of Birds Observed	Birds/km² ± SE[1]
American golden-plover	0	0	9	3.1 ± 1.6	12	1.8 ± 0.8
Semipalmated plover	0	0	0	0	20	3.0 ± 1.3
Semipalmated sandpiper	0	0	2	0.7 ± 0.7	2	0.3 ± 0.2
Least sandpiper	2	5.6 ± 2.8	33	11.5 ± 3.9	61	9.2 ± 2.7
Pectoral sandpiper	2	5.6 ± 5.6	0	0	1	0.2 ± 0.2
Stilt sandpiper	3	8.3 ± 8.3	3	1.0 ± 0.8	1	0.2 ± 0.2
Wilson's snipe	0	0	2	0.7 ± 0.5	1	0.1 ± 0.2
Red-necked phalarope	4	11.1 ± 7.4	13	4.5 ± 2.6	21	3.2 ± 1.1
ALL SHOREBIRDS	11	30.6 ± 22.7	62	21.5 ± 5.7	119	18.0 ± 4.0

Notes:

SE = standard error

[1] Densities reflect all 2012 PRISM surveys. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).

Least sandpiper was the most common shorebird encountered during the 2012 surveys, observed in high-, moderate-, and low-quality habitats. Least sandpipers occurred in the highest densities (11.5 birds/km²) in moderate-quality habitats (see Table 6.4). The species was usually associated with sedge wetlands or shorelines but in many cases these features were small and did not necessarily dominate the plots. Least sandpiper has not been well represented during PRISM surveys across the Arctic because it is primarily found near the treeline, and their estimated density was less than 2.5 birds/km² (Bart and Smith 2012). Similarly to our result, studies at Ekati Diamond Mine found that least sandpiper was the dominant shorebird species present and reported densities of 8.4 to 12.4 birds/km² (Smith et al. 2010).

American golden-plover's highest density (3.1 birds/km²) was found in moderate-quality habitats, but individuals were seen in the moderate- and low-quality habitats (see Table 6.4). The preferred habitat for American golden-plover is somewhat variable across the Arctic and often associated with sparse, low vegetation on well-drained rocky slopes but may also use wetter sites (Johnson and Connors 2010). The density of this species within the Project region compared to other surveyed areas in the Arctic is near average. The average density of American golden-plover in surveyed areas across the Arctic (northern Quebec to western Alaska) is uplands = 2.8 birds/km², moist areas = 3.2 birds/km², and wetlands = 1.5 birds/km² (Bart and Smith 2012). In the Queen Maud Gulf region to the east of the RSA, the calculated densities ranged from a low of 0.7 birds/km² to a high of 2.4 birds/km² (Bart and Smith 2012), while at Ekati, located southeast of the RSA, the average density of American golden-plover was 2.0 birds/km² (Smith et al. 2010).

Semipalmated plover was found only in the low-quality sites (upland) and the calculated density for this species was 3.0 birds/km² (see Table 6.4). This is reflective of its preferred breeding habitat which is typically well-drained areas of exposed gravel (Nol and Blanken 1999). This species has been found sporadically during PRISM surveys in other Arctic regions and in general the densities for semipalmated plovers have been low with a high degree of variability (Bart and Smith 2012). For example, surveys at Ekati found densities of semipalmated plovers ranging from 0.8 to 1.6 birds/km² (Smith et al. 2010).

Red-necked phalarope was found in high-, moderate-, and low-quality habitats with the highest density (11.1 birds/km²) in the high-quality habitats (see Table 6.4). This species across all three habitat categories had a high standard error due to the high range of variability in the number of individuals observed per plot. Nests of red-necked phalarope are typically located on mounds or tussocks near small tundra lakes, pools, marshes, and within or near small streams (Rubega et al. 2020). In comparison to other PRISM surveys across the Arctic, the density of this species within the Project region is slightly below average, with the average reported densities in wetlands, moist areas, and uplands were 14.5, 8.4, and 8.2 birds/km², respectively (Bart and Smith 2012). When compared to survey data from the Queen Maud Gulf, the highest density was 10.05 birds/km² in wetlands, while the density reported in this study is slightly higher than that (Bart and Smith 2012), and Ekati's density is 1.2 to 3.6 birds/km² (Smith et al. 2010). During the 2025 terrestrial transect surveys, the density of red-necked phalaropes was 1.33 birds/km² (see Table 6.7).

Reproduction

During the 2008 and 2012 surveys, breeding was confirmed for three species of shorebirds within the RSA: American golden-plover, semipalmated plover, and least sandpiper. Breeding confirmation was based either on an active nest or strong behavioural evidence of breeding, such as recently fledged young or distraction displays. American golden-plover and least sandpiper were the most common shorebird nests found. American golden-plover nests were typically found in areas described as 'gravelly tundra', and least sandpiper nests were found in wet tundra or sedge tussock/sedge non-tussock habitat. Semipalmated plover nests were located along gravelly shoreline or dry tundra habitats. Two additional shorebird species were confirmed to be breeding within the region during the 2008 and 2012 surveys, semipalmated sandpiper and red-necked phalarope, although the identified nests were found outside of the RSA. In 2025, a semipalmated plover nest was identified within the Port PDA along the Arctic ocean coastline. Pairs of red-necked phalaropes and least sandpipers were also identified; however, no active nests were identified.

6.2.2 Upland Game Birds and Passerines

PRISM survey data from 2012 were used to calculate regional densities for upland game birds and passerine species. Similarly, terrestrial transect surveys were used to calculate density in the LSA. Unlike the habitat suitability categories used for shorebirds, the density of upland game birds and passerines was assessed using the same broad habitat categories as the assessment of species diversity (above). The regional density of upland game birds (aka. ptarmigan) during the 2012 field surveys was relatively low, with 3.3 birds/km² for willow and rock ptarmigan combined (see Table 6.5). In comparison, studies at Ekati found densities of 4.4–6.4 willow ptarmigan/km² and 1.6–4.0 rock ptarmigan/km² (Smith et al. 2010), while extensive PRISM surveys on the North Slope of Alaska recorded an overall density of

13.7 ptarmigan/km² (Bart et al. 2012b). Ptarmigan numbers are cyclical and vary geographically (Hannon et al. 1998), so it is possible that the low regional densities observed in 2012 resulted from the population's cyclical low. However, analysis of the 2008 Project survey results, while not directly comparable to the above results due to different survey methods, also found low densities within the Project region (combined average of 3.9 ptarmigan/km²). In 2025, willow ptarmigan were seen at a density of 1.33 birds/km². No other ptarmigan were observed in 2025. Overall, in 2008, 2012, and 2025, willow ptarmigans were observed more frequently than rock ptarmigan and were found to have the highest density in plots dominated by shrubs. Rock ptarmigan was the most common species in plots that were sparsely vegetated.

Passerine regional density across all habitat types during the 2012 field surveys was 191.8 birds/km² and this result included a total of 1,864 individuals observed on 81 plots surveyed (see Table 6.6). The timing of the 2012 field surveys may have been too late during the breeding season to adequately sample some species. For instance, it appeared that many of the redpolls had already fledged their young at the time of the surveys as many of these birds were observed in feeding flocks on the plots and were recorded as incidental observations (i.e., not included in the density estimates). If the 2012 field surveys were completed one week earlier, the density of passerines may have been higher. In comparison, surveys completed at Ekati between 1996 and 2003 found a mean density of 228.4 birds/km² across all years (Smith et al. 2010).

Analysis of the 2012 PRISM data indicated that plots containing shrubs had the highest density of individuals, followed by plots containing sedges and the lowest density of birds found in sparsely vegetated habitats. This is consistent with the 2004 breeding bird transects in the High Lake area, which found that the highest densities of birds were in riparian shrub and sedge habitats and the lowest in bedrock/boulder habitats. Therefore, shrub habitats, particularly riparian shrub thickets, are important to the local bird community. Several species, in particular gray-cheeked thrush and yellow warbler, were confined to this habitat within the RSA. Several other species, such as redpolls and American tree sparrow, strongly preferred shrub habitats. This strong preference with shrub cover is similar to other studies completed at the Snap Lake Diamond Project (De Beers 2002) and Doris North (Miramar Hope Bay Ltd. 2005). A map of the observed densities of passerine species by habitat type (see Section 2.5.3 for methodology) indicated that habitats containing shrubs or sedges with higher densities of passerines were distributed throughout the terrestrial RSA but were often associated with water bodies and were most concentrated in the northern-most sections of the RSA (see Figure 6.2).

In 2025, transect surveys resulted in passerine birds at a density of 105.54 bird/km² regardless of habitat with a total of 318 individual birds found among 11 species (see Table 6.7; Figure 6.3). The most abundant passerines observed were redpoll and savannah sparrow (26.22 birds/km² and 25.89 birds/km², respectively) and the least abundant birds were snow bunting and yellow warbler (both 0.33 birds/km²; see Table 6.7).

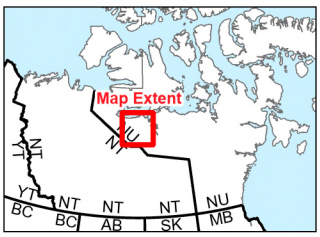
Table 6.5 Densities of Upland Game Birds by Broad Habitat Categories during 2012 Field Surveys

Species	Birds / km² ± SE[1]							
	Heath (n = 23)	**Sparsely Vegetated (n = 9)**	**Shrub (n = 3)**	**Heath/ Shrub (n = 10)**	**Heath/ Sedge (n = 4)**	**Heath/ Sparse Veg. (n = 18)**	**Mixture of ≥3 Habitat Types (n = 14)**	**ALL PLOTS (n = 81)**
Rock ptarmigan	0	2.8 ± 2.0	0	0.8 ± 0.3	0	0	0	**0.4 ± 0.3**
Willow ptarmigan	3.6 ± 1.5	0	13.9 ± 13.9	0.8 ± 0.3	4.2 ± 4.2	3.7 ± 2.2	1.2 ± 1.2	**2.9 ± 0.9**
All Upland Game Birds	3.2 ± 1.5	2.8 ± 2.0	13.9 ± 13.9	1.7 ± 1.1	4.2 ± 42	3.7 ± 2.2	1.2 ± 1.2	**3.3 ± 0.9**

Note:

SE = standard error

[1] Densities reflect all 2012 PRISM surveys. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).



Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Natural Resources Canada, Government of Canada (https://www.nrcan.gc.ca/earth-sciences/geography/download-geographical-names-data/9245)
Publication Date: Unknown
Downloaded: September 7, 2021
Last Checked: September 7, 2021

- Grays Bay Port
- Grays Bay Road
- Tibbitt to Contwoyto Winter Road
- Territorial Boundary
- Treeline
- Watercourse
- Terrestrial Regional Study Area (RSA)

Passerine Densities

- Nil
- Low Density
- Moderate Density
- High Density

0 20 40 Kilometres

(At original document size of 8.5x11) 1:1,500,000

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

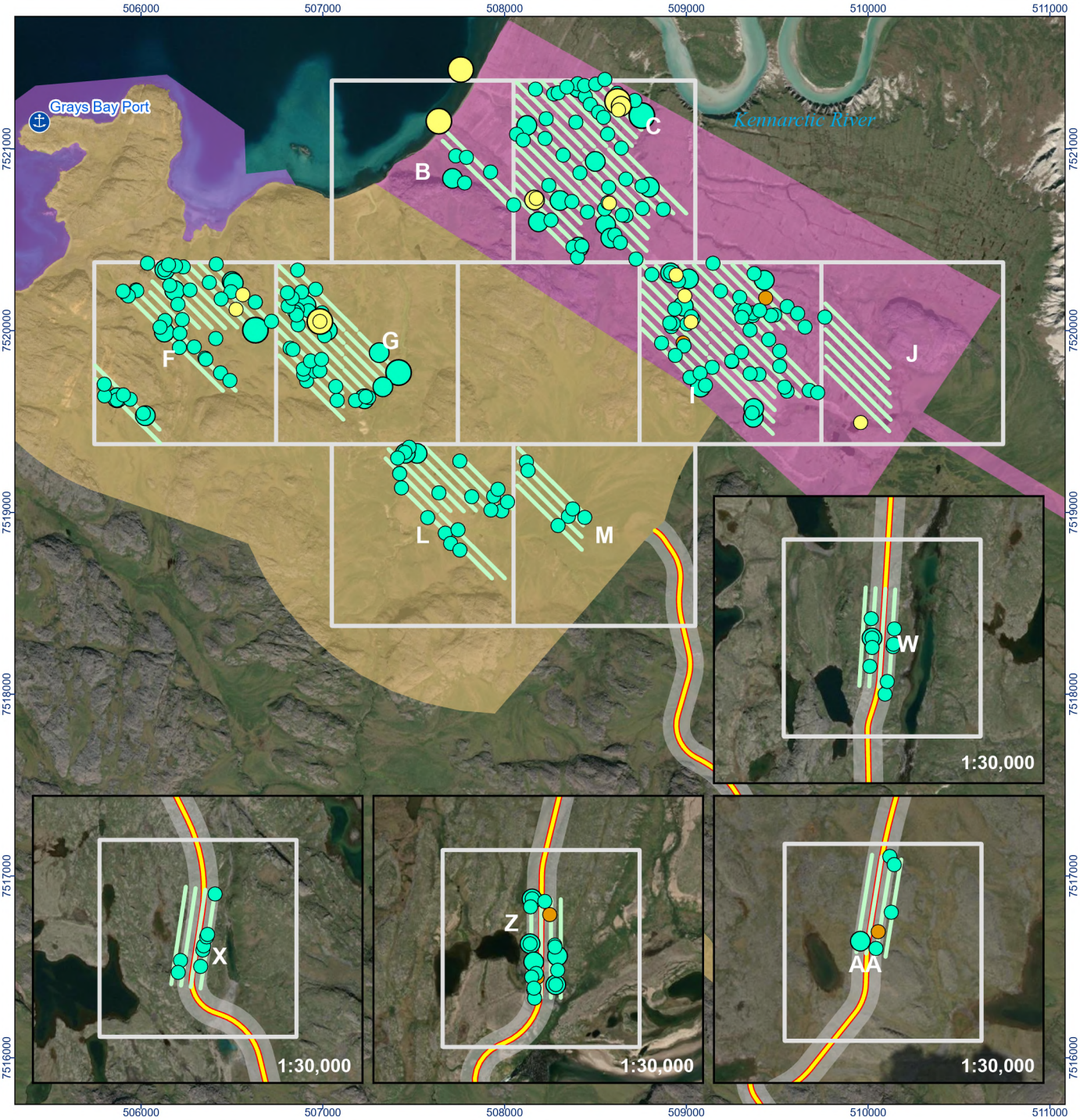
Prepared by OliviaLeblanc on 2026-02-18

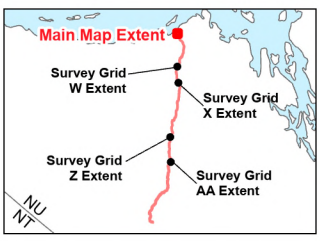
Client/Project 24Y0376
West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
6.2

Title
Passerine Densities by Habitat Type in the Terrestrial Regional Study Area Based on 2012 Field Surveys

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx\24Y0376_BirdBaseline_Fig6-2_PasserineDensities_20260218; Revised: 2026-02-18 By: OliviaLeblanc





Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Government of Canada, Stantec, Downloaded by David Spry (Stantec GIS) in mid-December 2016 from ftp://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/fgdb/Hydro/ Last Modified 08-Nov-2016, Vantor

- Grays Bay Port
- Terrestrial Survey Transects
- Grays Bay Road
- Survey Grid

Project Development Area (PDA)

- Aerodrome
- Port (Landside Infrastructure)
- Port (Marine-based Infrastructure)
- Road

Terrestrial Bird Survey Locations

Waterbirds Observed
- 1
- 2 - 3
- 4 +

Passerines Observed
- 1
- 2 - 3
- 4 +

Ptarmigan and Raptors Observed
- 1
- 2 - 3
- 4 +

0 0.4 0.8 Kilometres

(At original document size of 8.5x11) 1:32,500

N

WEST KITIKMEOT RESOURCES CORP

EDI ENVIRONMENTAL DYNAMICS INC.

Project Location
West Kitikmeot Region
Nunavut

Prepared by OliviaLeblanc on 2026-02-18

Client/Project
24Y0376

West Kitikmeot Resources Corp (WKR)
Grays Bay Road and Port

Figure No.
6.3

Title
Terrestrial Transect Survey Results in 2025

Path: L:\PROJECTS\2024\WH\24Y0029_GBRP\BirdBaselineUpdates_2025.aprx Layout: 24Y0376_BirdBaseline_Fig6-3_BirdSurveyTransects_Terrestrial_20260218 Revised: 2026-02-18 By: OliviaLeblanc

Table 6.6 Densities of Passerines by Broad Habitat Categories during 2012 Field Surveys

Species	Birds / km² ± SE[1]							
	Heath (n = 23)	**Sparsely Vegetated (n = 9)**	**Shrub (n = 3)**	**Heath/Shrub (n = 10)**	**Heath/ Sedge (n = 4)**	**Heath/ Sparsely Veg. (n = 18)**	**Mixture of ≥3 Habitat Types (n = 14)**	**ALL PLOTS (n = 81)**
Horned lark	10.5 ± 2.5	38.0 ± 16.4	0	15.8 ± 4.6	8.3 ± 5.9	12.0 ± 2.8	8.9 ± 3.5	**13.8 ± 2.4**
Gray-cheeked thrush	0.4 ± 0.4	0	2.8 ± 2.8	0	0	0.5 ± 0.5	1.8 ± 1.3	**0.6 ± 0.3**
American robin	0	0	2.8 ± 2.8	0	0	0	0	**0.1 ± 0.1**
American pipit	1.8 ± 0.9	11.1 ± 4.2	0	6.7 ± 4.6	0	0.5 ± 0.5	4.2 ± 2.6	**3.4 ± 0.9**
Lapland longspur	89.1 ± 14.9	31.5 ± 14.2	8.3 ± 8.3	65.8 ± 13.5	93.8 ± 18.8	52.8 ± 8.7	30.9 ± 6.2	**59.0 ± 6.0**
Yellow warbler	0	0	5.6 ± 5.6	0.8 ± 0.8	0	1.4 ± 1.4	3.0 ± 1.1	**1.1 ± 0.4**
American tree sparrow	14.5 ± 4.1	5.6 ± 2.0	44.4 ± 2.8	40.8 ± 8.4	33.3 ± 10.2	17.1 ± 5.6	29.8 ± 6.4	**22.0 ± 2.6**
Savannah sparrow	69.2 ± 9.6	18.5 ± 6.5	88.9 ± 24.2	85.8 ± 14.2	77.1 ± 17.8	43.1 ± 8.1	72.0 ± 11.5	**61.4 ± 4.9**
Harris's sparrow	6.5 ± 3.9	0	5.6 ± 5.6	5.0 ± 5.0	0	1.9 ± 1.4	2.4 ± 1.6	**3.5 ± 1.3**
White-crowned sparrow	3.6 ± 2.0	7.4 ± 4.3	13.9 ± 10.0	10.0 ± 4.9	2.1 ± 2.1	4.2 ± 2.9	7.1 ± 4.3	**5.9 ± 1.4**
Common/Hoary redpoll	14.5 ± 4.5	17.6 ± 5.5	77.8 ± 53.0	29.2 ± 8.8	12.5 ± 4.2	14.4 ± 3.7	26.8 ± 10.3	**21.0 ± 3.4**
All Passerines	210.1 ± 18.8	129.6 ± 30.9	250.0 ± 88.2	260.0 ± 12.8	227.1 ± 19.1	147.7 ± 14.0	186.9 ± 23.4	**191.8 ± 9.7**

Note:

SE = standard error

[1] Densities reflect all 2012 PRISM surveys in the region. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).

Table 6.7 Passerine Densities Observed During the 2025 Terrestrial Transect Surveys

Species	Number Observed	Density (Individuals/km²)
American pipit	11	3.65
American robin	2	0.66
American tree sparrow	25	8.30
Horned lark	24	7.97
Lapland longspur	27	8.96
Redpoll	79	26.22
Savannah sparrow	78	25.89
Snow bunting	1	0.33
White-crowned sparrow	47	15.60
Yellow warbler	1	0.33
Unknown species	19	6.31
Total	**318**	**105.54**

The ARU dataset analyzed in 2025 detected a total of 28 species, including 3 species at risk, and 2 species groups (e.g., unidentified loon) (see Table 6.8) The number of species detected per ARU ranged from 4 to 11 (mean = 7.2), while the total number of bird detections per ARU ranged from 9 to 20 (mean = 14.5). Species diversity and number of detections were greater in the southern portion of the LSA (23 species, 57% of detections), compared to the northern portion (20 species, 43% of detections).

The three most frequently detected species, white-crowned sparrow (*nungaktuagruk*; *Zonotrichia leucophrys*), American tree sparrow, and savannah sparrow, accounted for 49% of all detections. A total of 117 detections of listed bird species (either federally or territorially listed) were recorded in 2025 (see Table 6.8). The American tree sparrow was the most frequently detected listed species (noted as Vulnerable in NT; see Table 3.2), representing 62% of all detections of listed bird species. Seven listed bird species 64% of their detections occurred in the southern portion of the LSA, compared to four species and 36% of detections in the northern portion.

Table 6.8 Number of Bird Detections, Total Detections, and Summed Species Detections by Site

Species	North Sites														South Sites																Total
	ARU04	ARU05	ARU06	ARU07	ARU09	ARU11	ARU12	ARU19_A	ARU20	ARU21	ARU22	ARU23	ARU24	ARU38	ARU28	ARU32	ARU41	ARU42	ARU43	ARU44	ARU46	ARU47	ARU48	ARU49	ARU51	ARU52	ARU54	ARU58	ARU59	ARU60	
American pipit (*Anthus rubescens*)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
American tree sparrow (*Spizelloides arborea*)^	0	2	2	1	1	2	2	3	3	3	3	3	2	3	3	3	3	3	2	2	3	3	1	2	3	3	2	3	3	3	72
Canada goose (*Branta canadensis*)	2	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	9
Common raven (*Corvus corax*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Gray-cheeked thrush (*Catharus minimus*)	0	0	0	0	0	0	0	2	3	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Glaucous gull (*Larus hyperboreus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Harris' sparrow (*Zonotrichia querula*)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	3	3	3	0	1	0	0	0	1	15
Horned lark (*Eremophila alpestris*)	1	0	0	0	0	0	0	0	0	0	0	3	3	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	10
Lapland longspur (*Calcarius lapponicus*)	1	1	0	0	0	0	0	0	0	0	2	1	3	0	2	1	0	0	0	2	2	0	0	0	1	1	1	0	1	0	19
Least sandpiper (*Calidris minutilla*)	0	0	0	0	0	0	0	0	0	0	1	1	2	1	3	0	0	0	1	0	1	1	0	0	0	0	3	0	0	2	16
Lincoln's sparrow (*Melospiza lincolnii*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Long-tailed duck (*Clangula hyemalis*)^	1	3	3	3	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1	17
Northern pintail (*Anas acuta*)^	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Pacific loon (*Gavia pacifica*)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Redpoll (*Acanthis flammea*)	0	3	3	2	0	1	3	3	1	2	1	2	1	3	1	4	1	2	0	0	0	1	1	0	1	1	0	0	0	0	37
Red knot (*Calidris canutus*)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Red-necked phalarope (*Phalaropus lobatus*)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	3
Rock ptarmigan (*Lagopus muta*)	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	2	1	0	2	0	0	1	10
Sandhill crane (*Grus canadensis*)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Savannah sparrow (*Passerculus sandwichensis*)	3	3	3	3	2	2	3	0	1	3	0	1	0	0	3	3	3	3	2	3	3	2	0	1	3	3	3	3	3	3	65
Semipalmated sandpiper (*Calidris pusilla*)^	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	2	0	0	0	6
Spotted sandpiper (*Actitis macularius*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Stilt sandpiper (*Calidris himantopus*)	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Unidentified loon species	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Unidentified species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
White-crowned sparrow (*Zonotrichia laucophrys*)	3	3	3	3	3	3	3	3	3	3	2	2	3	3	1	3	3	3	3	2	1	3	2	3	3	2	3	3	0	3	78
Willow ptarmigan (*Lagopus lagopus*)	2	0	1	0	0	0	1	0	0	0	2	0	0	2	2	2	2	2	3	3	3	2	2	3	3	3	3	2	3	2	48

Species	North Sites														South Sites																Total
	ARU04	ARU05	ARU06	ARU07	ARU09	ARU11	ARU12	ARU19_A	ARU20	ARU21	ARU22	ARU23	ARU24	ARU38	ARU28	ARU32	ARU41	ARU42	ARU43	ARU44	ARU46	ARU47	ARU48	ARU49	ARU51	ARU52	ARU54	ARU58	ARU59	ARU60	
Wilson's snipe (*Gallinago delicata*)	2	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Yellow-billed loon (*Gavia adamsii*)^	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Yellow warbler (*Setophaga petechia*)	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Detection Total	16	17	18	15	9	11	14	11	12	15	12	13	14	12	19	19	14	18	13	15	13	17	11	16	20	18	19	14	11	16	442
Species Total	9	8	8	7	6	6	7	4	6	6	7	7	6	5	11	9	7	9	6	8	6	9	7	8	9	10	8	5	5	8	28

Note: * = Species listed under SARA; ^ = Territorial listed species.

Savannah sparrow was the most common passerine observed during the 2012 field surveys, accounting for 32% of all passerines and the second most common during the 2025 terrestrial transect surveys, comprising 26% of all passerines. In 2012, the overall regional density of this species across all habitat types was 61.4 birds/km², with the highest densities recorded on plots dominated by shrub, heath/shrub, or heath/sedge, and the lowest density on sparsely vegetated plots (see Table 6.6). Calculated densities from other surveyed areas using PRISM indicate that the density of savannah sparrow may be above average within the RSA (see Table 6.9). The density of savannah sparrows was 26 birds/km² in 2025 regardless of habitat using ground-based transects (see Table 6.9).

Table 6.9 Density of Savannah Sparrows in the Project Region as Compared to Other Surveys Completed using PRISM Methodology

Survey Area	Density of Savannah Sparrow (birds/km²)	Reference
Project region (Terrestrial RSA + Izok area)	61.4[1]	2012 study
Ekati Diamond Mine	27.6–45.2	Smith et al. (2010)
North Slope of Alaska	12.5	Bart et al. (2012b)
Yukon North Slope/ Mackenzie Delta	64.1[2]	Rausch and Johnston (2012)
Northern Quebec (Hudson's Bay coast)	7.1[2]	Bart et al. (2012a)

Notes:

RSA = regional study area

[1] Density was assessed based on the 2012 PRISM surveys. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).

[2] Inferred density estimates (i.e., densities were not calculated by the authors).

Lapland longspur was the second most common passerine encountered during the 2012 field surveys and accounted for 31% of all passerines observed on the PRISM plots; however, they only accounted for 8% of passerines in the 2025 transect surveys. The overall density of this species in 2012 across all habitat types was 59.0 birds/km², with the highest densities recorded on plots dominated by heath or heath/sedge and the lowest densities in plots dominated by shrubs (see Table 6.6). There was a relationship between the density of Lapland longspur and the proportion of heath habitats within the plots, where higher densities of individuals were associated with a higher proportion of these habitats (see Table 6.6). This species has been recorded on numerous PRISM surveys across the Arctic and the comparison of densities from other surveyed areas indicates that the density of Lapland longspur is high within the Project region (see Table 6.10). In 2025, the density of Lapland longspur was lower at 8.96 birds/km² (see Table 6.7).

Table 6.10 Density of Lapland Longspur in the Project Region as Compared to Other Surveys Completed using PRISM Methodology

Survey Area	Density of Lapland Longspur (birds/km²)	Reference
Project region (Terrestrial RSA + Izok area)	59.0[1]	2012 study
Ekati Diamond Mine	82.8–105.6	Smith et al. (2010)
North Slope of Alaska	14.3	Bart et al. (2012b)
Prince Charles / Air Force Island, Nunavut	12.6[1]	Johnston and Smith (2012)
Western Baffin Island, Nunavut	5.9[1]	Johnston and Smith (2012)
Yukon North Slope/ Mackenzie Delta	62.8[1]	Rausch and Johnston (2012)
Southampton Island, Nunavut	20.1[1]	Smith et al. (2012)
Coats Island, Nunavut	23.9[1]	Smith et al. (2012)
Northern Quebec (Hudson's Bay coast)	31.0[1]	Bart et al. (2012a)

Notes:
RSA = regional study area
[1] Density was assessed based on the 2012 PRISM surveys. The PRISM survey plots were mostly located within the terrestrial RSA; however, additional plots located outside the RSA were also included (Figure 2.2).
[2] Inferred density estimates (i.e., densities were not calculated by the authors).

American tree sparrow was another species commonly observed during the field surveys. In the 2012 PRISM study, the density of this species across all habitat types was 22.0 birds/km², with the highest density in plots dominated by shrub (44.4 birds/km²) or heath/shrub (40.8 birds/km²; see Table 6.6). The overall density of American tree sparrows in this study was slightly less than those reported at Ekati between 1996 and 2003 (24.0–34.4 birds/km²; Smith et al. 2010). Densities reported from other Arctic and subarctic regions seem to vary greatly; for example, on the North Slope of Alaska, American tree sparrow was found exclusively in moist areas and uplands and the overall density across the survey area was 2.7 birds/km² while the density of this species within the Colville River survey area was 156.7 birds/km² (Bart et al. 2012b). Within PRISM region 12 (Yukon North Slope/Mackenzie Delta), the inferred density of this species was 15.5 birds/km² (Rausch and Johnston 2012), and within a northern Quebec survey area on the Hudson Bay coastline, the density of this species was 8.6 birds/km². During the 2025 transect surveys, American tree sparrow density was 8.3 birds/km² (see Table 6.7).

Redpolls were found in abundance during field surveys. During the 2012 PRISM surveys, across all habitat types, the density of all redpolls was 21.0 birds/km², and the highest density (77.8 birds/km²) was observed in areas dominated by shrubs (see Table 6.6).There is limited PRISM density information available for redpolls, but in northern Quebec, the inferred density of common redpoll was 0.5 birds/km² (Bart et al. 2012a), while at Ekati mine the density of common and hoary redpolls was 1.6–2.4 and 1.2–2.8 birds/km², respectively (Smith et al. 2010). During the 2025 transect surveys, the density of redpolls was 26.2 birds/km². They were the most abundant passerine observed in 2025.

The density of horned lark in 2012 across all habitats was 13.8 birds/km² with the highest density on sparsely vegetated plots (see Table 6.6). This species has been recorded on numerous Arctic PRISM surveys, but there is limited information on its regional densities. At the Ekati mine, densities of horned lark were 6.4–11.2 birds/km² (Smith et al. 2010). None were observed on 29 plots on Coats Island, NU, but on Southampton Island, five pairs were observed on 24 plots surveyed (inferred density of 3.5 birds/km²; Smith et al. 2012). Surveys in northern Quebec recorded 48 individuals on 98 plots (inferred density of 4.9 birds/km²; Bart et al. 2012a). These comparative data suggest that there may be a high density of breeding horned larks within the RSA. In 2025, transect surveys found horned larks at a density of 8.0 birds/km².

American pipit (*ingliktayuk*; *Anthus rubescens*), Harris's sparrow, and white-crowned sparrow were observed sporadically during the 2012 surveys. Pipits were most common in plots dominated by sparse vegetation (11.1 birds/km²). Harris's sparrow was most common in plots dominated by heath (6.5 birds/km²) and shrubs (5.6 birds/km²) and white-crowned sparrows were more common in plots dominated by shrubs (13.9 birds/km²). During the 2025 transect surveys, American pipit and white-crowned sparrow were observed at densities of 3.6 birds/km² and 15.6 birds/km², respectively.

Reproduction

Both willow and rock ptarmigan were confirmed breeding within the RSA. Indicative of the habitat requirements of these species, rock ptarmigan nests were in rocky upland areas, while the willow ptarmigan nests were in shrubby tundra habitats.

Breeding has been confirmed for nine passerine species including horned lark, cliff swallow (*aupaluk*; *Petrochelidon pyrrhonota*), gray-cheeked thrush, Lapland longspur, American tree sparrow, savannah sparrow, white-crowned sparrow, common redpoll, and hoary redpoll. However, most passerine species documented within the RSA are presumed to breed there. During the 2008 and 2012 field surveys, Lapland longspur, savannah sparrow, and hoary redpoll nests were the most frequently found. Most of the longspur nests were in heath tundra with some nests also in heath/boulder and heath/sedge habitats. Savannah sparrow nests were most frequently found in sedge tussock habitats, heath bedrock, and herb tundra. Hoary redpoll nests were associated with shrub habitats along lake edges or in esker kettles. During the 2025 transect surveys, nests of savannah sparrow (6 nests) and American tree sparrow (1 nest) were found.

6.3 Summary

The tundra breeding bird assemblages within the RSA are a mixture of Arctic breeding species and species that are more typically associated with the boreal forest and are nearing the northern extent of their range in the study area. To date, 11 shorebird species, 14 passerine species, and 2 species of ptarmigan were documented in the Project region. An additional seven shorebird species and seven passerine species have the potential to be found in the area, but given that field surveys have not detected them, if present, their occurrence is expected to be sporadic and uncommon within the RSA. Red-necked phalarope, which is listed as a species of Special Concern under (COSEWIC 2014), was observed within the terrestrial RSA.

Overall, within the tundra breeding birds, shorebird regional densities are low compared to other studies from Arctic regions. This is likely due to the limited availability of extensive wetland and marsh habitats. Least sandpiper is the most common species found in the terrestrial RSA. Ptarmigan densities also are low, although this could be the result of the population being at a cyclical low at the time of the Project surveys. In contrast, passerine species appear relatively abundant within the terrestrial RSA. Common passerine and game bird species observed within the Project region were savannah sparrow, Lapland longspur, American tree sparrow, common and hoary redpolls, horned lark, and least sandpiper.

7 References

7.1 Literature Cited

Alexander, S.A., Dickson, D.L., and Westover, S.E. 1997. Spring migration of eiders and other waterbirds in offshore areas of the western Arctic. pp. 6–20. In D.L. Dickson (eds.) King and Common Eiders of the Western Canadian Arctic. Canadian Wildlife Service Occasional Paper No. 94, Ottawa, Ontario.

Anctil, A., Franke, A., and Bêty, J. 2014. Heavy rainfall increases nestling mortality of an Arctic top predator: experimental evidence and long-term trend in peregrine falcons. Oecologia 174(3):1033–1043. DOI: 10.1007/s00442-013-2800-y

Baker, A., Gonzalez, P., Morrison, R.I.G., and Harrington, B.A. 2020. Red Knot (*Calidris canutus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://doi.org/10.2173/bow.redkno.01

Baker, A.J., Gonzalez, P.M., Piersma, T., Niles, L.J., de Lima Serrano do Nascimento, I., Atkinson, P.W., Clark, N.A., Minton, C.D.T., Peck, M.K., and Aarts, G. 2004. Rapid population decline in red knots: fitness consequences of decreased refuelling rates and late arrival in Delaware Bay. Proceedings of the Royal Society B: Biological Sciences 271(1541):875–882. DOI: 10.1098/rspb.2003.2663

Banci, V. and Spicker, R. 2024. Kitikmiut Knowledge of the Proposed Kogloktoakyok (Grays Bay) Port and Road Project. Naonaiyaotit Inuit Knowledge Project (NTKP). Kitikmeot Inuit Association, Lands & Environment Department. West Kitikmeot Resources Corp., Kugluktuk, Nunavut. 150 pp.

Banks, R.C., Cicero, C., Dunn, J.L., Kratter, A.W., Rasmussen, P.C., Remsen, J.V., Rising, J.D., and Stotz, D.F. 2004. Forty-fifth supplement to the American Ornithologists' Union Check-list of North American Birds. Auk 121(3):985–995.

Bart, J. and Smith, P. 2012. Summary. pp. 213–238. In J. Bart, V. Johnston (eds.) Arctic shorebirds in North America: a decade of monitoring, Volume 44. Studies in Avian Biology. University of California Press, Oakland, California.

Bart, J., Brown, S., Harrington, B., and I. Guy Morrison, R. 2007. Survey trends of North American shorebirds: population declines or shifting distributions? Journal of Avian Biology 38(1):73–82. DOI: 10.1111/j.2007.0908-8857.03698.x

Bart, J., Andres, B.A., Elliott, K.H., Francis, C.M., Johnston, V., Morrison, R.I.G., Pierce, E.P., and Rausch, J. 2012a. Small-scale and Reconnaissance Surveys. pp. 141–155. In J. Bart, V. Johnston (eds.) Arctic shorebirds in North America: a decade of monitoring, Volume 44. Studies in Avian Biology. University of California Press, Oakland, California.

Bart, J., Brown, S., Andres, B.A., Platte, R., and Manning, A. 2012b. North Slope of Alaska. pp. 37–96. In J. Bart, V. Johnston (eds.) Arctic Shorebirds in North America: A Decade of Monitoring. Studies in Avian Biology 44. University of California Press, Berkeley, California.

Bechard, M.J., Swem, T.R., Orta, J., Boesman, P.F.D., Garcia, E., and Marks, J.S. 2020. Rough-legged Hawk (*Buteo lagopus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/species/rolhaw/cur/introduction

Bibby, C.J., Burgess, N.D., and Hill, D.A. 1992. Bird Census Techniques. Published for the British Trust for Ornithology and the Royal Society for the Protection of Birds by Academic Press, London, United Kingdom. 257 pp.

Boarman, W.I. and Heinrich, B. 1999. Common Raven (*Corvus corax*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/comrav/2.0/introduction

Booms, T.L., Cade, T.J., and Clum, N.J. 2008. Gyrfalcon (*Falco rusticolus*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/gyrfal/2.0/introduction

Booms, T.L., Talbot, S.L., Sage, G.K., McCaffery, B.J., McCracken, K.G., and Schempf, P.F. 2011. Nest-site fidelity and dispersal of gyrfalcons estimated by noninvasive genetic sampling. The Condor 113(4):768–778.

Booms, T.L., Holroyd, G., Gahbauer, M.A., Trefry, H.E., Wiggins, D.A., Holt, D.W., Johnson, J.A., Lewis, S.B., Larson, M.D., Keyes, K.L., and Swengel, S.R. 2014. Assessing the status and conservation priorities of the short-eared owl in North America. Journal of Wildlife Management 78:772–778.

Booms, T.L., Cade, T.J., and Clum, N.J. 2020. Gyrfalcon (*Falco rusticolus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/species/gyrfal/cur/introduction. Accessed December 20, 2021.

Bradley, M., Court, G., and Duncan, T. 1997. Influence of weather on breeding success of peregrine falcons in the Arctic. The Auk 114(4):786–791. DOI: 10.2307/4089303

Bromley, R.G. 1988. Status of Peregrine Falcons in the Kitikmeot, Baffin, and Keewatin regions, Northwest Territories, 1982-1985. pp. 51–57. In T.J. Cade, J.H. Enderson, C.G. Thelander, C.M. White (eds.) Peregrine Falcon populations: their management and recovery. The Peregrine Fund, Boise, ID.

Brown, C.R. and Brown, M.B. 1999. Barn Swallow (*Hirundo rustica*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/barswa/1.0/introduction

Brown, M.B. and Brown, C.R. 2020. Barn Swallow (*Hirundo rustica*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/species/barswa/cur/introduction. Accessed May 30, 2023.

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://doi.org/10.2173/bow.baleag.01

Burger, J., Gochfeld, M., and Garcia, E. 2020. Ross's Gull (*Rhodostethia rosea*) version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://doi.org/10.2173/bow.rosgul.01

Canadian Endangered Species Conservation Council. 2011. Wild Species 2010: The General Status of Species in Canada. Canadian Endangered Species Conservation Council, National General Status Working Group, Ottawa, Ontario. Available at: www.wildspecies.ca

Canadian Endangered Species Conservation Council. 2022. Wild Species 2020: The General Status of Species in Canada. Canadian Endangered Species Conservation Council National General Status Working Group. 172 pp. Available at: www.wildspecies.ca

Canadian Wildlife Service. 2008. 2008 PRISM (program for regional and international shorebird monitoring) field manual. Unpublished Report. Canadian Wildlife Service, Environment Canada. 15 pp.

Canadian Wildlife Service Waterfowl Committee. 2013. Population Status of Migratory Game Birds in Canada: November 2013. CWS Migratory Birds Regulatory Report 40. Canadian Wildlife Service Waterfowl Committee.

Canamera Geological Ltd. 1996. Echo Bay Mines Ltd – Ulu Project: Wildlife and wildlife habitat assessment. Prepared for Echo Bay Mines Ltd., Vancouver, B.C. 141 pp.

Carrière, S., Abernethy, D., Bradley, Bromley, R.G., Matthews, S.B., Obst, J., and Setterington, M. 2003. Raptor trends in the Northwest Territories and Nunavut: a Peregrine Falcon case study. Bird Trends 9:57–62.

Caslys Consulting. 2013. Proposed Izok Mine Land Cover Mapping - Draft Summary Report.

Cornell Lab of Ornithology. 2024. eBird: An online database of bird distribution and abundance. Available at: https://ebird.org/home

COSEWIC. 2006. COSEWIC assessment and update status report on the Ivory Gull *Pagophila eburnea* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 42 pp.

COSEWIC. 2012. COSEWIC assessment and status report on the Buff-breasted Sandpiper (*Tryngites subruficollis*) in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 44 pp.

COSEWIC. 2014. COSEWIC assessment and status report on the Red-necked Phalarope *Phalaropus lobatus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 52 pp.

COSEWIC. 2021a. COSEWIC assessment and status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 69 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/short-eared-owl-2021.html

COSEWIC. 2021b. COSEWIC assessment and update status report on the Ross's gull (*Rhodostethia rosea*) in Canada. Committee on the Status of Endangered Wildllife in Canada, Ottawa, Ontario. 47 pp.

COSEWIC. 2021c. COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON. 60 pp.

COSEWIC. 2023a. COSEWIC wildlife species assessments (detailed version), May 2023.

COSEWIC. 2023b. COSEWIC assessment and update status report on the Ivory Gull *Pagophila eburnea* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, Ontario. 53 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/ivory-gull-2023.html

Court, G.S., Gates, C.C., and Boag, D.A. 1988. Natural history of the peregrine falcon in the Keewatin District of the Northwest Territories. Arctic 41(1):17–30.

De Beers. 2002. Environmental assessment report for the Snap Lake diamond project. Prepared by Golder Associates Ltd. for De Beers Canada Inc. Yellowknife, NWT.

Dickson, D.L. 2012. Seasonal movement of Pacific Common Eiders Breeding in Arctic Canada. Technical Report Series. 521. Canadian Wildlife Service, Edmonton, Alberta. 58 pp.

Dickson, D.L. and Gilchrist, H.G. 2002. Status of marine birds of the southeastern Beaufort Sea. Arctic 55(1):46–58.

Dickson, D.L., Raven, G.H., and Bowman, T. 2009. Tracking the movement of Pacific common eiders from nesting grounds near Bathurst Inlet, Nunavut to moulting and wintering areas using satellite telemetry: 2006-2008 progress report. Canadian Wildlife Service and U.S Fish and Wildlife Service. 32 pp.

Downes, C., Blancher, P., and Collins, B. 2011. Landbird trends in Canada, 1968-2006. Technical Thematic Report. Canadian Biodiversity: Ecosystem Status and Trends 2010 12. Canadian Councils of Resource Ministers, Ottawa, ON. 94 pp.

Ely, C.R. and Dzubin, A.X. 1994. Greater White-fronted Goose (*Anser albifrons*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/gwfgoo/2.0/introduction

ECCC (Environment and Climate Change Canada). 2013. Important Areas for Birds in Nunavut - Qikiqtaaluk Region. Environment and Climate Change Canada.

ECCC. 2024. Species at risk public registry. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html. Accessed January 22, 2025.

Franke, A. and Galipeau, P. 2013. Brood reduction by infanticide in peregrine falcons. Arctic 66(2):226–229.

Franke, A., Setterington, M., Court, G., and Birkholz, D. 2010. Long-term trends of persistent organochlorine pollutants, occupancy and reproductive success in peregrine falcons (*Falco peregrinus tundrius*) breeding near Rankin Inlet, Nunavut, Canada. Arctic 63(4):442–450.

Freeman, M.M.R. 1976. Inuit Land Use and Occupancy Project, of 3. Department of Indian and Northern Affairs, Ottawa, Ontario. 287 pp.

Gaston, A.J., Mallory, M.L., and Gilchrist, H.G. 2012. Populations and trends of Canadian Arctic seabirds. Polar Biology 35(8):1221–1232. DOI: 10.1007/s00300-012-1168-5

Government of British Columbia. 2021. Wildlife Habitat Mapping. Available at: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/wildlife/wildlife-habitats/wildlife-habitat-mapping

GOC (Government of Canada). 2024. National Ecological Framework. Available at: https://sis.agr.gc.ca/cansis/nsdb/ecostrat/index.html

GOC. 2025. Species at risk public registry. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Gratto-Trevor, C., Morrison, R.I.G., Collins, B., Rausch, J., Drevor, M., and Johnston, V. 2011. Trends in Canadian Shorebirds. . Canadian Biodiversity: Ecosystem Status and Trends 2010 Technical Thematic Report No 13. Canadian Council of Resource Ministers, Ottawa, ON. 38 pp.

Groves, D.J. and Mallek, E.J. 2011a. Migratory bird survey in the Canadian Arctic 2009. U. S. Fish and Wildlife Service.

Groves, D.J. and Mallek, E.J. 2011b. Migratory bird survey in the western Canadian Arctic 2010. U. S. Fish and Wildlife Service.

Hannon, S.J., Eason, P.K., and Martin, K. 1998. Willow Ptarmigan (*Lagopus lagopus*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/wilpta/2.0/introduction

Hines, J.E., Wiebe Robertson, M.O., Kay, M.F., and Westover, S.E. 2006. Aerial surveys of greater white-fronted geese, Canada geese and tundra swans on the mainland of the Inuvialuit Settlement Region, Western Canadian Arctic, 1989-1993. Surveys of geese and swans in the Inuvialuit Settlement Region, Western Canadian Arctic, 1989-2001. Occasional Paper 112. Canadian Wildlife Service.

Holt, D.W. 1993. Trophic niche of nearctic Short-eared Owls. Wilson Bulletin 105:497–503.

Hoover, A.K., Dickson, D.L., and Dufour, K.W. 2010. Survival and nesting success of the Pacific eider (*Somateria mollissima v-nigrum*) near Bathurst Inlet, Nunavut. Canadian Journal of Zoology 88:511–519.

Hubert and Associates Ltd. 2002a. 1999 and Y2000 Wildlife Field Studies Data Report, Jericho Diamond Project. Prepared for Tahera Corporation. 201 pp.

Hubert and Associates Ltd. 2002b. Terrestrial Wildlife of Hope Bay, Nunavut: an integration and overview of data collected from 1994 – 2002. Prepared for Miramar Hope Bay Limited. 224 pp.

IAG (Inuit Advisory Group). 2025. Grays Bay Road and Port Project What We Heard Report - Inuit Advisory Group Workshop #1 Summary. Inuit Knowledge Integration Methods and Mitigation Strategies. Prepared by West Kitikmeot Resources Corp., Kugluktuk, Nunavut. 85 pp.

Johnson, G.D., Young Jr, D.P., Erickson, W.P., Derby, C.E., Strickland, M.D., Good, R.E., and Kern, J.W. 2000. Wildlife Monitoring Studies: SeaWest Windpower Project, Carbon County, Wyoming, 1995-1999. Prepared for SeaWest Energy Corporation, San Diego, California and Bureau of Land Management, Rawlins District Office, Rawlins, Wyoming, Cheyenne, Wyoming. 207 pp.

Johnson, O.W. and Connors, P.G. 2010. American Golden-Plover (*Pluvialis dominica*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/amgplo/2.0/introduction

Johnston, V. and Smith, P.A. 2012. Prince Charles, Air Force, and Baffin Islands. pp. 127–140. In J. Bart, V. Johnston (eds.) Arctic shorebirds in North America: a decade of monitoring. Studies in Avian Biology 44. University of California Press, Berkeley, California.

Kirk, D. and Hyslop, C. 1998. Population status and recent trends in Canadian raptors: A review. Biological Conservation 83(1):91–118.

Kochert, M.N. and Steenhof, K. 2002. Golden Eagles in the U.S. and Canada: Status, Trends, and Conservation Challenges. Journal of Raptor Research 36(1 Supplement):32–40.

Kochert, M.N., Steenhof, K., McIntyre, C.L., and Craig, E.H. 2002. Golden Eagle (*Aquila chrysaetos*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/goleag/2.0/introduction

Korňan, M. and Macek, M. 2011. Parental infanticide followed by cannibalism in Golden Eagles (*Aquila chrysaetos*). Journal of Raptor Research 45:95–96.

Lanctot, R.B. and Laredo, C.D. 1994. Buff-breasted Sandpiper (*Calidris subruficollis*), version 1.0. Available at: https://doi.org/10.2173/bna.91

Latour, P.B., Leger, J., Hines, J.E., Mallory, M.L., Mulders, D.L., Gilchrist, H.G., Smith, P.A., and Dickson, D.L. 2008. Key migratory bird terrestrial habitat sites in the Northwest Territories, third edition. Canadian Wildlife Service Occasional Paper 114. Environment Canada, Ottawa, Ontario. 120 pp.

Maftei, M., Davis, S., Jones, I.L., and Mallory, M.L. 2012. Breeding habitats and new breeding locations for Ross's gull (Rhodostethia rosea) in the Canadian High Arctic. Arctic 65(3):283–288.

Mallory, M.L. and Fontaine, A.J. 2004. Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories. Occasional Paper Number 109. Environment Canada, Canada Wildlife Service, Ottawa, Ontario. 95 pp.

Mallory, M.L., Gilchrist, H.G., and Mallory, C.L. 2006. Ross's gull (*Rhodostethia rosea*) breeding in Penny Strait, Nunavut, Canada. Arctic 59(3):319–321.

Mallory, M.L., Stenhouse, I.J., Gilchrist, H.G., Robertson, G.J., Haney, J.C., and Macdonald, S.D. 2020. Ivory Gull (*Pagophila eburnea*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/species/ivogul/

Manning, T.H., Höhn, E.O., and Macpherson, A.H. 1956. The Birds of Banks Island. Department of Northern Affairs and National Resources. Available at: https://archive.org/details/bulletin143nati/bulletin143nati/mode/2up

McCarty, J.P., Wolfenbarger, L.L., Laredo, C.D., Pyle, P., and Lanctot, R.B. 2020. Buff-breasted Sandpiper (*Cadlidris subruficollis*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://doi.org/10.2173/bow.bubsan.01

McIntyre, C.L. and Adams, L.G. 1999. Reproductive Characteristics of Migratory Golden Eagles in Denali National Park, Alaska. The Condor 101:115–123.

Miramar Hope Bay Ltd. 2005. Final report, proposed wildlife mitigation and monitoring program for the Doris North Gold Mine Project. Miramar Hope Bay Ltd., North Vancouver, BC.

Morrison, R.I.G., Aubry, Y., Butler, R.W., Beyersbergen, G.W., Donaldson, G.M., Gratto-Trevor, C.L., Hicklin, P.W., Johnston, V.H., and Ross, R.K. 2001. Declines in North American shorebird populations. Wader Study Group Bulletin 94:34–38.

Mowbray, T.B., Cooke, F., and Ganter, B. 2000. Snow Goose (*Chen caerulescens*), version 2.0. Available at: https://doi.org/10.2173/bna.514

Newton, I. 1979. Population Ecology of Raptors. Buteo Books, Vermillion, South Dakota. Available at: https://archive.org/details/populationecolog0000newt/mode/2up

NIRB. 2025a. Public Scoping and Impact Statement Guidelines Meetings Summary Report – Supplementary Report. October 16, 2025. Available at: https://www.nirb.ca/portal/dms/script/dms_download.php?fileid=357637&applicationid=125987&sessionid=sisnjd5nop3bdltskgj1n5jfk6. Accessed December 2025.

NIRB. 2025b. Inuit Qaujimajatuqangit. Available at: https://www.nirb.ca/inuit-qaujimajatuqangit. Accessed October 2025.

Nol, E. and Blanken, M.S. 1999. Semipalmated Plover (*Charadrius semipalmatus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. (https://doi.org/10.2173/tbna.444.p)

North American Bird Conservation Initiative Canada. 2024. The State of Canada's Birds – 2024. North American Bird Conservation Initiative Canada, Ottawa, Ontario. Available at: https://naturecounts.ca/nc/socb-epoc/report/2024/en/

NTKP (Naonaiyaotit Traditional Knowledge Project). 2018. Naonaiyaotit Traditional Knowledge Project. Cartographic material, transcripts, quotes, placenames and photos. Proprietary ArcGIS 10.5 Geodatabase and associated textual and photographic databases. Kitikmeot Inuit Association, Kugluktuk NU. Available at: https://www.ntkp.ca/

O'Brien, M. 2006. The shorebird guide. Houghton Mifflin Company, New York, New York, USA. 477 pp.

Obst, J. 2011. Breeding phenology, densities and population trends of tundra breeding birds at Daring Lake, Southern Arctic Ecozone, Northwest Territories, 1998-2010. Department of Environment and Natural Resources, Wildlife Division, and Protected Areas Strategy Secretariat, Government of the Northwest Territories; and Environment and Conservation, Indian and Northern Affairs Canada. 33 pp.

Parmelee, D.F. 1992. Snowy Owl (*Bubo scandiacus*), version 1.0. Available at: https://birdsna.org/Species-Account/bna/species/snoowl1/introduction

Poole, K.G. 1988. A replacement clutch in wild gyrfalcons, *Falco rusticolus*, in the Northwest Territories. Canadian Field-Naturalist 102(1):62–64.

Poole, K.G. and Boag, D.A. 1988. Ecology of gyrfalcons, Falco rusticolus, in the central Canadian Arctic: diet and feeding behaviour. Canadian Journal of Zoology 66:334–344.

Poole, K.G. and Bromley, R.G. 1988a. Natural history of the Gyrfalcon in the central Canadian Arctic. Arctic :31–38.

Poole, K.G. and Bromley, R.G. 1988b. Interrelationships within a raptor guild in the central Canadian arctic. Canadian Journal of Zoology 66(10):2275–2282.

Priest, H. and Usher, P.J. 2004. Nunavut Wildlife Harvest Study. Nunavut Wildlife Management Board, Iqaluit, Nunavut. 822 pp. Available at: http://www.nwmb.com/inu/publications/harvest-study/1824-156-nwhs-report-2004-156-0003/file

Rausch, J. 2025. Insights for Grays Bay Port and Road Project. Email from Jennie Rausch, Environment and Climate Change Canada to Eve Fernandes, EDI Environmental Dynamics Inc. Email. April 14, 2025 email.

Rausch, J. and Johnston, V. 2012. Yukon North Slope and Mackenzie Delta. pp. 97–112. In J. Bart, V. Johnston (eds.) Arctic shorebirds in North America: a decade of monitoring. Studies in Avian Biology 44. University of California Press, Berkeley, CA.

Rescan Environmental Services Ltd. 2011. Ekati Diamond Mine 2010 Wildlife Effects Monitoring Program. BHP Billiton Canada Inc., Yellowknife, Northwest Territories. 267 pp.

Richard, S., Gilchrist, H.G., Hennin, H.L., and Nguyen, V.M. 2023. Collaboration between local Indigenous and visiting non-Indigenous researchers: Practical challenges and insights from a long-term environmental monitoring program in the Canadian Arctic. Ecological Solutions and Evidence 4(3).

Richards, J.M. and Gaston, A. (eds.). 2018. Birds of Nunavut, Volume 2 Passerines. UBC Press, Vancouver, British Columbia, Canada. 499 pp.

Riewe, R. 1992. Nunavut atlas. Canadian Circumpolar Institute and Tungavik Federation of Nunavut, Edmonton, Alberta. 259 pp.

Rubega, M.A., Schamel, D., and Tracy, D.M. 2020. Red-necked Phalarope (*Phalaropus lobatus*), version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. (https://doi.org/10.2173/bow.renpha.01). Accessed April 8, 2020.

Shank, C.C., Bromley, R.G., and Poole, K.G. 1993. Increase in breeding population of Tundra Peregrine Falcons in the central Canadian Arctic. Wilson Bulletin 105:188–190.

Shank, C.C. and Poole, K.G. 1994. Status of gyrfalcon *Falco rusticolus* populations in the Northwest Territories, Canada. Raptor conservation today :421–435.

Sinclair, A.R.E., Mduma, S., and Brashares, J.S. 2003. Patterns of predation in a diverse predator-prey system. Nature 425(6955):288–290. DOI: 10.1038/nature01934

Smith, A.C., Virgl, J.A., Panayi, D., and Armstrong, A.R. 2010. Effects of a Diamond Mine on Tundra-Breeding Birds. ARCTIC 58(3):295–304. DOI: 10.14430/arctic431

Smith, K.G., Wittenberg, S.R., Macwhirter, R.B., and Bildstein, K.L. 2011. Northern Harrier (*Circus cyaneus*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/norhar/2.0/introduction

Smith, P.A., Johnston, V., and Rausch, J. 2012. Southampton and Coats Islands. In J. Bart, V. Johnston (eds.) Arctic shorebirds in North America: a decade of monitoring, Volume 44. Studies in Avian Biology. University of California Press, Berkeley, California.

Smith, P.A., Smith, A.C., Andres, B., Francis, C.M., Harrington, B., Friis, C., Morrison, R.I.G., Paquet, J., Winn, B., and Brown, S. 2023. Accelerating declines of North America's shorebirds signal the need for urgent conservation action. Ornithological Applications 125(2):1–14. DOI: 10.1093/ornithapp/duad003

Spencer, N.C., Gilchrist, H.G., and Mallory, M.L. 2014. Annual movement patterns of endangered ivory gulls: The importance of sea ice. PLoS ONE 9:1–19.

Steenhoff, K. and Newton, I. 2007. Assessing nesting success and productivity. pp. 181–192. In D.M. Bird, K.L. Bildstein (eds.) Raptor research and management techniques. Hancock House, Blaine, WA.

Suydam, R.S., Dickson, D.L., Fadely, J.B., and Quakenbush, L.T. 2000. Population declines of king and common eiders of the Beaufort Sea. The Condor 102(1):219–222. DOI: 10.1650/0010-5422(2000)102[0219:PDOKAC]2.0.CO;2

Swem, T.R.Jr. 1996. Aspects of the Breeding Biology of Rough-Legged Hawks Along the Colville River, Alaska. MSc. Boise State University. (https://scholarworks.boisestate.edu/td/687/)

Swem, T. and Matz, A. 2011. Observations of gyrfalcons along the Colville River, Alaska, 1981–2005. In R.T. Watson, T.J. Cade, M.R. Fuller, G. Hunt, E. Potapov (eds.) Gryfalcons and ptarmigan in a changing world. The Peregrine Fund, Boise, Idaho.

Swem, T., McIntyre, C., Ritchie, R.J., Bente, P.J., and Roseneau, D.G. 1994. Distribution, abundance, and notes on the breeding biology of Gyrfalcons *Falco rusticolus* in Alaska. pp. 437–444. In B.-U. Meyburg, R.D. Chancellor (eds.) Raptor Conservation Today: Proceedings of the IV World Conference on Birds of Prey and Owls, Berlin, Germany, 10-17 May 1992. WWGBP, Berlin, London and Paris. Available at: http://www.raptors-international.org/book/book_raptor_conservation_today_1994.html

Thorpe Consulting Services Ltd. 2014. The Caribou is the Boss of the Mine: Izok Corridor Project Caribou Inuit Qaujimajatuqangit Report. Results from Interviews and a Workshop carried out in Qurluqtuq (Kugluktuk) in 2012. Prepared by N. Thorpe and K. Scott with contributions from M. Kakkianiun and G. Angulalik for MMG Ltd. Vancouver, BC.

Thorpe, N., Hakongak, N., Eyegetok, S., and Elders, Q. 2001. The Tuktu and Nogak Project: a caribou chronicle. Final Report. West Kitikmeot/Slave Study Society, Yellowknife, NWT.

Whitaker, D.M., Montevecchi, W.A., and Gosse, J.W. 1996. Breeding season irruptions of rough-legged hawks (*Buteo lagopus*) on insular Newfoundland. Arctic 49(3):306–310.

White, C.M. and Nelson, R.W. 1991. Hunting range and strategies in a tundra breeding Peregrine and Gyrfalcon observed from a helicopter. The Journal of Raptor Research 25(3):49–62.

White, C.M., Clum, N.J., Cade, T.J., and Hunt, W.G. 2024. Peregrine Falcon (*Falco peregrinus*), version 1.1. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/species/perfal/cur/introduction

Wiggins, D.A., Holt, D.W., and Leasure, S.M. 2006. Short-eared Owl (*Asio flammeus*), version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA. Available at: https://birdsoftheworld.org/bow/historic/bna/sheowl/2.0/introduction

7.2 Personal Communications

Dickson, Lynne. 2006. Canadian Wildlife Service, Environment Canada, Edmonton, Alberta. Personal communication, April 2006.