Appendix 15A

Vegetation Baseline Report

Grays Bay Road and Port Project
Vegetation Baseline Report

Prepared for:

West Kitikmeot Resources

Prepared by:

Nunami Stantec Limited

March 2026

Project No.: 123514868

Sign-off

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Abbreviations

AMBI	Alberta Biodiversity Monitoring Institute
ANPC	Alberta Native Plant Council
CDC	Conservation Data Centre
Cig	Chlorophyll Index
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DEM	Digital Elevation Model
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
GIS	geographical information system
GOC	Government of Canada
GPS	Global Positioning System
IAG	Inuit Advisory Group
IS	impact statement
LAA	Local Assessment Area
MMG	Materials and Metals Group Ltd.
NDMI	Normalized Difference Moisture Index
NDSI	Normalized Difference Soil Index
NDVI	Normalized Difference Vegetation Index
NDWI	Normalized Difference Water Index
OBIA	Object-Based Image Analysis
PDA	Project Development Area
RAA	Regional Assessment Area
SAR	Species at Risk
SARA	*Species at Risk Act*
SAVI	Soil Adjusted Vegetation Index
SOCC	Species of Conservation Concern
TCWR	Tibbitt to Contwoyto Winter Road
WKR	West Kitikmeot Resources Corp.

Symbols and Units of Measure

% ..... percent

cm..... centimetre

ha ..... hectare

km..... kilometre

m ..... metre

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. WKR's largest shareholder is a wholly-owned subsidiary of the Kitikmeot Inuit Association. The Project is proposed as 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 Nunavut. Subject to approval, the Project would result in the establishment of the first deep-water port in the Canadian Central Arctic at Grays Bay, as well as a 230 kilometre (km) all-season access road between Grays Bay and Jericho station near Contwoyto Lake. The Project will connect to the already approved Tibbitt to Contwoyto Winter Road (TCWR). The multi-user, multi-use project would allow for the establishment of shared infrastructure with many potential users including the federal and territorial governments, communities, community members, resource companies, and defence agencies.

In support of the Project environmental assessment, the Grays Bay Road and Port Project Vegetation Baseline Report (Baseline report) provides information on existing vegetation conditions of the Project Vegetation local and regional assessment areas. Information was obtained by a combination of desktop review and field surveys, including information collected in support of the previously planned Izok Corridor Project (Materials and Metals Group (MMG) Ltd. 2013a; CASLYS 2013).

1.1 Inuit Knowledge, Traditional Knowledge, and Community Knowledge

A considerable amount of Inuit Knowledge has been documented for the Project, which has substantially informed WKR's understanding of baseline environmental and socio-economic conditions in the Project Development Area (PDA). For the purposes of the impact statement (IS), focus is placed on Inuit of the Kitikmeot Region, or Kitikmiut. The Project is located wholly within the Kitikmeot Region; as such, the region and its people are where key project interactions and effects are most likely to occur.

Verified Inuit Knowledge and perspectives considered and integrated in the IS were shared through two primary project-specific sources.

1. **Naonaiyaotit Traditional Knowledge Project (NTKP):** The Kitikmeot Inuit Association maintains a repository of Inuit Knowledge for the Kitikmeot Region within a Geographic Information System (GIS)-based database called the NTKP. The NTKP contains the collective body of documented and verified Inuit Knowledge of the Kitikmeot Region, including but not limited to knowledge of birds, fish, terrestrial and marine mammals, water quality, travel routes, gathering places, and heritage. The Kitikmeot Inuit Association compiled a Project-specific report called *Kitikmiut Knowledge of the Proposed Kogloktoakyok (Grays Bay) Port and Road Project* (Banci and Spicker 2024), which provides the majority of the Inuit Knowledge shared and integrated in the IS.

2. **Inuit Advisory Group (IAG)**: Initiated in 2018 by the previous project proponent, WKR re-initiated the IAG in 2025. Through a series of IAG workshops, WKR and Inuit land users, Elders, and Knowledge Holders have met to discuss and document feedback and advice about the Project, including but not limited to dialogue about wildlife, fisheries, land use, archaeology, water, air quality, and access management. Through the IAG, multiple perspectives have been shared, allowing for the integration of knowledge systems (both Inuit Knowledge and western science), resulting in a more informed and sustainable project. At the time of filing, four IAG workshops had occurred (GBEEC 2018a, 2018b; IAG 2025a, 2025b), with additional workshops planned for the future.

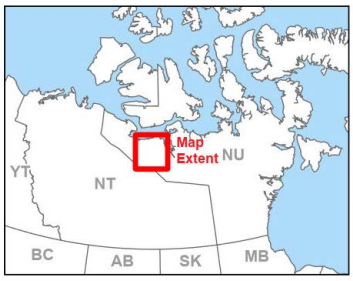
Pertinent baseline information from these sources of Inuit Knowledge is not presented further here; rather, this information is provided in the above-noted reports themselves, the 'Baseline Conditions' sections of each assessment section, and integrated in the Vegetation sections where appropriate. The same process was applied when integrating baseline information associated with applicable Traditional Knowledge and Community Knowledge shared in publicly available literature and through the Project-specific engagement program.

2 Study Areas

Baseline conditions are assessed for the Project Development Area (PDA), a Local Assessment Area (LAA), and a Regional Assessment Area (RAA) (Figure 2.1):

- The PDA encompasses the physical footprint of all project components, including both permanent and temporary disturbances (e.g., extent of project infrastructure, planned clearing, and laydown areas). The PDA includes six sub-areas based on the types of components to be developed: the Port (which is further divided into marine and landside infrastructure), Road, Aerodrome, Jericho Station, and Winter Road PDAs. The boundaries of the PDAs were created by applying buffers around where the Project components will be sited, and varies by each of the sub-areas depending on necessary flexibility for final siting of certain project components based on conditions on the ground. For the Road PDA and Winter Road PDA, a 75 m buffer was applied to the roads centreline, for the Port PDA and the Aerodrome PDA, the areas were subdivided based on the conceptual project component locations and then buffered approximately 1,000 m for the landside Port PDA, approximately 300 m for the marine Port PDA, and 500 m for the Aerodrome PDA. The Jericho Station PDA was buffered based on the existing development from the old Jericho Mine site that will be used for the Project and the need for additional space to accommodate the Project components that will be developed as part of the Project for this location. The Winter Road PDA will only exist annually between the beginning of February and end of March, will be built on land where the existing Jericho Station road ends, at the southeastern portion of Jericho Station, to the shoreline of Contwoyto Lake where it will connect to the TCWR. For the purposes of the impact assessment, the PDA is the same as the Site Study Area identified in the IS Guidelines. The PDA is displayed on Figure 2.1. The PDA is 5,019.8 ha in size.
- The LAA is the maximum area within which project environmental effects, both direct and indirect, can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA includes the PDA and adjacent areas where environmental effects may reasonably be expected to occur. For vegetation, the area is the 1 km buffer around the PDA. The LAA equals 49,863.8 ha in size.
- The RAA is the area that provides context to the changes occurring in the LAA for vegetation. The RAA is also the area within which the Project's environmental effects on vegetation may interact or accumulate with the environmental effects of other projects or activities that have been or will be carried out, such that cumulative environmental effects may occur. A 30 km buffer around the PDA, and the PDA is used as the RAA for vegetation. The RAA is 1,488,922.8 ha in size.

The Project is located in the Takijuq Lake Upland ecoregion of the southern arctic ecozone (Government of Canada (GOC) 2024a). This ecoregion is composed mainly of unvegetated rock and has a low arctic ecoclimate (The Ecological Framework of Canada n.d.). Vegetation consists of shrub tundra with dwarf birch (*Betula pumila*), willows (*Salix* spp.), northern Labrador tea (*Rhododendron tomentosum*), avens (*Dryas* spp.), and *Vaccinium* spp. Spruce trees (*Picea* sp.) are scattered along the southern edge of the ecoregion.



Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Governments of Nunavut and Canada, Stantec

- Local Assessment Area (LAA)
- Regional Assessment Area (RAA)
- Grays Bay Port
- Grays Bay Road
- Grays Bay Winter Road
- Grays Bay Winter Road Optional Alignment

Project Development Area (PDA)

- Aerodrome
- Jericho Station
- Port (Landside Infrastructure)
- Port (Marine-based Infrastructure)
- Road
- Advanced Mineral Exploration Site
- Closed Mine Site
- Territorial Boundary
- Tibbitt to Contwoyto Winter Road
- Watercourse
- Ocean
- Waterbody

0 10 20 Kilometres

(At original document size of 8.5x11) 1:1,350,000

N

NUNAMI STANTEC LIMITED

WEST KITIKMEOT RESOURCES CORP

Project Location
Kitikmeot Region, Nunavut

Prepared by BSPRY on 2026-02-03
TR by SL on 2026-02-03

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

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Figure No.
2.1

Title
Vegetation Assessment Area

3 Methods

3.1 Desktop Assessment

3.1.1 MMLand Cover Classification and Mapping

At present, a standardized system for classifying land cover within Nunavut does not exist. Vegetation communities within the Assessment Areas were classified to land cover class and/or ecosite classification, based on classifications developed for the Izok Corridor Project (MMG 2013a).

Land cover and ecosite classification frameworks were developed through desktop and field studies, including the inclusion of Inuit Knowledge and Traditional Knowledge (MMG 2013a).

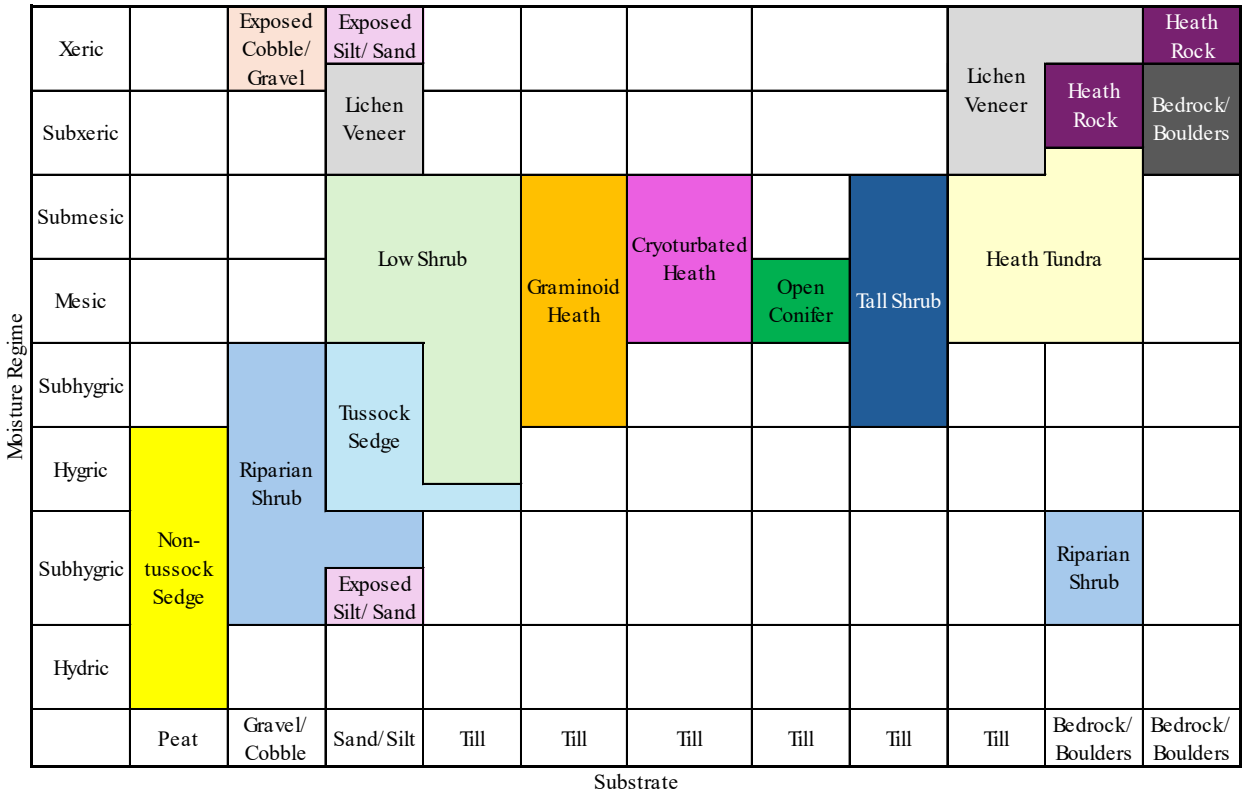
The land cover classes from the Izok Corridor Project were used as the basis for developing project-specific mapping for this Baseline report. The Izok land cover classifications, developed for a 30 km wide area surrounding the Izok Corridor Project's development footprint, were developed iteratively using remote sensing and field data, including the collection of aerial photography (scale of 1:20,000) flown in 2004 and 2007. Ecological land classification (ELC) mapping was also done for a 1 km wide buffer surrounding the Izok Corridor Project's development footprint. In general, ecosites are more detailed classifications based on physical and vegetation, landscape and soil conditions. Preliminary land cover and ELC mapping was refined based on field verification. Details are provided in the Izok Corridor Project Vegetation Baseline Appendix Report (MMG 2013a) and Proposed Izok Mine Land Cover Mapping Summary Report (CASLYS 2013).

The classification for the Izok Corridor Project regional study area resulted in 18 unique land cover classes. Each land cover class represents a unique combination of physical and vegetation cover components as well as soil moisture regime and substrate. Figure 3.1 shows a summary of relationships between land cover classes, moisture, and substrate amongst the ecosite classes.

For this Project, two spatial resolutions of mapping were undertaken, with land cover within the RAA mapped using 10 m resolution satellite imagery, and the LAA was mapped using 3 m resolution satellite imagery, as detailed in Sections 3.1.1.1 and 3.1.1.2. Although both land cover and ecosite classification frameworks were developed, mapping for the Project was not conducted to ecosite level as suitable plant height information for separating communities was not available. However, field surveyed locations were classified to ecosite level.

For the evaluation of land cover distribution, land cover classes of limited distribution were defined as natural land cover classes occupying less than 1% of the area being evaluated (i.e., RAA, LAA, PDA). Disturbed and environmental land cover classes were not included in the evaluation of land cover classes of limited distribution.

Figure 3.1 Relationships Between Land Cover Classes, Moisture, and Substrate



Note:
The lichen veneer and conifer open land cover classes were not included in the 2024 land cover mapping.
Source: MMG (2013a)

3.1.1.1 Regional Assessment Area Land Cover Mapping

Within the RAA, land cover was mapped using Sentinel-2 10 m resolution satellite imagery acquired on July 26, 2023 (Copernicus 2023). The classification was focused on classifying and delineating the various land cover types, as informed by field samples, through Object-Based Image Analysis (OBIA) segmentation with Trimble's eCognition software (v 10.4) utilizing the supervised machine-learning random trees classification algorithm. Pre- and post-processing of the imagery, spatial layers, and metric generation was completed using ArcGIS Pro 3.3.1. Input layers for the OBIA processing included all 10 and 20 m spectral bands of the Sentinel-2 imagery and additional indices (i.e., NDVI [Normalized Difference Vegetation Index], SAVI [Soil Adjusted Vegetation Index], NDMI [Normalized Difference Moisture Index], NDWI [Normalized Difference Water Index], Cig [Chlorophyll Index], NDSI [Normalized Difference Soil Index]) along with publicly available 2 m Arctic Digital Elevation Model (DEM) (Porter et al. 2024) resampled to 10 m to inform general differences in terrain.

Field data available for this project were collected in 2008, 2012, and 2024, and were used in combination with 50 cm high resolution imagery (available in the LAA only; Skysat Planet 2024), 3m imagery (available in the LAA only, PlanetScope 2023) and 10 m satellite imagery (Copernicus 2023) to inform selection of objects representative of a designated land cover class. These objects were used as the classification model training dataset. Pre-2013 data from MMG and CASLYS (MMG 2013a,b) was used as a general reference for the GIS Analyst to understand the expected land cover within the area, while the 2024 field samples were used for training. A combination of threshold-based and supervised classifications was used to generate the classification based on their advantages. The threshold-based classification involves the GIS analyst using the spectral signatures of one or more spectral bands to specify a break point where the values either above or below represent the desired class, which is particularly useful for spectrally distinct classes to be quickly and objectively classified, such as bare rock or open water. The supervised classification technique is used to leverage the machine learning random forest algorithm within eCognition to generate a training model, based on the input signatures (bands) to assign the unclassified objects into the appropriate class. For this technique, the analyst must select objects representative of the classes which, are then input into an algorithm through the software and, which in turn, generates a training model that is applied to the unclassified objects.

The land cover classes identified in the RAA are discussed in Section 5.1. Adjustments made to the classification included removing classes where there was either insufficient or no field sample data in which to base the training on, or a lack of input LiDAR data that is a crucial input parameter in differentiating the classes from the surrounding land cover.

3.1.1.2 Local Assessment Area Land Cover Mapping

Within the LAA, land cover was mapped using 3 m resolution satellite imagery (PlanetScope 2023) acquired on August 1, 2023. This classification was informed by the same field samples as the RAA classification. Similarly, the same OBIA segmentation and supervised machine-learning random trees classification algorithm within Trimble's eCognition software (v 10.4) was used to classify land cover in the LAA. The input imagery layers for the LAA classification included the four spectral bands (i.e., red, green, blue and near infrared) and additional indices of the 3m imagery purchased for the LAA (PlanetScope 2023). These indices assisted in emphasizing spectral differences between the various land cover classes, and particularly for separating the vegetation classes (i.e., NDVI, SAVI, NDMI, NDWI, CIg, NDSI). Publicly available 2 m Arctic DEM (Porter et al. 2023) was also an input layer to inform general topography and potential tall vegetation areas.

50cm high-resolution imagery (Skysat Planet 2024) available for the LAA, provided a reference layer for the GIS Analyst in classification training sample selection and post-classification validation. The imagery was not used for the classification process because the spectral variation due to multiple imagery capture timeframes across the LAA would introduce spectral differences between the same land cover types and result in errors when applying the training model.

The land cover classes identified in the RAA are discussed in Section 5.1. Two additional classes were identified in the LAA that were not included in the RAA classification: shadow and tall shrub. Shadow was identified as shadowed areas near rock outcrops, of which the underlying land cover is not identifiable.

Tall Shrub was identified in the LAA by basing training on field samples which have a distinguishable, increased reflectance in the infrared bands and vegetation indices, as well as the smaller segment size delineated the tall shrub areas. This land cover class could not be identified with the lower resolution imagery in the RAA.

3.1.2 Species of Conservation Concern

Vegetation Species of Conservation Concern (SOCC) were assessed in the PDA, LAA and RAA. The following sources of information were reviewed to evaluate vegetation SOCC potential in the PDA, LAA, and RAA:

- Critical Habitat for Species at Risk National Dataset (GOC 2024b)
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments and status reports (COSEWIC 2017)
- Nunavut Conservation Data Centre (CDC) list of subnational conservation rankings for vascular plants, bryophytes, and lichens (Mulder 2024, pers. comm.)
- Species at Risk Public Registry (GOC 2024c)
- A desktop review of vegetation SOCC results from the Izok Corridor Project

Vegetation SOCC historical occurrence information is not available from the Nunavut CDC (Mulder 2024, pers. comm.) and therefore, potential interactions with historically documented occurrences could not be evaluated.

For this report, a vegetation SOCC is defined as a species that possess one or more of the following attributes:

- listed under Schedule 1, Schedule 2, or Schedule 3 of the federal *Species at Risk Act* (SARA) as endangered, threatened, or special concern (GOC 2024c)
- listed as endangered, threatened, or special concern by the federal Committee of the Status of Endangered Wildlife in Canada (COSEWIC) (GOC 2024c)
- National ranking of NX, NH, N1, N2, N3, or a combination of these ranks by NatureServe Central Sciences using a standardized procedure developed by NatureServe (Faber-Langendoen et al. 2012; Master et al. 2012) (Table 3.1)
- Subnational ranking of SX, SH, S1, S2, S3, or a combination of these ranks by the Nunavut CDC using a standardized procedure developed by NatureServe (Faber-Langendoen et al. 2012; Master et al. 2012) (Table 3.1)

The term Species at Risk (SAR) is used to describe a subset of SOCC that have been granted legal protection under SARA or the *Nunavut Wildlife Act*.

All species nomenclature in this report follows the Nunavut CDC species list current as of December 11, 2024 (Mulder 2024, pers. comm.). Nomenclature for species that do not appear on this list was sourced as follows:

- vascular plants from the Database of Vascular Plants of Canada (Brouillet et al. 2010+)
- bryophytes from the Flora of North America (Flora of North America Editorial Committee, eds. 1993+) and NatureServe Explorer (NatureServe 2025)
- lichens from the NatureServe Explorer (NatureServe 2025)

Table 3.1 National and Subnational Conservation Status Ranks and Definitions

National Rank	Subnational Rank	Definition	Rationale
NX	SX	presumed extirpated	Species is believed to be extirpated from the jurisdiction (i.e., nation or province/territory). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
NH	SH	possibly extirpated	Known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the jurisdiction, but not enough to state this with certainty.
N1	S1	critically imperiled	At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
N2	S2	imperiled	At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
N3	S3	vulnerable	At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
N4	S4	apparently secure	At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern because of local recent declines, threats, or other factors.
N5	S5	secure	At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
NNA	SNA	not applicable	A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., non-native species, cultivated species, hybrids without conservation value).
NNR	SNR	unranked	Conservation status has yet to be assessed.
NU	SU	unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
N#N#	S#S#	range rank	A numeric range rank (e.g., S2S3) used to indicate any range of uncertainty about the status of the species.

Source: Master et al. (2012)

3.1.3 Non-Native and Invasive Plant Species

Potential non-native and invasive plant species were identified for the Project area. The term “non-native” is used to describe species that are not normally found within Nunavut and have been introduced by human activities (Environment and Climate Change Canada (ECCC) 2010). Non-native species that cause harm to the environment, human health, or economic activity are considered invasive species.

In the absence of territorial weed control legislation, the following sources were used to identify non-native and invasive species known to occur or with the potential to occur in Nunavut:

- Non-Native and Invasive Species in Nunavut (ECCC 2010)
- General Status Ranks of Wild Species in the Northwest Territories (Working Group on General Status of Northwest Territories Species 2021)
- Field Guide to Alien Plants in the Northwest Territories (Northwest Territories Council on Invasive Species, Pests, and Pathogens 2023)

3.2 Field Assessment

Historical baseline vegetation data, which overlaps the RAA, LAA or PDA, was incorporated to characterize baseline vegetation conditions. Historical field studies occurred during the following years:

- 2004, 2005, and 2006 for the High Lake Project
- 2008 for the Izok Project
- 2012 for the Izok Corridor Project (MMG 2013a)

A project-specific vegetation field program was completed between August 1 and 10, 2024. The field program included ecosite characterization and vegetation SOCC surveys within the Port and Aerodrome PDA, minus the water source lakes (Figure 2.1). Surveys in 2024 focused on the Port and Aerodrome portions of the PDA, as historical surveys in these areas were limited to the coast. Surveys were conducted by a team consisting of one vegetation specialist, an Inuit assistant from Kugluktuk, and a wildlife monitor from Cambridge Bay.

3.2.1 Land Cover and Ecological Land Classification

3.2.1.1 Historical Land Cover Classification Surveys

Land cover survey sites were surveyed for the Izok Corridor Project regional study area at pre-selected and randomly selected locations within the 18 land cover classes identified in the remote sensing classification. During these helicopter-supported surveys, the helicopter landed briefly or hovered over large patches of relatively uniform vegetation cover. Percent cover of vegetation layers was visually estimated at each site, including trees, tall shrubs (>1.5 m in height), low shrubs (0.2 – 1.5 m in height), ground shrubs (<0.2 m in height), herbaceous plants (graminoids and forbs), mosses, and lichens. Physical site characteristics of topographic position, landforms (e.g., presence of hummocks, tussocks,

etc.), surface expression, slope, aspect, moisture regime, substrate (e.g., peat, boulder, bedrock, etc.) and physical ground cover (i.e., percent cover of rock, exposed soil, litter, standing water, and ice) were also recorded.

3.2.1.2 Historical Ecosite Surveys

Ecosite characterization surveys were conducted for the Izok Corridor Project regional study area to collect vegetation community data used to describe and map the ecosites. Survey methods were guided by the Standard for Terrestrial Ecosystem Mapping in British Columbia (Resource Inventory Committee 1998). The ecosite characterization field assessment included reconnaissance surveys, detailed plots, ground inspections, and visual checks.

Detailed plots (i.e. full plots) provided the most comprehensive ecological data for a point sample and were used to support the development of ecosite descriptions and summary statistics. Ground inspections were abbreviated plots (i.e., ground plots) that provide basic ecological data and are intended for confirmation of the identified ecosites in addition to providing data for characterizing ecosite attributes. Visual checks are the least detailed type of field data collection and were done to verify the accuracy of the preliminary vegetation map. Reconnaissance surveys were used to assess the availability of different ecosites in the study area and to pre-select ELC survey sites.

Detailed and ground plots were conducted using a 400 m^2 assessment plot, typically 20 m x 20 m, or altered to accommodate site dimensions (e.g., 10 m x 40 m). Plots were established within an area of homogenous vegetation of at least 30 m in diameter and were located at least 20 m away from any disturbance or edge to avoid edge effects (MMG 2013b). The minimum size of a mapped ecosite polygon was 1.0 hectares (ha) except for unique or linear terrain features such as eskers and riparian areas. Physical site characteristics, including landforms, elevation, slope percent, slope position, aspect, moisture regime, drainage, soil classification, soil nutrient regime, and depth to permafrost, were recorded at all full and ground plots.

At full and ground plots, each shrub species occupying more than 1% cover was inventoried, identified to the species level, and the percent cover in each layer was visually estimated. Layers consisted of tall shrubs (>1.5 m in height), low shrubs (0.2 – 1.5 m in height), and ground shrubs (<0.2 m in height). At detailed plots, a 20 m transect was established through the center of the plot, with ten microplots evenly placed along the transect (roughly one plot every 2 m). Microplots equaled 1 m^2 in size (1 m x 1 m) and were used to collect ground cover data, including total percent cover of each vascular plant < 0.2 m in height, each bryophyte, and each lichen species, and total vascular plant, bryophyte, lichen, litter, bare ground, and water cover. Species accounting for 5% or more of the total site cover that could not be identified were collected for later identification. At ground plots, the total ground cover of vascular plants < 0.2 m in height, bryophytes, lichens, bare ground, litter, and standing water was recorded for the entire 400 m^2 plot.

Visual checks were conducted from the ground or a helicopter hovering over a uniform vegetation association. The ecosite was identified and the total percent cover of vegetation, bedrock, rocks/boulders, bare ground, and water were recorded along with any other relevant terrain information.

3.2.1.3 2024 Land Cover Classification and Ecosite Survey

A combined land cover classification and ecosite survey was conducted in 2024 to evaluate the historical land cover mapping and support revised mapping. Target survey sites were randomly selected prior to fieldwork using the RStudio random package (RStudio Team 2020). Target locations were stratified by land cover class, and the number of targets was proportional to class abundance within the Port and Aerodrome PDA. Thirty sites were selected for the survey with a minimum of two sites per land cover class. Survey locations were adjusted in the field, so each plot was in an area of homogenous vegetation at least 20 m x 20 m in size. Additional sites were established in the field where interesting vegetation communities were observed.

In the absence of Nunavut survey methodology, survey methods followed the British Columbia *Field Manual for Describing Terrestrial Ecosystems* (Government of British Columbia 2010) and the Alberta Biodiversity Monitoring Institute's (AMBI) *Terrestrial Field Data Collection Protocols* (AMBI 2021). A total of 32 ground plots were established in the Port Field portion of the LAA, each measuring 10 m x 10 m. At each site, vascular plants occupying more than 1% cover were identified to species level, and the percent cover in each layer was visually estimated. Vascular plant cover was recorded by species and layer, with layers consisting of tall shrubs (2 m - 5 m in height), low shrubs (0.5 m - 2 m in height), and herbaceous (graminoids, forbs, and shrubs < 0.5 m in height). Vascular plants that could not be confidently identified in the field were collected for later identification, provided more than 50 individuals of the plant were present at the survey location. Total ground cover was also documented, consisting of vascular plants (excluding trees and shrubs < 0.3 cm in height), bryophytes, lichens, bare ground, litter, and standing water, with total cover summing to 100% and viewed as a single layer. Surface expression, slope position, slope percentage, and moisture regime were also recorded. Photographs were taken at the central point of each plot facing in each cardinal direction and downwards (i.e., ground) to capture site conditions. Each survey site was classified to land cover class in the field and ecosite post-field.

3.2.2 Species of Conservation Concern

3.2.2.1 Historical Surveys

In 2004, 2008, and 2012 vegetation SOCC surveys were conducted to develop an understanding of potential "hot spots" for vegetation SOCC within the Izok Corridor Project study areas, including fine scale landscape features and small patch vegetation communities with a higher probability of supporting SOCC. This included uncommon plant communities, unusual habitats, unusual landscape features, and known occurrence locations (MMG 2013a).

Vegetation SOCC collected from areas overlapping the Project's RAA, LAA and PDA were incorporated into this Baseline report. However, survey site location information (i.e., site coordinates) is not available for the 2004 and 2008 vegetation SOCC data.

3.2.2.2 2024 Surveys

In 2024 a SOCC survey was completed to evaluate the presence, location, and occurrence of plant SOCC in the LAA near the Port area of the PDA. Survey methods followed Environment Canada's *Occupancy Survey Guidelines for Prairie Plant Species At Risk* (Henderson 2009), *Inventory and Survey Methods for Rare Plants and Lichens, Standards for Components of British Columbia's Biodiversity No. 43* (Resources Information Standards Committee 2018), and the Alberta Native Plant Council's (ANPC) *Guidelines for Rare Vascular Plant Surveys in Alberta* (ANPC 2012). Survey guidelines are not available for Nunavut or Northwest Territories, and the selected guidelines provide guidance on reducing survey bias and improving rare plant detection. Survey locations were randomly selected prior to fieldwork by applying 200 m x 200 m sampling grids to the Port Field portion of the LAA and targeting a representative sample of land cover classes equivalent to the abundance of each class. Thirty-five grids containing target land cover classes were randomly selected using the RStudio random package (RStudio Team 2020) as survey targets.

A meander transect of at least 100 m was walked within each survey grid, crossing ecosites present, including transition areas and microsites not fitting the ecosite classification. Plant SOCC reportedly occur more frequently in transition zones between communities and spanning more than one community type helped increase coverage of potential plant SOCC conditions (ANPC 2012). Additional transects were established in the field by the surveyor if unique or under-sampled areas were encountered.

Observed vascular plants within a four metre wide band were recorded, and a global positioning system (GPS) track collected. When a vegetation SOCC was detected, occurrence data was collected, including occurrence (i.e., patch) center point, number of individual plants, phenology (e.g., percent in flower, or vegetative), physical properties of the site, and representative photographs. The number of plants were counted if less than 50 were present and estimated if more than 50 were present. Vascular plants that could not be confidently identified in the field were collected for later identification, provided more than 50 individuals of the plant were present at the survey location. Photographs showing characteristic features were taken if fewer than 50 individuals were present.

3.2.3 Non-Native and Invasive Plant Species

Non-native and invasive plant species were documented as encountered during the vegetation surveys. The species, abundance, distribution, phenology, and GPS location was recorded when a non-native and invasive plant was observed.

4 Data Analysis

Land cover and ELC abundance and spatial distribution were determined using post-field project mapping. Ground cover characteristics and species diversity of the land cover classes were also analyzed. To allow comparison between the historical ecological land classification sites and the 2024 data, the Izok Corridor Project (MMG 2013b) ecological land classification data were processed as follows:

- To align with 2024 data collection methods, historic forb and graminoid cover, which was collected by strata without a height assigned, were assumed to be < 30 cm in height, on average, and were classified as “vascular ground cover” for the purposes of ground cover analysis
- The ground cover components (e.g., rock, bryophyte, water percent cover) were converted to a weighted mean, based on the relative ratio of each ground cover strata to the total percent cover to address overlapping ground cover components (e.g., in historical data, if water cover was present overtop of bare ground, both were recorded as percent cover values)

In land cover classifications with higher vegetation coverage (e.g., shrub and graminoid classes), the weighted means calculated for the Izok Corridor Project data likely over-estimate the mean cover of bare ground, water, litter and non-vascular species when compared to the 2024 data, as the 2024 data only recorded unobstructed cover of these strata when viewed from above. This data discrepancy is likely lower or not present in sparse land cover classes, such as the Rock, Unvegetated Sediment, and Heath Bedrock/Boulder land cover classes.

Land cover and ELC field data was compiled, and species richness calculated by land cover class and ecosite. Due to the lack of individual plot data from the Izok Corridor Project (MMG 2013b), mean vascular species richness was only calculated using 2024 data and only at the ecosite level.

5 Results

5.1 Land Cover Classification

A total of 15 unique land cover classes were identified within the RAA and LAA from 2024 Project mapping, with 13 occurring within the RAA, and 14 occurring within the LAA (Table 5.1). Land cover mapping within the RAA and LAA are presented in Map Books A.1 and A.2 (Appendix A).

The four most dominant land cover classes by area in the RAA are heath bedrock/boulder, boulder/bedrock, water, and heath tundra, representing 32.4%, 18.6%, 16.6%, and 15.7% of the RAA respectively (Table 5.1). In general, the heath land cover classes are more widely distributed across the southern portion of the RAA, and the boulder/bedrock rock class increases in distribution towards the northern extent of the RAA (Appendix A, Map Book A.1).

The four most dominant land cover classes by area in the LAA are heath tundra, tussock sedge, heath bedrock/boulder, and water, representing 37.1%, 14.8%, 14.6%, and 9.8% of the LAA, respectively (Table 5.1). These land cover types are distributed throughout the LAA (Appendix A, Map Book A.2).

Water is distributed across the RAA and LAA as rivers, including the Hood River, James River, small lakes and ponds, and several larger lakes, including Contwoyto Lake, Burnside Lake, Kathawachaga Lake (Appendix A, Map Book A.1).

Land cover classes of limited distribution are Land cover classes of limited distribution are Heath Cryoturbated (0.4 % of RAA, 0.6% of LAA), Heath Graminoid (< 0.1% of RAA, < 0.1% of LAA), Tall Shrub (0.9% of LAA), Unvegetated Exposed Gravel/Cobble (0.5% of RAA, 0.1% of LAA), and Unvegetated Exposed Silt/Sand/Gravel (0.5% of RAA)) (Table 5.1).

Summaries of each land cover class are presented in Appendix B.

Table 5.2 presents a concordance of land cover types from the Project-specific land cover mapping and ecosite classifications, providing context of potential vegetation community diversity within each land cover class. As shown in Table 5.2, several ecosites have been grouped together under land cover classes due to lack of spectral distinguishability during the land cover mapping. The ecosite characterizations within the 2024 surveys were broadly consistent with ecosites described in the Izok Corridor Project ELC framework (MMG 2013a).

Four of the ecosites are classified as wetland ecosites: the Non-tussock Sedge, Birch Seep, Riparian Tall Shrub, and Riparian Willow ecosites (MMG 2013a). These are expected to occur primarily within the Non-tussock Sedge, and Shrub/Tall Shrub ecosites. Additional wetland types may occur as small polygons within a variety of land cover classes.

Table 5.1 Project Land Cover Class Abundance within the Regional Assessment Area and Local Assessment Area

Land Cover Class Group	Land Cover Class Name	RAA		LAA	
		Area (ha)	Proportion (%)	Area (ha)	Proportion (%)
Disturbed	Mine Sites	455.0	< 0.1	108.9	0.2
Environmental	Snow	1,982.4	0.1	---	---
	Shadow	---	---	151.6	0.3
Heath Tundra	Heath Bedrock/Boulder	482,193.8	32.4	7,260.6	14.6
	Heath Cryoturbated	5,442.2	0.4	281.5	0.6
	Heath Graminoid	759.3	< 0.1	11.9	< 0.1
	Heath Tundra	233,210.7	15.7	18,478.2	37.1
Rock	Boulder/Bedrock	277,235.0	18.6	3,872.4	7.8
Sedge	Non-tussock Sedge	25,602.0	1.7	1,919.7	3.8
	Tussock Sedge	73,962.0	5.0	7,371.3	14.8
Shrub	Shrub	133,746.9	9.0	4,342.9	8.7
	Tall Shrub	---	---	465.1	0.9
Unvegetated Sediment	Unvegetated Exposed Gravel/Cobble	71.1	< 0.1	56.9	0.1
	Unvegetated Exposed Silt/Sand/Gravel	6,867.9	0.5	657.3	1.3
Water	Water	247,394.6	16.6	4,885.7	9.8
Total		**1,488,922.8**	**100**	**49,863.8**	**100**

Note:
Potential for variances in sums due to rounding

Table 5.2 Concordance of Mapped Land Cover Classes and Ecosite Classifications within RAA and LAA

Land Cover Class Group	Land Cover Class Name	Land Cover Class Description	Ecosite Group	Ecosite Class	Ecosite Class Description
Disturbed	Mine Sites	Anthropogenic disturbance on the landscape; features include mine sites, associated airstrips, and roads.	N/A	N/A	N/A
Environmental	Shadow	Areas of shadows within the Landsat image			
	Snow	Areas covered with snow obscuring land cover classification			
Heath Tundra	Bedrock/Boulders Heath Tundra	A transitional class between heath tundra and rock features (bedrock/boulders class); consists of 20% to 70% heath tundra mixed with exposed boulder or bedrock on mid, upper, and crest slope positions	Heath Tundra	Heath Bedrock	A transitional class between heath tundra and rock features (bedrock/boulders class); consists of 20% to 70% heath tundra mixed with exposed boulder or bedrock on mid, upper, and crest slope positions
				Heath Boulders	A transitional class between heath tundra and rock features (bedrock/boulders class); consists of 20% to 70% heath tundra mixed with exposed boulder or bedrock on mid, upper, and crest slope positions
			Raised Beach	Raised Beach Lichen Heath	Low-lying heath, graminoids and lichen on exposed marine sediment substrates
	Cryoturbated Heath Tundra	Hummocky heath tundra developing through cryoturbation on blanket till slopes; large flat hummocks with lichen-covered centers occur	Heath Tundra	Cryoturbated Heath Tundra	Heath tundra areas containing large amounts of frost boils causing hummocky ground occurring predominately on till blanket landforms within the southern portion of the study area
	Graminoid Heath Tundra	High graminoid tundra found primarily on till blankets with mesic moisture regimes in wetter moisture regimes than other tundra classes	Heath Tundra	Graminoid Heath Tundra	Heath tundra with 20 to 40% ground cover of graminoids occurring on long, straight, gentle slopes

Land Cover Class Group	Land Cover Class Name	Land Cover Class Description	Ecosite Group	Ecosite Class	Ecosite Class Description
Heath Tundra (cont'd)	Heath Tundra	Occurs on well to moderately drained soils (mesic-xeric moisture regime) and is dominated by ericaceous shrubs, lichens, and some graminoids; consists of >70% vegetative cover with <30% rock, with vegetative cover consisting of 30% to 50% heaths and prostrate shrubs up to 20 cm tall on mid slope to crest positions	Heath Tundra	Heath Tundra	30 to 50% cover of heaths and prostrate shrub cover up to 20 cm tall on mid-slope to crest positions
				Snowbank Community	Lee side (typically southeast aspect) of large steep slopes, generally covered with graminoids and low forbs
			Esker/Outwash Complex	Outwash Diverse	Moderately to steeply sloping glaciofluvial outwash supporting dry heath, low shrub, sedge ecosites, ponds, or exposed sediment.
			Esker/Outwash Complex	Outwash Lichen Heath	Level to gently sloping glacio-fluvial outwash with low, thin plant cover often with a high lichen cover component or with thick vegetation cover
			Marine Sediment	Marine Heath Tundra	Mid-slope to upper slope positions on uplands near the coast, where fine marine sediments have been deposited. It is characterized by a 20% to 90% cover of heaths and prostrate to low shrubs.
Rock Land	Bedrock/Boulder	Bedrock outcrops and boulder fields; typically >80% ground cover of rounded or angular boulders or bedrock, potentially interspersed with small patches of heath tundra	Bedrock and Boulders	Bedrock Association	>80% bedrock cover with patches of heath tundra between
			Bedrock and Boulders	Bedrock Cliffs	Steep cliff faces and ledges
			Bedrock and Boulders	Boulder Field/Felsenmeer	>80% ground cover of rounded or angular boulders

Land Cover Class Group	Land Cover Class Name	Land Cover Class Description	Ecosite Group	Ecosite Class	Ecosite Class Description
Sedge	Non-tussock Sedge	Emergent sedges (*Carex* spp.) and cottongrasses (*Eriophorum* spp.) in standing or slow waters in basins. Non-tussock Sedge is a wetland land cover class.	Sedge	Non-Tussock Sedge	Same as Land Cover class
	Tussock Sedge	Cottongrass tussock on lower slope positions where water is flowing on the permafrost boundary and saturating the active layer; often found in conjunction with areas of low shrub.	Sedge	Tussock Sedge	Same as Land Cover class
			Marine Sediment	Marine Tussock Sedge	Cottongrass (*Eriophorum* spp.) tussock on marine sediments occurring on lower slope positions where water is flowing on the permafrost boundary and saturating the active layer
Shrub	Low Shrub	Low (> 20 cm to <1.5 m) birch (*Betula* spp.) and willow on lower slope positions and flat open areas where water is collected beneath the surface on the permafrost boundary, saturating the active layer	Shrub	Low Shrub	Low (>20 cm to < 1.5m) birch and willow (Salix spp.) occupying lower slope positions and flat open areas where water is collected beneath the surface on the permanent boundary, saturating the active layer
				Riparian Willow	Willows and graminoids linked to standing or slow-moving water at or below the surface. Riparian Willow is a wetland ecosite class.
				Steep Shrub Slopes	Birch shrubs on draining lee slopes, often steep or rocky, or slopes with a moisture source like snowbanks; on mid to upper slope positions, often over bedrock with a boulder component
			Marine Sediment	Marine Low Shrub	Marine sediments associated with shallow water receiving lower slopes and basins where sub-surface flow or ponding occurs on top of permafrost

Land Cover Class Group	Land Cover Class Name	Land Cover Class Description	Ecosite Group	Ecosite Class	Ecosite Class Description
Shrub (cont'd)	Tall Shrub	Transition shrub class found near tree line; cover of erect shrubs is dense but not as wet as the riparian shrub class; shrub heights range from 1.5 m to 5 m	Shrub	Riparian Tall Shrub	Tall (>1.5 m) birch and willows linked to standing or slow-moving water at or below the surface where water is flowing on bedrock or the permafrost boundary. Riparian Tall Shrub is a wetland ecosite class.
				Transition Tall Shrub	Transition zone shrub community replacing health tundra on upland sites closer to tree line; shrub cover (mostly glandular birch [*Betula glandulosa*] and grey-leaved willow [*Salix glauca*]) and height increases on warm sites and with proximity to the southern tree line
				Birch Seep	Areas of active seepage through boulder fields or boulder streams dominated by birch (Betula spp.) to 1 m tall. Birch seep is a wetland ecosite class.
Unvegetated Sediments	Unvegetated Exposed Gravel/Cobble	Sparsely vegetated (<20% vegetation cover) elevated coarse sediments consisting of either gravel or cobble supporting a variety of forbs, lichens, and graminoids	Unvegetated Terrain	Exposed Cobble and Coarse Gravel	Edges of rivers, lakes, drained lakes, seasonally flooded or iced areas or eroding slopes with <20% vegetation cover
			Raised Beach	Raised Beach Cobble	<20% vegetated; elevated beach sediments consisting of either gravel or sand supporting a variety of forbs, lichens and graminoids
	Unvegetated Exposed Silt/Sand/Gravel	Sparsely vegetated (<20% vegetation cover) moderately to steeply sloping exposed fine sediment	Unvegetated Terrain	Exposed Silt, Sand and Fine Gravel	Sparsely vegetated areas (<20% cover) exposed by wind and water erosion predominantly on crest and upper slope positions occurring on fine textured materials
				Exposed Marine Sediment	Moderately to steeply sloping exposed marine sediments with <20% vegetation cover

Land Cover Class Group	Land Cover Class Name	Land Cover Class Description	Ecosite Group	Ecosite Class	Ecosite Class Description
Water	Water	Water features identified in the imagery; typically, waterbodies >0.75 ha in size and rivers >75 m wide are distinguishable in the imagery	N/A	N/A	N/A

Note:

Land Cover Class Group as per CASLYS (2013); MMG (2013a)

Descriptions of ecosite characteristics are provided in Appendix C. Representative photos of land cover classes and ecosites from the 2024 field survey are provided in Appendix D.

5.1.1 Ecosite Characterization

A total of 536 land cover and ELC locations were surveyed in the LAA and RAA and adjacent Izok Corridor Project regional study area, including 233 land cover characterization sites, and 303 ecosite characterization sites (Table 5.3). Of the land cover characterization sites, 134 occurred within the Assessment Areas (i.e., 5 in the LAA, and 129 in the RAA). Of the 303 ecosite characterization sites, a total of 96 detailed and 207 ground plots were completed, with 210 ecosite characterization surveys being completed within the Assessment Areas (i.e., 38 in the PDA, 97 in the LAA, and 75 in the RAA).

The locations of the sites occurring within the Assessment Areas are presented in Map Book A.1 (Appendix A). Data from the survey sites which occur outside of the Assessment Areas are included in this Baseline report, as they are considered representative of conditions within the RAA.

Table 5.3 Land Cover and ELC Survey Site Summary

Survey Type	Site Type	Survey Year	Total Number of Sites Surveyed In and Out of the Assessment Areas[3]	Sites Outside of the Assessment Areas	Sites within the Assessment Areas[4]			
					PDA	LAA	RAA	Total
Land Cover Characterization	Land Cover Survey Site	2005	unknown[1]	-	-	-	-	
		2008	97	24	0	4	69	73
		2012	136	75	0	1	60	61
Land Cover Characterization Subtotal			**233**	**99**	**0**	**5**	**129**	**134**
Ecosite Characterization	Detailed Plot[2]	2008	72	41	3	26	26	55
		2012	24					
	Ground Plot[2]	2005	24	52	12	62	49	123
		2008	96					
		2012	55					
		2024	32	0	23	9	0	32
Ecosite Characterization Subtotal			**303**	**93**	**38**	**97**	**75**	**210**
Total			**536**	**192**	**38**	**102**	**204**	**344**

Notes:

1 Locations of 2005 survey sites not provided in the dataset obtained from MMG (2013a)

2 Detailed and ground plot locations obtained from MMG (2013a) do not include survey years

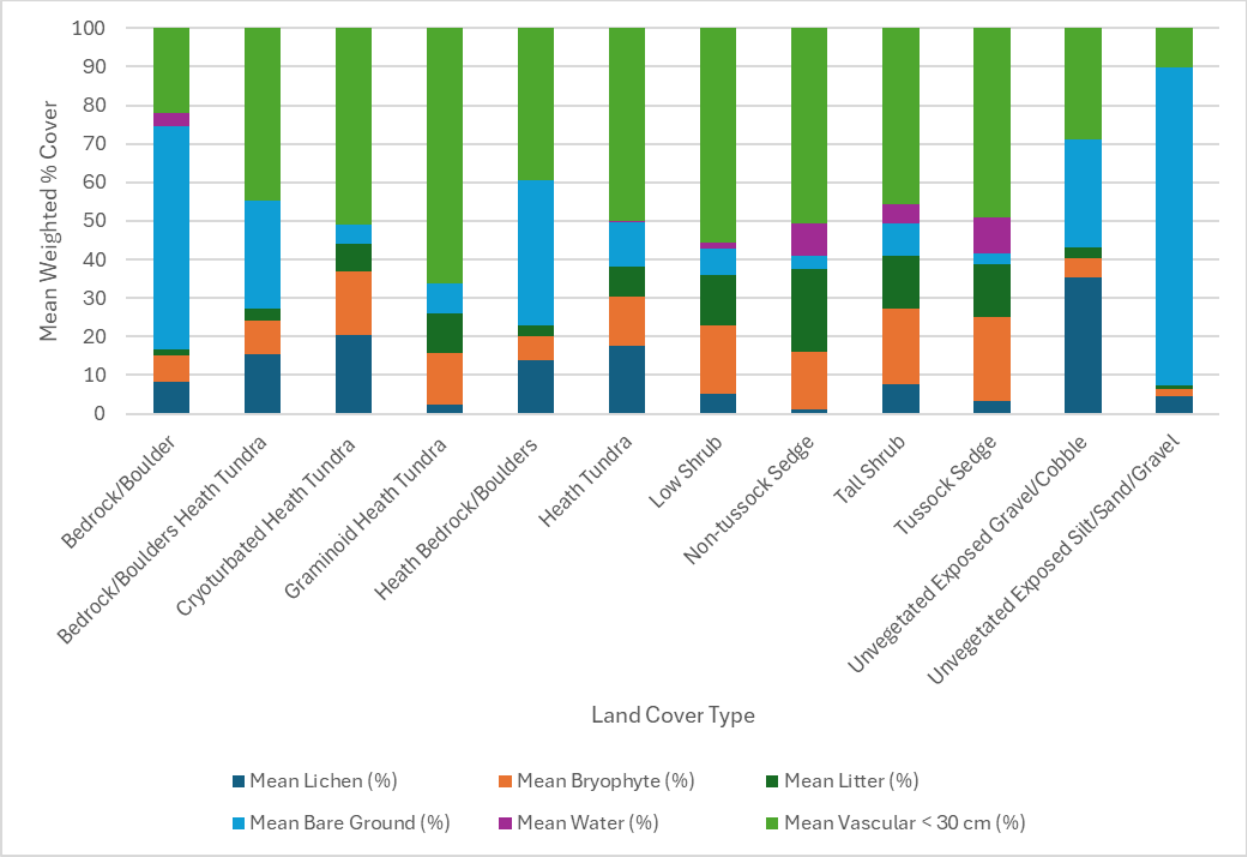
3 Number of sites surveyed includes sites occurring within the Assessment Areas (PDA, LAA, RAA) and occurring outside of the Assessment Areas

4 Survey sites located within the LAA were located within the LAA but outside of the PDA, and survey sites within the RAA were within the RAA, but outside of the PDA and LAA.

5.1.2 Ground Cover

Of the land cover classes, Graminoid Heath Tundra and Low Shrub had the highest vascular plant ground cover, with 66.3% and 55.6%, respectively, while Unvegetated Exposed Silt/Sand/Gravel and Bedrock/Boulder had the lowest cover, with 10.2% and 22.0%, respectively (Figure 5.1). Unvegetated Exposed Silt/Sand/Gravel and Bedrock/Boulder had the highest cover of bare ground, with 82.4% and 57.9%, respectively. Non-vascular cover (lichen and bryophytes) was highest in the Unvegetated Exposed Gravel/Cobble (40.4% combined), and Cryoturbated Heath Tundra (36.8% combined) land cover classes. Water cover was observed across several land cover classes, with the highest percent cover within Non-tussock Sedge, Tussock Sedge, and Tall Shrub, Bedrock/Boulder land cover classes, with 8.6%, 9.3%, and 5.1%, respectively. Non-tussock Sedge is a wetland class. The other landcover types with the highest water cover are typically upland classes, however they may have wetland areas included within mapped polygons.

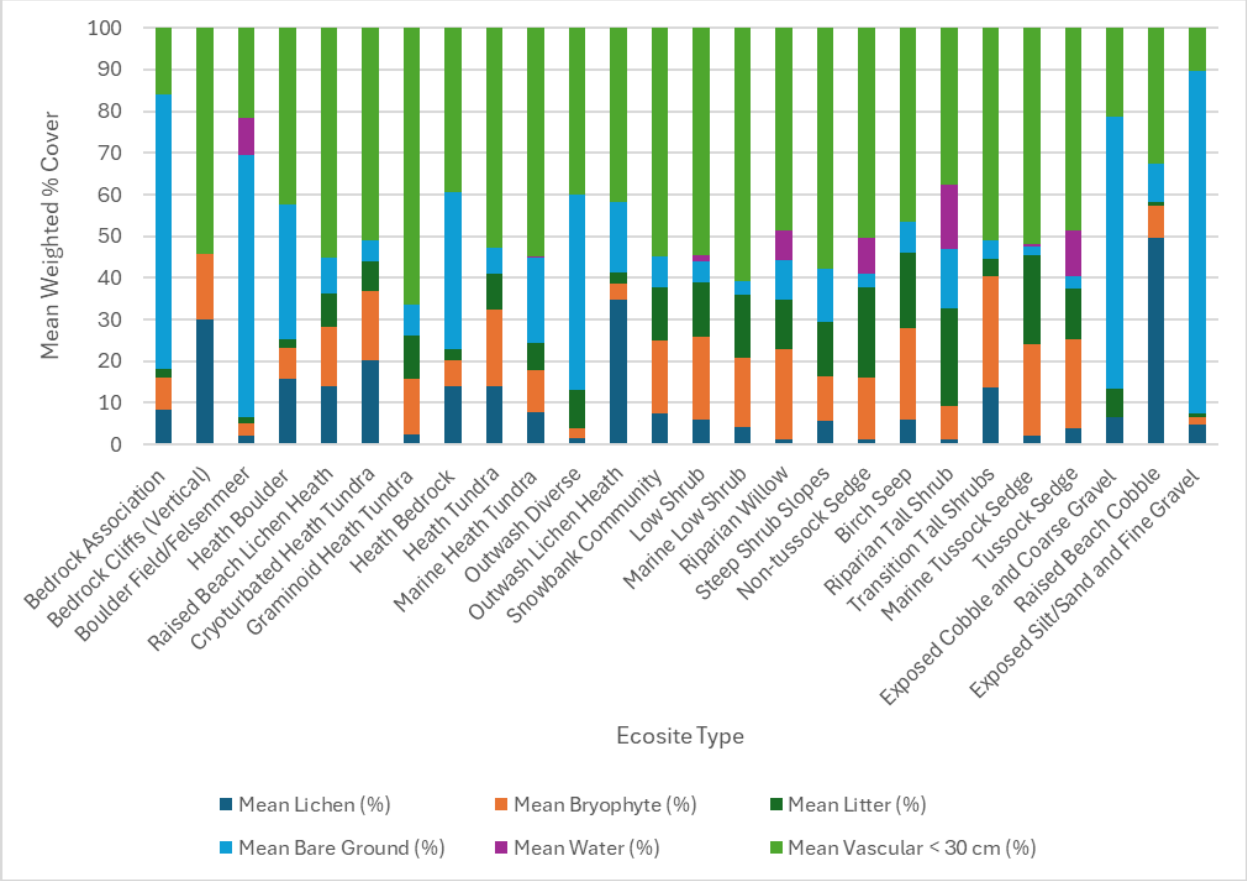
Figure 5.1 Mean Percent Ground Cover by Land Cover Class



Of the ecosite classes, Graminoid Heath Tundra and Marine Low Shrub ecosites have the greatest total vascular plant ground cover, with 66.3% and 60.7%, respectively (Figure 5.2). Exposed Silt/Sand and Fine Gravel and Bedrock Association had the lowest vascular plant ground cover, with 10.2% and 15.9%, respectively. Exposed Silt/Sand and Fine Gravel ecosites had the highest cover of bare ground (82.4%), followed by Bedrock Association, Exposed Cobble and Coarse Gravel, and Boulder Field/Felsenmeer, with 65.9%, 65.6%, and 63.0%, respectively. Non-vascular cover (i.e., lichen and bryophytes) was highest in the Raised Beach Cobble (57.3% combined) and Bedrock Cliffs (45.8% combined) ecosites.

Water was present in low amounts across several ecosites, including Riparian Tall Shrub (15.3%), Tussock Sedge (10.9%), Non-tussock Sedge (8.6%), and Riparian Willow (7.0%). Of the four ecosites with higher cover of surface water, Riparian Tall Shrub, Non-tussock Sedge, and Riparian Willow are wetland classes. Birch Seep, also a wetland ecosite, did not have surface water when surveyed.

Figure 5.2 Mean Percent Ground Cover by Ecosite Type



5.1.3 Species Richness

A total of 350 vascular (e.g., forbs, shrubs, graminoids) and 151 non-vascular plant taxa were detected during ELC and SOCC surveys, including 108 bryophyte (e.g., mosses, and liverworts), and 43 lichen taxa and species (Table 5.4, Appendix E.1). Of these, 309 vascular plants and 102 non-vascular plants (72 bryophytes, and 30 lichens) were identified to the species level. A total of 346 species have been ranked by the Nunavut CDC, including 345 native species and one non-native species (Table 5.8). Thirty-four species have been deemed currently unrankable (SU) by the CDC due to a lack of information or due to substantially conflicting information about status or trends within the territory (Master et al. 2012). The remaining 40 species have not been ranked by the CDC and do not appear in the CDC database (Mulder 2024, pers. comm.). Of the 74 unrankable or unranked species, 64 are considered native to Canada and have been assigned national rankings by NatureServe Central Sciences, seven have not been ranked at the national level (NNR), and three are currently deemed unrankable (NU) at the national level (NatureServe 2025). For example, small cranberry (*Vaccinium oxycoccos*), has not been ranked by the Nunavut CDC and does not appear in the Nunavut CDC database (Mulder 2024, pers. comm.). However, small cranberry is considered native to Canada and is nationally ranked as secure (N5) (NatureServe 2025).

Table 5.4 Number of Plant and Lichen Species Detected by Subnational Rank

Subnational Rank[1]	Definition[2]	Number of Species Detected			
		Vascular	Bryophyte	Lichen	Total
S1S2	critically imperiled to imperiled	-	2	-	**2**
S1S3	critically imperiled to vulnerable	-	5	-	**5**
S2	imperiled	2	3	-	**5**
S2S3	imperiled to vulnerable	1	-	-	**1**
S2S4	imperiled to apparently secure	-	2	-	**2**
S3	vulnerable	23	5	-	**28**
S3S4	vulnerable to apparently secure	3	14	3	**20**
S4	apparently secure	155	22	5	**182**
S4S5	apparently secure to secure	4	-	3	**7**
S5	secure	73	-	16	**89**
SH	possibly extirpated	4	-	-	**4**
SNA	not applicable	1	-	-	**1**
SNR[3]	unranked	26	12	2	**40**
SU	unrankable	17	16	1	**34**
N/A	taxa not identified to species	41	27	13	**81**
Total		**350**	**108**	**43**	**501**

Notes:

[1] Mulder (2024, pers. comm.)

[2] Master et al. (2012)

[3] Does not appear in the Nunavut CDC database

Of the plants identified to the species level, 394 are ranked nationally. However 20 species are designated as unranked (NNR), and six are unrankable (NU). The remaining species are ranked apparently secure (N4), apparently secure to secure (S4S5), or secure (N5) (NatureServe 2025) (Appendix E.1).

5.1.3.1 Total Species Richness by Land Cover Class and Ecosite

Of the land cover classes with ELC data, the Heath Tundra and Low Shrub land cover classes had the highest number of taxa and species observed, with a total of 134 and 115, respectively (Table 5.4). These included 98 and 77 vascular taxa and species, and 36 and 38 non-vascular taxa and species observed, respectively. The Tall Shrub and Bedrock/Boulders Heath Tundra land cover classes also had a high number of taxa and species observed, with a total of 98 and 96 taxa and species in each class. Land cover classes in the Unvegetated Sediments grouping and Non-tussock Sedge had the lowest number of taxa and species observed, with 27 and 34 species and taxa observed in the Unvegetated Exposed Silt/Sand/Gravel, Unvegetated Exposed Gravel/Cobble land cover classes, and 40 taxa and species observed in the Non-tussock Sedge land cover class.

Land cover classes with more associated ecosites generally have higher numbers of plant taxa and species observed than land cover classes which correlate to only one ecosite class. For example, the Heath Tundra land cover class includes four ecosite classes and has the highest number of taxa and species observed of the land cover classes. Similarly, the Low Shrub land cover class has four ecosites included, with the second highest number of taxa and species observed (115 taxa and species) (Table 5.4).

Of the ecosites with field data, the Low Shrub and Heath Tundra ecosites had the highest number of taxa and species, with 82 and 78 taxa and species, respectively (Table 5.5). Both of these ecosites also had the highest number of vascular species, with 46 and 60 vascular taxa and species, respectively. The Low Shrub ecosite also had 36 non-vascular species observed, which was the highest number of non-vascular species observed, along with Heath Boulders (25 taxa and species), and Birch Seep (24 taxa and species). The Exposed Cobble and Coarse Gravel and Esker/Outwash Complex ecosites had the lowest number of species observed, with a total of 4 and 12 taxa and species observed, respectively. The Exposed Cobble and Coarse Gravel ecosite has 4 vascular taxa and no non-vascular taxa and species were observed, while the Coarse Gravel and Esker/Outwash Complex had 12 vascular taxa and no non-vascular taxa and species observed.

Table 5.5 Species Diversity by Land Cover Class and Ecosite

Land Cover Class Group	Land Cover Class Name	Land Cover Class Species Diversity			Ecosite Group	Ecosite Class	Ecosite Class Species Diversity		
		Vascular	Non-Vascular	Total			Vascular	Non-Vascular	Total
Heath Tundra	Bedrock/Boulders Heath Tundra	61	35	96	Heath Tundra	Heath Bedrock	20	18	38
						Heath Boulders	25	25	50
					Raised Beach	Raised Beach Lichen Heath	43	12	55
	Cryoturbated Heath Tundra	29	22	51	Heath Tundra	Cryoturbated Heath Tundra	29	22	51
	Graminoid Heath Tundra	40	6	46	Heath Tundra	Graminoid Heath Tundra	40	6	46
	Heath Tundra	98	36	134	Heath Tundra	Heath Tundra	41	23	64
						Snowbank Community	60	18	78
					Esker/Outwash Complex	Outwash Diverse	12	0	12
					Esker/Outwash Complex	Outwash Lichen Heath	28	20	48
					Marine Sediment	Marine Heath Tundra	38	14	52
Rock Land	Bedrock/Boulder	34	17	51	Bedrock and Boulders	Bedrock Association	14	10	24
					Bedrock and Boulders	Bedrock Cliffs	21	6	27
					Bedrock and Boulders	Boulder Field/Felsenmeer	17	10	27

Land Cover Class Group	Land Cover Class Name	Land Cover Class Species Diversity			Ecosite Group	Ecosite Class	Ecosite Class Species Diversity		
		Vascular	Non-Vascular	Total			Vascular	Non-Vascular	Total
Sedge	Non-tussock Sedge	32	8	40	Sedge	Non-Tussock Sedge	32	8	40
	Tussock Sedge	48	29	77	Sedge	Tussock Sedge	28	15	43
					Marine Sediment	Marine Tussock Sedge	32	20	52
Shrub	Low Shrub	77	38	115	Shrub	Low Shrub	46	36	82
						Riparian Willow	36	12	48
						Steep Shrub Slopes	34	7	41
					Marine Sediment	Marine Low Shrub	29	21	50
	Tall Shrub	61	37	98	Shrub	Riparian Tall Shrub	29	17	46
						Transition Tall Shrub	43	16	59
						Birch Seep	17	24	41
Unvegetated Sediments	Unvegetated Exposed Gravel/Cobble	30	4	34	Unvegetated Terrain	Exposed Cobble and Coarse Gravel	4	0	4
					Raised Beach	Raised Beach Cobble	27	4	31
	Unvegetated Exposed Silt/Sand/Gravel	21	6	27	Unvegetated Terrain	Exposed Silt, Sand and Fine Gravel	21	6	27
						Exposed Marine Sediment	N/A		

Note:
Land Cover and Ecosite classes and groups follow Izok (CASLYS 2013; MMG 2013a)

5.1.3.2 Vascular Species Richness and Frequency by Ecosite

Mean vascular species richness, including vascular plants identified to the taxa and species levels, recorded during the 2024 vegetation field program, ranged from a mean of 10.0 in the Raised Beach Cobble ecosite to a mean of 1.0 in the Bedrock Association ecosite (Table 5.6). The total number of taxa and species detected per ecosite ranged from a high of 12.0 in the Heath Tundra ecosite to a low of 1.0 in the Bedrock Association ecosite. These results are influenced by sample size, and only a single ground plot was surveyed in each of the Raised Beach Cobble and Bedrock Association ecosites.

Table 5.6 Mean Vascular Species Richness by Ecosite

Ecosite Class Group	Ecosite Class	Number of Sites Surveyed	Total Species Detected	Species Richness			
				Mean	Maximum	Minimum	Standard Deviation[3]
Bedrock and Boulders	Bedrock Association	1	0	0	0	0	N/A
	Bedrock Cliffs	N/A					
	Boulder Field/Felsenmeer						
Esker/ Outwash Complex	Outwash Diverse	2	12	6.0	6.0	5.0	0
	Outwash Lichen Heath	N/A					
Heath Tundra	Cryoturbated Heath Tundra	1	7	7.0	7.0	7.0	N/A
	Graminoid Heath Tundra	2	16	9.0	12.0	6.0	3.0
	Heath Bedrock	4	13	6.3	9.0	3.0	2.2
	Heath Boulders	N/A					
	Heath Tundra	5	20	8.6	11.0	6.0	1.9
	Snowbank Community	0	-	-	-	-	-
Marine Sediment	Marine Heath Tundra	0	-	-	-	-	-
	Marine Low Shrub	3	19	8.3	10.0	6.0	1.7
	Marine Tussock Sedge	N/A					
Raised Beach	Raised Beach Cobble	1	10	10.0	10.0	10.0	N/A
	Raised Beach Lichen Heath	N/A					
Sedge	Non-tussock Sedge	2	8	5.0	7.0	3.0	2.0
	Tussock Sedge	3	10	5.7	7.0	3.0	1.9

Ecosite Class Group	Ecosite Class	Number of Sites Surveyed	Total Species Detected	Species Richness			
				Mean	Maximum	Minimum	Standard Deviation[3]
Shrub	Birch Seep	N/A					
	Low Shrub	5	14	5.6	6.0	5.0	0.5
	Riparian Tall Shrub						
	Riparian Willow	1	9	9.0	9.0	9.0	N/A
	Steep Shrub Slopes	N/A					
	Transitional Tall Shrub						
Small Patch Vegetation Communities	Coastal Vegetation Communities	2	4	3.0	4.0	2.0	1.0
Unvegetated Terrain	Exposed Cobble and Coarse Gravel	N/A					
	Exposed Marine Sediment						
	Exposed Silt, Sand, and Fine Gravel						

Notes:

Species richness includes species identified to genus (i.e. taxa).

“N/A” Indicates species richness data was not available for the ecosite.

The ten most frequently observed vascular plant species detected at the 67 2024 survey sites (32 ELC survey sites and 35 SOCC transects) during the vegetation field program are listed in Table 5.7. Frequency is expressed as the percentage of the 67 sites at which a species was detected.

Table 5.7 Most Frequently Occurring Vascular Plant Species (2024 Vegetation Field Program)

Scientific Name	Common Name	Number of Sites	Frequency (%)
Anthoxanthum monticola	alpine sweetgrass	30	44.8
Arctagrostis latifolia	wide-leaved polargrass	27	40.3
Betula nana	arctic dwarf birch	45	67.2
Cassiope tetragona	four-angled mountain heather	27	40.3
Empetrum nigrum	black crowberry	40	59.7
Rhododendron tomentosum	northern Labrador tea	45	67.2
Salix glauca	grey-leaved willow	44	65.7
Salix reticulata	net-veined willow	30	44.8
Vaccinium uliginosum	bog bilberry	39	58.2
Vaccinium vitis-idaea	mountain cranberry	43	64.2

5.2 Species of Conservation Concern

A search of the federal Species at Risk Public Registry identified one plant SAR known to occur within Nunavut, Porsild's bryum (*Haplodontium macrocarpum*). Porsild's bryum is listed as threatened under Schedule 1 of the federal SARA (GOC 2024c) and critically imperiled (S1) within Nunavut (Mulder 2024, pers. comm.). This rare moss species is presently known from 19 subpopulations in Canada, including three in Nunavut, located in Quttinirpaaq National Park of Canada on Northern Ellesmere Island (COSEWIC 2017). There are no known occurrences of vegetation SAR within the PDA, LAA, and RAA. A query of the Critical Habitat for Species at Risk National Dataset found no areas of critical habitat for plant SAR within the PDA, LAA, and RAA (GOC 2024b).

SOCC surveys were completed at 175 locations within the RAA and adjacent Izok Corridor Project regional study area. Of these, 136 locations were surveyed within the RAA (Table 5.8). Data from survey sites outside of the Project RAA have been included in this Baseline report, as they are considered representative of conditions within the RAA.

Forty-eight locations were surveyed for SOCC within the PDA, 64 within the LAA, beyond the PDA; and 24 within the RAA, beyond the LAA (Table 5.8). SOCC survey locations are presented in Map Book A.1 (Appendix A).

Table 5.8 SOCC Survey Site Summary

Survey Year(s)	Number of Sites Surveyed	Sites Outside of the Assessment Areas	Sites within the Assessment Areas[2]			
			PDA	LAA	RAA	Total
2004 – 2012[1]	140	39	23	54	24	**101**
2024	35	0	25	10	0	**35**
Total	**175**	**39**	**48**	**64**	**24**	**136**

Note:

1 SOCC survey site locations obtained from MMG (2013a) do not include survey years

2 Survey sites within the LAA are located outside of the PDA, and survey sites within the RAA are outside of the PDA and LAA.

A total of 69 SOCC were identified from field surveys, including 34 vascular plants (20 forbs, 8 graminoids, 6 shrubs), 32 bryophytes (28 mosses, 4 liverworts), and three lichens (Table 5.9; Appendix A, Map Book A.3). Subdivided by phenology, the 34 vascular plant species include 33 perennials and one annual. Occurrence data was collected for 39 of these species, as the remaining 30 species were not designated as SOCC in 2013. Three of the previously identified SOCC were also detected within the PDA during the 2024 vegetation field program: Pumpelly's brome (*Bromus pumpellianus*), beach pea (*Lathyrus japonicus*), and arctic dock (*Rumex arcticus*).

Sixty-eight of the observed SOCC are subnationally ranked, and three are nationally ranked SOCC (Table 5.9; Appendix E.2):

- wedge-leaved willow (*Salix sphenophylla*), which is nationally ranked as imperiled (N2) and is subnationally unranked (SNR)
- oval-leaved willow (*Salix ovalifolia*), which is nationally ranked as vulnerable (N3) and subnationally ranked as imperiled to vulnerable (S2S3)
- starwart chickweed (*Cerastium cerastoides*), nationally ranked as vulnerable to apparently secure (N3N4) and has been deemed unrankable (SU) by the Nunavut CDC

As detailed in Table 5.4, the SOCCs detected ranged in subnational and national rankings, which indicate various levels of potential vulnerability. Subnationally, SOCC rankings range from critically imperiled to imperiled (S1S2) to vulnerable to apparently secure (S3S4). Conservation rankings which include critically imperiled (S1/N1), imperiled (S2/N2), or possibly extirpated (SH) within their rankings, either as stand alone ranking or as part of a potential range of rank (e.g., S1S3), can be considered of particular sensitivity based on their risk of risk of extirpation within a region. As detailed in Table 3.1, S1/N1 and S2/N2 both indicated that the species is at risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors, with S1/N1 indicating very high risk, and S2/N2 indicating high risk (NatureServe 2025). The SH/NH indicates the species is possibly extirpated from the region. A total of 15 of the SOCC are ranked between S1S2 and S2S4, and one SOCC is ranked SH. Additionally, one SOCC is ranked as N2 nationally, but SNR subregionally (Table 5.9; Appendix E.2).

A total of 270 unique SOCC occurrences were recorded, including 65 within the PDA, 109 within the LAA, and 71 within the RAA (Appendix A, Map Book B.3). Within the PDA, 28 SOCC occurrences were observed within the Port Landside Infrastructure boundary and Aerodrome Infrastructure boundary. Pumpelly's brome was observed on steep gravelly slopes, exposed outwash channels, and creek banks with sandy to gravelly soils within the Port and Aerodrome PDA. Beach pea was largely restricted to coastal sites along the arctic coast, except for one occurrence found on a sandy slope within the Aerodrome PDA. Arctic dock was found in a variety of different habitats including riparian willow, low shrub, heath tundra, graminoid wetland margins, and wet depressions throughout the Port PDA.

Plant SAR were not detected.

Table 5.9 Number of SOCC Detected by National and Subnational Rank

Subnational Rank[1]	National Rank[2]	Number of Species Detected				
		Vascular	Bryophyte	Lichen	Subtotal	Total
S1S2	N4	--	1	--	**1**	**2**
	NU	--	1	--	**1**	
S1S3	N4	--	1	--	1	**5**
	N5	--	3	--	**3**	
	NU	--	1	--	1	
S2	N5	2	3	--	**5**	**5**
S2S3	N3	1	--	--	**1**	**1**
S2S4	N5	--	1	--	**1**	**2**
	NU	--	1	--	**1**	
S3	N4	4	--	--	**4**	**28**
	N4N5	--	1	--	**1**	
	N5	19	4	--	**23**	
S3S4	N4	--	1	--	**1**	**20**
	N4N5	--	2	--	**2**	
	N5	3	11	3	**17**	
SH	N4N5	1	--	--	**1**	**4**
	N5	3	--	--	**3**	
SNR	N2	1	--	--	**1**	**1**
SU	N3N4	1	--	--	**1**	**1**
	Total	35	31	**3**	**69**	**69**

Notes:

[1] Subnational ranks: S3 – vulnerable; S3S4 – vulnerable to apparently secure (Master et al. 2012)

[2] National ranks: N5 – secure (Master et al. 2012)

5.3 Non-Native and Invasive Plant Species

One non-native plant species, common dandelion (*Taraxacum officinale*), was identified during the historical vegetation assessments (MMG 2013a). Non-native plant species were not detected during the 2024 field surveys.

Common dandelion is considered an exotic species by the Nunavut CDC (Mulder 2024, pers. comm). This perennial herb rapidly colonizes both naturally and anthropogenically disturbed upland sites, including roadsides in the Southern Arctic ecozone (Porsild and Cody 1980; Stewart-Wade et al. 2002). Common dandelion is considered invasive within Alaska, where it is known to compete with native plants for moisture, nutrients, and sunlight while potentially altering their pollination ecologies (Klein 2011). It may also impact the natural succession processes of plant communities by changing the density of existing herbaceous vegetation layers or by forming a new herbaceous vegetation layer on exposed mineral soil. Based on its known habitat preferences and distribution, common dandelion may act as an invasive species in disturbed sites within the PDA.

6 Closing

This Baseline report evaluated baseline vegetation characteristics within the PDA, LAA, and RAA for the Project. Studies in support of the Baseline report included land cover mapping, and desktop and field evaluation of land cover, ELC and SOCC. Data from studies previously completed for the Izok Corridor Project (MMG 2013b) overlap the RAA and were incorporated into the Baseline report.

The land cover mapping identified 15 land cover classes, which included 12 natural land cover classes, one anthropogenic land cover class (Mine Sites), and two environmental land cover classes related to obscured land cover (i.e., snow and shadow). Within the RAA, Heath Bedrock/Boulders, Boulder/Bedrock, Water, and Heath Tundra were the most abundant land cover classes. Within the LAA, the most abundant land cover classes were Heath Tundra, Tussock Sedge, Heath Bedrock/Boulders, and Water (Table 5.1).

A total of 536 land cover and ELC survey sites were completed, with 344 occurring within the Project RAA. Specifically, 38 locations were surveyed within the PDA, 102 within the LAA, and 204 within the RAA (Table 5.3). Graminoid and shrub dominated land cover classes and ecosites generally had the highest vegetation cover (e.g., Graminoid Heath Tundra, Low Shrub ecosites), while ecosites and land cover classes occurring in areas with high amounts of rock cover or exposed sediments had lower vegetation cover, but often had higher non-vascular cover (e.g., Raised Beach Cobble and Bedrock Cliffs ecosites).

A total of 501 plant taxa and species were observed during the ELC and SOCC surveys (Appendix E.1). Low Shrub and Heath Tundra ecosites had the highest number of observed taxa and species. Exposed sediments, ecosites, and land cover classes generally had the lowest number of observed taxa and species (Table 5.4). A total of 175 locations were surveyed for SOCC, with 136 occurring within the Project RAA. No plant SAR were detected, or have potential habitat within the Project RAA. Sixty-nine SOCC were observed, with 307 unique SOCC occurrences in the Project RAA, including 35 vascular, 31 bryophyte, and 3 lichen species (Table 5.9, Appendix E.2). Sixty-six SOCC are ranked subnationally only (i.e., from the Nunavut CDC), two are ranked subnationally and nationally, and one is only ranked nationally (Appendix E.2). SOCC ranks ranged from critically imperiled to imperiled (S1S2) to imperiled to vulnerable (S2S4). During the Izok Corridor Project studies (MMG 2013b) one exotic plant species was detected (common dandelion), all other observed plant species are considered native in Nunavut, or if unranked in Nunavut, are considered native in Canada.

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7.2 Personal Communications

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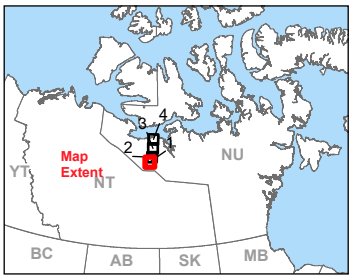
Appendix A Map Books



Land Cover

- Boulder / Bedrock
- Unvegetated Exposed Gravel / Cobble
- Exposed Silt Sand
- Heath Cryoturbated
- Heath Graminoid
- Heath Bedrock / Boulder
- Heath Tundra
- Mine Sites
- Non-Tussock Sedge
- Shrub
- Snow
- Tussock Sedge
- Water
- Local Assessment Area (LAA)
- Regional Assessment Area (RAA)
- Grays Bay Road
- Grays Bay Winter Road
- Tibbitt to Contwoyto Winter Road
- Watercourse
- Ocean
- Waterbody

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NUNAMI

WEST KITIKMEOT RESOURCES CORP

Notes

1. Coordinate System: WGS 1984 UTM Zone 12N
2. Data Sources: Governments of Nunavut and Canada, Stantec, MMG

Project Location
Kitikmeot Region, Nunavut

Prepared by DSPRY on 2026-02-03
TR by SL on 2026-02-03

Client/Project
123514868_088

West Kitikmeot Resources Corp
Grays Bay Road and Port

Figure No.
A.1

Title
Landcover Classification within the Regional Assessment Area

Revised: 2026-02-04 By: dcspry

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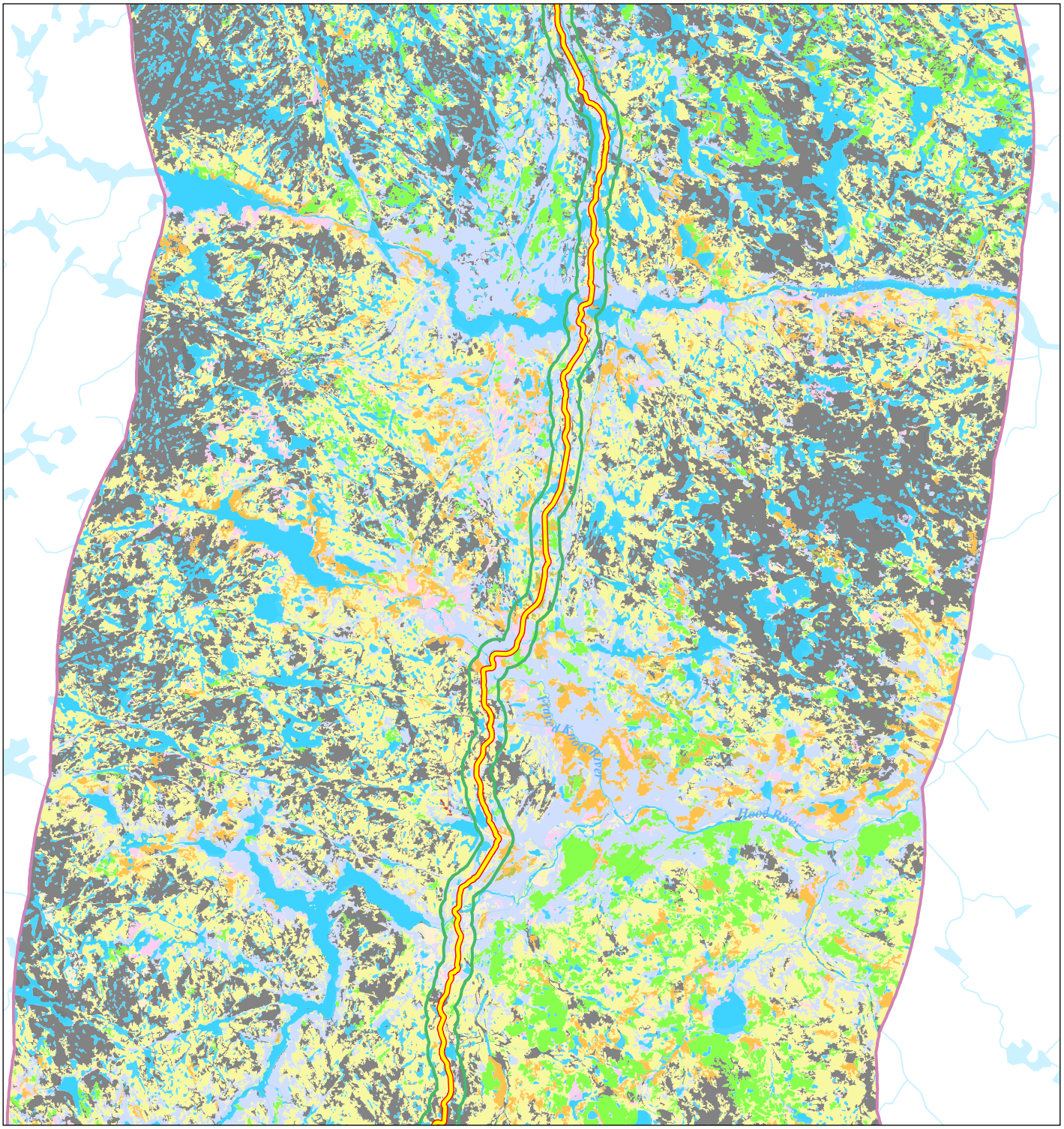

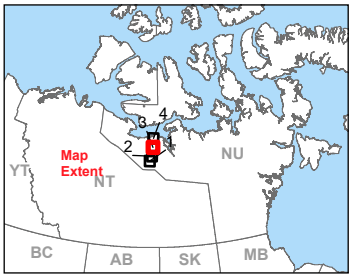

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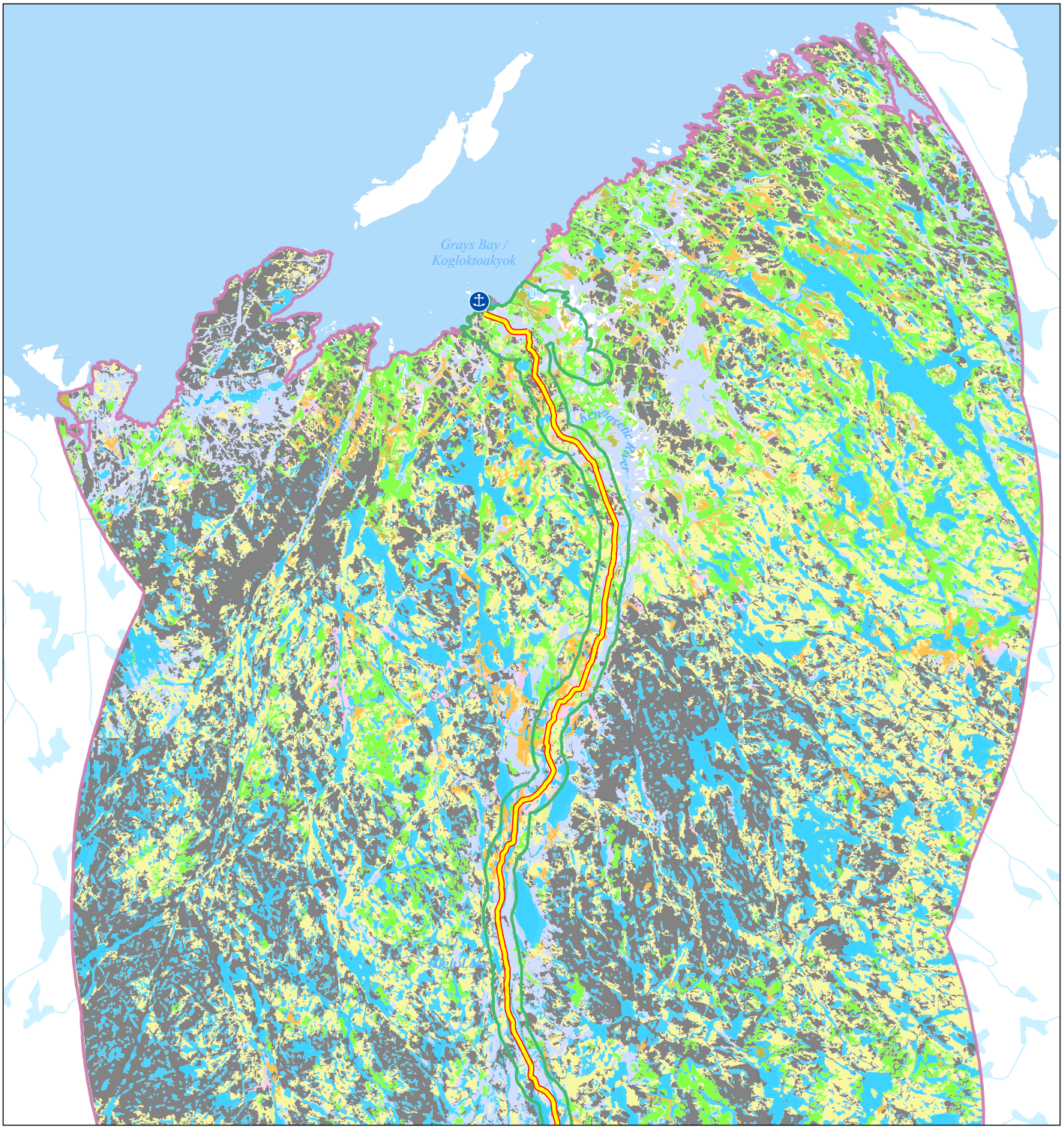

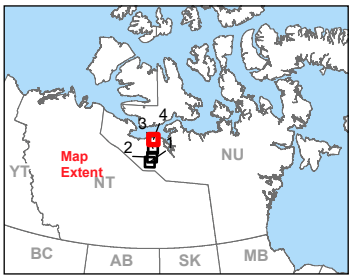

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