

**FINAL  
REPORT ON**

**BASELINE VEGETATION AND PLANT COMMUNITIES  
FOR THE PROPOSED  
NICO PROJECT**

**Submitted to:**

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# **1 INTRODUCTION**

## **1.1 LOCATION**

Fortune Minerals Limited (Fortune) is proposing to develop the NICO Cobalt-Gold-Bismuth-Copper Project (Project), in the Northwest Territories (NWT). The Project is located within the Marian River drainage basin, approximately 10 kilometres (km) east of Hislop Lake at a latitude of 63°33' North and a longitude of 116°45' West (Figure 1.1-1). The area is located within the Taiga Shield and Taiga Plains Ecozones (Environment Canada 2005). The Project site is about 50 km northeast of the nearest community, Whatì, and 160 km northwest of Yellowknife.

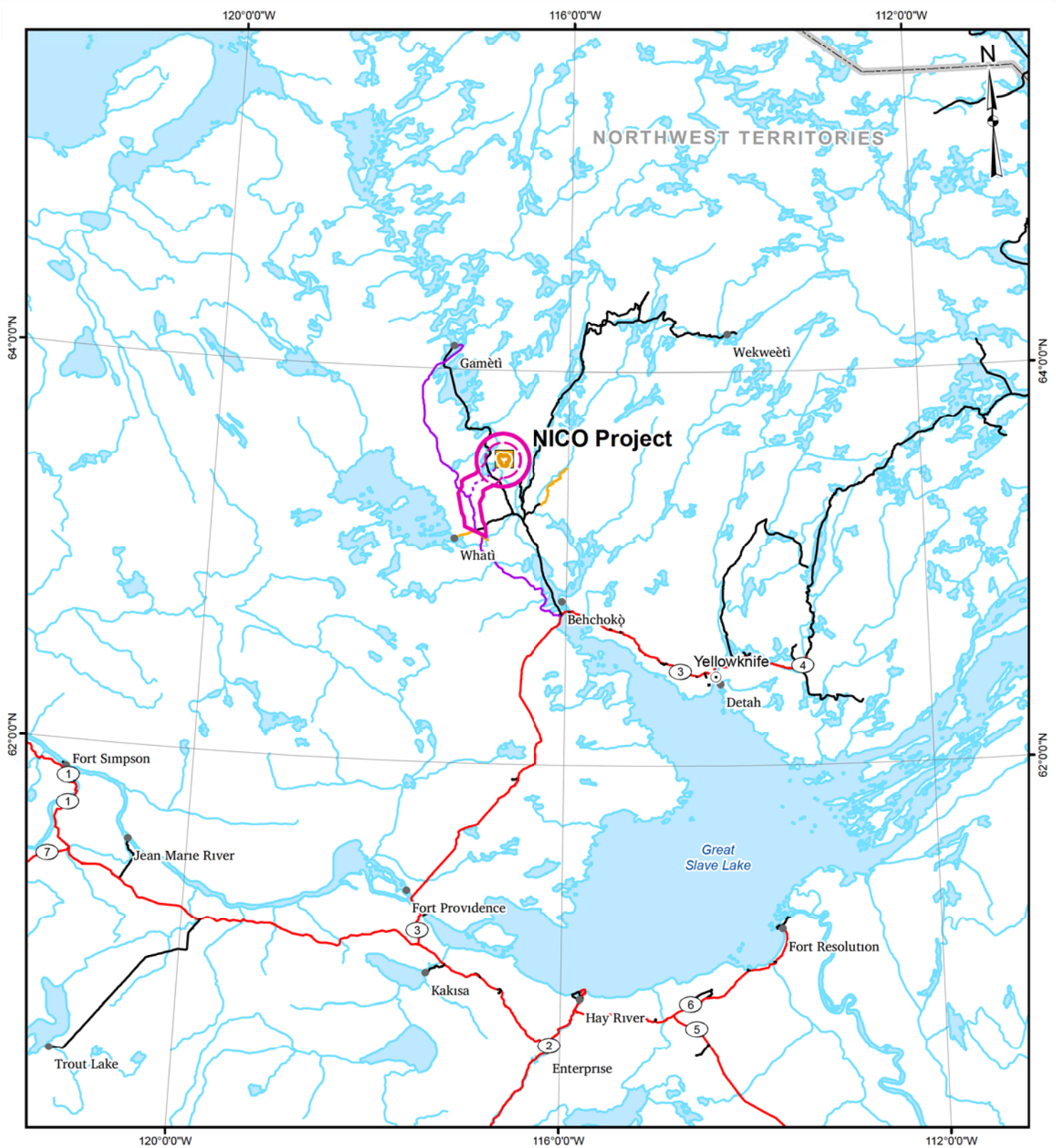
The vegetation and plant communities baseline is one component of the comprehensive environmental and socio-economic baseline program for the Project. The vegetation and plant communities baseline report presents mapping and vegetation analysis results from the local and regional areas.

## **1.2 BACKGROUND**

Mapping and vegetation field studies for the Project were carried out from 2003 to 2008. This work focused on characterizing the distribution and diversity of habitats and plant species that may be affected by the Project. Baseline studies included aerial reconnaissance vegetation surveys, rare plant surveys, and detailed vegetation inventory surveys.

Aerial reconnaissance vegetation surveys were completed in 2003 to 2006. Rare plant surveys were carried out in 2004 and 2005. Detailed vegetation inventory surveys were carried out in 2006 and 2008. A baseline terrestrial report summarizing the results of data collected over the period 2003 to 2005 for the Fortune Mineral NICO Project was completed in 2006 (Fortune 2006). Results presented in that report and the data collected more recently have been merged into this report as appropriate.

Vegetation studies were conducted to provide adequate baseline data on vegetation and plant communities to complete a Developers Assessment Report (DAR) for the Project. To achieve this purpose, the objectives of this baseline study were to:



# LEGEND

- |  |                                     |  |                                    |
|--|-------------------------------------|--|------------------------------------|
|  | NICO PROJECT                        |  | WATERCOURSE                        |
|  | TERRITORIAL CAPITAL                 |  | WATERBODY                          |
|  | POPULATED PLACE                     |  | LOCAL STUDY AREA                   |
|  | HIGHWAY                             |  | REGIONAL STUDY AREA (2003-2006)    |
|  | EXISTING ALL-WEATHER ROAD           |  | REGIONAL STUDY AREA (2007-PRESENT) |
|  | EXISTING WINTER ROAD                |  |                                    |
|  | PROPOSED ALL-LAND WINTER ROAD ROUTE |  |                                    |
|  | PROPOSED NICO PROJECT ACCESS ROAD   |  |                                    |
|  | TERRITORIAL/PROVINCIAL BOUNDARY     |  |                                    |

## REFERENCE

Base data obtained from Atlas of Canada, DMTI and ESRI.  
Projection: Canada Lambert Conformal Conic

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SCALE 1:3,000,000 KILOMETRES

PROJECT FORTUNE MINERALS LIMITED  
NICO DEVELOPERS ASSESSMENT REPORT

TITLE LOCATION OF THE NICO PROJECT



FILE NO. B-Veg-001-GIS			
PROJECT NO.	08-1373-0017	SCALE AS SHOWN	REV. 0
DESIGN	JK 04 Dec. 2008	FIGURE: 1.1-1	
GIS	CW 06 May 2010		
CHECK	LY 17 Nov. 2010		
REVIEW	GA 17 Nov. 2010		

- collect vegetation and plant community data within the local and regional study areas (LSA and RSA, respectively);
- define and map ecosystems within the study areas following standard Ecological Landscape Classification (ELC) conventions;
- identify and report on valued components (VCs);
- map and describe occurrences of rare plants within the study areas; and
- characterize the diversity of plant species within the region.

To meet these objectives, the vegetation and plant communities baseline report has been organized into the following sections:

- Section 1.3 provides the criteria and precedent for using an ELC to map and characterize the major land cover classes within the study areas.
- Section 1.4 provides the criteria used in the selection of valued components.
- Section 1.5 provides the criteria used in defining the spatial extents of the local and regional study areas.
- Section 2 provides the methods used in collecting and analyzing the vegetation and plant community data.
- Section 3 provides the results of local and regional land cover mapping, vegetation field programs, plant species diversity analysis, and valued component evaluations.
- Section 4 provides a summary of the methods and results presented in Sections 2 and 3.

### **1.3 ECOLOGICAL LANDSCAPE CLASSIFICATION**

An Ecological Landscape Classification (ELC) system was used to define and map land cover units that are identifiable on the ground and from remote sources (e.g., satellite imagery). Using an ELC approach, baseline land cover was mapped for local and regional study areas.

An ELC is a standardized ecological mapping process that involves the systematic treatment of ecological information about vegetation and plant communities within a given geographic area (Sims et al. 1996). Generally, ELC mapping is often undertaken as a part of an environmental impact assessment, as it provides a means of relating vegetation conditions with other critical resources such as soils and wildlife, and biodiversity (Treweek 1999). An ELC can also be used in the process of evaluating the effects of proposed mining developments (IUCN and ICM 2003).

Early vegetation studies were completed in the NWT by Larsen (1971) and Bradley et al. (1982). Larsen (1971) sampled vegetation from high boreal forest, tundra, and the forest-tundra transition zone in the area from Great Slave Lake north to Artillery Lake. He classified a number of broad forest and tundra plant communities, and described related soil and site conditions. Bradley et al. (1982) completed an ecological land survey of the Lockhart River map area, an area that extends from MacKay Lake in the northwest to Selwyn Lake in the southeast. Based on their field investigations, these authors identified and described a range of plant communities and related environmental conditions. Information from these studies was later used by other investigators who carried out ELC mapping.

Several recent ELC investigations have been completed northeast of Yellowknife where minerals and diamond exploration and mining are being completed. These investigations provide an example of the type of descriptive and spatial information an ELC provides. Table 1.3-1 provides a summary of ELC studies completed since 1995 in the general vicinity of the Project.

**Table 1.3-1 Recent Ecological Landscape Classification Studies Near the NICO Project**

Project	Description	Reference
Ekati Mine NWT Diamonds Project	new description and classification of 12 detailed ecosystem types	Rescan Environmental Consultants Ltd. (1995)
Ekati Mine – Sable, Pigeon and Beartooth Mines	1:20 000 scale ecosystem mapping completed for the LSA around the Ekati Diamond Mine	BHP Billiton Diamonds Inc. (1995, 1999, 2000)
West Kitikmeot/Slave Province Final Report	broad mapping of land cover units using Landsat TM	Matthews et al. (2001)
Snap Lake Project	mapping of vegetation classes using Landsat TM; same methods and mapping units as Matthews et al. (2001) plus 4 new vegetation units	De Beers Canada Inc. (2002)
Tibbitt-to-Contwoyto Winter Road	1:3500 scale ecosystem mapping of the portages for the Tibbitt-to-Contwoyto winter road corridor; identified and mapped 18 ecosystem types based on field data and in part adapted from the above studies	EBA Engineering Consultants Ltd. (2002)

NWT = Northwest Territories; TM= thematic mapper

## 1.4 SELECTION OF VALUED COMPONENTS

Valued components (VCs) represent physical, biological, cultural, social, and economic properties of the environment that are considered important to society. Five vegetation VCs were selected for detailed study in the baseline report. Valued component selection was based on the following criteria:

- associations or species that reflect the interests of regulatory agencies First Nations groups, communities, and other people interested in the Project;
- ecological, social, cultural, and economic aspects of the ecosystem;
- territorial (Government of Northwest Territories [GNWT] 2010) and federal listed (i.e., Committee on the Status of Endangered Wildlife in Canada [COSEWIC] 2009; Species at Risk Act [SARA] 2009) species; and
- current experience with environmental assessments and effects monitoring programs in the NWT and Nunavut (e.g., Diavik Diamond Mine, Ekati Diamond Mine, Snap Lake Mine, Gahcho Kué Project, Doris North Gold Mine Project, and Jericho Diamond Project).

The selected VCs consisted of plant species of interest, land cover classes (i.e., ELCs), and community-level biodiversity metrics. The rationale for each VC is provided in Table 1.4-1.

**Table 1.4-1 Valued Components Selected for Detailed Evaluation within the Study Areas**

Valued Component	Rationale for Selection
Plant populations and communities (ecological land cover types)	ecological land cover classes, especially those with restricted distribution that may be disproportionately affected by Project activities
Traditional use plants	plants used in the NWT primarily by aboriginal persons, including edible plants, medicinal plants, and plants used for construction or other purposes
Economic use plants	harvestable timber
Listed (rare) plants	plant species of the NWT listed as rare ("At Risk", "May be at Risk", "Sensitive" or "Undetermined") <sup>a</sup> ; therefore, may be disproportionately affected by Project activities
Rare plant habitat potential	habitat with the potential to support rare plant species of the NWT
Regional-scale biodiversity	important for support of ecosystem processes and services, ecosystem resiliency and spiritual and aesthetic values

<sup>a</sup> Status is based on GNWT 2010 and COSEWIC 2009.

## 1.5 SPATIAL BOUNDARIES

The Project is within the Marian River drainage basin and is located within the Taiga Shield and Taiga Plains Ecoregions (Ecosystem Classification Working Group 2007, 2008). To facilitate the assessment and interpretation of potential effects associated with the Project, it is necessary to define appropriate spatial boundaries. Spatial boundaries were developed with consideration of all

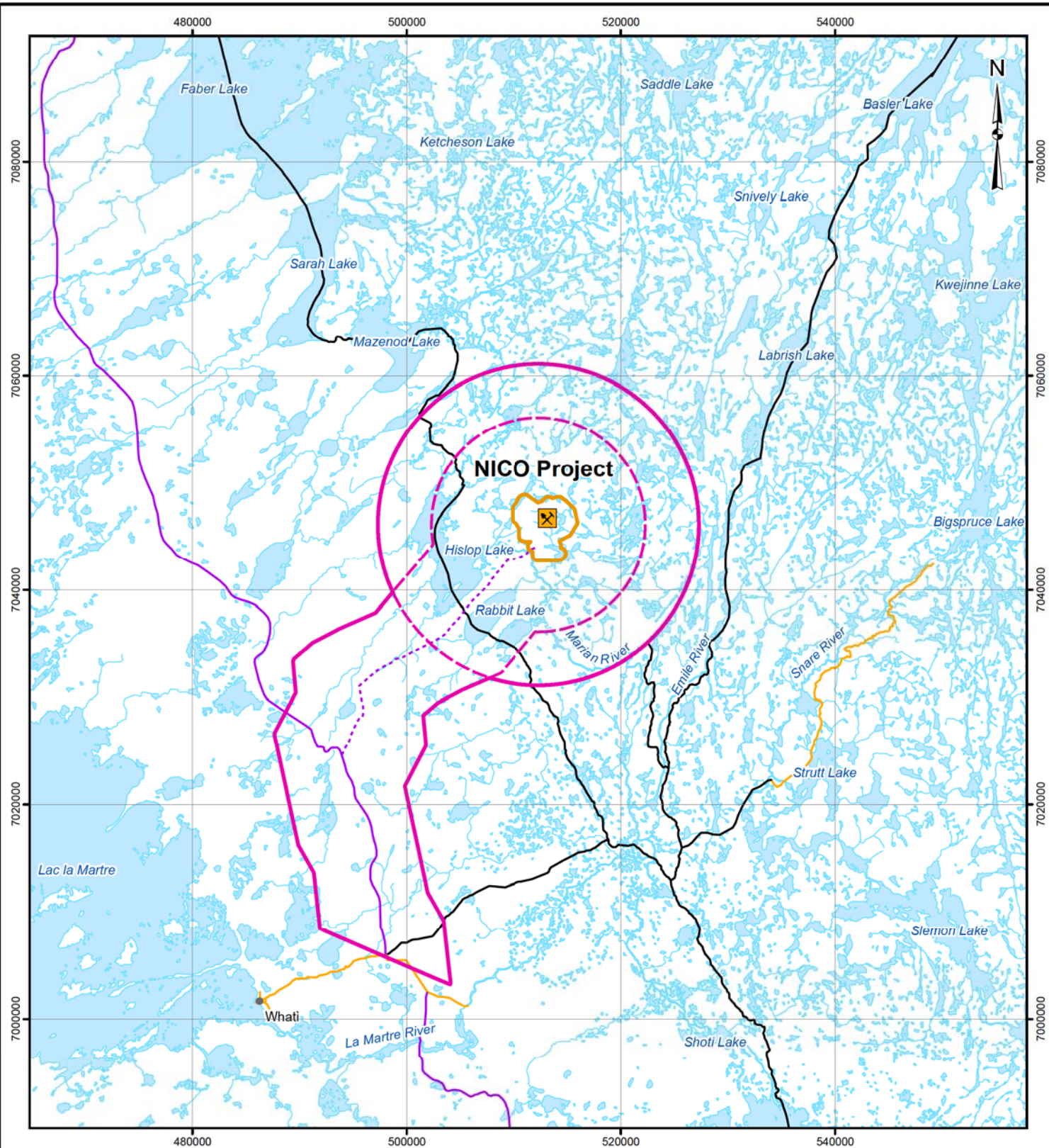
terrestrial components (i.e., soil and terrain, terrestrial vegetation and wetlands, wildlife, and biodiversity).

Vegetation and plant community baseline studies were completed within the following spatial boundaries:

- RSA for the proposed mine site (i.e., mine RSA);
- RSA for the Proposed NICO Project Access Road (NPAR RSA); and
- LSA for the anticipated mine site (i.e., LSA).

The RSAs (Figure 1.5-1) were selected to capture any effects that may extend beyond 1 km from the Project, and to assess potential cumulative effects to vegetation in the broader regional area. The LSA (Figure 1.5-1) was selected to assess the immediate direct and indirect effects of the Project on vegetation and plant communities.





# LEGEND

- |  |                                     |  |                                    |
|--|-------------------------------------|--|------------------------------------|
|  | NICO PROJECT                        |  | LOCAL STUDY AREA                   |
|  | POPULATED PLACE                     |  | REGIONAL STUDY AREA (2003-2006)    |
|  | EXISTING ALL-WEATHER ROAD           |  | REGIONAL STUDY AREA (2007-PRESENT) |
|  | EXISTING WINTER ROAD                |  |                                    |
|  | PROPOSED ALL-LAND WINTER ROAD ROUTE |  |                                    |
|  | PROPOSED NICO PROJECT ACCESS ROAD   |  |                                    |
|  | WATERCOURSE                         |  |                                    |
|  | WATERBODY                           |  |                                    |

## REFERENCE

Base data obtained from Atlas of Canada, DMTI and GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

10 0 10  
SCALE 1:500,000 KILOMETRES

PROJECT FORTUNE MINERALS LIMITED  
NICO DEVELOPERS ASSESSMENT REPORT

TITLE VEGETATION REGIONAL AND  
LOCAL STUDY AREAS



FILE NO. B-Veg-002-GIS			
PROJECT No.	08-1373-0017	SCALE AS SHOWN	REV. 0
DESIGN	JK 04 Dec. 2008	FIGURE: 1.5-1	
GIS	CW 06 May 2010		
CHECK	LY 17 Nov. 2010		
REVIEW	GA 17 Nov. 2010		

The methods for defining the mine and NPAR portions of the RSAs and LSA are described below. For vegetation and plant communities, the combined RSAs is 109 016 hectares (ha) and includes the mine RSA (70 686 ha) and NPAR RSA (38 330 ha), and the LSA is 2644 ha.

### 1.5.1 Regional Study Area (Proposed Mine)

The proposed mine RSA was defined to capture the large scale direct and indirect effects of the Project on vegetation and plant communities (Figure 1.5-1). In 2007, the RSA was increased from 314 square kilometres (km<sup>2</sup>) to 706 km<sup>2</sup> for terrestrial components (i.e., the radius was increased from 10 km to 15 km, centered on the proposed mine site) because of increased knowledge about the effects from disturbance on barren-ground and woodland caribou (Golder 2010a). For example, studies on the movements of woodland caribou in the boreal forest of Newfoundland near resource extraction industries indicated that caribou avoided mining activities, with avoidance distances of up to 4 km during the summer and 6 km during the late winter, pre-calving, and calving seasons (Weir et al. 2007). Based on this information, it is anticipated that the boundary of the RSA around the proposed mine and road should be large enough to contain exposure and reference areas to predict and monitor potential effects on terrestrial resources in this region.

The proposed mine RSA includes 2 Level II Ecoregions: Taiga Shield and Taiga Plains. The Taiga Shield Ecoregion is located northeast of Rabbit and Hislop lakes (Ecosystem Classification Working Group 2008), while the Taiga Plains Ecoregion covers the southwest portion of the RSA (Ecosystem Classification Working Group 2007).

The Taiga Shield High Boreal Level III Ecoregion is bedrock-dominated with jack pine and mixed spruce forests on rock outcrops. White spruce (*Picea glauca*) and trembling aspen (*Populus tremuloides*) stands are found in low areas with adequate nutrient and water supplies. Peat plateaus and shore and floating fens are scattered throughout the Ecoregion (Ecosystem Classification Working Group 2008).

The Taiga Plains Ecoregion is comprised of the Great Slave Uplands High Boreal and Central Great Bear Plains Low Subarctic Level III Ecoregions. The Great Slave Uplands region is dominated by low-growing open black spruce forests (*Picea mariana*), treed bogs, horizontal fens, and peat plateaus are dominant. Upland deciduous, mixedwood, and coniferous stands are found in elevated areas with better drainage (Ecosystem Classification Working Group 2007). The Central Great Bear Plains Ecoregion is dominated by closed to open mixed spruce forest with shrub, moss, and lichen understories or regenerating dwarf



birch. Pond and fen complexes are scattered throughout, while closed mixedwood, white spruce, and jack pine (*Pinus banksiana*) stands occupy rolling to ridged glacial flutings (Ecosystem Classification Working Group 2007).

### **1.5.2 Proposed NICO Project Access Road Study Area**

The Proposed NICO Project Access Road (NPAR) RSA was defined by the expected limit of direct and indirect effects from the NPAR on surrounding soil, vegetation, and wildlife. The proposed NPAR during baseline studies was a 50 km road that joins the Project to the existing all-weather access road east of Whatì. The NPAR distance has since been reduced to 27 km, however the original 50 km NPAR was evaluated during baseline analyses. The NPAR RSA was defined by a 6.5 km buffer surrounding the 50 km road alignment (Figure 1.2-1), based on a study by Cameron et al. (2005) that detected a reduced density of barren-ground caribou within 4 km of roads and pipelines.

The RSA for the NPAR contains soil, terrain, and vegetation typical of regional conditions. However, the NPAR RSA is located within the Taiga Plains Ecozone and tends to have a more subdued landscape characterized by level to gently rolling plains containing broad plateaus and lowlands. Hummocky morainal and glacial outwash deposits are common in this area and vegetation tends to be more heavily treed than the RSA and LSA for the anticipated mine.

### **1.5.3 Local Study Area**

The LSA was defined by the anticipated extent of direct (e.g., Project footprint) and indirect effects (e.g., air emissions) of the Project on soil, vegetation, wildlife, and wildlife habitat (Figure 1.5-1). The boundary is represented by a 500 metre (m) buffer around the Project lease boundary, and had previously included the proposed alignment for the NPAR. For vegetation data summaries, plot data in the LSA and along the proposed alignment of the NPAR have been compiled, analyzed and presented together.

The LSA contains habitat that is characteristic of regional soil conditions and vegetation that is typical of the Taiga Shield Ecoregion. Most plant community types are equally represented within the LSA and proposed mine RSA; however, coniferous spruce, treed fen, marsh/graminoid fen, and deep water habitats are more common within the proposed mine RSA than the LSA. Bedrock-open conifer habitat is more common within the LSA than the RSA.

## 2 METHODS

### 2.1 FIELD DATA COLLECTION

Aerial reconnaissance vegetation surveys were completed each year from 2003 through 2006 for ELC mapping purposes. Rare plant surveys were completed within the local and regional areas in July 2004 and August 2005 (Table 2.1-1). Detailed vegetation inventory surveys were completed in the local and regional study areas in July 2006 and August 2008.

Each survey consisted of a 2-person team led by an experienced vegetation ecologist. The timing of each survey aimed to meet the goals and objectives of the vegetation sampling program. Sites were accessed by helicopter and once on the ground accessed on foot. Detailed vegetation surveys were completed to obtain plant community information for each ELC type and to assess species diversity within the region.

**Table 2.1-1 Vegetation Surveys**

Survey Type	Survey Period				
	September 2003	July 2004	August 2005	July 2006	August 2008
Aerial reconnaissance vegetation survey	•	•	•	•	
Detailed vegetation survey				•	•
Rare plant survey		•	•		

#### 2.1.1 Aerial Reconnaissance Surveys

Landsat Thematic Mapper (TM) satellite imagery was collected for the RSAs on 24 July 2001. The imagery was evaluated prior to conducting field work to select training areas to be visited by vegetation and remote sensing specialists. The aerial reconnaissance survey was completed in September 2003 to verify a draft land cover classification. After this initial survey, a supervised vegetation classification of the imagery was undertaken using the field verification data collected from 132 sites. This initial classification was updated and finalized using field data collected during vegetation and wildlife surveys carried out between 2003 and 2006.

Land cover polygons in the LSA and along the NPAR were selected for sampling during an aerial reconnaissance survey completed in July 2006. IKONOS satellite imagery was obtained on 5 August 2006 and 21 August 2006 as this

higher resolution imagery was deemed more suitable for mapping at the local scale. This newer imagery was classified in a similar manner as described above.

## 2.1.2 Detailed Vegetation Inventory Surveys

Detailed vegetation inventory plots were established in 2006 and 2008 in the LSA and along the NPAR to obtain site-specific, descriptive information on the nature and characteristics of plant communities within the region. The data collected from these surveys were also used to classify and describe the ELC types.

The sampling strategy was designed to select a cross-section of land cover classes within the study areas, while taking size and distribution of the ELC types and access constraints into account. Plots were located along the proposed NPAR and mine site, and at different landscape positions to capture a broad range of communities.

Each detailed vegetation plot was established in a representative location within an ELC polygon. Plot sizes were based on methods described in the *Ecological Site Description Survey Manual* (Alberta Sustainable Resource Development [ASRD] 2003). A 10×10 m plot defined the boundary of the primary plot. Within this plot, species composition and percent cover of the understorey vegetation layers (e.g., tall shrub, low shrub, forb, grass, bryophyte, terrestrial lichen, and epiphyte layer) were recorded. Site characteristics were described within this plot. In certain circumstances, such as a narrow vegetation band alongside a waterbody, the plot shape was adjusted so that all areas within the plot had the same ecological conditions.

After defining and assessing the primary plot, a second 20×20 m tree canopy plot (where applicable) was established to estimate tree species composition and canopy cover (i.e., main and secondary canopies). The shape of this plot was adjusted where necessary. For example, a 10×40 m tree canopy plot may have been more appropriate for a narrowly shaped plant community alongside a stream.

Key administrative information recorded on the detailed vegetation inventory form included Project name and number, plot number, waypoint identifier, UTM co-ordinates, date, surveyor initials, and photo numbers.

Information collected on site characteristics included the following variables:

- ecosystem type;
- slope;

- aspect;
- successional status;
- surface expression;
- riparian subclass;
- flood hazard;
- disturbance subclass;
- surface shape;
- slope position;
- moisture regime;
- nutrient regime;
- surface substrate type and percent cover;
- landscape profile diagram; and
- comments.

Vegetation data included the following variables:

- vegetation strata height and percent cover;
- species composition;
- species percent cover;
- tree cores (for age);
- tree diameter at breast height (DBH); and
- comments.

### **2.1.3 Rare Plant Surveys**

Rare plant surveys were undertaken in July 2004 and August 2005 in the LSA and along the NPAR to search for and document occurrences of rare plants. Survey methods followed Alberta Native Plant Council (ANPC) guidelines for rare plant surveys (ANPC 2000) and Golder's Technical Procedure for Rare Plant and Rare Plant Community Surveys (Golder 2005).

Prior to conducting the field surveys, a list of rare and sensitive plant species with the potential to occur within the region was prepared using information presented in the Government of the Northwest Territories Species Monitoring Infobase website (GNWT 2010), *Species at Risk Act* (SARA 2009), and the

Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2009). Plants listed by the GNWT (2010) as “sensitive,” “may be at risk,” or “at risk” were included in this preliminary species list. No federally designated species were known to occur within the region (SARA 2009; COSEWIC 2009).

Additional information compiled for each species included the associated ecozone, habitats, and the Nature Conservancy element rank (if listed) (McJannert et al. 1995). The final list of rare plants with the potential to occur within the region is provided in Appendix I. Other reports reviewed include McJannet et al. (1993, 1995), Porsild and Cody (1980), and De Beers (2002). Prior to conducting field work, rare plant specimens were examined at the University of Calgary’s herbarium so that field staff would be familiar with their physical characteristics.

Rare plant surveys were completed within a wide range of plant communities. Greater effort was focused in habitat with the highest potential to support rare plant species. Within key communities, surveyors searched for rare plant species using a random meandering technique, focusing the search effort on microhabitats (e.g., pools, fallen logs, and habitat edges). The length of each “meander” varied according to the complexity and number of microhabitats present at each location.

General vegetation information was recorded at each rare plant survey site, including the following:

- plant community or wetlands type;
- moisture regime;
- landform class;
- aspect and slope;
- dominant tree, shrub, forb, grass, lichen, and moss species;
- percent cover of vegetation layers;
- forest seral stage; and
- location coordinates.

Plant species that could not be identified in the field were collected for later identification. Samples were only collected in cases where the collection removed less than 5% of the population. Species were identified using standard plant identification keys and consultation with expert botanists.

## 2.2 ECOLOGICAL LANDSCAPE CLASSIFICATION

Land cover classification sampling, analyses, and mapping conventions were followed to provide a broad-level inventory of habitats in the local and regional study areas. Ecological Landscape Classification types were defined and delineated following an analysis of field training sites as part of the supervised classifications carried out for both the LSA and RSA (i.e., proposed mine and NPAR RSAs). Subsequent field work was completed to provide detailed descriptions for each ELC type.

In the RSA, ELC polygons were generated using a set of standardized remote sensing analytical techniques applied to Landsat TM earth-observation satellite image data. For the LSA and along the proposed alignment for the NPAR, the same principles were applied, but the ELC system was based on finer-scale land cover units using IKONOS satellite imagery.

The ELC types mapped in the LSA and RSA are described in Table 2.2-1. A portion of the IKONOS image within the LSA was obscured by cloud, haze or shadow, and is reported as unclassified in this report. The 14 ELC types for the LSA and 11 ELC types for the RSAs can be categorized into 6 main classes:

- uplands;
- wetlands;
- miscellaneous vegetation;
- non-vegetated;
- disturbances; and
- unclassified.

**Table 2.2-1 Ecological Landscape Classification Types in the Local and Regional Study Areas**

Map Code	Ecological Landscape Classification Type	LSA	RSA
<b>Uplands</b>			
UBC	Bedrock open conifer	•	•
UCP	Coniferous pine	•	•
UCS	Coniferous spruce	•	• <sup>a</sup>
UDE	Deciduous aspen-paper birch	•	•
UMI	Mixedwood spruce-paper birch-aspen	•	not mapped
<b>Wetlands</b>			
WMF	Marsh/graminoid fen	•	•

**Table 2.2-1 Ecological Landscape Classification Types in the Local and Regional Study Areas (continued)**

Map Code	Ecological Landscape Classification Type	LSA	RSA
WOB	Open bog	•	•
WSH	Shrubland	•	•
WTB	Treed bog	•	•
WTF	Treed fen	•	•
<b>Miscellaneous Vegetation</b>			
BUR	Burn	•	•
<b>Non-vegetated</b>			
WAT	Water	•	•
<b>Disturbance</b>			
DIS	Disturbance	•	not mapped
<b>Unclassified</b>			
UNC	Unclassified (cloud, haze and shadow)	•	not present

<sup>a</sup> The UCS class in the RSA includes mixedwoods, which have been separated at the LSA scale into the UMI class.  
ELC = Ecological Landscape Classification.

Names for each ELC type were defined according to the dominant species and/or key habitat characteristic. The naming conventions for the LSA and RSA ELC types are the same except for a few notable differences:

- disturbances could not be mapped for the RSA due to the coarse-scale Landsat TM imagery;
- cloud, haze, and shadow were not present in the satellite imagery at the RSA scale; and
- the mixedwood spruce-paper birch-aspen ELC type could not be differentiated at the RSA scale; therefore, these stands are included in the coniferous spruce class in the RSA classification.

## 2.2.1 Regional Study Area

A regional ELC was developed to provide information on the relative abundance of land cover classes within the RSA (i.e., proposed mine and NPAR RSAs). Image classification is a method of automatically categorizing all pixels in an image. The RSA land cover classification for this report used up-to-date satellite imagery and classification methods as follows:

- LANDSAT 5 satellite spectral imagery with a 28×28 m pixel size;
- cloud-free coverage; and

- images captured on 24 July 2001.

The resolution of the imagery (i.e., pixel size) was appropriate for a regional-level land cover classification as it strikes a balance between computer processing time and resolution. The imagery was also cloud-free and captured during the summer, resulting in a high-quality image. Quality control measures were implemented so that the imagery was correctly geo-referenced within the RSA. The imagery was loaded into remote sensing software for the classification process.

Training sites were selected to capture the range of variation in the reflectance values or spectral signature for each ELC type. These sites were classified to the appropriate land cover class during aerial reconnaissance surveys. These field-validated observation points were divided for use in both the classification and accuracy assessment for the study area.

Based on the spectral signatures and the field-validated observation points at the training sites, the remote sensing software assigned a best-fit classification to all pixels in the image. The process of selecting training sites and image classification was iterative and balanced the objectives of having as many meaningful land cover classes as possible with a reasonable level of accuracy. Once the classification was complete, polygons other than those used as training sites were compared against the classification for validation.

In the summer of 2008, a fire burned a portion the LSA and RSA. To update the ELC, a Landsat 7 image captured on 8 August 2008 was obtained. The burned area was classified and isolated from the rest of the imagery. The resulting burn polygon was used to update the ELC polygons.

## **2.2.2 Local Study Area**

The ELC map for the LSA was developed using IKONOS satellite imagery and geographic information system (GIS) to provide information on the relative abundance of land cover classes at the local scale. The same classification scheme and classification procedures developed for the RSA were used for the LSA so that there is consistency between the 2 areas (see Section 2.2.1)

## **2.3 TRADITIONAL USE PLANTS**

The Traditional Knowledge (TK) and Traditional Land Use (TLU) Baseline (Golder 2010b) describes the methods and results for the TK and TLU study



program. Relevant TK and TLU information collected as a part of this program has been incorporated into the Vegetation and Plant Communities Baseline.

## **2.4 RARE PLANTS**

A rare plant species is any native plant that, because of biological characteristics or for some other reason, exists in low numbers or in very restricted areas (Drury 1974; Rabinowitz 1981). By definition, rare plants have restricted spatial, ecological, and/or temporal distributions in variable or diverse environments (Harper 1981). Plant rarity is generally determined by 3 factors including geographic range, habitat specificity, and local population size (Argus and Pryer 1990; Given 1994).

The occurrence and potential of rare plants within the LSA and along the proposed alignment of the NPAR was determined through field surveys and assessing the rare plant habitat potential of ELC types. Both approaches are described below.

### **2.4.1 Rare Plant Occurrences**

For the purposes of the vegetation and plant community baseline, rare plant species of the NWT include the following:

- any plant species listed as rare (At Risk, May be at Risk, or Sensitive) in the NWT according to the NWT Species Monitoring Infobase (GNWT 2010);
- The Rare Vascular Plants in the Northwest Territories (McJannet et al. 1995); and
- plants listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2009) or listed on *Species at Risk Act* (SARA 2009).

Rare species are dynamic and change as new information becomes available or as the status of the population changes. Based on morphology, lifecycle, and habitat, each rare plant species with the potential to be found in the region was included in a reference list (Appendix I). Global ranking of these species were also included in the list. This ranking system is outlined in Table 2.4-1.

**Table 2.4-1 Ranking System for Rare Plants**

Global Rank	Rank Description and Concerns
G1	≤5 occurrences or only a few remaining individuals; may be especially vulnerable to extirpation because of some factor of its biology
G2	6 to 20 occurrences, or with many individuals in fewer occurrences; may be especially vulnerable to extirpation because of some factor of its biology
G3	21 to 100 occurrences; may be rare and local throughout its range, or in a restricted range (may be abundant in some locations), or may be vulnerable to extirpation because of some factor of its biology
G4	apparently secure under present conditions, typically >100 occurrences, but may be fewer with many large populations; may be rare in parts of its range, especially peripherally
G5	demonstrably secure under present conditions, >100 occurrences, may be rare in parts of its range, especially peripherally
GU	status uncertain often because of low search effort or cryptic nature of the element; possibly in peril, unable to rank, more information needed
G?	not yet ranked

Source: Adapted from the Nature Conservancy's global ranking system (McJannet et al. 1995; NatureServe 2009).

≤ = less than or equal to; > = greater than.

The general strategy of a rare plant survey attempts to maximize the probability of finding rare plants. However, at the time of sampling, plants may be at a stage of development that makes taxonomic identification difficult without flowers, fruit, or seeds. In addition, it is not possible to search all habitats completely. Hence, a rare plant survey cannot confirm the absence of rare plants; it can only confirm their presence.

## 2.4.2 Rare Plant Habitat Potential

The LSA was assessed for its potential to support rare plant habitat (Table 2.4-2). The approach incorporates field survey information and ELC mapping. Ecological Landscape Classification types within the LSA were assigned scores to reflect their rare plant habitat potential. Scores were assigned based on the relationships between rare plants and the habitat they are typically found (Hultén 1968; Porsild and Cody 1968, 1980; Anderson 1974; Douglas et al. 1981; McJannet et al. 1995; GNWT 2010). The scores were categorized into ranks and applied to the mapped ELC types.

**Table 2.4-2 Rare Plant Habitat Potential Rating System**

Ecological Landscape Classification Type	Potential Number of Rare Species	Ranking	Rare Plant Habitat Potential
Unclassified	n/a	n/a	n/a
Disturbed	7	1	low
Burn	8	1	low
Deciduous aspen paper birch	8	1	low
Mixedwood-spruce-paper birch-aspen	8	1	low
Treed fen	17	2	moderate
Coniferous spruce	20	2	moderate
Treed bog	21	2	moderate
Open bog	24	2	moderate
Bedrock Open Conifer	25	3	high
Coniferous pine	26	3	high
Watera	32	3	high
Shrubland	50	4	very high
Marsh/graminoid fen	57	4	very high

<sup>a</sup> Water generally represents deep water, which has a very low rare plant habitat potential. However, it is classed with a high rare plant habitat potential as it is also associated with shallow water (e.g., littoral zones) where a relatively high number of rare plants may be found.

ELC = Ecological Landscape Classification; n/a = not applicable.

Four categories of rare plant habitat potential were derived from a frequency histogram of the number of rare plant species per ELC type. The 4 categories are low (1), moderate (2), high (3), and very high (4) rare plant habitat potential (Table 2.4-2). There were no ELC types with less than 7 potential rare plants (except unclassified); thus, a very low potential category was excluded from the rating system. While this method includes a level of subjectivity in determining rankings, the scoring system does provide a reasonable basis to rate ELC types for their potential to support rare plants.

## 2.5 BIODIVERSITY

The vegetation data used in the biodiversity assessment were collected during the field surveys completed in 2005 to 2008. Species diversity was assessed for each ELC type based on the number and percentage of vascular species, the number of rare species, and the number of species unique to each ELC type. Two diversity indices (species richness and species evenness) were also calculated from the field data. Species richness is simply a count of the total number of species in a plot. Species evenness describes the relative abundance and distribution of species in an area. Calculated values range between 0 and 1, with higher values representing a more even distribution of species within a plot (Kent and Coker 1992).

## **3 RESULTS**

### **3.1 ECOLOGICAL LANDSCAPE CLASSIFICATION**

#### **3.1.1 Regional Study Area**

The RSA covers 109 016 ha and is classified into 11 ELC types (Table 3.1-1). Similar ELC types are identified for the LSA but the coarseness of the Landsat imagery did not allow for the identification of disturbances at the RSA scale. The resolution of the Landsat imagery also did not allow for distinguishing between the mixedwood spruce-paper birch-aspen class and the coniferous spruce class (Section 3.2). Consequently, the coniferous spruce class at the RSA scale includes some proportion of mixedwood stands. Cloud, haze, and shadow are not part of the RSA classification.

The mapped distribution of ELC types in the RSA is illustrated in Figure 3.1-1. Upland ELC types compose a majority (68%) of the RSA, with the coniferous spruce ELC type dominating the landscape at 55% of the RSA. Water occupies 14% of the RSA, while treed bog is the most prominent wetlands ELC type, occupying 5% of the RSA. Vegetation plots in the RSA are shown in Figure 3.1-2.

**Table 3.1-1 Total Area and Percent Cover of Ecological Landscape Classification Types in the Regional Study Area**

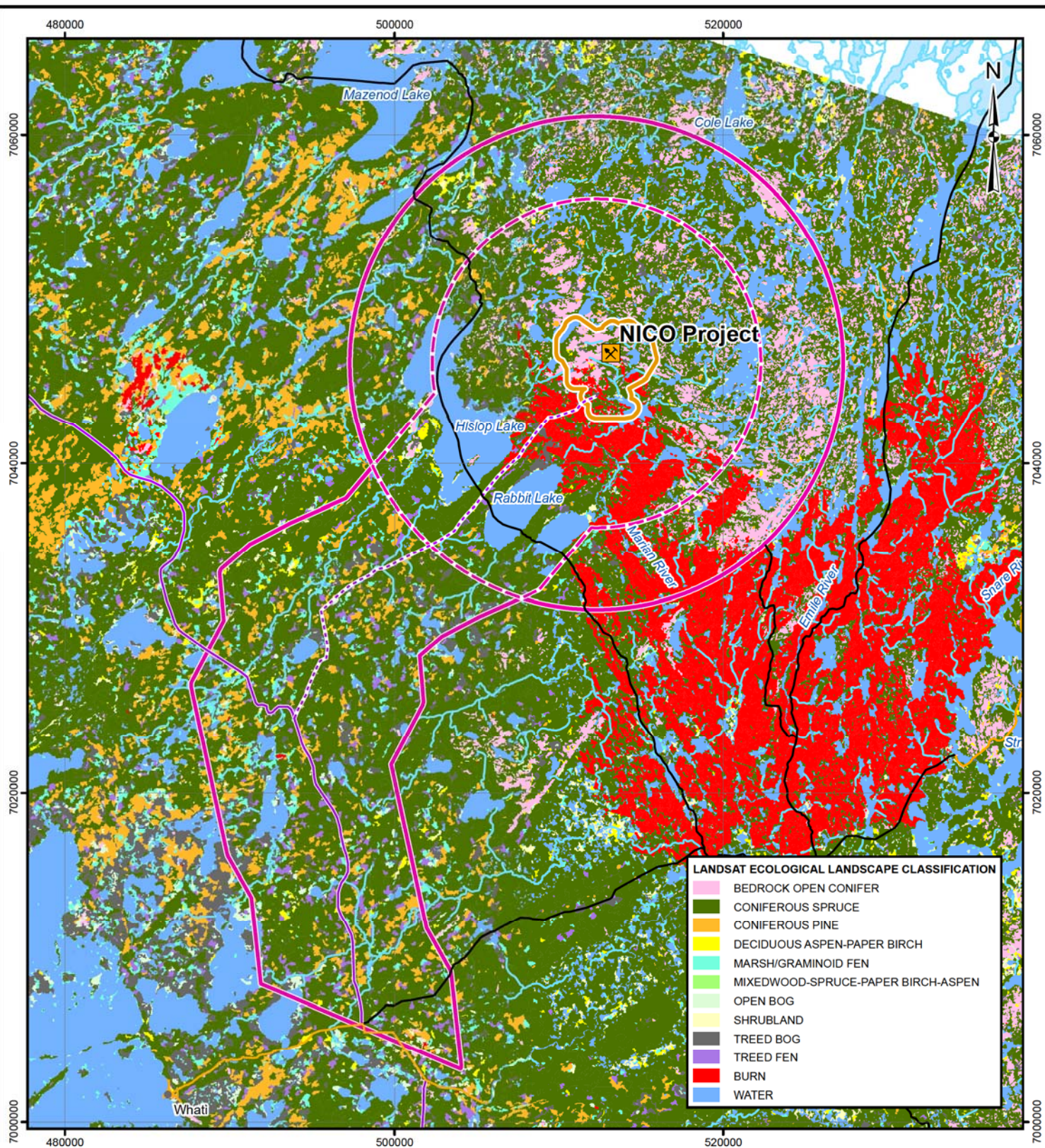
Map Code	Ecological Landscape Classification Types	Proposed Mine RSA		NPAR RSA		Total RSA		Average Polygon Size (ha)	Minimum Polygon Size (ha)	Maximum Polygon Size (ha)
		Area (ha)	%	Area (ha)	%	Area (ha)	%			
Uplands										
UBC	Bedrock open conifer	8773	12	119	<1	8892	8	4	<1	617
UCP	Coniferous pine	1194	2	3537	9	4730	4	6	<1	140
UCS	Coniferous spruce	34 804	49	25 091	65	59 896	55	42	<1	54 044
UDE	Deciduous aspen-paper birch	535	1	407	1	942	1	4	<1	68
uplands ELC types subtotal		45 306	64	29 154	76	74 460	68	14	<1	4044
Wetlands										
WMF	Marsh/graminoid fen	620	1	1782	5	2402	2	3	<1	77
WOB	Open bog	935	1	639	2	1574	1	2	<1	45
WSH	Shrubland	457	1	135	<1	592	1	3	<1	14
WTB	Treed bog	2442	3	2496	7	4939	5	4	<1	162
WTF	Treed fen	755	1	2003	5	2758	3	7	<1	42
wetlands ELC types subtotal		5209	7	7055	18	12 265	11	4	<1	162
Miscellaneous Vegetation										
BUR	Burn	6905	10	36	<1	6941	6	4	<1	538
miscellaneous ELC types subtotal		6905	10	36	<1	6941	6	4	<1	538
Non-vegetated										
WAT	Water	13 265	19	2086	5	15 350	14	13	<1	3433
non-vegetated ELC types subtotal		13 265	19	2086	5	15 350	14	13	<1	3433
Total		70 686	100	38 330	100	109 016	100	8	<1	4010

Note: Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

%= percent; < = less than; ha = hectare; NPAR = Proposed NICO Project Access Road; ELC = Ecological Landscape Classification; RSA = regional study area.



I:\CLIENTS\FORTUNE\_MINERAL\08-1373-0017\Mapping\MXD\Vegetation\B-Veg-008-GIS.mxd



LANDSAT ECOLOGICAL LANDSCAPE CLASSIFICATION	
<span style="display:inline-block; width:15px; height:15px; background-color:lightpink;"></span>	BEDROCK OPEN CONIFER
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	CONIFEROUS SPRUCE
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	CONIFEROUS PINE
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	DECIDUOUS ASPEN-PAPER BIRCH
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue;"></span>	MARSH/GRAMINOID FEN
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen;"></span>	MIXEDWOOD-SPRUCE-PAPER BIRCH-ASPEN
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	OPEN BOG
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	SHRUBLAND
<span style="display:inline-block; width:15px; height:15px; background-color:darkgrey;"></span>	TREED BOG
<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span>	TREED FEN
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	BURN
<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span>	WATER

#### LEGEND

- |  |                                     |  |                                    |
|--|-------------------------------------|--|------------------------------------|
|  | NICO PROJECT                        |  | REGIONAL STUDY AREA (2003-2006)    |
|  | POPULATED PLACE                     |  | REGIONAL STUDY AREA (2007-PRESENT) |
|  | EXISTING ALL-WEATHER ROAD           |  |                                    |
|  | EXISTING WINTER ROAD                |  |                                    |
|  | PROPOSED ALL-LAND WINTER ROAD ROUTE |  |                                    |
|  | PROPOSED NICO PROJECT ACCESS ROAD   |  |                                    |
|  | WATERCOURSE                         |  |                                    |
|  | WATERBODY                           |  |                                    |
|  | LOCAL STUDY AREA                    |  |                                    |

#### REFERENCE

Base data obtained from Atlas of Canada, DMTI and GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

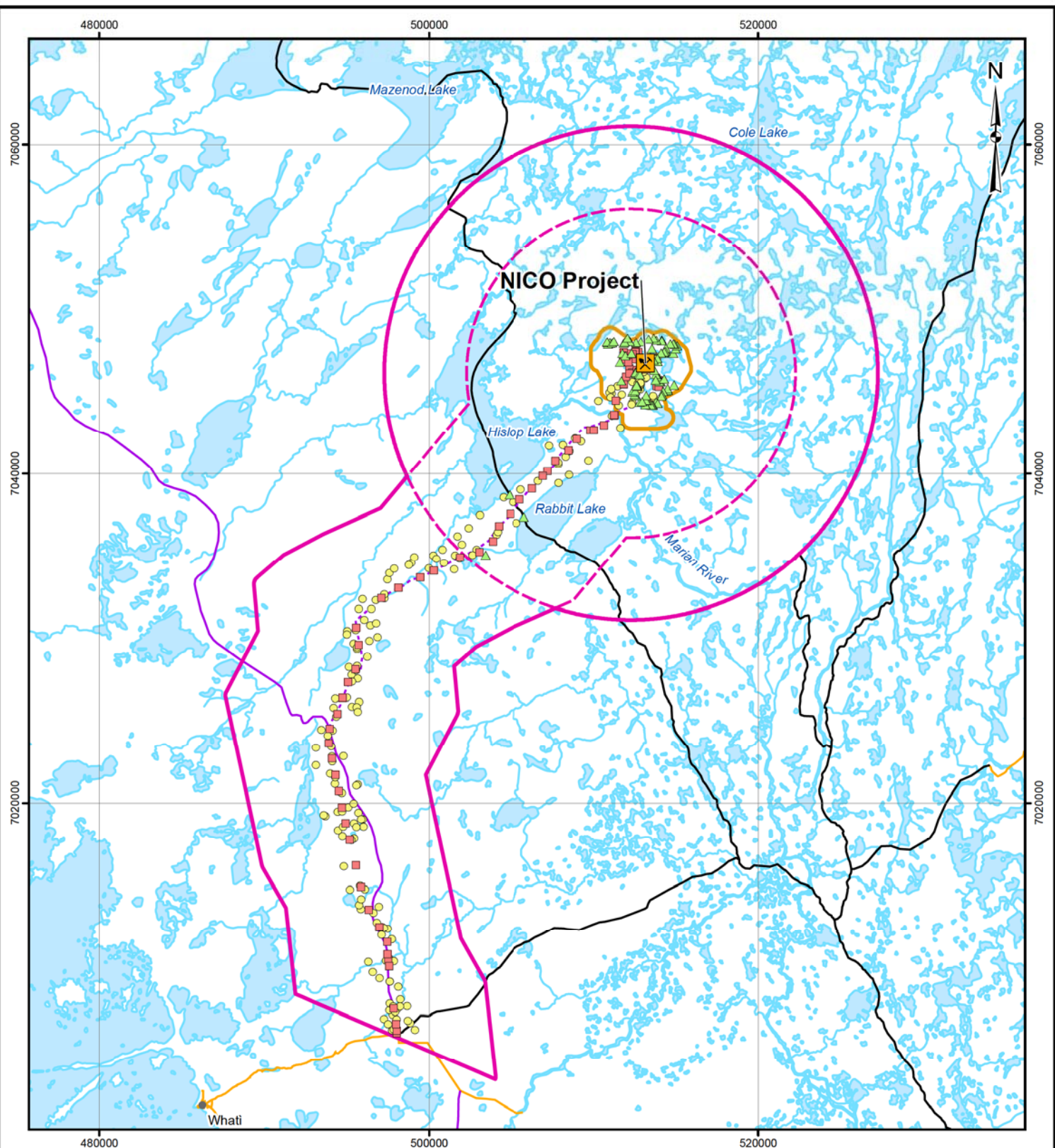
7.5 0 7.5  
SCALE 1:325,000 KILOMETRES

PROJECT		FORTUNE MINERALS LIMITED NICO DEVELOPERS ASSESSMENT REPORT		
TITLE		ECOLOGICAL LANDSCAPE CLASSIFICATION IN THE REGIONAL STUDY AREA		
		FILE NO. B-Veg-008-GIS		
		PROJECT No. 08-1373-0017	SCALE AS SHOWN	REV. 0
DESIGN	JK	04 Dec. 2008		
GIS	CW	06 May 2010		
CHECK	LY	17 Nov. 2010		
REVIEW	GA	17 Nov. 2010		



FIGURE: 3.1-1





# LEGEND

- |  |                                     |  |                                    |
|--|-------------------------------------|--|------------------------------------|
|  | NICO PROJECT                        |  | REGIONAL STUDY AREA (2003-2006)    |
|  | POPULATED PLACE                     |  | REGIONAL STUDY AREA (2007-PRESENT) |
|  | EXISTING ALL-WEATHER ROAD           |  | VEGETATION SURVEY PLOT - 2005      |
|  | EXISTING WINTER ROAD                |  | VEGETATION SURVEY PLOT - 2006      |
|  | PROPOSED ALL-LAND WINTER ROAD ROUTE |  | VEGETATION SURVEY PLOT - 2008      |
|  | PROPOSED NICO PROJECT ACCESS ROAD   |  |                                    |
|  | WATERCOURSE                         |  |                                    |
|  | WATERBODY                           |  |                                    |
|  | LOCAL STUDY AREA                    |  |                                    |

# REFERENCE

Base data obtained from Atlas of Canada, DMTI and GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

7.5 0 7.5  
SCALE 1:325,000 KILOMETRES

# PROJECT

FORTUNE MINERALS LIMITED  
NICO DEVELOPERS ASSESSMENT REPORT

# TITLE

VEGETATION SURVEY PLOTS  
IN THE REGIONAL STUDY AREA



FILE NO. B-Veg-005-GIS			
PROJECT No. 08-1373-0017		SCALE AS SHOWN	REV. 0
DESIGN	JK	04 Dec. 2008	
GIS	CW	06 May 2010	
CHECK	LY	17 Nov. 2010	
REVIEW	GA	17 Nov. 2010	

FIGURE: 3.1-2

## 3.1.2 Local Study Area

### 3.1.2.1 Ecological Landscape Classification Type Descriptions

In total, 139 ground plots (63 detailed vegetation plots and 76 rare plant survey sites) were sampled in the LSA and along the NPAR (Table 3.1-2). Locations of rare plant survey sites and detailed vegetation inventory plots within the LSA are shown in Figure 3.1-3. In addition to these survey locations, 215 aerial reconnaissance vegetation survey plots used for satellite image classification and ELC mapping were sampled.

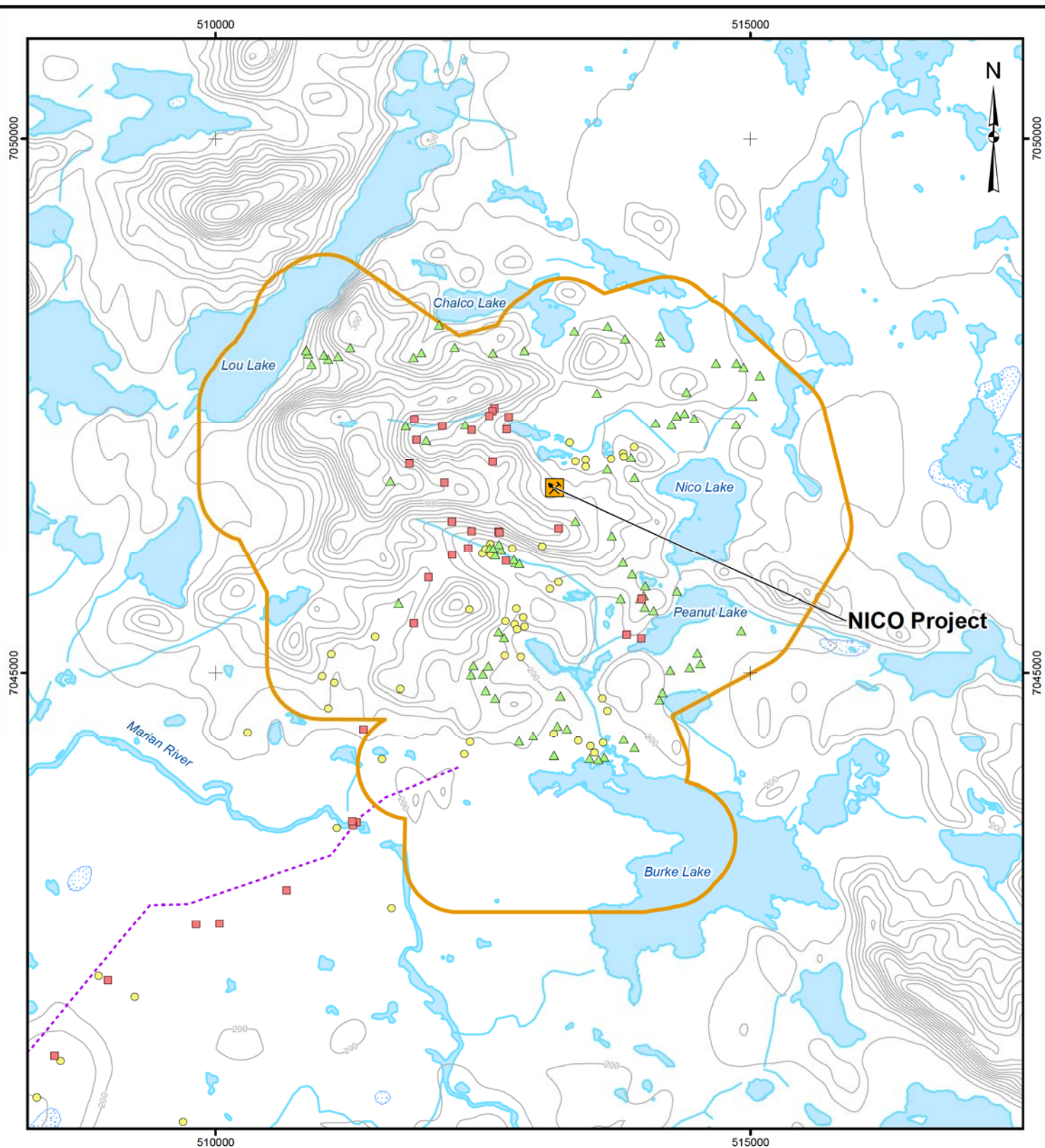
In total, 257 plant species were identified during field sampling within the LSA and along the NPAR. This total includes 6 trees, 49 shrubs, 59 forbs, 18 graminoids, 63 mosses, 44 lichens, and 24 epiphytes (note that there is some overlap in species between the tree and shrub layers). All plant species recorded from the LSA and along the NPAR are listed in Appendices II and III.

**Table 3.1-2 Number of Vegetation Survey Plots and Rare Plant Survey Sites per Ecological Landscape Classification Type in the Local Study Area and Along the Proposed NICO Project Access Road**

Map Code	Ecological Landscape Classification Type	Detailed Vegetation Inventory Plots	Rare Plant Survey Sites	Total Number of Plots and Sites
<b>Uplands</b>				
UBC	Bedrock open conifer	6	16	22
UCP	Coniferous pine	4	3	7
UCS	Coniferous spruce	14	16	30
UDE	Deciduous aspen-paper birch	8	1	9
UMI	Mixedwood spruce-paper birch-aspen	6	8	14
<i>uplands ELC types subtotal</i>		38	44	82
<b>Wetlands</b>				
WMF	Marsh/ graminoid fen	4	3	7
WOB	Open bog	4	6	10
WSH	Shrubland	6	5	11
WTB	Treed bog	5	6	11
WTF	Treed fen	6	12	18
<i>wetlands ELC types subtotal</i>		25	32	57
<b>Total</b>		<b>63</b>	<b>76</b>	<b>139</b>

ELC = Ecological Landscape Classification.





# LEGEND

- |  |                                   |  |                               |
|--|-----------------------------------|--|-------------------------------|
|  | NICO PROJECT                      |  | VEGETATION SURVEY PLOT - 2005 |
|  | CONTOUR (10 METRE INTERVAL)       |  | VEGETATION SURVEY PLOT - 2006 |
|  | PROPOSED NICO PROJECT ACCESS ROAD |  | VEGETATION SURVEY PLOT - 2008 |
|  | WATERCOURSE                       |  |                               |
|  | WATERBODY                         |  |                               |
|  | WETLAND                           |  |                               |
|  | LOCAL STUDY AREA                  |  |                               |

# REFERENCE

Base data obtained from GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

1 0 1  
SCALE 1:50,000 KILOMETRES

PROJECT		FORTUNE MINERALS LIMITED NICO DEVELOPERS ASSESSMENT REPORT		
TITLE		VEGETATION SURVEY PLOT LOCATIONS IN THE LOCAL STUDY AREA		
		FILE NO. B-Veg-003-GIS		
PROJECT No.	08-1373-0017	SCALE AS SHOWN	REV. 0	
DESIGN	JK	04 Dec. 2008		
GIS	CW	06 May 2010		
CHECK	LY	17 Nov. 2010		
REVIEW	GA	17 Nov. 2010		



**FIGURE 3.1-3**

The LSA covers 2643 ha and is classified into 14 ELC types (Table 3.1-3; Figure 3.1-4). Upland ELC types compose the majority (58%) of the LSA, with the coniferous spruce and bedrock open conifer ELC types dominating the landscape at 27% and 23% of the LSA, respectively. The treed fen ELC type is the most prominent wetlands ELC type, occupying 6% of the LSA. Water occupies 13% of the LSA, whereas burn occupies 12%, and anthropogenic disturbances account for less than 1% of the LSA.

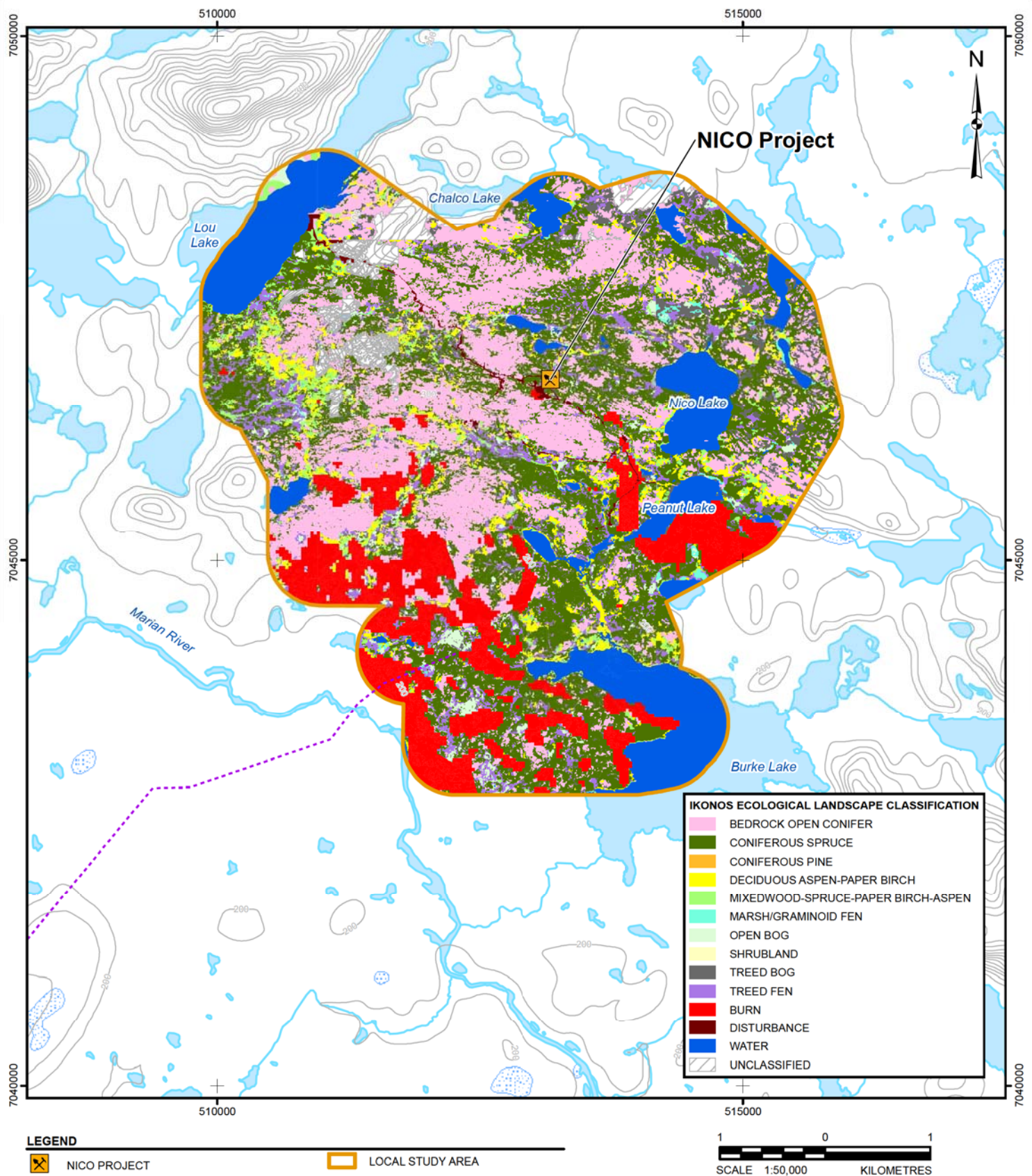
**Table 3.1-3 Total Area and Percent Cover of Ecological Landscape Classification Types in the Local Study Area**

Map Code	Ecological Landscape Classification Types	Proposed Mine Area		Polygon Size (ha)		
		Area (ha)	% LSA	Average	Min.	Max.
Uplands						
UBC	Bedrock open conifer	610	23	<1	<1	47
UCP	Coniferous pine	1	<1	<1	<1	8
UCS	Coniferous spruce	721	27	<1	<1	847
UDE	Deciduous aspen-paper birch	121	5	<1	<1	3
UMI	Mixedwood spruce-paper birch-aspen	73	3	<1	<1	39
uplands ELC types subtotal		1526	58	<1	<1	847
Wetlands						
WMF	Marsh/graminoid fen	9	<1	<1	<1	13
WOB	Open bog	49	2	<1	<1	13
WSH	Shrubland	1	<1	<1	<1	2
WTB	Treed bog	121	5	<1	<1	9
WTF	Treed fen	170	6	<1	<1	10
wetlands ELC types subtotal		350	13	<1	<1	13
Miscellaneous Vegetation						
BUR	Burn	328	12	<1	<1	114
miscellaneous vegetation ELC types subtotal		328	12	<1	<1	114
Non-vegetated						
WAT	Water	344	13	1	<1	144
non-vegetated ELC types subtotal		344	13	1	<1	144
Disturbance						
DIS	Disturbance	12	<1	<1	<1	3
disturbance ELC types subtotal		12	<1	<1	<1	3
Unclassified						
UNC	Unclassified (cloud, haze and shadow)	83	3	<1	<1	18
unclassified ELC types subtotal		83	3	<1	<1	18
Total		2643	100	<1	<1	847

Note: Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

% = percent; < = less than; ; ha = hectare; ELC = Ecological Landscape Classification.






NOTE: Unclassified areas are portions of the LSA for which an ELC vegetation class could not be assigned due to satellite interference.

#### REFERENCE

Base data obtained from GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

PROJECT		FORTUNE MINERALS LIMITED NICO DEVELOPERS ASSESSMENT REPORT			
TITLE		ECOLOGICAL LANDSCAPE CLASSIFICATION IN THE LOCAL STUDY AREA			
 <b>Golder Associates</b> Edmonton, Alberta		FILE NO. B-Veg-006-GIS			
		PROJECT No. 08-1373-0017		SCALE AS SHOWN	REV. 0
		DESIGN	JK	04 Dec. 2008	
		GIS	CW	28 Oct. 2010	
		CHECK	LY	17 Nov. 2010	
		REVIEW	GA	17 Nov. 2010	
		FIGURE:3.1-4			



**FIGURE:3.1-4**

The following sections describe the 14 ELC types present within the LSA (Table 3.1-3) and presented in Figure 3.1-4. The unclassified portion of the LSA is comprised of cloud, haze, and shadow captured by the satellite imagery. Photographs that represent each of the ELC types are provided in Appendix IV. These ELC type descriptions are also applicable to the ELC types mapped in the RSA (Section 3.1).

## ***Uplands Ecological Landscape Classification Types***

There are 5 uplands ELC types within the LSA, characterized by vegetation cover, landscape position, and substrate. Uplands are defined as areas where the soil is not saturated for extended periods. In general, poorly vegetated units are associated with bedrock, sandy mineral soil substrates, shallow soils or rocky substrates. Woodlands generally occur at mid to lower slope positions and on finer-textured mineral soils. Mean species cover by ELC type is listed in Appendix II.

### **Bedrock Open Conifer**

The bedrock open conifer ELC type consists of a subxeric (dry) to very xeric moisture regime. The ground surface is characterized by exposed bedrock or boulders. Soils are absent or thin, very rapidly drained and often sandy of glaciofluvial origin. The nutrient regime is poor to very poor. The exposed bedrock and boulders, along with dry, nutrient poor soils, results in patchy vegetation establishment in this ELC type.

The bedrock open conifer ELC type is characterized by exposed bedrock covered with lichens and scattered jack pine (*Pinus banksiana*) trees. Lichen cover is prominent with navel lichen (*Umbilicaria hyperborea*) and rock lichens (*Arctoparmelia centrifuga*) being the most prominent (Table 3.1-4). A sparse tree cover of jack pine, black spruce (*Picea mariana*) and paper birch (*Betula papyrifera*) is scattered between exposed bedrock where soil conditions allow for woody vegetation growth. Tree and shrub layers average only 1% and 2%, respectively. Shrubs that are present include ground juniper (*Juniperus communis*), bearberry (*Arctostaphylos uva-ursi*), and jack pine and black spruce tree saplings. The average cover of forbs is less than 1%, with harebell (*Campanula rotundifolia*), parsley fern (*Cryptogramma acrostichoides*), and rock polypody (*Polypodium virginianum*) being most common. Graminoid and moss layers average 1% or less. The bedrock open conifer ELC type covers 610 ha (23%) of the LSA (Table 3.1-3).

**Table 3.1-4 Dominant Plant Species by Ecological Landscape Classification Type and Layer**

Ecological Landscape Classification Type	Average Layer Cover (%)	Characteristic Species <sup>a</sup>
<b>Tree Layer</b>		
Bedrock open conifer	1	n/a
Coniferous pine	15	jack pine, black spruce
Coniferous spruce	21	black spruce, white spruce
Deciduous aspen-paper birch	28	aspen, white birch
Mixedwood spruce-paper birch-aspen	24	white spruce, white birch
Marsh/graminoid fen	0	n/a
Open bog	1	n/a
Shrubland	<1	n/a
Treed bog	4	black spruce
Treed fen	13	black spruce, tamarack
<b>Shrub Layer</b>		
Bedrock open conifer	2	black spruce, ground juniper
Coniferous pine	33	jack pine, bog cranberry
Coniferous spruce	27	twinline, Labrador tea
Deciduous aspen-paper birch	24	bearberry, green alder
Mixedwood spruce-paper birch-aspen	14	bog cranberry, Labrador tea
Marsh/graminoid fen	1	n/a
Open bog	43	bog rosemary, bilberry sp
Shrubland	61	flat-leaved willow, birch sp
Treed bog	51	Labrador tea, black spruce
Treed fen	43	bilberry sp, birch sp
<b>Forb Layer</b>		
Bedrock open conifer	<1	n/a
Coniferous pine	4	northern bastard toadflax
Coniferous spruce	2	arctic wintergreen
Deciduous aspen-paper birch	4	bunchberry, northern bastard toadflax
Mixedwood spruce-paper birch-aspen	6	northern bastard toadflax, one-sided wintergreen
Marsh/graminoid fen	1	n/a
Open bog	4	cloudberry, common horsetail
Shrubland	5	marsh cinquefoil, marsh-marigold
Treed bog	7	dwarf scouring-rush, woodland horsetail
Treed fen	<1	n/a
<b>Graminoid Layer</b>		
Bedrock open conifer	1	n/a
Coniferous pine	<1	n/a
Coniferous spruce	1	n/a

**Table 3.1-4 Dominant Plant Species by Ecological Landscape Classification Type and Layer (continued)**

Ecological Landscape Classification Type	Average Layer Cover (%)	Characteristic Species <sup>a</sup>
Deciduous aspen-paper birch	<1	n/a
Mixedwood spruce-paper birch-aspen	<1	n/a
Marsh/graminoid fen	92	small bottle sedge, water sedge
Open bog	11	russett cotton grass, slender cotton grass
Shrubland	15	<i>Carex</i> sp. unknown, grass sp. unknown
Treed bog	1	n/a
Treed fen	5	water sedge, n/a
<b>Moss Layer</b>		
Bedrock open conifer	<1	n/a
Coniferous pine	7	stair-step moss, Schreber's moss
Coniferous spruce	31	Schreber's moss, stair-step moss
Deciduous aspen-paper birch	1	n/a
Mixedwood spruce-paper birch-aspen	5	knight's plume moss , cushion moss
Marsh/graminoid fen	1	n/a
Open bog	54	rusty peat moss, Girgensohn's moss
Shrubland	16	golden moss, sphagnum sp.
Treed bog	66	Schreber's moss, peat moss ( <i>S. angustifolium</i> )
Treed fen	26	acute-leaved peat moss, golden moss
<b>Lichen Layer</b>		
Bedrock open conifer	48	navel lichen, <i>Arctoparmelia centrifuga</i> <sup>b</sup>
Coniferous pine	14	grey reindeer lichen, studded leather lichen
Coniferous spruce	6	green reindeer lichen, grey reindeer lichen
Deciduous aspen-paper birch	5	grey reindeer lichen, <i>Arctoparmelia centrifuga</i> <sup>b</sup>
Mixedwood spruce-paper birch-aspen	2	studded leather lichen, green reindeer lichen
Marsh/graminoid fen	0	n/a
Open bog	3	green reindeer lichen, flattened snow lichen
Shrubland	<1	n/a
Treed bog	1	n/a
Treed fen	4	northern reindeer lichen, green reindeer lichen

<sup>a</sup> The scientific name for the species listed can be found in Appendix II, Table II-1.

<sup>b</sup> This species does not have a common name.

n/a = not applicable; % = percent; < = less than.

### **Coniferous Pine**

The coniferous pine ELC type occurs on sandy, acidic, and very rapidly drained soils. The moisture regime is dry (xeric), and the soil nutrient regime is generally very poor.

This ELC type is similar to the bedrock open conifer ELC type; however, the canopy of the coniferous pine ELC type is denser (15% average). White spruce (*Picea glauca*) or black spruce may occur occasionally in the tree canopy. Most vegetation within this ELC type occurs in the shrub layer (33% average cover) (Table 3.1-4). Jack pine and bog cranberry (*Vaccinium vitis-idaea*) are prominent species in the shrub layer. Average forb cover is 4%, with northern bastard toadflax (*Geocaulon lividum*) being the dominant species in this layer. Lichen cover averages 14%. The coniferous pine ELC type covers 1 ha (<1%) of the LSA (Table 3.1-3).

### **Coniferous Spruce**

The coniferous spruce ELC type is characterized by upland black spruce stands on very rapidly to moderately drained soils, with a submesic moisture regime. The nutrient regime is generally poor to medium.

Most vegetation cover within this ELC type occurs within the tree, shrub, and moss layers (Table 3.1-4). The tree canopy averages 21% cover and consists of black spruce and white spruce. Total shrub cover averages 27% with twinflower (*Linnaea borealis*) and Labrador tea (*Ledum groenlandicum*) dominating this layer. The moss layer includes Schreber's moss (*Pleurozium schreberi*) and stair-step moss (*Hylocomium splendens*), which dominate the forest floor. Arctic wintergreen (*Pyrola grandiflora*) is the dominant forb species. Graminoid species are sparse with only 1% total cover. Green reindeer lichen (*Cladina mitis*) and grey reindeer lichen (*Cladina rangifera*) contribute the highest average species cover within the lichen layer. Dominant epiphytic lichen species include speckled horsehair (*Bryoria fuscescens*) and boreal oak-moss lichen (*Evernia mesomorpha*), which contribute to an average cover for this layer of 2%. The coniferous spruce ELC type covers the greatest area in the LSA (Table 3.1-3) at 721 ha (27% of the LSA).

### **Deciduous Aspen-Paper Birch**

The deciduous aspen-paper birch ELC type occurs on moderately well drained upland soils. The moisture regime ranges from mesic to submesic, with a nutrient regime ranging from medium to poor. The deciduous aspen-paper birch ELC type covers 121 ha (5%) of the LSA (Table 3.1-3).

The vegetation of this ELC type is dominated by trees and shrubs. The tree layer is composed primarily of aspen (*Populus tremuloides*) and white birch (Table 3.1-4). Average shrub cover is 24%, often including bearberry and green alder (*Alnus crispa*). Bunchberry (*Cornus canadensis*) and northern bastard toadflax are the most prominent species within the forb layer. Graminoid species are sparse with less than 1% total cover. Common hair cap (*Polytrichum commune*) is the only prominent species within the moss layer. Average lichen cover is 5% with grey reindeer lichen and *Arctoparmelia centrifuga* being the most prominent species.

### **Mixedwood Spruce-Paper Birch-Aspen**

The mixedwood spruce-paper birch-aspen ELC type is found in mesic (moist) sites, with soil drainage and nutrient characteristics capable of supporting mixedwood species. This upland ELC type supports deciduous species such as aspen and birch, and mixed with white spruce. The nutrient regime in this ELC type ranges from very poor to medium. The mixedwood spruce-paper birch-aspen ELC type covers 73 ha (3%) of the LSA (Table 3.1-3).

The dominant vegetation layers progress from the top down, with trees (24% average cover), shrubs (14% average cover), forbs (6% average cover), and graminoids (less than one percent) showing a decrease in density per layer towards the forest floor (Table 3.1-4). The moss layer averages 5% total cover, whereas the terrestrial lichen layer averages 2%.

The tree layer is dominated by white spruce and white birch, while dominant shrubs include bog cranberry and Labrador tea. Northern bastard toadflax is the most prominent forb, while the graminoid layer totals less than 1% cover. In the moss layer, knight's plume moss (*Ptilium crista-castrensis*) and cushion moss (*Dicranum spadiceum*) contribute the greatest cover. There is little lichen cover but studded leather lichen (*Peltigera aphthosa*) is the most prominent species.

### ***Wetlands Ecological Landscape Classification Types***

Wetlands within the LSA consist of 5 types. Wetlands are represented by sites where the water table is at, near or above the surface or where the ground is saturated long enough to promote the establishment and growth of water tolerant vegetation. Wetlands include peatlands and mineral wetlands that are influenced by excess water but produce little or no peat. Landscape position and moisture availability generally dictate the location and concentration of wetlands within the LSA.



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## Marsh/Graminoid Fen

The marsh/graminoid fen ELC type is typically situated along waterbodies or in saturated depressions. The substrate varies from mineral soil (marshes) to organic soil (graminoid fens). Moisture regime is typically hygric to hydric, with the nutrient regime ranging between medium and rich, reflecting the connectivity of these wetlands to groundwater carrying nutrients.

The marsh/graminoid fen ELC type lacks a tree layer and has only a sparse shrub layer with species that can tolerate saturated soil conditions such as bog rosemary (*Andromeda polifolia*), Labrador tea, and willow (Table 3.1-4). Marsh cinquefoil (*Potentilla palustris*) is the only prominent forb species. Graminoids are the dominant species in this ELC type, with a total average cover of 92%. Small bottle sedge (*Carex utriculata*) and water sedge (*Carex aquatilis*) are the most common graminoids. The moss layer is sparse with an average cover of 5%. No lichens were observed in the plots sampled. The marsh/graminoid fen ELC type covers 9 ha (<1%) of the LSA (Table 3.1-3).

## Open Bog

The open bog ELC type typically has a hygric moisture regime and a poor nutrient regime. Open bogs consist of low, saturated, primarily *Sphagnum* moss dominated depressions coupled with drier *Sphagnum* or lichen-covered hummocks. Bog vegetation is disconnected to the groundwater resulting in a lack of available nutrients, low pH and acid-tolerant species. Soils are often classed as Organic Cryosols, with the peat layer exceeding 0.5 m. The lack of a consistent tree layer in open bogs may be due to the poor nutrient regime, poor drainage, and/or presence of permafrost, all of which may inhibit the growth of black spruce. The open bog ELC type covers 49 ha (2%) of the LSA (Table 3.1-3).

The tree layer of this ELC type consists of black spruce with an average cover of 1%. Shrub cover is moderate (43%) with the dominant species including bog rosemary and bilberry species (*Vaccinium sp*) (Table 3.1-4). The most prominent forbs include cloudberry (*Rubus chamaemorus*) and common horsetail (*Equisetum arvense*), which contribute to an average forb layer of 4%. Prominent species in the graminoid layer include russet cotton grass (*Eriophorum chamissonis*) and slender cotton grass (*Eriophorum gracile*). Average graminoid cover is 11%. The moss layer averages 54% cover, with rusty peat moss (*Sphagnum fuscum*) and Girgensohn's moss (*Sphagnum girgensohnii*) representing the most prominent species. Lichen cover averages 3%, with the most prominent species being green reindeer lichen and flattened snow lichen (*Cetraria nivalis*).

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## Treed Bog

The treed bog ELC type generally has a hygric moisture regime and a poor nutrient regime. As in open bogs, treed bogs consist of low, saturated, *Sphagnum* dominated depressions coupled with drier *Sphagnum* or lichen-covered hummocks. Groundwater is disconnected from the rooting zone resulting in low nutrient levels. Soils are generally Organic Cryosols, with peat extending to depths greater than 0.5 m. These conditions create a low, acidic pH promoting the growth of acid-tolerant species.

The treed bog ELC type is characterized by stunted black spruce stands that occur on poorly drained soils. Tamarack (*Larix* spp.) is typically absent in this ELC type. The growth of black spruce is typically stunted, often not exceeding 5 m in height.

The tree layer is generally sparse (4% cover). Black spruce is more prominent in the tall shrub layer while Labrador tea dominates the low shrub layer (Table 3.1-4). Total cover of the shrub layers in the treed bog ELC type averages 51%. Forb cover is typically low with an average cover value of 7%. Dwarf scouring rush (*Equisetum scirpoides*) is the most prominent forb species followed by woodland horsetail (*Equisetum sylvaticum*). Graminoid cover is sparse. The moss layer dominates the forest floor with an average of 66%. Schreber's moss (*Pleurozium schreberi*) and peat moss (*Sphagnum angustifolium*) are the most prominent species. Lichen cover is sparse. The treed bog ELC type covers 121 ha (5%) of the LSA (Table 3.1-3).

## Treed Fen

The treed fen ELC type occurs on Organic soils, with peat extending to depths greater than 0.5 m. This ELC type is located in depressional, moisture-receiving areas. Treed fens differ from treed bogs in that there is connectivity between the rooting zone and the surficial groundwater resulting in greater availability of nutrients than in bogs. The treed fen ELC type covers 170 ha (6%) of the LSA (Table 3.1-3).

Black spruce and tamarack trees are characteristic of the treed fen ELC type. Tamarack is more characteristic of more nutrient-rich sites. Total average tree cover is 13% while the shrub layer averages 43% with bilberry species and birch species (*Betula* sp) being the most prominent species (Table 3.1-4). The forb layer has less than 1% total average cover, while total average graminoid cover averages 5%. Water sedge is the dominant graminoid species. Average moss cover is 26%, dominated by acute-leaved peat moss (*Sphagnum capillifolium*) and golden moss. Northern reindeer lichen (*Cladina stellaris*) and green reindeer lichen are the most common lichens.

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## Shrubland

The shrubland ELC type is generally situated in low lying areas, often in the transition zone between upland and wetlands ELC types. The shrubland ELC type moisture regime ranges from subhygric (moist) to hydric (very saturated). However, saturated conditions may not persist through the growing season. Moisture tolerant shrub species such as willows thrive within this ELC type. The nutrient regime ranges from poor to rich, with rich nutrient conditions being more prevalent.

Within the shrubland ELC type, the tree layer is sparse (1% total cover) (Table 3.1-4). The shrub layer is the dominant layer, with an average cover of 61%. Prominent shrubs within this layer include flat-leaved willow (*Salix planifolia*) and birch species. The forb layer is dominated by marsh cinquefoil (*Potentilla palustris*) and marsh marigold (*Caltha palustris*). The graminoid layer has an average cover of 15% and is composed primarily of sedges and grasses. Golden moss and *Sphagnum* moss are the most common species in the moss layer. Terrestrial lichens are present in trace amounts. The shrubland ELC type covers 1 ha (<1%) of the LSA (Table 3.1-3).

## Miscellaneous Ecological Landscape Classification Types

### Burn

The burn ELC type consists of upland or wetlands habitat that has been recently burned. Burns cover 328 ha (12%) of the LSA (Table 3.1-3). This ELC type is represented by a large burn that occurred in the summer of 2008 in the LSA and RSA (Section 2.3).

## Non-Vegetated Types

### Water

Open water occurs in patches throughout the region, with some larger lakes present in the RSA. Waterbodies include lakes, rivers, streams, ponds, and shallow open water. The Water ELC type covers 344 ha (13%) of the LSA (Table 3.1-3).

## Disturbance Ecological Landscape Classification Types

### Disturbances

Disturbances within the LSA may include clearings for exploration, quarrying, and other disturbances. There are 12 ha (<1%) of disturbances in the LSA (Table 3.1-3). This ELC type is not included at the RSA scale due to the coarse-scale Landsat TM imagery.

## **Unclassified Areas**

Shadow, cloud, and haze have been grouped together as “unclassified” for mapping purposes. Cloud and haze describes those areas where the imagery of the earth’s surface had been blocked during the image capture period. The shadow category represents those areas where satellite imagery could not capture surficial data due to shadows casted by clouds. Unclassified areas cover a total of 83 ha (3%) of the LSA.

## **3.2 ECOLOGICAL LANDSCAPE CLASSIFICATION TYPES OF RESTRICTED DISTRIBUTION IN THE LOCAL STUDY AREA**

Ecological Landscape Classification types of restricted distribution are defined as land cover classes that represent 1% or less of the land base within the LSA (Table 3.2-1; Figure 3.2-1). Three ELC types have been identified as representing <1% of the LSA. These include the coniferous pine, marsh/graminoid fen, and shrubland ELC types (Table 3.2-1). The disturbance ELC type also has limited distribution in the LSA (10 ha or <1% of the LSA). However, due to the nature of this land cover class there is no concern about its restricted distribution.

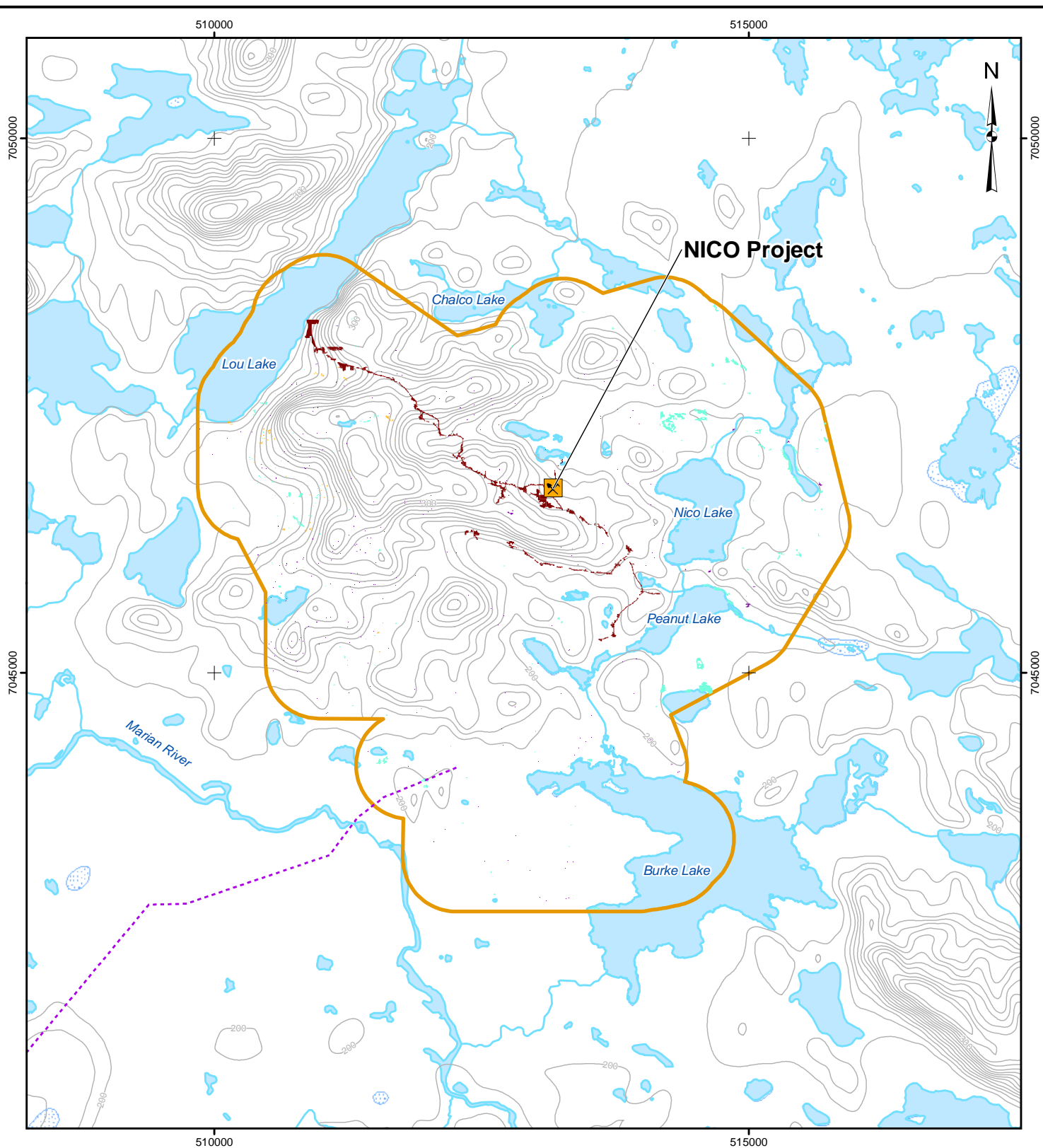
**Table 3.2-1 Ecological Landscape Classification Types of Restricted Distribution in the Local Study Area**

Map Code	Ecological Landscape Classification Type	Total LSA	
		Area (ha)	%
Upland ELC Types			
UCP	Coniferous pine	1	<1
Wetlands ELC Types			
WMF	Marsh/graminoid fen	9	<1
WSH	Shrubland	1	<1

% = percent; < = less than; ha = hectare; LSA = local study area.

## **3.3 TRADITIONAL USE PLANTS**

A list of traditional plants applicable to the Project by the most probable ELC types where these plant species will occur with sufficient abundance for traditional use is provided in Table 3.3-1. This list provides a coarse filter for assessing plant associations for their potential traditional plant value.



# LEGEND

- NICO PROJECT
- CONTOUR (10 METRE INTERVAL)
- PROPOSED NICO PROJECT ACCESS ROAD
- WATERCOURSE
- WATERBODY
- WETLAND
- LOCAL STUDY AREA

## UPLANDS ECOLOGICAL LANDSCAPE CLASSIFICATION

- CONIFEROUS PINE

## WETLANDS ECOLOGICAL LANDSCAPE CLASSIFICATION

- MARSH/GRAMINOID FEN
- SHRUBLAND

## OTHER ECOLOGICAL LANDSCAPE CLASSIFICATION

- DISTURBANCE

# REFERENCE

Base data obtained from GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83

1 0 1  
SCALE 1:50,000 KILOMETRES

PROJECT		FORTUNE MINERALS LIMITED NICO DEVELOPERS ASSESSMENT REPORT		
TITLE		ECOLOGICAL LANDSCAPE CLASSIFICATION TYPES OF RESTRICTED DISTRIBUTION IN THE LOCAL STUDY AREA		
		FILE NO. B-Veg-009-GIS		
		PROJECT No. 08-1373-0017	SCALE AS SHOWN	REV. 0
DESIGN	JK	04 Dec. 2008	FIGURE:3.2-1	
GIS	CW	06 May 2010		
CHECK	LY	17 Nov. 2010		
REVIEW	GA	17 Nov. 2010		

**Table 3.3-1 Traditional Plant Use of the Northwest Territories and Associated Ecological Landscape Classification Types**

Common Name	Scientific Name	Traditional Use	Bedrock open conifer	Coniferous pine	Coniferous spruce	Deciduous aspen-paper birch	Mixedwood spruce-paper birch-aspen	Marsh/graminoid fen	Open bog	Shrubland	Treed fen	Treed bog
acerbic bulrush	<i>Schoenoplectus acutus</i>	food, medicine, baskets <sup>b</sup>						•				
tamarack	<i>Larix laricina</i>	medicine, fuel <sup>c</sup>									•	
aspen	<i>Populus tremuloides</i>	food, medicine, tools, fuel <sup>b</sup>				•	•					
black currant (blackberry)	<i>Ribes hudsonianum</i> <sup>a</sup>	food <sup>c</sup>				•	•					
blueberry	<i>Vaccinium uliginosum</i> / <i>V. caespitosum</i>	food, medicine <sup>c</sup>		•	•							
cloudberry	<i>Rubus chamaemorus</i>	food <sup>c</sup>							•			•
high-bush cranberry	<i>Viburnum edule</i>	food, medicine <sup>b</sup>				•	•					
jack pine	<i>Pinus banksiana</i>	food, medicine, tools, shelter, fuel <sup>b</sup>	•	•								
paper birch	<i>Betula papyrifera</i>	food, medicine, tools, bait <sup>c</sup>				•	•					
raspberry	<i>Rubus ideaus</i>	food <sup>c</sup>				•	•					
white spruce	<i>Picea glauca</i>	food, medicine, shelter, fuel, tools <sup>c</sup>			•		•					
black spruce	<i>Picea mariana</i>	food, medicine, shelter, fuel, tools <sup>c</sup>			•						•	•
gooseberry	<i>Ribes oxycanthoides</i> <sup>a</sup>	food, medicine <sup>b</sup>			•	•	•					
green alder	<i>Alnus crispa</i>	medicine, fuel <sup>c</sup>			•	•	•					
juniper (berries)	<i>Juniperus communis</i>	medicine <sup>c</sup>	•	•	•							

**Table 3.3-1 Traditional Plant Use of the Northwest Territories and Associated Nico Project Ecological Land Cover Classification Types (continued)**

Common Name	Scientific Name	Traditional Use	Bedrock open conifer	Coniferous pine	Coniferous spruce	Deciduous aspen-paper birch	Mixedwood spruce-paper birch-aspen	Marsh/graminoid fen	Open bog	Shrubland	Treed fen	Treed bog
willow (various)	<i>Salix</i> spp.	fuel, food, tools, shelter, medicine, tobacco, insect repellent, moth ball, fire starter <sup>c</sup>					•			•	•	
crowberry	<i>Empetrium nigrum</i>	food, medicine <sup>c</sup>		•	•				•			•
kinnikinnick (bear berry)	<i>Arctostaphylos uva-ursi</i> / <i>A. rubra</i> / <i>A. alpina</i> <sup>a</sup>	food <sup>c</sup>	•	•	•	•						
lichen	<i>Cladina</i> spp., <i>Cetraria</i> spp., <i>Parmelia</i> spp., <i>Actinogyra</i> spp. <sup>a</sup>	food, medicine <sup>b</sup>	•	•	•				•			
prickly rose	<i>Rosa acicularis</i>	food, medicine <sup>c</sup>		•	•	•	•					
sphagnum moss	<i>Sphagnum</i> spp., wetlands species	diapers, cleaner <sup>c</sup>						•	•		•	•
bog cranberry	<i>Vaccinium vitis-idaea</i>	food, medicine, dye <sup>c</sup>		•	•		•		•			•
Labrador tea	<i>Ledum groenlandicum</i>	food, medicine <sup>c</sup>		•	•				•		•	•

<sup>a</sup> Genus or species not observed during 2005 to 2008 field surveys.

<sup>b</sup> Marles et al. (2000).

<sup>c</sup> Andre and Fehr (2002).

spp. = multiple species.

## **3.4 RARE PLANTS**

### **3.4.1 Rare Plant Occurrences**

No confirmed rare plant species as listed by the GNWT (2010) or federal listed species (COSEWIC 2010; SARA 2010) were confidently identified as occurring within the LSA during the 2005, 2006, and 2008 field programs. Only one species, rock polypody (*Polypodium virginianum*), which is listed as status undetermined by the GNWT (2010) had confirmed occurrences in the LSA. An undetermined status indicates that there is insufficient information or data available on the species to accurately determine its listing status, so further investigation is required.

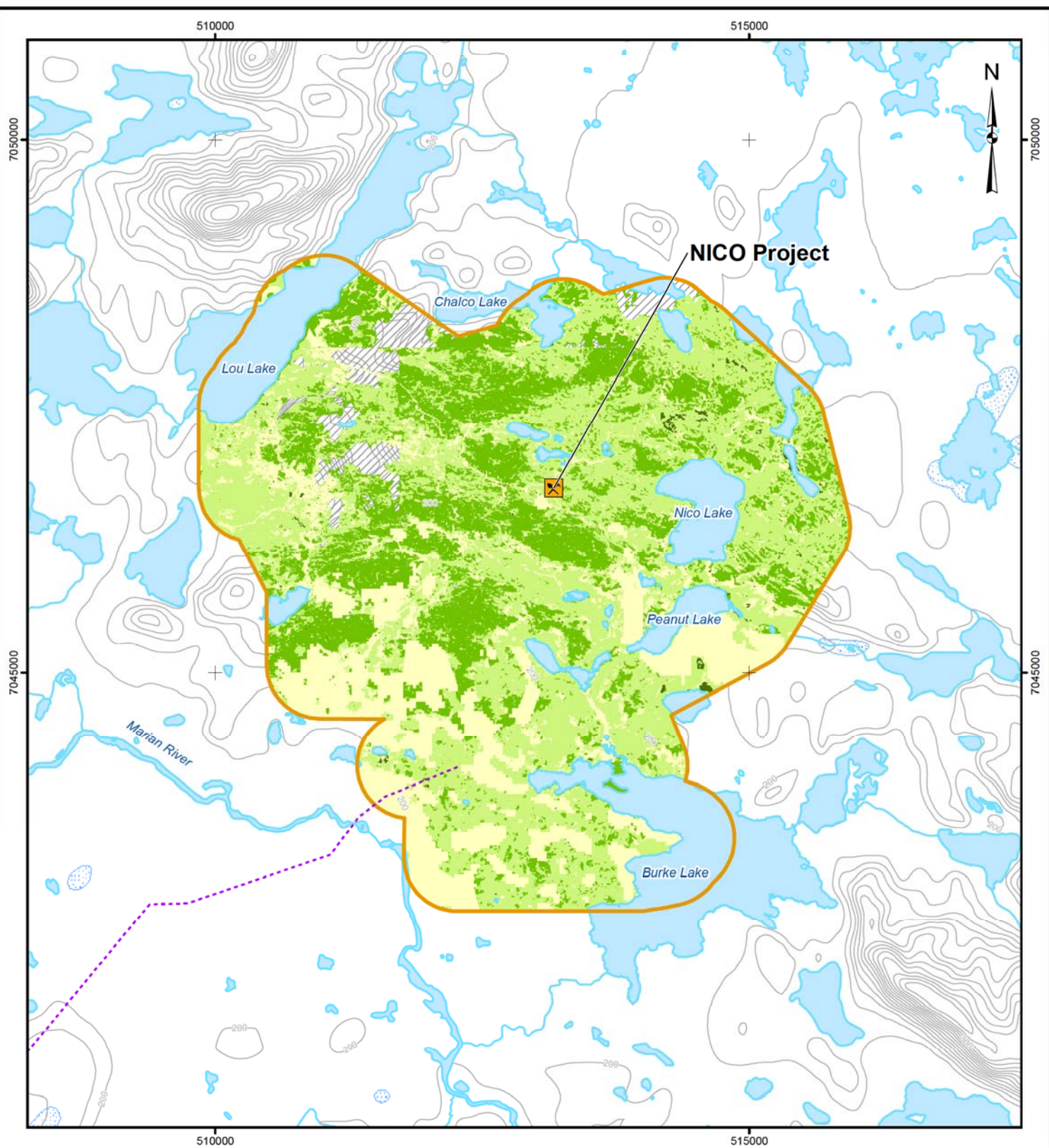
The absence of rare plant observations does not preclude the potential for rare plants to inhabit the area. There are situations when even the best-conducted plant survey can miss rare plant occurrences at a site because the relative abundance of a species can vary annually or locally. For example, some plant species have the ability to withstand stresses by storing seeds for extended periods. Climatic fluctuations may not allow the species to produce flowers, making them difficult to spot and identify. Available microhabitats within larger habitat types may also vary. Hence, a rare plant survey cannot confirm the absence of rare plants; it can only confirm their presence.

### **3.4.2 Rare Plant Habitat Potential**

Ecological Landscape Classification types within the LSA were ranked according to their ability to potentially support rare plant species. Rankings were assigned using field survey information, the ELC types present in the LSA, and the habitat requirements of rare plant species (Section 2.6.2). The distribution of rare plant potential classes within the LSA is shown in Table 3.4-1 and Figure 3.4-1.



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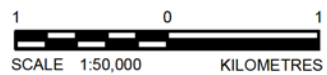


**LEGEND**

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| NICO PROJECT                      | <b>RARE PLANT HABITAT POTENTIAL</b> |
| CONTOUR (10 METRE INTERVAL)       | LOW                                 |
| PROPOSED NICO PROJECT ACCESS ROAD | MODERATE                            |
| WATERCOURSE                       | HIGH                                |
| WATERBODY                         | VERY HIGH                           |
| WETLAND                           | N/A                                 |
| LOCAL STUDY AREA                  |                                     |

**REFERENCE**

Base data obtained from GeoGratis.  
Projection: UTM Zone 11 Datum: NAD 83



PROJECT	FORTUNE MINERALS LIMITED NICO DEVELOPERS ASSESSMENT REPORT		
	TITLE RARE PLANT HABITAT POTENTIAL IN THE LOCAL STUDY AREA		
 Edmonton, Alberta	FILE NO. B-Veg-011-GIS		
	PROJECT No. 08-1373-0017	SCALE AS SHOWN	REV. 0
	DESIGN JK 04 Dec 2008		
	GIS CW 06 May 2010		
	CHECK LY 17 Nov 2010		
	REVIEW GA 17 Nov 2010		

**FIGURE:3.4-1**

**Table 3.4-1 Rare Plant Habitat Potential in the Local Study Area**

Rank	Total Area of LSA (ha)	Total Percent of LSA (%)
low	534	20
moderate	1062	40
high	956	36
very high	10	<1
not applicable <sup>a</sup>	83	3
<b>Total</b>	<b>2644</b>	<b>100</b>

Note: Numbers are rounded for presentation purposes; therefore, it may appear that the totals do not equal the sum of the individual values.

<sup>a</sup> "Not applicable" accounts for the "Cloud/haze" and "Shadow" ELC types.

% = percent; ha = hectare; LSA = local study area.

## 3.5 BIODIVERSITY

### 3.5.1 Introduction

Maintenance of current biodiversity levels is considered an important component of ecosystem management in Canada (Bocking 2002). Political jurisdictions such as the NWT have initiated regional biodiversity action plans in response (Northwest Territories Biodiversity Team 2004). Species diversity, richness and evenness provide measures of biodiversity (Gaston and Spicer 1998; Loreau et al. 2001; Symstad et al. 2003) and can provide an important conceptual link in terms of integrating ELC types, wildlife, and ecosystem health (De Beers 2002).

### 3.5.2 Species Diversity, Richness, and Evenness

Species data were collected across 10 ELC types, which included 5 upland and 5 wetlands ELC types (Table 3.5-1). In total, 257 plant species (126 vascular species, 131 non-vascular species) were identified within the LSA and along the NPAR. This includes 49 woody species (trees and shrubs), 59 forbs, 18 graminoids, 63 mosses, 44 terrestrial lichens, and 24 epiphytes.

Species diversity indices were calculated by ELC type are listed and detailed below:

- total number of vascular species;
- total number of rare vascular species;
- total number of vascular species unique to a single ecosite phase or wetlands type;

- species richness; and
- species evenness.

### 3.5.2.1 Total Number of Vascular Species

The number of vascular plant species among ELC types was calculated as one measure of species biodiversity. The highest numbers of vascular plant species occurred within the coniferous spruce upland ELC type, and shrubland and treed fen wetlands ELC types, with 70, 59, and 52 vascular species, respectively (Table 3.5-1). A total of 80 vascular plants were observed in all upland ELC types while a total of 90 vascular plants were observed in all wetlands (Table 3.5-1).

**Table 3.5-1 Vascular Plant Biodiversity Measures by Ecological Landscape Classification Type in the Local Study Area and Along the Proposed NICO Project Access Road**

Map Code	Ecological Landscape Classification Type	Number of Sites <sup>a</sup>	Number of Vascular Species <sup>b</sup>	Percent of All Vascular Species <sup>b</sup>	Number of Rare Vascular Species Occurrences <sup>c</sup>	Number of Vascular Species Unique to ELC Type <sup>d</sup>
<b>Upland ELC Types</b>						
UBC	Bedrock open conifer	22	43	28	1 (3)	12
UCP	Coniferous pine	7	26	17	0	0
UCS	Coniferous spruce	30	70	46	4 (1)	5
UDE	Deciduous aspen-paper birch	9	29	19	1	1
UMI	Mixedwood spruce-paper birch-aspen	14	46	30	2	3
<i>upland ELC types subtotal</i>		<i>82</i>	<i>80</i>	<i>n/a</i>	<i>8 (4)</i>	<i>21</i>
<b>Wetlands ELC Types</b>						
WMF	Marsh/ graminoid fen	7	31	21	1 (2)	7
WOB	Open bog	10	29	19	2	2
WSH	Shrubland	11	59	39	9 (1)	11
WTB	Treed bog	11	47	31	5	6
WTF	Treed fen	18	52	34	5 (1)	7
<i>wetlands ELC types subtotal</i>		<i>57</i>	<i>90</i>	<i>n/a</i>	<i>22 (4)</i>	<i>33</i>
<b>Total</b>		<b>139</b>	<b>126</b>	<b>n/a</b>	<b>30 (8)</b>	<b>54</b>

<sup>a</sup> The number of sites are based on rare plant surveys from 2005, and 2006 and Detailed Vegetation Inventory (DVI) plots from 2008.

<sup>b</sup> Subtotals and totals are numbers of vascular species found in that ELC type. Thus, the same species may occur in more than one ELC type. The total number of vascular species is 126.

<sup>c</sup> Rare vascular species according to their NWT provincial rank (GNWT 2010). Number outside of brackets includes "May Be At Risk" and "Sensitive" species. Number inside of brackets includes "Undetermined" and "No Records Found" in NWT species list. "At Risk" species were not found in the LSA.

<sup>d</sup> Does not include unidentified species.

ELC = Ecological Landscape Classification; n/a = not applicable.

The lowest number of vascular plant species occurred within the coniferous pine (26 species), deciduous aspen-paper birch (29 species) and open bog ELC types (29 species).

### **3.5.2.2 Total Number of Rare Vascular Species**

A total of 30 rare plant species occurrences were documented from field surveys conducted in 2005, 2006, and 2008 in the LSA and along the NPAR. These species are listed by the NWT as “May Be At Risk” or “Sensitive” (GNWT 2010). An additional 6 occurrences are listed as “Undetermined,” and another 2 species have no previous records documented in the NWT Infobase. The highest numbers of rare vascular species were found in the shrubland ELC type with 9 rare species (Table 3.5-1). Five rare species were found in the treed fen ELC type and 4 rare species were found in the coniferous spruce ELC type. No rare species were found in the coniferous pine ELC type (Table 3.5-1).

### **3.5.2.3 Total Number of Unique Species**

Calculating the total number of unique species within ELC types is a way of expressing habitat uniqueness. This index of biodiversity is presented in Table 3.5-1. The bedrock open conifer ELC type and shrubland ELC type had the highest numbers of unique species with 12 and 11 species, respectively. The lowest number of unique species occurred in the coniferous pine ELC type with no unique species found, followed by the deciduous-aspen-paper birch ELC type with one unique species not observed in any other ELC type.

### **3.5.2.4 Species Richness and Evenness**

Species richness for vascular plants, bryophytes and lichens are shown in Table 3.5-2. Among the highest values for vascular plant species richness are the coniferous spruce and mixedwood spruce-paper birch-aspen, open bog and treed fen ELC types. The marsh/graminoid fen wetlands ELC type was found to have the lowest species richness.

**Table 3.5-2 Species Richness and Evenness in the Local Study Area and Along the Proposed NICO Project Access Road**

Map Code	Ecological Landscape Classification Type	Number of Detailed Vegetation Plots Sampled	Species Richness <sup>a</sup>	Species Evenness <sup>a</sup>
<b>Upland ELC Types</b>				
UBC	Bedrock open conifer	6	8 to 31	0.28 to 0.54
UCP	Coniferous pine	4	19 to 28	0.41 to 0.68
UCS	Coniferous spruce	14	12 to 44	0.39 to 0.71
UDE	Deciduous aspen-paper birch	8	14 to 30	0.27 to 0.61
UMI	Mixedwood spruce-paper birch-aspen	6	14 to 38	0.44 to 0.70
<b>Wetlands ELC Types</b>				
WMF	Marsh/ graminoid fen	4	2 to 11	0.01 to 0.60
WOB	Open bog	4	14 to 38	0.44 to 0.74
WSH	Shrubland	6	7 to 36	0.44 to 0.54
WTB	Treed bog	5	27 to 30	0.42 to 0.62
WTF	Treed fen	6	18 to 38	0.49 to 0.73

<sup>a</sup> Minimum and maximum values for species richness and evenness.

Species evenness combines the number of species (richness) and the dominance of the species based on relative cover values. The more species and the more evenly distributed they are, the higher the index value (between 0 and 1). Evenness is expressed as a proportion of maximum diversity for a given number of species. High evenness occurs when the community type is not dominated by one or a few species.

The highest evenness values were recorded in the open bog and treed fen ELC types (Table 3.5-2). Uplands ELC types with high evenness included the coniferous spruce and mixedwood spruce-paper birch-aspen ELC types.

## **4 SUMMARY**

### **4.1 GENERAL SETTING**

The vegetation and plant communities baseline is one component of a comprehensive environmental and socio-economic baseline program to collect information about the natural and socio-economic environment in the vicinity of the Project. The vegetation and plant communities baseline report presents mapping and vegetation analysis results from the local and regional areas.

The proposed mine regional study area (RSA) was defined with consideration to wildlife as RSA-level information will be used as a basis to quantify the potential effects of the Project on all terrestrial components including soils, vegetation, wildlife and wildlife habitat. Thus, the RSA encompasses the potential zone of influence on caribou use of habitat from mining activities based on currently available information. The RSA also includes all regional land cover classes that may be directly (e.g., Project footprint) or indirectly (e.g., air emissions) influenced by the Project. The Proposed NICO Project Access Road (NPAR) associated with the RSA was also defined by the expected limit of direct and indirect effects from the NPAR on surrounding soil, vegetation, wildlife and wildlife habitat.

The LSA was defined by the anticipated extent of direct (e.g., Project footprint) and indirect effects (e.g., air emissions) of the Project on soil, vegetation, wildlife and wildlife habitat. The boundary is represented by a 500 metre (m) buffer around the Project lease boundary.

The RSA is situated within the Taiga Plains and the Taiga Shield Ecozones covering a total area of approximately 109 016 ha, while the LSA falls entirely within the Taiga Shield Ecozone. The Taiga Plains Ecozone is characterized by open, slow growing coniferous forests dominated by black spruce. The well-developed shrub layer includes species such as dwarf birch, Labrador tea, and willow. The forb and graminoid layers in these black spruce forests include species such as bearberry and sedges. Other habitat in this ecozone support stands of white and black spruce, jack pine, tamarack, white birch, trembling aspen, and balsam poplar. The nutrient-rich alluvial flats located along rivers of the Taiga Plains Ecozone support white spruce and balsam poplar.

The Taiga Shield Ecozone is characterized by stunted forests of black spruce and jack pine. Bogs and fens are scattered between these forest along with stands of paper birch and trembling aspen on elevated terrain. Understorey vegetation in these communities is similar to that of the Taiga Plains Ecozone. Rocky outcrops

are also scattered throughout the landscape and dominated by ericaceous shrubs and lichens. Much of the low-lying forest and wetlands within the Taiga Shield Ecozone occurs on permafrost soils.

The western portion of the RSA is located within the Keller Lake Plain Ecoregion of the Taiga Plains Ecozone, and encompasses Johnny Hoe River and Lacs Taché and Grandin south of the McVicar Arm of Great Bear Lake. Vegetation in the Keller Lake Plain Ecoregion is characterized by open bogs and fens dominated by black spruce with an understorey of dwarf birch, Labrador tea, lichen, and moss. Better drained areas contain stands of white spruce paper birch and occasionally aspen.

The eastern portion of the RSA is located within the Coppermine River Upland Ecoregion of the Taiga Shield Ecozone. Vegetation in the Coppermine River Upland Ecoregion is characterized by closed stands of trembling aspen and balsam poplar with white spruce, balsam fir and black spruce occurring in late successional stages. Poorly drained fens and bogs are characterized by open stands of stunted tamarack and black spruce. Localized areas within these wetlands contain permafrost.

Initial vegetation mapping surveys were completed in September 2003. Rare plant surveys were carried out in July 2004 and August 2005. Detailed vegetation inventory surveys were carried out in July 2006 and August 2008. A total of 139 field survey plots (63 detailed vegetation inventory plots and 76 rare plant surveys) were completed in the LSA and along the NPAR. In addition to detailed species information, site data collected included slope percent, aspect, slope position, nutrient regime and moisture regime.

## **4.2 REGIONAL STUDY AREA ECOLOGICAL LANDSCAPE CLASSIFICATION**

### **4.2.1 Methods**

A regional ELC was developed to provide information on the relative abundance of land cover classes within the RSA. Image classification is a method of automatically categorizing all pixels in an image. The RSA land cover classification for this report used up-to-date satellite imagery and classification methods based on LANDSAT 5 satellite imagery (30×30 m pixel size) captured on 24 July 2001.



## **4.2.2 Results**

The RSA covers 109 016 ha and is classified into 11 ELC types. Upland ELC types compose a majority (68%) of the RSA, with the coniferous spruce ELC type dominating the landscape at 55% of the RSA. Water occupies 14% of the RSA, while treed bog ELC type is the most prominent wetlands ELC type, occupying 5% of the RSA.

## **4.3 LOCAL STUDY AREA ECOLOGICAL LANDSCAPE CLASSIFICATION**

### **4.3.1 Methods**

The ELC map for the LSA was developed using IKONOS satellite imagery and GIS to provide information on the relative abundance of land cover classes at the local scale. The same classification scheme and classification procedures developed for the RSA were used for the LSA so that there is consistency between the two areas.

### **4.3.2 Results**

The LSA covers 2643 ha and is classified into 14 ELC types. Upland ELC types compose the majority (58%) of the LSA, with the coniferous spruce and bedrock open conifer ELC types dominating the landscape at 27% and 23% of the LSA, respectively. The treed fen ELC type is the most prominent wetlands ELC type, occupying 6% of the LSA. Water occupies 13% of the LSA, whereas burn occupies 12%, and anthropogenic disturbances account for less than 1% of the LSA.

## **4.4 ECOLOGICAL LANDSCAPE CLASSIFICATION TYPES OF LIMITED DISTRIBUTION IN THE LOCAL STUDY AREA**

### **4.4.1 Methods**

Ecological Landscape Classification types of restricted distribution are defined as land cover classes that represent 1% or less of the land base within the LSA.

## **4.4.2 Results**

Three ELC types have been identified as representing <1% of the LSA. These include the coniferous pine, marsh/graminoid fen, and shrubland ELC types.

## **4.5 TRADITIONAL USE PLANTS**

### **4.5.1 Methods**

The Traditional Knowledge (TK) and Traditional Land Use (TLU) baseline describes the methods and results for the TK and TLU study program. Relevant TK and TLU information collected as a part of this program has been incorporated into the Vegetation and Plant Communities Baseline.

### **4.5.2 Results**

Traditional plants used in the Northwest Territories include edible plants, medicinal plants, and plants used for construction or other purposes primarily by Aboriginal people. A total of 23 traditional plants are applicable to the Project. This list provides a coarse filter for assessing plant associations for their potential traditional plant value.

## **4.6 RARE PLANTS**

### **4.6.1 Rare Plant Occurrence Methods**

For the purposes of the vegetation and plant community baseline, rare plant species of the NWT include the following:

- any plant species listed as rare (At Risk, May be at Risk or Sensitive) in the NWT Species 2006 - 2010: General Status Ranks of Wild Species in the Northwest Territories (GNWT 2010);
- The Rare Vascular Plants in the Northwest Territories (McJannet et al. 1995); and
- plants listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2009) or listed on *Species at Risk Act* (SARA 2009).

Rare species are dynamic and change as new information becomes available or as the status of the population changes. Based on morphology, lifecycle, and

habitat, each rare plant species with the potential to be found in the region was included in a reference list. Global ranking of these species were also included in the list.

The general strategy of a rare plant survey attempts to maximize the probability of finding rare plants. However, at the time of sampling, plants may be at a stage of development that makes taxonomic identification difficult without flowers, fruit, or seeds. In addition, it is not possible to search all habitats. Hence, a rare plant survey cannot confirm the absence of rare plants; it can only confirm their presence.

#### **4.6.2 Rare Plant Occurrence Results**

No confirmed rare plant species as listed by the GNWT (2010) or federal listed species (COSEWIC 2010; SARA 2010) were confidently identified as occurring within the LSA during the 2005, 2006, and 2008 field programs. Only one species, rock polypody (*Polypodium virginianum*), which is listed as status undetermined by the GNWT (2010) had confirmed occurrences in the LSA.

#### **4.6.3 Rare Plant Habitat Potential Methods**

The LSA was assessed for its potential to support rare plant habitat. The approach incorporates field survey information and ELC mapping. Ecological Landscape Classification types within the LSA were assigned scores to reflect their rare plant habitat potential. Scores were assigned based on the relationships between rare plants and the habitat they are typically found. The scores were categorized into ranks and applied to the mapped ELC types. Four categories of rare plant habitat potential were derived from a frequency histogram of the number of rare plant species per ELC type. The 4 categories are low, moderate, high, and very high.

#### **4.6.4 Rare Plant Habitat Potential Results**

Rare plant habitat potential within the LSA was determined to be primarily moderate (1062 ha or 40%). There are 956 ha (36%) of high rare plant habitat potential and 10 ha (<1%) of very high potential in the LSA. Low rare plant potential comprises 534 ha (20%) of the LSA.

## **4.7 LOCAL STUDY AREA BIODIVERSITY**

### **4.7.1 Methods**

The vegetation data used in the biodiversity assessment was collected during the field surveys completed in 2005 to 2008. Species diversity was assessed for each ELC type based on the number and percentage of vascular species, the number of rare species, and the number of species unique to each ELC type. Two diversity indices (species richness and species evenness) were also calculated from the field data.

### **4.7.2 Results**

The highest numbers of vascular plant species occurred within the coniferous spruce upland ELC type, and shrubland and treed fen wetlands ELC types, with 70, 59, and 52 vascular species, respectively. A total of 80 vascular plants were observed in all upland ELC types while a total of 90 vascular plants were observed in all wetlands. The lowest number of vascular plant species occurred within the coniferous pine (26 species), deciduous aspen-paper birch (29 species), and open bog ELC types (29 species).

The highest numbers of rare vascular species were found in the shrubland ELC type with 9 rare species. Five rare species were found in the treed fen ELC type and 4 rare species were found in the coniferous spruce ELC type. No rare species were found in the coniferous pine ELC type.

The bedrock open conifer ELC type and shrubland ELC type had the highest numbers of unique species with 12 and 11 species, respectively. The lowest number of unique species occurred in the coniferous pine ELC type with no unique species found, followed by the deciduous-aspen-paper birch ELC type with one unique species not observed in any other ELC type.

Among the highest values for vascular plant species richness are the coniferous spruce and mixedwood spruce-paper birch-aspen, open bog and treed fen ELC types. The marsh/graminoid fen wetlands ELC type was found to have the lowest species richness.

The highest evenness values were recorded in the open bog and treed fen ELC types. Uplands ELC types with high evenness included the coniferous spruce and mixedwood spruce-paper birch-aspen ELC types.

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## 6 GLOSSARY OF TERMS

<b>Anthropogenic</b>	Pertaining to the influence of human activities.
<b>Baseline</b>	A surveyed or predicted condition that serves as a reference point to which later surveys are coordinated or correlated.
<b>Bedrock</b>	The body of rock that underlies gravel, soil or other Subregion material.
<b>Biodiversity</b>	The variety of plant and animal life in a particular habitat (e.g., plant community or a country). It includes all levels of organization, from genes to landscapes, and the ecological processes through which these levels are connected.
<b>Bog</b>	A peat-covered area or peat-filled wetlands. The water table is at or near the surface. The surface is often raised, or level with the surrounding wetlands, and is virtually unaffected by the nutrient-rich groundwater from the surrounding mineral soils. Hence, the ground water of the bog is generally acid and low in nutrients. The dominant peat materials are <i>sphagnum</i> and forest peat underlain, at times, by fen peat. The associated soils are fibrisols, mesisols and organic cryosols. Bogs may be treed or treeless and they are usually covered with <i>Sphagnum</i> and feather mosses, and ericaceous shrubs.
<b>Boreal forest</b>	The northern hemisphere, circumpolar, tundra forest type consisting primarily of black spruce and white spruce with balsam fir, birch and aspen.
<b>Bryophyte</b>	Non-vascular plants from the phylum Bryophyta. Species within this phylum include mosses, liverworts, and hornworts.
<b>Classification, Vegetation</b>	The systematic arrangement of plant communities into categories according to their inherent characteristics. Groupings are made on the basis of dominant vegetation species, in association with commonly associated species and a commonly associated set of site and soil conditions.
<b>Coniferous</b>	A plant (usually a tree) bearing cones or strobili (a cone-like cluster).
<b>Dominant</b>	In natural resources mapping, the feature (soil type, terrain, or other feature) that constitutes the majority of a mapping unit (generally 40% or more, and usually 50% or more).
<b>Ecological landscape classification (ELC)</b>	An ecological mapping process that involves the integration of site, soil, and vegetation information.
<b>Ecoregion</b>	Relatively homogeneous Subregion within an ecozone.

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<b>Ecosystem</b>	An integrated and stable association of living and non-living resources functioning within a defined physical location. A community of organisms and its environment functioning as an ecological unit. For the purposes of assessment, the ecosystem must be defined according to a particular unit and scale.
<b>Ecosystem type</b>	An ecosystem type is a standardized name that is given to an identifiable group of living organisms (defined by and named using the most common plant species) that interact among themselves and which, together with their environment (soil, climate, water and light), function as a unit.
<b>Ecological landscape cover classification (ELC) type</b>	An ecosystem type classed through supervised satellite image interpretation and verified with field survey points.
<b>Ecozone</b>	An area of the earth's surface that is representative of a broad-scale ecological unit characterized by particular abiotic (non-living) and biotic (living) factors, e.g., taiga forest, tundra.
<b>Epiphyte</b>	Arboreal growing plant species.
<b>Fen</b>	A fen is a peat-covered or peat-filled wetlands with a high water table that is usually at or above the surface.
<b>Forb</b>	An herbaceous plant, that is not a grass, sedge, or rush.
<b>Geographic Information System (GIS)</b>	A computer-based tool for analyzing, displaying, and manipulating digital spatial data.
<b>Glaciofluvial</b>	Sediments or landforms produced by melt waters originating from glaciers or ice sheets. Glaciofluvial deposits commonly contain rounded cobbles arranged in bedded layers.
<b>Graminoid</b>	Grass-like in form.
<b>Habitat</b>	The physical location or type of environment in which an organism or biological population lives or occurs.
<b>Hygric</b>	Soil moisture conditions where water is removed slowly enough to keep the soil wet for most of the growing season. Permanent seepage and mottling are present and possibly weak gleying.
<b>Landform</b>	A particular type of land formation.
<b>Landscape</b>	A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout. From a wildlife perspective, a landscape is an area of land containing a mosaic of habitat patches within which a particular "focal" or "target" habitat patch is embedded.

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<b>Local study area (LSA)</b>	Area defined for the description of vegetation types in the vicinity of the Project footprint. The area where direct effects of the Project might be expected to occur. Occurs within the regional study area.
<b>Lowlands</b>	Areas with ground slopes of less than 0.5% and typically poorly drained.
<b>Map unit</b>	Code developed to represent an Ecological Landscape Classification (ELC) type on vegetation mapping.
<b>Marsh</b>	A mineral or a peat-filled wetlands, which is periodically inundated by standing or slowly moving water.
<b>Moisture regime</b>	The relative moisture supply at a site available for plant growth.
<b>Non-vascular plant</b>	Plants that do not possess conductive tissues (e.g., veins) for the transport of water and food.
<b>Nutrient regime</b>	The relative supply of nutrients available for plant growth at a given site.
<b>Nutrients</b>	Environmental substances (elements or compounds), such as nitrogen or phosphorus, that are necessary for the growth and development of plants and animals.
<b>Oligotrophic</b>	Trophic state classification for lakes characterized by low productivity and low nutrient inputs (particularly total phosphorus).
<b>Parameter</b>	A particular physical, chemical, or biological property that is being measured in a waterbody; whatever it is you measure in a waterbody.
<b>Patch</b>	An area that is different from the area around it (e.g., vegetation types, non-forested areas). This term is used to recognize that most ecosystems are not homogeneous, but rather exist as a group of patches or ecological islands that are recognizably different from the parts of the ecosystem that surround them but nevertheless interact with them.
<b>Permafrost</b>	Permanently frozen ground (subsoil). Permafrost areas are divided into more northern areas in which permafrost is continuous, and those more southern areas in which patches of permafrost alternate with unfrozen ground.
<b>Plant community</b>	A collection of plants that live together on a relatively uniform area of land with a floristic composition and structure that is distinct from surrounding vegetation.
<b>Polygon</b>	The spatial area delineated on a map to define one feature unit (e.g., one type of ecosite phase).
<b>Rare plants</b>	A native plant species found in restricted areas, at the edge of its range or in low numbers within a province, state, territory or country.

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<b>Regional study area (RSA)</b>	A broad area defined for the description of vegetation conditions generally centred on the Project and surroundings, and including areas where indirect effects of the Project might be expected to occur. Includes the local study area.
<b>Riparian</b>	Refers to terrain, vegetation or simply a position next to or associated with a stream, floodplain, or standing waterbody.
<b>Sedge</b>	Any plant of the genus <i>Carex</i> , perennial herbs, often growing in dense tufts in marshy places. They have triangular jointless stems, a spiked inflorescence and long grass-like leaves which are usually rough on the margins and midrib. There are several hundred species.
<b>Seral stage</b>	In an ecological succession, the series of biotic communities that follow one another on the way to the stable stage, or climax community.
<b>Shrub</b>	A woody perennial plant differing from a tree by its low stature and by generally producing several basal shoots instead of a single trunk.
<b>Species</b>	A group of organisms that actually or potentially interbreed and are reproductively isolated from all other such groups; a taxonomic grouping of genetically and morphologically similar individuals; the category below genus.
<b>Species evenness</b>	A measure of equitability calculated to incorporate the sum of the proportional contributions of an individual species to the total population of a community.
<b>Species richness</b>	The number of different species occupying a given area.
<b>Subhydric</b>	Soil moisture conditions where water is removed slowly enough to keep the water table at or near the surface for most of the year; organic and gleyed mineral soils are present as well as permanent seepage less than 30 cm below the surface.
<b>Successional stage</b>	A particular phase of the forest succession continuum with its own characteristic of age, structure, and composition of species. Stages may include the following: pioneer, young seral, maturing seral, old seral, young edaphic, mature edaphic, young climatic, mature climatic, and disclimax.
<b>Supervised image classification</b>	Automated mapping method typically composed of 3 stages: training, classification, and output. The training stage involves the identification of training areas and associated spectral responses that correspond to various land cover categories. The classification stage compares each unknown pixel to the spectral patterns identified during the training stage and assigns them to the most appropriate land cover category. The output stage allows for the presentation of results, either as maps, tables, or GIS data files. From Lillesand et al. (2004).

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<b>Upland</b>	Areas that have typical ground slopes of 1 to 3% and are better-drained.
<b>Vascular plant</b>	Plants possessing conductive tissues (e.g., veins) for the transport of water and food.

## 6.1 ABBREVIATIONS AND ACRONYMS

ANPC	Alberta Native Plant Council
ASRD	Alberta Sustainable Resource Development
NPAR	Proposed NICO Project Access Road
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DAR	Developer's Assessment Report
DBH	diameter at breast height
DVI	Detailed Vegetation Inventory
EBA	EBA Engineering Consultants Ltd.
e.g.	for example
ELC	Ecological Landscape Classification
et al.	group of authors
Fortune	Fortune Minerals Limited
GIS	geographic information system
GNWT	Government of the Northwest Territories
Golder	Golder Associates Ltd.
i.e.	that is
ICMM	International Council on Mining and Minerals
IUCN	International Union for Conservation of Nature
LSA	local study area
NWT	Northwest Territories
Project	NICO Cobalt-Gold-Bismuth-Copper Project
Rescan	Rescan Environmental Services Ltd.
RSA	regional study area
RWED	Department of Resources, Wildlife and Economic Development



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SARA	<i>Species at Risk Act</i>
sp.	single species
spp.	multiple species
TK	traditional knowledge
TLU	traditional land use
TM	Thematic Mapper (Landsat satellite image product)
UTM	Universal Transverse Mercator
VC	valued component

## 6.2 UNITS OF MEASURE

%	percent
°C	degrees Celsius
<	less than
>	greater than
≤	less than or equal to
±	plus minus
cm	centimetre
ha	hectare
km	kilometre
km <sup>2</sup>	square kilometre
m	metre
mm	millimetre

## **APPENDIX I**

### **RARE PLANTS POTENTIALLY PRESENT IN THE LOCAL STUDY AREA**

**Table I-1 Rare Plants Potentially Present in the Local Study Area**

Common Name	Scientific Name	Habitat Information
Several Vein Sweetflag (Rat Root)	<i>Acorus americanus (Acorus calamus)</i>	wetlands
Orange False Dandelion	<i>Agoseris aurantiaca</i>	meadows, hot springs, disturbed areas
Pearly Everlasting	<i>Anaphalis margaritacea</i>	subalpine wooded areas and meadows
Seaside Angelica	<i>Angelica lucida (Coelopleurum gmelinii)</i>	shrubby alpine tundra
Indian Hemp	<i>Apocynum cannabinum (Apocynum sibiricum)</i>	exposed river banks
Calder's Rockcress	<i>Arabis calderi</i>	grassy clearings, meadows, and openings in thickets in subalpine and alpine areas
Alaska Sagebrush	<i>Artemisia alaskana</i>	cliffs and scree slopes
White Sagebrush	<i>Artemisia ludoviciana</i>	open woodlands and grass areas (B036), salt plains (H156)
Green Spleenwort	<i>Asplenium trichomanes-ramosum</i>	Moist, rocky slope and crevices
Canadian Milk-vetch	<i>Astragalus canadensis</i>	river banks and moist, open woods
Thick-leaved Orache	<i>Atriplex dioica (syn Atriplex subspicata)</i>	salt plains
Red Clubrush	<i>Blysmopsis rufus (Blysmus rufus; Scirpus rufus)</i>	wet river banks and saline meadows
Saltmarsh Bulrush	<i>Bolboschoenus maritimus (Schoenoplectus maritimus; Scirpus paludosus; Scirpus maritimus)</i>	salt plains
Mingan Moonwort	<i>Botrychium minganense</i>	grassy meadows
Leathery Grape-fern	<i>Botrychium multifidum</i>	circumpolar prairie clearings
Northwestern Moonwort	<i>Botrychium pinnatum (Botrychium boreale)</i>	grassy tundra; grassy slopes, streambanks, woods
Small-leaved Bittercress	<i>Cardamine microphylla</i>	wet places on slopes and stream banks
Small-flowered Bittercress	<i>Cardamine parviflora</i>	sandy, open places or rocky ledges
Northern Clustered Sedge	<i>Carex arcta</i>	wet woodland bogs, marshes and sandy beaches
Needle-leaved Sedge	<i>Carex duriuscula (Carex stenophylla)</i>	prairie
Goosegrass Sedge	<i>Carex eleusinoides</i>	tundra bogs; patterned fen
Weak Sedge	<i>Carex laxa</i>	tundra bogs; patterned fen
Mackenzie Sedge	<i>Carex mackenziei (Carex norvegica Willdenow ex Schkuhr, Besch. Riedgrä )</i>	brackish marshes
Few-seeded Sedge	<i>Carex oligosperma</i>	wet, sandy lake shores
Prairie Sedge	<i>Carex prairea</i>	bogs
Retorse Sedge	<i>Carex retrorsa</i>	woodland marshes
Three-seed Sedge	<i>Carex trisperma</i>	bogs
Yukon Indian Paintbrush	<i>Castilleja yukonis</i>	spruce woods, treed bogs, and grassy slopes
Rose Chamaerhodos	<i>Chamaerhodos erecta (Chamaerhodos ssp. nuttallii)</i>	dry calcareous slopes
Red Pigweed (Coast-Blite Goosefoot)	<i>Chenopodium rubrum</i>	salt plains and disturbed soils
Leafy Thistle	<i>Cirsium foliosum</i>	sedge and grass meadow
Swedish Dogwood	<i>Cornus suecica</i>	wet mossy areas
Water Pigmy-weed	<i>Crassula aquatica (Tillaea aquatica)</i>	shallow ponds

**Table I-1 Rare Plants Potentially Present in the Local Study Area (continued)**

Common Name	Scientific Name	Habitat Information
Slender Rock-brake	<i>Cryptogramma stelleri</i>	moist shale slopes
Pinnate Tansy Mustard	<i>Descurainia pinnata</i>	sandy beaches and disturbed areas
Yellowstone Whitlow-grass	<i>Draba incerta</i>	alpine tundra and rocky slopes
Slenderleaf Sundew	<i>Drosera linearis</i>	wet calcareous bog- and pond-margins
Spinulose Wood-fern	<i>Dryopteris carthusiana</i> ( <i>D. spinulosa</i> )	rich woods
Slender Spike Rush	<i>Eleocharis elliptica</i> (was misreported as <i>Eleocharis compressa</i> in B003)	calcareous sandy and muddy shoreline
Hornemann Willowherb	<i>Epilobium hornemannii</i>	wet alpine tundra
White-flower Willowherb	<i>Epilobium lactiflorum</i>	wet meadows and moss by alpine brooks
Linear-leaved Willowherb	<i>Epilobium leptophyllum</i>	marshes, sloughs, bogs, and sedge meadows
Yukon Fleabane	<i>Erigeron yukonensis</i>	calcareous, stony slopes
Showy Forget-me-not	<i>Eritrichium splendens</i>	alpine scree slopes and rock ledges
Macoun's Gentian	<i>Gentianopsis macounii</i> ( <i>Gentiana macounii</i> )	gravelly beaches, marly shores, and marshy areas
Prairie-smoke	<i>Geum triflorum</i>	dry prairie and grassland spp. - typical alvar species
Sea Milkwort	<i>Glaux maritima</i>	saline sloughs
Broadleaf Gumweed	<i>Grindelia squarrosa</i>	salt plains
Northern Stickseed	<i>Hackelia deflexa</i> ( <i>Hackelia deflexa</i> var. <i>americana</i> )	thickets, woods, clearings and banks
Hooker's Alpine Oat Grass	<i>Helictotrichon hookeri</i> ( <i>Avenula hookeri</i> )	woodland meadows
Richardson Alumroot	<i>Heuchera richardsonii</i>	woodland meadows
Lake Quillwort	<i>Isoetes lacustris</i> ( <i>Isoetes macrospora</i> )	shallow, sandy lake margins
Oriental Koeler's Grass	<i>Koeleria asiatica</i> ( <i>Koeleria cairnesiana</i> )	dry tundra and shale scree
Beach Pea	<i>Lathyrus japonicus</i>	sheltered beaches and river banks
Calder's Bladderpod	<i>Lesquerella calderi</i>	alpine slopes
Northern Mudwort	<i>Limosella aquatica</i>	wet, muddy or sandy pond margins
Water Lobelia	<i>Lobelia dortmanna</i>	shallow, sandy shores of lakes and ponds
Segmented Luetkea	<i>Luetkea pectinata</i>	alpine tundra and snowbeds
Rufous Wood Rush	<i>Luzula rufescens</i>	bogs, marshes, and river banks
White Adder's-mouth	<i>Malaxis monophyllos</i>	damp calcareous fens
Bog Adder's-mouth	<i>Malaxis paludosa</i>	treed bog
Common Large Monkey Flower	<i>Mimulus guttatus</i>	wet meadows and streams
Yukon Stitchwort	<i>Minuartia yukonensis</i> ( <i>Arenaria laricifolia</i> )	alpine areas and delta area in the NWT - Beringian species
Alternate-flower Water Milfoil	<i>Myriophyllum alterniflorum</i>	grasslands
Green Tussock Grass (Feather Grass)	<i>Nassella viridula</i> ( <i>Stipa viridula</i> )	grasslands

**Table I-1 Rare Plants Potentially Present in the Local Study Area (continued)**

Common Name	Scientific Name	Habitat Information
Rocky Mountain Pond Lily	<i>Nuphar polysepala</i> ( <i>Nuphar lutea</i> ssp. <i>polysepala</i> )	lakes and slow moving streams
Dwarf White Waterlily	<i>Nymphaea leibergii</i> (syn <i>Nymphaea tetragona</i> ssp. <i>leibergii</i> )	shallow lakes and slow moving streams
Yellow Owl's Clover	<i>Orthocarpus luteus</i>	sandy riverbanks and lakeshores
McConnell's Poppy	<i>Papaver mcconnellii</i>	alpine shale slopes
Muskeg Lousewort	<i>Pedicularis macrodonta</i> (syn <i>Pedicularis parviflora</i> var. <i>macrodonta</i> (Richards))	bogs and marshes, fens
Oeder's Lousewort	<i>Pedicularis oederi</i>	moist alpine tundra
Whorled Lousewort	<i>Pedicularis verticillata</i>	damp meadows, near beaches or lake shores
Smooth Cliff-brake	<i>Pellaea glabella</i>	limestone cliffs
Seaside Plantain	<i>Plantago maritima</i> ( <i>Plantago juncooides</i> )	cliffs and sea-beaches or inland saline springs
Polar Bluegrass	<i>Poa pseudoabbreviata</i>	rocky slopes, snow beds, and ridges
Illinois Pondweed	<i>Potamogeton illinoensis</i>	still water
Flatleaf Pondweed	<i>Potamogeton robbinsii</i>	aquatic
Arctic Primrose	<i>Primula eximia</i> ( <i>Primula tschuktschorum</i> ssp. <i>cairnesiana</i> )	meadows and stream margins
Choke Cherry	<i>Prunus virginiana</i>	thickets
Goldenweed	<i>Pyrrocoma uniflora</i> ( <i>Haplopappus uniflorus</i> , <i>H. lanceolatus</i> subsp.)	salt plains
Bristly Crowfoot	<i>Ranunculus pensylvanicus</i>	disturbed and marshy places
Turner's Buttercup	<i>Ranunculus turneri</i>	subalpine meadows
White Beakrush	<i>Rhynchospora alba</i>	fens and bogs
Hoary Yellowcress	<i>Rorippa barbareifolia</i>	disturbed sites
Asiatic Cress/ Mackenzie River Yellowcress	<i>Rorippa crystallina</i>	<i>Carex</i> meadows and marshes
Lapland Sorrel	<i>Rumex lapponicus</i> ( <i>Rumex acetosa</i> ssp. <i>alpestris</i> , <i>Rumex alpestris</i> ssp. <i>lapponica</i> )	moist alpine or subalpine meadows
Arctic Seashore Willow	<i>Salix ovalifolia</i> ( <i>S. ovalifolia</i> var. <i>arctolitoralis</i> )	sand beaches and terraces
Raup's Willow	<i>Salix raupii</i>	gravel floodplains and treed bogs
Matte Saxifrage	<i>Saxifraga bronchialis</i>	rocky or gravelly alpine areas
Rusty-hair Saxifrage	<i>Saxifraga ferruginea</i>	moist rocky ledges
White Mountain Saxifrage	<i>Saxifraga paniculata</i> ( <i>Saxifraga aizoon</i> )	rocky ledges
Three-square Bulrush	<i>Schoenoplectus pungens</i>	Taiga plains
Freshwater Cordgrass	<i>Spartina pectinata</i>	salt plains
Umbellate Stitchwort	<i>Stellaria umbellata</i>	moist alpine slopes
Purple-stemmed Aster	<i>Symphyotrichum puniceus</i> ( <i>Aster puniceus</i> )	moist or swampy places
Yukon Aster	<i>Symphyotrichum yukonense</i> ( <i>Aster yukonensis</i> )	sandy loam soil and plentiful water supply, usually in valleys; can tolerate saline conditions (has been found near hot springs)

**Table I-1      Rare Plants Potentially Present in the Local Study Area (continued)**

Common Name	Scientific Name	Habitat Information
Alaska Kitten-tail	<i>Synthyris borealis</i>	alpine cliffs, shale slopes, and heathy slopes
Floccose Tansy	<i>Tanacetum bipinnatum (T. huronense)</i>	sandy river banks
Rolland's Bulrush	<i>Trichophorum pumilum (Scirpus pumilus, Scirpus rollandii)</i>	marly lake shores and hot springs
Northern Bladderwort	<i>Utricularia ochroleuca</i>	small, eutrophic ponds
Velvetleaf Blueberry	<i>Vaccinium myrtilloides</i>	in dry or acid soil
Purslane Speedwell	<i>Veronica peregrina</i>	moist places of settled areas
Canada Violet	<i>Viola canadensis (Viola rugulosa)</i>	woodlands along streams and hot springs
Great-spurred Violet	<i>Viola selkirkii</i>	moist thickets, woods, fens and alpine tundra
Horned pondweed	<i>Zannichellia palustris</i>	shallow, fresh or mildly saline ponds or sluggish streams

Note: Plant species in table are listed as "May Be At Risk" by the government of the Northwest Territories (GNWT 2010). Some species shown may have less probability than others of occurring within the region due to specific habitat requirements.

## **APPENDIX II**

### **SPECIES LIST BY ECOLOGICAL LANDSCAPE CLASSIFICATION TYPE**

**Table II-1 Species List by Ecological Landscape Classification Type**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
<b>Bedrock open conifer</b>				
	canopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Betula papyrifera</i>	white birch	1
		<i>Betula sp</i>	birch species	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Linnaea borealis</i>	twinlineflower	<1
		<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rubus idaeus</i>	wild red raspberry	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Campanula rotundifolia</i>	harebell	<1
		<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
		forb species unknown	forb species unknown	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Polypodium virginianum</i>	rock polypody	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
		<i>Saxifraga tricuspidata</i>	three-toothed saxifrage	<1
	graminoid	<i>Smilacina trifolia</i>	three-leaved Solomon's-seal	<1
		<i>Agrostis scabra</i>	rough hair grass	<1
		<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex canescens</i>	short sedge	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		<i>Deschampsia</i> species unknown	<i>Deschampsia</i> species unknown	<1
		grass species unknown	grass species unknown	<1
		<i>Poa glauca</i>	timberline bluegrass	<1



**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
	moss	<i>Ceratodon purpureus</i>	purple horn-toothed moss	<1
		<i>Dicranum flagellare</i>	whip fork moss	<1
		<i>Dicranum scoparium</i>	broom moss	<1
		<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		moss species unknown	moss species unknown	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
		<i>Pohlia nutans</i>	copper wire moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Polytrichum piliferum</i>	awned hair-cap	<1
		<i>Polytrichum strictum</i>	slender hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Sphagnum angustifolium</i>	peat moss	<1
		<i>Sphagnum fuscum</i>	rusty peat moss	<1
		<i>Sphagnum magellanicum</i>	midway peat moss	<1
		<i>Tortella fragilis</i>	fragile screw moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	19
		<i>Biatora</i> species unknown	dot lichen	<1
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	3
		<i>Cladina rangiferina</i>	grey reindeer lichen	5
		<i>Cladina stellaris</i>	northern reindeer lichen	9
		<i>Cladonia amaurocraea</i>	no common name	<1
		<i>Cladonia borealis</i>	red pixie-cup	1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Lasallia pensylvanica</i>	Pennsylvania toadskin lichen	<1
		<i>Melanelia exasperata</i>	no common name	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	2
		<i>Rhizocarpon</i> species unknown	<i>Rhizocarpon</i> species unknown	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
		<i>Umbilicaria hyperborea</i>	navel lichen	10
		<i>Umbilicaria muehlenbergii</i>	lesser rocktripe	5
		<i>Xanthoparmelia coloradoensis</i>	no common name	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
Coniferous pine				
	canopy	<i>Picea glauca</i>	white spruce	<1
		<i>Pinus banksiana</i>	jack pine	8
	subcanopy	<i>Betula papyrifera</i>	white birch	1
		<i>Picea glauca</i>	white spruce	1
		<i>Picea mariana</i>	black spruce	3
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	3
		tall shrub	<i>Alnus viridis ssp crispa</i>	green alder
	<i>Betula papyrifera</i>		white birch	1
	<i>Picea glauca</i>		white spruce	<1
	<i>Pinus banksiana</i>		jack pine	19
	<i>Populus tremuloides</i>		aspen	<1
	<i>Salix</i> species unknown		willow species unknown	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	3
		<i>Betula papyrifera</i>	white birch	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Linnaea borealis</i>	twinlineflower	1
		<i>Picea glauca</i>	white spruce	8
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	16
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Cornus canadensis</i>	bunchberry	<1
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	3

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
		<i>Oryzopsis pungens</i>	northern rice grass	<1
	moss	<i>Abietinella abietina</i> (also <i>Thuidium abietinum</i> )	no common name	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	6
		<i>Pleurozium schreberi</i>	Schreber's moss	1
		<i>Pohlia nutans</i>	copper wire moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Polytrichum juniperinum</i>	juniper hair-cap	<1
		<i>Polytrichum piliferum</i>	awned hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Pylaisiella polyantha</i>	pylaisiella moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	<1
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	4
		<i>Cladina rangiferina</i>	grey reindeer lichen	8
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	3
		<i>Peltigera didactyla</i>	no common name	<1
		<i>Peltigera malacea</i>	veinless pelt	1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
<b>Coniferous spruce</b>				
	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Larix laricina</i>	tamarack	<1
		<i>Picea glauca</i>	white spruce	7
		<i>Picea mariana</i>	black spruce	6
		<i>Pinus banksiana</i>	jack pine	<1
	subcanopy	<i>Betula papyrifera</i>	white birch	1
		<i>Larix laricina</i>	tamarack	<1
		<i>Picea glauca</i>	white spruce	4
		<i>Picea mariana</i>	black spruce	2
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus balsamifera</i>	balsam poplar	<1
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Picea mariana</i>	black spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Salix bebbiana</i>	beaked willow	<1
		<i>Salix</i> species unknown	willow species unknown	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	4
		<i>Arctostaphylos rubra</i>	alpine bearberry	1
		<i>Arctostaphylos uva-ursi</i>	bearberry	1
		<i>Betula glandulosa</i>	bog birch	<1
		<i>Betula papyrifera</i>	white birch	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Larix laricina</i>	tamarack	<1
		<i>Ledum groenlandicum</i>	Labrador tea	5
		<i>Ledum palustre</i>	northern Labrador tea	<1
		<i>Linnaea borealis</i>	twinline	2
		<i>Myrica gale</i>	sweet gale	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Picea mariana</i>	black spruce	2
		<i>Pinus banksiana</i>	jack pine	<1
	low shrub	<i>Populus tremuloides</i>	aspen	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	1
		<i>Ribes oxycanthoides</i>	northern gooseberry	<1
		<i>Rosa acicularis</i>	prickly rose	2
		<i>Salix bebbiana</i>	beaked willow	<1
		<i>Salix glauca</i>	smooth willow	<1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	<1
		<i>Salix myrtillofolia</i>	myrtle-leaved willow	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		<i>shrub</i> species unknown	shrub species unknown	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	2
		<i>Viburnum edule</i>	low-bush cranberry	1
	forb	<i>Antennaria parvifolia</i>	small-leaved everlasting	<1
		<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Equisetum arvense</i>	common horsetail	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>forb</i> species unknown	forb species unknown	2
		<i>Galium</i> species unknown	<i>Galium</i> species unknown	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
		<i>Pyrola grandiflora</i>	Arctic wintergreen	1
		<i>Pyrola minor</i>	lesser wintergreen	<1
		<i>Pyrola</i> species unknown	wintergreen species unknown	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Agrostis scabra</i>	rough hair grass	<1
		<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex disperma</i>	two-seeded sedge	<1
		<i>Carex</i> species unknown	sedge species unknown	<1
		<i>Eriophorum</i> species unknown	<i>Eriophorum</i> species unknown	<1
		<i>grass</i> species unknown	grass species unknown	1
		<i>Leymus innovatus</i> (also <i>Elymus innovatus</i> )	hairy wild rye	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Oryzopsis</i> sp	rice grass species	<1
	moss	<i>Dicranella schreberiana</i>	Schreberian fork moss	<1
		<i>Dicranum elongatum</i>	long forked moss	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Distichium capillaceum</i>	no common name	<1
		<i>Hylocomium</i> species unknown	stair-step moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	4
		<i>Pleurozium schreberi</i>	Schreber's moss	25
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Polytrichum juniperinum</i>	juniper hair-cap	1
		<i>Polytrichum strictum</i>	slender hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	2
		<i>Ptilium crista-castrensis</i>	knight's plume moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	<1
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	3
		<i>Cladina rangiferina</i>	grey reindeer lichen	2
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia cervicornis</i> (also <i>C. verticillata</i> )	ladder lichen	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia multiformis</i>	sieve lichen	<1
		<i>Cladonia uncialis</i>	thorn cladonia	<1
		<i>Melanelia stygia</i>	no common name	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
		<i>Stereocaulon paschale</i>	no common name	<1
	epiphyte	<i>Arthonia edgewoodensis</i>	no common name	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Bryoria fuscescens</i>	speckled horsehair	<1
		<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	2
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Lecanora circumborealis</i>	black-eyed rim lichen	<1
		<i>Lecanora symmicta</i>	fused rim-lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Melanelia</i> species unknown	<i>Melanelia</i> species unknown	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Parmeliopsis hyperopta</i>	gray starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis ciliaris</i>	no common name	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea cavernosa</i>	old man's beard	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Usnea scabrata</i>	straw beard lichen	<1
		<i>Usnea substerilis</i>	beard lichen	<1
		<i>Vulpicida pinastr</i> (also <i>Tuckermannopsis pinastr</i> )	powdered sunshine lichen	<1
Deciduous aspen-paper birch				
	canopy	<i>Betula papyrifera</i>	white birch	9
		<i>Picea glauca</i>	white spruce	1
		<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	13
	subcanopy	<i>Betula papyrifera</i>	white birch	2
		<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Populus tremuloides</i>	aspen	2
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Betula papyrifera</i>	white birch	1
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	5

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Arctostaphylos uva-ursi</i>	bearberry	6
		<i>Betula papyrifera</i>	white birch	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Ledum groenlandicum</i>	Labrador tea	1
		<i>Linnaea borealis</i>	twinline	1
		<i>Picea glauca</i>	white spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	1
		<i>Rosa acicularis</i>	prickly rose	2
		<i>Salix glauca</i>	smooth willow	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	6
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Antennaria parvifolia</i>	small-leaved everlasting	<1
		<i>Aster</i> species unknown	aster species unknown	<1
		<i>Campanula rotundifolia</i>	harebell	<1
		<i>Cornus canadensis</i>	bunchberry	1
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	2
		<i>Hieracium umbellatum</i>	narrow-leaved hawkweed	<1
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
		<i>Oryzopsis</i> sp	rice grass species	<1
		<i>Oryzopsis pungens</i>	northern rice grass	<1
	moss	<i>Dicranum muehlenbeckii</i>	thin-leaf curved-tail moss	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Dicranum undulatum</i>	wavy dicranum	<1
		<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Hypnum callichroum</i>	no common name	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Pylaisiella polyantha</i>	pylaisiella moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	1



**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattenned snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	3
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Cladonia pyxidata</i>	pebbled pixie-cup	<1
		<i>Cladonia sulphurina</i>	greater sulphur cup	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
		<i>Rhizocarpon</i> species unknown	<i>Rhizocarpon</i> species unknown	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
		<i>Umbilicaria muehlenbergii</i>	lesser rocktripe	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	<1
		<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Caloplaca cerina</i>	no common name	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Lecanora pulicaris</i>	rim-lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Vulpicida pinastr</i> (also <i>Tuckermannopsis pinastr</i> )	powdered sunshine lichen	<1
Marsh/graminoid fen				
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Betula sp</i>	birch species	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Ledum palustre</i>	northern Labrador tea	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	<1
		<i>Salix</i> species unknown	willow species unknown	1
	forb	<i>Drosera rotundifolia</i>	round-leaved sundew	<1
		<i>Galium trifidum</i>	small bedstraw	<1
		<i>Potentilla palustris</i>	marsh cinquefoil	2
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	3
		<i>Carex aquatilis</i>	water sedge	48
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	27
		<i>Carex utriculata</i>	small bottle sedge	25
		<i>Eriophorum angustifolium</i>	tall cotton-grass	1
		<i>Glyceria grandis</i>	common tall manna grass	3
	moss	<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	2
<b>Mixedwood spruce-paper birch-aspen</b>				
	canopy	<i>Betula papyrifera</i>	white birch	10
		<i>Picea glauca</i>	white spruce	19
		<i>Picea mariana</i>	black spruce	<1
		<i>Populus tremuloides</i>	aspen	1
	subcanopy	<i>Betula papyrifera</i>	white birch	3
		<i>Picea glauca</i>	white spruce	4
		<i>Picea mariana</i>	black spruce	1
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Alnus viridis ssp. crispa</i>	green alder	<1
		<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	2
		<i>Salix bebbiana</i>	beaked willow	<1
		<i>Salix planifolia</i>	flat-leaved willow	<1
	low shrub	<i>Alnus viridis ssp. crispa</i>	green alder	3
		<i>Arctostaphylos rubra</i>	alpine bearberry	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Betula papyrifera</i>	white birch	<1
		<i>Ledum groenlandicum</i>	Labrador tea	2
		<i>Linnaea borealis</i>	twinlineflower	<1
		<i>Picea glauca</i>	white spruce	2

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Populus tremuloides</i>	aspen	<1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Ribes oxycanthoides</i>	northern gooseberry	<1
		<i>Ribes triste</i>	wild red currant	<1
		<i>Rosa acicularis</i>	prickly rose	2
		<i>Salix glauca</i>	smooth willow	<1
		<i>Salix maccalliana</i>	velvet-fruited willow	<1
		<i>Salix myrtillofolia</i>	myrtle-leaved willow	<1
		<i>Salix</i> species unknown	<i>Salix</i> species unknown	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	11
		<i>Viburnum edule</i>	low-bush cranberry	<1
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	6
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1
		<i>Pyrola grandiflora</i>	Arctic wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Dicranum acutifolium</i>	cushion moss	<1
		<i>Dicranum flagellare</i>	whip fork moss	<1
		<i>Dicranum spadiceum</i>	cushion moss	1
		<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	1
		<i>Pleurozium schreberi</i>	Schreber's moss	3
		<i>Pohlia nutans</i>	copper wire moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	1
		<i>Ptilium crista-castrensis</i>	knight's plume moss	1
		<i>Thuidium recognitum</i>	no common name	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	<1
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladonia mitis</i>	green reindeer lichen	<1
		<i>Cladonia stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera didactyla</i>	no common name	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	<1
		<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Vulpicida pinastris</i> (also <i>Tuckermannopsis pinastris</i> )	powdered sunshine lichen	<1
Open bog	canopy	<i>Picea mariana</i>	black spruce	1
		<i>Pinus banksiana</i>	jack pine	<1
	subcanopy	<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
	tall shrub	<i>Larix laricina</i>	tamarack	<1
		<i>Picea mariana</i>	black spruce	2
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Andromeda polifolia</i>	bog rosemary	13
		<i>Betula sp</i>	birch species	<1
		<i>Chamaedaphne calyculata</i>	leatherleaf	1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Ledum groenlandicum</i>	Labrador tea	10
		<i>Ledum palustre</i>	northern Labrador tea	<1
		<i>Myrica gale</i>	sweet gale	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	1
		<i>Picea mariana</i>	black spruce	1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Vaccinium sp</i>	bilberry sp	3
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
	forb	<i>Drosera rotundifolia</i>	round-leaved sundew	<1
		<i>Equisetum arvense</i>	common horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Rubus chamaemorus</i>	cloudberry	4
	graminoid	<i>Carex aquatilis</i>	water sedge	3
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	1
		<i>Eriophorum chamissonis</i>	russett cotton grass	4
		<i>Eriophorum gracile</i>	slender cotton grass	4
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Brachythecium turgidum</i>	no common name	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	1
		<i>Sphagnum angustifolium</i>	peat moss	5
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	<1
		<i>Sphagnum fuscum</i>	rusty peat moss	31
		<i>Sphagnum girgensohnii</i>	Girgensohn's moss	3
		<i>Sphagnum riparium</i>	shore-growing peat moss	<1
		<i>Sphagnum squarrosum</i>	squarrose peat moss	3
		<i>Sphagnum teres</i>	thin-leaved peat moss	10
		<i>Tomentypnum nitens</i>	golden moss	1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	2
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Immadophila ericetorum</i>	spraypaint	<1
	epiphyte	<i>Bryoria simplicior</i>	old man's beard	<1
		<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis ciliaris</i>	no common name	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
Shrubland				
	canopy	<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Betula occidentalis</i>	water birch	3
		<i>Larix laricina</i>	tamarack	1
		<i>Picea mariana</i>	black spruce	1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	1
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Arctostaphylos rubra</i>	alpine bearberry	2
		<i>Betula glandulosa</i>	bog birch	<1
		<i>Betula</i> sp	birch species	24
		<i>Chamaedaphne calyculata</i>	leatherleaf	<1
		<i>Larix laricina</i>	tamarack	1
		<i>Ledum groenlandicum</i>	Labrador tea	3
		<i>Myrica gale</i>	sweet gale	<1
		<i>Picea mariana</i>	black spruce	2
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	1
		<i>Salix alaxensis</i>	Alaska willow	7
		<i>Salix arbusculoides</i>	shrubby willow	<1
		<i>Salix bebbiana</i>	beaked willow	<1
		<i>Salix candida</i>	hoary willow	<1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	1
		<i>Salix maccalliana</i>	velvet-fruited willow	<1
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	<1
		<i>Salix planifolia</i>	flat-leaved willow	13
		<i>Salix</i> species unknown	willow species unknown	1
		<i>shrub</i> species unknown	shrub species unknown	<1
		<i>Vaccinium</i> sp	bilberry sp	1
		<i>Vaccinium uliginosum</i>	bog bilberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Caltha palustris</i>	marsh-marigold	1
		<i>Epilobium anagallidifolium</i>	alpine willowherb	<1
		<i>Equisetum arvense</i>	common horsetail	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Equisetum fluviatile</i>	swamp horsetail	1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Galium trifidum</i>	small bedstraw	<1
		<i>Hippuris vulgaris</i>	common mare's-tail	<1
		<i>Potentilla gracilis</i>	graceful cinquefoil	<1
		<i>Potentilla palustris</i>	marsh cinquefoil	4
		<i>Pyrola</i> species unknown	<i>Pyrola</i> species unknown	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1
		<i>Smilacina trifolia</i>	three-leaved Solomon's-seal	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex aquatilis</i>	water sedge	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	14
		grass species unknown	grass species unknown	1
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Campylium stellatum</i>	yellow star moss	<1
		<i>Cinclidium stygium</i>	common northern lantern moss	<1
		<i>Drepanocladus</i> species unknown	<i>Drepanocladus</i> species unknown	<1
		<i>Sanionia uncinata</i> (also <i>Drepanocladus uncinatus</i> )	brown moss	<1
		<i>Sphagnum riparium</i>	shore-growing peat moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	3
		<i>Sphagnum warnstorffii</i>	Warnstorff's peat moss	<1
		<i>Tomentypnum nitens</i>	golden moss	13
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover	
		<i>Usnea hirta</i>	shaggy beard lichen	<1	
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1	
Treed bog					
	canopy	<i>Picea mariana</i>	black spruce	4	
		<i>Populus balsamifera</i>	balsam poplar	<1	
	subcanopy	<i>Larix laricina</i>	tamarack	<1	
		<i>Picea mariana</i>	black spruce	1	
	tall shrub	<i>Larix laricina</i>	tamarack	1	
		<i>Picea mariana</i>	black spruce	15	
		<i>Salix alaxensis</i>	Alaska willow	<1	
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1	
		<i>Arctostaphylos rubra</i>	alpine bearberry	1	
		<i>Betula papyrifera</i>	white birch	<1	
		<i>Betula sp</i>	birch species	1	
		<i>Chamaedaphne calyculata</i>	leatherleaf	<1	
		<i>Empetrum nigrum</i>	crowberry	1	
		<i>Larix laricina</i>	tamarack	1	
		<i>Ledum groenlandicum</i>	Labrador tea	16	
		<i>Ledum palustre</i>	northern Labrador tea	<1	
		<i>Oxycoccus microcarpus</i>	small bog cranberry	1	
		<i>Picea mariana</i>	black spruce	7	
		<i>Rosa acicularis</i>	prickly rose	<1	
		<i>Salix alaxensis</i>	Alaska willow	<1	
		<i>Salix arbusculoides</i>	shrubby willow	<1	
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	<1	
		<i>Salix</i> species unknown	willow species unknown	1	
		<i>Vaccinium uliginosum</i>	bog bilberry	1	
		<i>Vaccinium vitis-idaea</i>	bog cranberry	2	
		forb	<i>Epilobium angustifolium</i>	fireweed	<1
			<i>Equisetum arvense</i>	common horsetail	1
	<i>Equisetum pratense</i>		meadow horsetail	<1	
	<i>Equisetum scirpoides</i>		dwarf scouring-rush	5	
	<i>Equisetum sylvaticum</i>		woodland horsetail	<1	
	<i>Geocaulon lividum</i>		northern bastard toadflax	<1	
	<i>Lycopodium annotinum</i>		stiff club-moss	<1	
	<i>Pyrola</i> species unknown		<i>Pyrola</i> species unknown	<1	
	<i>Rubus arcticus</i> (also <i>R. acaulis</i> )		dwarf raspberry	<1	



**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Rubus chamaemorus</i>	cloudberry	1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	1
		<i>Carex vaginata</i>	sheathed sedge	<1
		grass species unknown	grass species unknown	<1
		<i>Leymus innovatus</i> (also <i>Elymus innovatus</i> )	hairy wild rye	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	1
		<i>Dicranum undulatum</i>	wavy dicranum	<1
		<i>Hylocomium splendens</i>	stair-step moss	1
		<i>Pleurozium schreberi</i>	Schreber's moss	23
		<i>Polytrichum juniperinum</i>	juniper hair-cap	<1
		<i>Sphagnum angustifolium</i>	peat moss	14
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	1
		<i>Sphagnum fuscum</i>	rusty peat moss	12
		<i>Sphagnum girgensohnii</i>	Girgensohn's moss	<1
		<i>Sphagnum riparium</i>	shore-growing peat moss	<1
		<i>Sphagnum russowii</i>	wide-tongued peat moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	12
		<i>Sphagnum squarrosum</i>	squarrose peat moss	<1
		<i>Sphagnum teres</i>	thin-leaved peat moss	2
		<i>Tomentypnum nitens</i>	golden moss	1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladina stygia</i>	black-footed reindeer lichen	<1
	lichen	<i>Cladonia amaurocraea</i>	no common name	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Lecanora circumborealis</i>	black-eyed rim lichen	<1
		<i>Lecanora symmicta</i>	fused rim-lichen	<1
		<i>lichen species unknown</i>	lichen species unknown	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea cavernosa</i>	old man's beard	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Usnea subfloridana</i>	beard lichen	<1
		<i>Usnea substerilis</i>	beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
Treed fen				
	canopy	<i>Larix laricina</i>	tamarack	2
		<i>Picea mariana</i>	black spruce	5
	subcanopy	<i>Larix laricina</i>	tamarack	2
		<i>Picea mariana</i>	black spruce	4
	tall shrub	<i>Larix laricina</i>	tamarack	1
		<i>Picea mariana</i>	black spruce	2
		<i>Populus tremuloides</i>	aspen	<1
		<i>Salix bebbiana</i>	beaked willow	<1
		<i>Salix</i> species unknown	willow species unknown	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Arctostaphylos rubra</i>	alpine bearberry	<1
		<i>Betula sp</i>	birch species	5
	low shrub	<i>Chamaedaphne calyculata</i>	leatherleaf	<1
		<i>Empetrum nigrum</i>	crowberry	3
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Larix laricina</i>	tamarack	2
		<i>Ledum groenlandicum</i>	Labrador tea	7
		<i>Myrica gale</i>	sweet gale	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
<i>Picea mariana</i>		black spruce	5	
<i>Potentilla fruticosa</i>		shrubby cinquefoil	1	
<i>Rosa acicularis</i>		prickly rose	<1	

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	<1
		<i>Salix myrtillofolia</i>	myrtle-leaved willow	2
		<i>Salix pedicellaris</i>	bog willow	<1
		<i>Salix planifolia</i>	flat-leaved willow	2
		<i>Salix</i> species unknown	willow species unknown	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	<1
		<i>Vaccinium</i> sp	bilberry sp	2
		<i>Vaccinium uliginosum</i>	bog bilberry	3
		<i>Vaccinium vitis-idaea</i>	bog cranberry	8
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Equisetum arvense</i>	common horsetail	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Petasites frigidus</i>	no common name	<1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
		<i>Pyrola chlorantha</i> (also <i>Pyrola virens</i> )	greenish-flowered wintergreen	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
		<i>Spiranthes romanzoffiana</i>	hooded ladies'-tresses	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex aquatilis</i>	water sedge	5
		<i>Carex chordorrhiza</i>	prostrate sedge	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		grass species unknown	grass species unknown	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Brachythecium rivulare</i>	no common name	<1
		<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Cinclidium stygium</i>	common northern lantern moss	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Hylocomium splendens</i>	stair-step moss	6
		<i>Philonotis fontana</i>	Philonotis moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	5
		<i>Ptilidium ciliare</i>	liverwort	1
		<i>Sphagnum angustifolium</i>	peat moss	1
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	4

**Table II-1 Species List by Ecological Landscape Classification Type  
(continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name	Average Percent Cover
		<i>Sphagnum fuscum</i>	rusty peat moss	1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	<1
		<i>Sphagnum warnstorffii</i>	Warnstorff's peat moss	1
		<i>Tomentypnum nitens</i>	golden moss	5
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	2
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia cervicornis</i> (also <i>C. verticillata</i> )	ladder lichen	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Cladonia sulphurina</i>	greater sulphur cup	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		lichen species unknown	lichen species unknown	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1

**Table II-2 Additional Species by Ecological Landscape Classification Type from Rare Plant Surveys**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name
Bedrock open conifer			
	forb	<i>Achillea millefolium</i>	common yarrow
		<i>Botrychium lunaria</i>	moonwort
		<i>Dryopteris fragrans</i>	fragrant shield fern
		<i>Potentilla norvegica</i>	rough cinquefoil
		<i>Woodsia ilvensis</i>	rusty woodsia
	graminoid	<i>Calamagrostis purpurascens</i>	purple reed grass
	moss	<i>Barbilophozia kunzeana</i>	liverwort
		<i>Ptilidium pulcherrimum</i>	liverwort
		<i>Sphagnum compactum</i>	neat bog moss
		<i>Warnstorfia exannulata</i>	brown moss
	lichen	<i>Cladina arbuscula</i>	reindeer lichen
		<i>Cladonia ecmocyna</i>	no common name
		<i>Nephroma arcticum</i>	no common name
		<i>Stereocaulon alpinum</i>	no common name
		<i>Stereocaulon</i> species unknown	<i>Stereocaulon</i> species unknown
		<i>Umbilicaria americana</i>	no common name
Coniferous pine			
	lichen	<i>Stereocaulon grande</i>	no common name
Coniferous spruce			
	shrub	<i>Salix reticulata</i>	snow willow
	forb	<i>Galium triflorum</i>	sweet-scented bedstraw
		<i>Parnassia palustris</i>	northern grass-of-parnassus
		<i>Rhynanthus minor</i>	yellow rattle
		<i>Zigadenus elegans</i>	white camas
		moss	<i>Barbilophozia floerkei</i>
	<i>Barbilophozia kunzeana</i>		liverwort
	<i>Blepharostoma trichophyllum</i>		liverwort
	<i>Dicranum brevifolium</i>		cushion moss
	<i>Hypnum recurvatum</i>		no common name
	<i>Ptilidium pulcherrimum</i>		liverwort
	<i>Tritomaria exsectiformis</i>		liverwort
	lichen		<i>Cetraria ericetorum</i>
		<i>Cladonia gracilis</i> ssp <i>turbinata</i>	no common name
		<i>Cladonia phyllophora</i>	felt cladonia
		<i>Cladonia symphylicarpa</i>	no common name
		<i>Stereocaulon alpinum</i>	no common name
Deciduous aspen-paper birch			
	forb	<i>Zigadenus elegans</i>	white camas

**Table II-2 Additional Species by Ecological Landscape Classification Type from Rare Plant Surveys (continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name
Marsh/graminoid fen			
	forb	<i>Calla palustris</i>	water arum
		<i>Tofieldia glutinosa</i>	sticky false asphodel
		<i>Triglochin maritima</i>	seaside arrow-grass
		<i>Typha latifolia</i>	cattail
	graminoid	<i>Carex lenticularis</i>	<i>Carex lenticularis</i>
	moss	<i>Warnstorfia exannulata</i>	brown moss
Mixedwood spruce-paper birch-aspen			
	shrub	<i>Salix reticulata</i>	snow willow
	forb	<i>Galium triflorum</i>	sweet-scented bedstraw
		<i>Parnassia palustris</i>	northern grass-of-parnassus
		<i>Rhinanthus minor</i>	yellow rattle
		<i>Senecio vulgaris</i>	common groundsel
		<i>Zigadenus elegans</i>	white camas
Open bog			
	shrub	<i>Kalmia polifolia</i>	northern laurel
	forb	<i>Parnassia palustris</i>	northern grass-of-parnassus
	moss	<i>Aulacomnium turgidum</i>	no common name
		<i>Calypogeia sphagnicola</i>	liverwort
		<i>Cephalozia pleniceps</i>	liverwort
		<i>Warnstorfia exannulata</i>	brown moss
Shrubland			
	shrub	<i>Dryas integrifolia</i>	northern white mountain avens
	forb	<i>Anemone parviflora</i>	small wood anemone
		<i>Galium triflorum</i>	sweet-scented bedstraw
		<i>Rhinanthus minor</i>	yellow rattle
		<i>Tofieldia glutinosa</i>	sticky false asphodel
Treed bog			
	shrub	<i>Salix reticulata</i>	snow willow
	forb	<i>Galium triflorum</i>	sweet-scented bedstraw
		<i>Parnassia palustris</i>	northern grass-of-parnassus
		<i>Rhinanthus minor</i>	yellow rattle
		<i>Triglochin maritima</i>	seaside arrow-grass
		moss	<i>Aulacomnium acuminatum</i>
	<i>Aulacomnium turgidum</i>		no common name
	<i>Drepanocladus aduncus</i>		brown moss
	<i>Limprichtia revolvens</i>		brown moss
	lichen	<i>Cetraria ericetorum</i>	Iceland lichen
		<i>Cladina arbuscula</i>	reindeer lichen

**Table II-2 Additional Species by Ecological Landscape Classification Type  
from Rare Plant Surveys (continued)**

Ecological Landscape Classification Type	Vegetation Layer	Scientific Name	Common Name
<b>Treed fen</b>			
	shrub	<i>Kalmia polifolia</i>	northern laurel
	forb	<i>Gentianella amarella</i>	felwort
		<i>Parnassia palustris</i>	northern grass-of-parnassus
		<i>Pinguicula villosa</i>	small butterwort
		<i>Rhinanthus minor</i>	yellow rattle
	moss	<i>Bryum pseudotriquetrum</i>	no common name
		<i>Dicranum brevifolium</i>	cushion moss
		<i>Hypnum bambergeri</i>	no common name
		<i>Limprichtia revolvens</i>	brown moss
		<i>Ptilidium pulcherrimum</i>	liverwort
		<i>Tortella tortuosa</i>	twisted moss

Note: Species percent cover values have not been presented for rare plant survey sites as there are no defined plot boundaries for this type of survey and species presence/absence is more commonly recorded.

### **APPENDIX III**

#### **SPECIES LIST BY DETAILED VEGETATION PLOT**



**Table III-1 Ecological Landscape Classification of Detailed Vegetation Plots**

Ecological Land Classification	Plot Number
Bedrock open conifer	NAV001
	NAV007
	NAV025
	NBV014
	NBV017
	NBV025
Coniferous pine	NAV026
	NBV003
	NBV027
	NBV038
Coniferous spruce	NAV006
	NAV008
	NAV011
	NAV013
	NAV014
	NAV016
	NAV021
	NAV022
	NBV005
	NBV008
	NBV012
	NBV026
	NBV029
	NBV030
Deciduous aspen-paper birch	NAV002
	NAV004
	NAV015
	NAV018
	NBV004
	NBV015
	NBV021
	NBV032
Marsh/graminoid fen	NAV010
	NBV007
	NBV011
	NBV035
Mixedwood spruce-paper birch-aspen	NAV005
	NAV023
	NAV024

**Table III-1 Ecological Landscape Classification of Detailed Vegetation Plots  
(continued)**

Ecological Land Classification	Plot Number
	NBV001
	NBV023
	NBV037
Open bog	NAV009
	NBV018
	NBV019
	NBV031
Shrubland	NAV012
	NAV020
	NBV009
	NBV010
	NBV024
	NBV033
Treed bog	NAV003
	NAV017
	NBV013
	NBV016
	NBV022
Treed fen	NAV019
	NBV002
	NBV020
	NBV028
	NBV034
	NBV036

**Table III-2 Species List by Detailed Vegetation Plot**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
NAV001	canopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Betula papyrifera</i>	white birch	2
		<i>Linnaea borealis</i>	twinspur	<1
		<i>Rubus idaeus</i>	wild red raspberry	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
		<i>Campanula rotundifolia</i>	harebell	<1
	forb	forb species unknown	forb species unknown	<1
		<i>Saxifraga tricuspidata</i>	three-toothed saxifrage	<1
		<i>Agrostis scabra</i>	rough hair grass	<1
	graminoid	<i>Poa glauca</i>	timberline bluegrass	<1
		<i>Dicranum scoparium</i>	broom moss	<1
	moss	<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Cladonia mitis</i>	green reindeer lichen	5
	lichen	<i>Cladonia rangiferina</i>	grey reindeer lichen	2
		<i>Cladonia stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	5
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	10
		<i>Picea mariana</i>	black spruce	1
NAV007	canopy	<i>Pinus banksiana</i>	jack pine	<1
		<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Empetrum nigrum</i>	crowberry	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Campanula rotundifolia</i>	harebell	<1
	forb	<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
		grass species unknown	grass species unknown	<1
	graminoid	<i>Ceratodon purpureus</i>	purple horn-toothed moss	<1
		<i>Pohlia nutans</i>	copper wire moss	<1
		<i>Polytrichum strictum</i>	slender hair-cap	<1
	moss	<i>Arctoparmelia centrifuga</i>	no common name	1
		<i>Cladonia mitis</i>	green reindeer lichen	5
		<i>Cladonia rangiferina</i>	grey reindeer lichen	5
		<i>Cladonia stellaris</i>	northern reindeer lichen	30

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cladonia amaurocraea</i>	no common name	1
		<i>Lasallia pensylvanica</i>	Pennsylvania toadskin lichen	1
		<i>Umbilicaria muehlenbergii</i>	Lesser rocktripe	1
		<i>Xanthoparmelia coloradoensis</i>	no common name	1
NAV025	canopy	<i>Pinus banksiana</i>	jack pine	2
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
	low shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	moss species unknown	moss species unknown	<1
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	20
		<i>Cladina stellaris</i>	northern reindeer lichen	20
	epiphyte	lichen species unknown	lichen species unknown	<1
NBV014	low shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Betula sp</i>	birch species	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		<i>Deschampsia</i> species unknown	<i>Deschampsia</i> species unknown	<1
	moss	<i>Dicranum flagellare</i>	whip fork moss	<1
		<i>Polytrichum piliferum</i>	awned hair-cap	1
		<i>Tortella fragilis</i>	fragile screw moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	60
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Melanelia exasperata</i>	no common name	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
		<i>Umbilicaria muehlenbergii</i>	Lesser rocktripe	15
	epiphyte	<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
NBV017		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
	tall shrub	<i>Picea mariana</i>	black spruce	2
		<i>Pinus banksiana</i>	jack pine	<1
	low shrub	<i>Betula papyrifera</i>	white birch	2
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Cryptogramma acrostichoides</i>	parsley fern	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
		<i>Smilacina trifolia</i>	three-leaved Solomon's-seal	<1
	graminoid	<i>Deschampsia</i> species unknown	<i>Deschampsia</i> species unknown	<1
	moss	<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Sphagnum angustifolium</i>	peat moss	<1
		<i>Sphagnum fuscum</i>	rusty peat moss	<1
		<i>Sphagnum magellanicum</i>	midway peat moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	20
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	2
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Rhizocarpon</i> species unknown	<i>Rhizocarpon</i> species unknown	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	1
		<i>Umbilicaria hyperborea</i>	no common name	50
		<i>Umbilicaria muehlenbergii</i>	Lesser rocktripe	5
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV025	tall shrub	<i>Picea mariana</i>	black spruce	<1
		<i>Pinus banksiana</i>	jack pine	<1
	low shrub	<i>Betula papyrifera</i>	white birch	1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Juniperus communis</i>	ground juniper	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Picea mariana</i>	black spruce	<1
		<i>Rubus idaeus</i>	wild red raspberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
		<i>Polypodium virginianum</i>	rock polypody	<1
	graminoid	<i>Carex canescens</i>	short sedge	<1
		<i>Deschampsia</i> species unknown	<i>Deschampsia</i> species unknown	1
	moss	<i>Polytrichum commune</i>	common hair-cap	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	30
		<i>Biatora</i> species unknown	dot lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	5
		<i>Cladina rangiferina</i>	grey reindeer lichen	2
		<i>Cladina stellaris</i>	northern reindeer lichen	2
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Melanelia exasperata</i>	no common name	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	1
		<i>Umbilicaria hyperborea</i>	no common name	10
		<i>Umbilicaria muehlenbergii</i>	Lesser rocktripe	10
	epiphyte	<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NAV026	canopy	<i>Picea glauca</i>	white spruce	<1
		<i>Pinus banksiana</i>	jack pine	15
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	1
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	1
		<i>Linnaea borealis</i>	twinsflower	2
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	1
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Pohlia nutans</i>	copper wire moss	<1
		<i>Polytrichum juniperinum</i>	juniper hair-cap	<1
		<i>Polytrichum piliferum</i>	awned hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	30
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	lichen species unknown	lichen species unknown	<1
NBV003	canopy	<i>Pinus banksiana</i>	jack pine	1
	tall shrub	<i>Picea glauca</i>	white spruce	<1
		<i>Pinus banksiana</i>	jack pine	75
		<i>Salix</i> species unknown	<i>Salix</i> species unknown	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	5
		<i>Empetrum nigrum</i>	crowberry	1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea glauca</i>	white spruce	30
		<i>Rosa acicularis</i>	prickly rose	2
		<i>Shepherdia canadensis</i>	Canada buffaloberry	3
		<i>Vaccinium vitis-idaea</i>	bog cranberry	40
	forb	<i>Cornus canadensis</i>	bunchberry	1
		<i>Epilobium angustifolium</i>	fireweed	<1
	graminoid	<i>Oryzopsis pungens</i>	northern rice grass	<1
	moss	<i>Polytrichum commune</i>	common hair-cap	<1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	10
		<i>Peltigera didactyla</i>	no common name	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV027	canopy	<i>Pinus banksiana</i>	jack pine	10
	subcanopy	<i>Betula papyrifera</i>	white birch	1
		<i>Populus tremuloides</i>	aspen	10
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	3
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	5
		<i>Juniperus communis</i>	ground juniper	1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	20
		<i>Viburnum edule</i>	low-bush cranberry	1
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	2
	moss	<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Pylaisiella polyantha</i>	<i>Pylaisiella</i> moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	1
		<i>Cladina mitis</i>	green reindeer lichen	10
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV038	canopy	<i>Picea glauca</i>	white spruce	1
		<i>Pinus banksiana</i>	jack pine	5
	subcanopy	<i>Betula papyrifera</i>	white birch	1
		<i>Picea glauca</i>	white spruce	2
		<i>Picea mariana</i>	black spruce	10
		<i>Pinus banksiana</i>	jack pine	<1
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Betula papyrifera</i>	white birch	3
		<i>Picea glauca</i>	white spruce	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Betula papyrifera</i>	white birch	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea glauca</i>	white spruce	3
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	10
	moss	<i>Abietinella abietina</i> (also <i>Thuidium abietinum</i> )	no common name	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	1



**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Hylocomium splendens</i>	stair-step moss	25
		<i>Pleurozium schreberi</i>	Schreber's moss	2
		<i>Ptilidium ciliare</i>	liverwort	<1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	5
		<i>Cladina rangiferina</i>	grey reindeer lichen	<1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera malacea</i>	veinless pelt	1
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
NAV006	canopy	<i>Picea glauca</i>	white spruce	5
	subcanopy	<i>Betula papyrifera</i>	white birch	1
	tall shrub	<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	15
		<i>Picea glauca</i>	white spruce	5
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	<1
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	5
	moss	<i>Dicranella schreberiana</i>	Schreberian fork moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	50
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	<1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	1
		<i>Usnea hirta</i>	shaggy beard lichen	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
NAV008		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Usnea substerilis</i>	beard lichen	1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	1
	canopy	<i>Picea mariana</i>	black spruce	1
		<i>Pinus banksiana</i>	jack pine	1
	subcanopy	<i>Picea mariana</i>	black spruce	1
		<i>Pinus banksiana</i>	jack pine	1
	low shrub	<i>Betula papyrifera</i>	white birch	2
		<i>Empetrum nigrum</i>	crowberry	1
		<i>Juniperus communis</i>	ground juniper	1
		<i>Ledum groenlandicum</i>	Labrador tea	20
		<i>Picea mariana</i>	black spruce	20
		<i>Pinus banksiana</i>	jack pine	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
	forb	<i>Corydalis sempervirens</i>	pink corydalis	<1
		<i>Cryptogramma acrostichoides</i>	parsley fern	<1
	graminoid	<i>Agrostis scabra</i>	rough hair grass	<1
		<i>Calamagrostis canadensis</i>	bluejoint	<1
		<i>Eriophorum</i> species unknown	<i>Eriophorum</i> species unknown	<1
		grass species unknown	grass species unknown	<1
	moss	<i>Dicranum elongatum</i>	long forked moss	<1
		<i>Polytrichum strictum</i>	slender hair-cap	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	1
		<i>Cladina mitis</i>	green reindeer lichen	3
		<i>Cladina stellaris</i>	northern reindeer lichen	5
		<i>Cladonia uncialis</i>	thorn cladonia	1
		<i>Melanelia stygia</i>	no common name	1
		<i>Stereocaulon paschale</i>	no common name	<1
NAV011	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea mariana</i>	black spruce	5
		<i>Pinus banksiana</i>	jack pine	<1
	subcanopy	<i>Picea mariana</i>	black spruce	2
	tall shrub	<i>Picea mariana</i>	black spruce	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	5
		<i>Ledum palustre</i>	northern Labrador tea	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	2
		<i>Salix</i> species unknown	willow species unknown	1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	forb	<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
		<i>Equisetum arvense</i>	common horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	2
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	2
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1
		<i>Imshaugia aleurites</i>	salted starburst lichen	1
		<i>Lecanora circumborealis</i>	black-eyed rim lichen	1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	1
		<i>Tuckermannopsis ciliaris</i>	no common name	1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	1
		<i>Usnea lapponica</i>	powdered beard lichen	1
		<i>Usnea scabrata</i>	straw beard lichen	1
NAV013	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea mariana</i>	black spruce	60
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	5
		<i>Ledum groenlandicum</i>	Labrador tea	3
		<i>Picea mariana</i>	black spruce	2
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Hylocomium splendens</i>	stair-step moss	5
		<i>Pleurozium schreberi</i>	Schreber's moss	60
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	1
		<i>Lecanora circumborealis</i>	black-eyed rim lichen	1
		<i>Lecanora symmicta</i>	fused rim-lichen	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
NAV014		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Tuckermannopsis ciliaris</i>	no common name	1
	canopy	<i>Picea glauca</i>	white spruce	10
		<i>Picea mariana</i>	black spruce	1
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea mariana</i>	black spruce	1
	tall shrub	<i>Picea glauca</i>	white spruce	2
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	30
		<i>Picea glauca</i>	white spruce	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	50
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	5
		<i>Cladina stellaris</i>	northern reindeer lichen	5
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	lichen species unknown	lichen species unknown	1
NAV016	canopy	<i>Picea glauca</i>	white spruce	40
	subcanopy	<i>Picea glauca</i>	white spruce	1
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Linnaea borealis</i>	twinsflower	30
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rosa acicularis</i>	prickly rose	30
		<i>Shepherdia canadensis</i>	Canada buffaloberry	3
		<i>Viburnum edule</i>	low-bush cranberry	2
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		forb species unknown	forb species unknown	30
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
	graminoid	<i>Leymus innovatus</i> (also <i>Elymus innovatus</i> )	hairy wild rye	<1
		<i>Oryzopsis sp</i>	rice grass species	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	25
		<i>Pleurozium schreberi</i>	Schreber's moss	25
	lichen	<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Lecanora symmicta</i>	fused rim-lichen	1
		<i>Melanelia</i> species unknown	<i>Melanelia</i> species unknown	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Vulpicida pinastris</i> (also <i>Tuckermannopsis pinastris</i> )	powdered sunshine lichen	1
NAV021	canopy	<i>Betula papyrifera</i>	white birch	2
		<i>Picea glauca</i>	white spruce	35
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	2
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea glauca</i>	white spruce	2
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	1
	graminoid	<i>Oryzopsis sp</i>	rice grass species	<1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	1
		<i>Pleurozium schreberi</i>	Schreber's moss	25
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Arthonia edgewoodensis</i>	no common name	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	20
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Parmeliopsis hyperopta</i>	gray starburst lichen	1
		<i>Tuckermannopsis ciliaris</i>	no common name	1
NAV022	canopy	<i>Picea glauca</i>	white spruce	2
		<i>Picea mariana</i>	black spruce	2
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Larix laricina</i>	tamarack	1
	tall shrub	<i>Salix</i> species unknown	willow species unknown	1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	10
		<i>Betula papyrifera</i>	white birch	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Larix laricina</i>	tamarack	<1
		<i>Ledum groenlandicum</i>	Labrador tea	40
		<i>Myrica gale</i>	sweet gale	1
		<i>Picea glauca</i>	white spruce	1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Salix</i> species unknown	willow species unknown	3
		<i>Vaccinium uliginosum</i>	bog bilberry	1
	forb	<i>Equisetum arvense</i>	common horsetail	<1
		<i>Pyrola</i> species unknown	wintergreen species unknown	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	grass species unknown	grass species unknown	1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	20
		<i>Sphagnum</i> species unknown	Sphagnum species unknown	1
	lichen	<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	lichen species unknown	lichen species unknown	2
NBV005	canopy	<i>Larix laricina</i>	tamarack	<1
		<i>Picea glauca</i>	white spruce	1
	subcanopy	<i>Picea glauca</i>	white spruce	20
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus balsamifera</i>	balsam poplar	<1
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Picea glauca</i>	white spruce	5
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Linnaea borealis</i>	twinline	<1
		<i>Picea glauca</i>	white spruce	4
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	1
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Salix bebbiana</i>	beaked willow	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	10
	forb	<i>Antennaria parvifolia</i>	small-leaved everlasting	<1
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Galium</i> species unknown	<i>Galium</i> species unknown	<1
NBV008	canopy	<i>Larix laricina</i>	tamarack	1
		<i>Picea glauca</i>	white spruce	5
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Larix laricina</i>	tamarack	1
		<i>Picea glauca</i>	white spruce	15
		<i>Picea mariana</i>	black spruce	2
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Salix bebbiana</i>	beaked willow	1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Betula glandulosa</i>	bog birch	1
		<i>Empetrum nigrum</i>	crowberry	2
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Ribes oxycanthoides</i>	northern gooseberry	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	2
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	3
		<i>Pyrola grandiflora</i>	Arctic wintergreen	10
		<i>Pyrola minor</i>	lesser wintergreen	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1
	graminoid	<i>Carex disperma</i>	two-seeded sedge	<1
		grass species unknown	grass species unknown	<1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Hylocomium</i> species unknown	stair-step moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	70
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Ptilium crista-castrensis</i>	knight's plume moss	<1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia cervicornis</i> (also <i>C. verticillata</i> )	ladder lichen	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia multiformis</i>	sieve lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV012	canopy	<i>Picea glauca</i>	white spruce	5

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	subcanopy	<i>Picea glauca</i>	white spruce	6
		<i>Picea mariana</i>	black spruce	2
	tall shrub	<i>Picea glauca</i>	white spruce	5
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	5
		<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	5
		<i>Salix sp</i>	willow species	5
		<i>Salix glauca</i>	smooth willow	5
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	5
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		shrub species unknown	shrub species unknown	1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Pyrola grandiflora</i>	Arctic wintergreen	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	20
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	10
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea cavernosa</i>	old man's beard	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV026	canopy	<i>Picea mariana</i>	black spruce	5
	subcanopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	10
	tall shrub	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1



**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	2
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	2
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	20
		<i>Pleurozium schreberi</i>	Schreber's moss	20
		<i>Ptilidium ciliare</i>	liverwort	20
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	20
		<i>Cladina rangiferina</i>	grey reindeer lichen	10
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	10
		<i>Peltigera malacea</i>	veinless pelt	1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV029	canopy	<i>Picea glauca</i>	white spruce	1
	subcanopy	<i>Betula papyrifera</i>	white birch	10
		<i>Picea glauca</i>	white spruce	5
		<i>Populus tremuloides</i>	aspen	2
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Picea glauca</i>	white spruce	1
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	5
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	10

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Viburnum edule</i>	low-bush cranberry	5
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	1
	moss	<i>Distichium capillaceum</i>	no common name	1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Ptilidium ciliare</i>	liverwort	1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia multiformis</i>	sieve lichen	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV030	canopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	10
	subcanopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	15
	tall shrub	<i>Picea mariana</i>	black spruce	5
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Picea mariana</i>	black spruce	5
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	10
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	1
	graminoid	grass species unknown	grass species unknown	5
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	1
		<i>Polytrichum juniperinum</i>	juniper hair-cap	12
		<i>Ptilidium ciliare</i>	liverwort	1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	10
		<i>Cladina rangiferina</i>	grey reindeer lichen	3

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	2
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea cavernosa</i>	old man's beard	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NAV002	canopy	<i>Betula papyrifera</i>	white birch	15
		<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
	subcanopy	<i>Picea glauca</i>	white spruce	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	5
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Betula papyrifera</i>	white birch	2
		<i>Ledum groenlandicum</i>	Labrador tea	5
		<i>Populus tremuloides</i>	aspen	1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	2
	graminoid	<i>Oryzopsis</i> sp	rice grass species	<1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	<1
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	1
NAV004	canopy	<i>Betula papyrifera</i>	white birch	40
		<i>Picea glauca</i>	white spruce	5
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
	tall shrub	<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	15
		<i>Betula papyrifera</i>	white birch	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Linnaea borealis</i>	twinlineflower	10
		<i>Picea glauca</i>	white spruce	1
		<i>Populus tremuloides</i>	aspen	<1
		<i>Rosa acicularis</i>	prickly rose	8
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
		<i>Viburnum edule</i>	low-bush cranberry	1
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	2
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
	moss	<i>Hypnum callichroum</i>	no common name	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	1
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Lecanora pulicaris</i>	rim-lichen	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Usnea lapponica</i>	powdered beard lichen	1
NAV015	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Pinus banksiana</i>	jack pine	1
		<i>Populus tremuloides</i>	aspen	60
	subcanopy	<i>Picea glauca</i>	white spruce	<1
	tall shrub	<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	20
		<i>Arctostaphylos uva-ursi</i>	bearberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	<1
	moss	<i>Dicranum muehlenbeckii</i>	thin-leaf curved-tail moss	<1
		<i>Dicranum undulatum</i>	wavy Dicranum	<1
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	lichen species unknown	lichen species unknown	1
NAV018	canopy	<i>Betula papyrifera</i>	white birch	5
		<i>Picea glauca</i>	white spruce	<1
	subcanopy	<i>Betula papyrifera</i>	white birch	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	2
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Arctostaphylos uva-ursi</i>	bearberry	10
		<i>Vaccinium vitis-idaea</i>	bog cranberry	8
	forb	<i>Campanula rotundifolia</i>	harebell	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Dicranum undulatum</i>	wavy Dicranum	<1
	lichen	<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	20
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	lichen species unknown	lichen species unknown	1
NBV004	canopy	<i>Populus tremuloides</i>	aspen	3
	subcanopy	<i>Populus tremuloides</i>	aspen	10
	tall shrub	<i>Betula papyrifera</i>	white birch	1
		<i>Populus tremuloides</i>	aspen	5
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Ledum groenlandicum</i>	Labrador tea	2
		<i>Linnaea borealis</i>	twinline	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Pinus banksiana</i>	jack pine	<1
		<i>Populus tremuloides</i>	aspen	2
		<i>Rosa acicularis</i>	prickly rose	5
		<i>Salix glauca</i>	smooth willow	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	forb	<i>Antennaria parvifolia</i>	small-leaved everlasting	<1
		Aster species unknown	aster species unknown	<1
		<i>Cornus canadensis</i>	bunchberry	10
		<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Hieracium umbellatum</i>	narrow-leaved hawkweed	<1
	graminoid	<i>Oryzopsis pungens</i>	northern rice grass	<1
	moss	<i>Polytrichum commune</i>	common hair-cap	3
	lichen	<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
	epiphyte	<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV015	canopy	<i>Betula papyrifera</i>	white birch	10
		<i>Picea glauca</i>	white spruce	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Alnus viridis ssp crista</i>	green alder	2
		<i>Arctostaphylos uva-ursi</i>	bearberry	15
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	7
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1
	moss	<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	<1
		<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina rangiferina</i>	grey reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia pyxidata</i>	pebbled pixie-cup	<1
		<i>Cladonia sulphurina</i>	greater sulphur cup	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
NBV021		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
	canopy	<i>Picea glauca</i>	white spruce	<1
	subcanopy	<i>Betula papyrifera</i>	white birch	11
		<i>Populus tremuloides</i>	aspen	4
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Arctostaphylos uva-ursi</i>	bearberry	20
		<i>Betula papyrifera</i>	white birch	<1
		<i>Populus tremuloides</i>	aspen	2
		<i>Vaccinium vitis-idaea</i>	bog cranberry	20
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	5
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Pylaisiella polyantha</i>	<i>Pylaisiella</i> moss	<1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	10
		<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
		<i>Rhizocarpon</i> species unknown	<i>Rhizocarpon</i> species unknown	1
		<i>Umbilicaria muehlenbergii</i>	lesser rocktripe	2
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
NBV032	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Populus tremuloides</i>	aspen	40
	subcanopy	<i>Picea glauca</i>	white spruce	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Populus tremuloides</i>	aspen	5
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Linnaea borealis</i>	twinlineflower	<1
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	1
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	3
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	1
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Ptilidium ciliare</i>	liverwort	<1
		<i>Pylaisiella polyantha</i>	<i>Pylaisiella</i> moss	<1
	lichen	<i>Cladonia mitis</i>	green reindeer lichen	1
		<i>Cladonia rangiferina</i>	grey reindeer lichen	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Caloplaca cerina</i>	no common name	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NAV010	low shrub	<i>Andromeda polifolia</i>	bog rosemary	1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Ledum palustre</i>	northern Labrador tea	1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Salix</i> species unknown	willow species unknown	1
	forb	<i>Drosera rotundifolia</i>	round-leaved sundew	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Carex aquatilis</i>	water sedge	85
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	1
NBV007	moss	<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	5
	forb	<i>Galium trifidum</i>	small bedstraw	<1
	graminoid	<i>Carex aquatilis</i>	water sedge	100
NBV011	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	10
		<i>Carex aquatilis</i>	water sedge	5
		<i>Carex utriculata</i>	small bottle sedge	75



**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Glyceria grandis</i>	common tall manna grass	10
NBV035	low shrub	<i>Betula sp</i>	birch species	1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	<1
		<i>Salix</i> species unknown	<i>Salix</i> species unknown	<1
	forb	<i>Potentilla palustris</i>	marsh cinquefoil	5
	graminoid	<i>Carex aquatilis</i>	water sedge	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	80
		<i>Eriophorum angustifolium</i>	tall cotton-grass	3
NAV005	canopy	<i>Picea glauca</i>	white spruce	5
	subcanopy	<i>Betula papyrifera</i>	white birch	5
		<i>Picea glauca</i>	white spruce	<1
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Betula papyrifera</i>	white birch	1
		<i>Rosa acicularis</i>	prickly rose	2
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	10
	moss	<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	1
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	<i>Bryoria fuscescens</i>	speckled horsehair	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Usnea lapponica</i>	powdered beard lichen	1
NAV023	canopy	<i>Betula papyrifera</i>	white birch	<1
		<i>Picea glauca</i>	white spruce	10
		<i>Populus tremuloides</i>	aspen	1
	subcanopy	<i>Betula papyrifera</i>	white birch	2
		<i>Picea glauca</i>	white spruce	5
		<i>Populus tremuloides</i>	aspen	2
	tall shrub	<i>Picea glauca</i>	white spruce	<1
	low shrub	<i>Betula papyrifera</i>	white birch	1
		<i>Linnaea borealis</i>	twinline	<1
		<i>Picea glauca</i>	white spruce	<1
		<i>Populus tremuloides</i>	aspen	2
		<i>Rosa acicularis</i>	prickly rose	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
		<i>Viburnum edule</i>	low-bush cranberry	2
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	5
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Dicranum acutifolium</i>	cushion moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Pohlia nutans</i>	copper wire moss	<1
	lichen	<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	lichen species unknown	lichen species unknown	<1
NAV024	canopy	<i>Betula papyrifera</i>	white birch	2
		<i>Picea glauca</i>	white spruce	10
	subcanopy	<i>Betula papyrifera</i>	white birch	1
		<i>Picea glauca</i>	white spruce	10
	tall shrub	<i>Picea glauca</i>	white spruce	2
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Picea glauca</i>	white spruce	1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	20
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	15
	moss	<i>Dicranum spadiceum</i>	cushion moss	3
		<i>Pleurozium schreberi</i>	Schreber's moss	5
		<i>Ptilidium ciliare</i>	liverwort	3
		<i>Ptilium crista-castrensis</i>	knight's plume moss	5
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Peltigera</i> species unknown	<i>Peltigera</i> species unknown	<1
	epiphyte	lichen species unknown	lichen species unknown	1
NBV001	canopy	<i>Betula papyrifera</i>	white birch	30
		<i>Picea glauca</i>	white spruce	50
		<i>Populus tremuloides</i>	aspen	5
	tall shrub	<i>Picea glauca</i>	white spruce	10
		<i>Salix planifolia</i>	flat-leaved willow	1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	15
		<i>Arctostaphylos rubra</i>	alpine bearberry	1
		<i>Arctostaphylos uva-ursi</i>	bearberry	<1
		<i>Linnaea borealis</i>	twinflor	1
		<i>Picea glauca</i>	white spruce	10

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Populus tremuloides</i>	aspen	<1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Ribes oxycanthoides</i>	northern gooseberry	<1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Salix glauca</i>	smooth willow	1
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	1
		<i>Salix</i> species unknown	<i>Salix</i> species unknown	2
		<i>Shepherdia canadensis</i>	Canada buffaloberry	2
		<i>Vaccinium vitis-idaea</i>	bog cranberry	20
	forb	<i>Epilobium angustifolium</i>	fireweed	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Orthilia secunda</i> (also <i>Pyrola secunda</i> )	one-sided wintergreen	1
		<i>Pyrola grandiflora</i>	Arctic wintergreen	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	8
		<i>Polytrichum commune</i>	common hair-cap	<1
		<i>Thuidium recognitum</i>	no common name	<1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	5
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV023	canopy	<i>Betula papyrifera</i>	white birch	25
		<i>Picea glauca</i>	white spruce	25
	subcanopy	<i>Betula papyrifera</i>	white birch	5
		<i>Picea glauca</i>	white spruce	2
	tall shrub	<i>Betula papyrifera</i>	white birch	<1
	low shrub	<i>Ribes triste</i>	wild red currant	<1
		<i>Rosa acicularis</i>	prickly rose	5
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Viburnum edule</i>	low-bush cranberry	<1
		<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Dicranum flagellare</i>	whip fork moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	5
		<i>Pleurozium schreberi</i>	Schreber's moss	1
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera didactyla</i>	no common name	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
NBV037	canopy	<i>Picea glauca</i>	white spruce	15
		<i>Picea mariana</i>	black spruce	2
	subcanopy	<i>Betula papyrifera</i>	white birch	3
		<i>Picea glauca</i>	white spruce	5
		<i>Picea mariana</i>	black spruce	5
		<i>Populus tremuloides</i>	aspen	<1
	tall shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Betula papyrifera</i>	white birch	1
		<i>Salix bebbiana</i>	beaked willow	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Betula papyrifera</i>	white birch	<1
		<i>Ledum groenlandicum</i>	Labrador tea	10
		<i>Picea glauca</i>	white spruce	<1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Salix maccalliana</i>	velvet-fruited willow	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	15
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	2
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Ditrichum flexicaule</i>	slender-stemmed hair moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	<1
		<i>Ptilidium ciliare</i>	liverwort	1
	lichen	<i>Arctoparmelia centrifuga</i>	no common name	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cladina mitis</i>	green reindeer lichen	2
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NAV009	canopy	<i>Picea mariana</i>	black spruce	<1
	subcanopy	<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Picea mariana</i>	black spruce	1
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	1
		<i>Empetrum nigrum</i>	crowberry	1
		<i>Ledum groenlandicum</i>	Labrador tea	25
		<i>Ledum palustre</i>	northern Labrador tea	1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	2
		<i>Picea mariana</i>	black spruce	2
		<i>Vaccinium</i> sp	bilberry species	10
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
	forb	<i>Equisetum arvense</i>	common horsetail	1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Rubus chamaemorus</i>	cloudberry	10
	graminoid	<i>Carex aquatilis</i>	water sedge	10
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	5
		<i>Sphagnum girgensohnii</i>	Girgensohn's moss	10
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	<1
	epiphyte	<i>Bryoria simplicior</i>	old man's beard	1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	1
		<i>Parmelia sulcata</i>	hammered shield moss	1
		<i>Tuckermannopsis ciliaris</i>	no common name	1
		<i>Tuckermannopsis sepicola</i>	chestnut wrinkle-lichen	1
		<i>Usnea hirta</i>	shaggy beard lichen	1
		<i>Usnea lapponica</i>	powdered beard lichen	1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	1
NBV018	low shrub	<i>Andromeda polifolia</i>	bog rosemary	50
		<i>Chamaedaphne calyculata</i>	leatherleaf	5
		<i>Ledum groenlandicum</i>	Labrador tea	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		<i>Eriophorum chamissonis</i>	russett cotton grass	15
		<i>Eriophorum gracile</i>	slender cotton grass	15
	moss	<i>Sphagnum angustifolium</i>	peat moss	9
		<i>Sphagnum fuscum</i>	rusty peat moss	55
		<i>Sphagnum riparium</i>	shore-growing peat moss	1
		<i>Sphagnum teres</i>	thin-leafed peat moss	30
NBV019	canopy	<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Picea mariana</i>	black spruce	<1
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Ledum groenlandicum</i>	Labrador tea	10
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Drosera rotundifolia</i>	round-leaved sundew	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Brachythecium turgidum</i>	no common name	<1
		<i>Sphagnum angustifolium</i>	peat moss	9
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	1
		<i>Sphagnum fuscum</i>	rusty peat moss	60
		<i>Sphagnum squarrosum</i>	squarrose peat moss	10
		<i>Sphagnum teres</i>	thin-leafed peat moss	10
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina rangiferina</i>	grey reindeer lichen	<1
		<i>Imadophila ericetorum</i>	spraypaint	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV031	canopy	<i>Picea mariana</i>	black spruce	2
		<i>Pinus banksiana</i>	jack pine	<1
	subcanopy	<i>Pinus banksiana</i>	jack pine	<1
	tall shrub	<i>Larix laricina</i>	tamarack	<1
		<i>Picea mariana</i>	black spruce	5
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Andromeda polifolia</i>	bog rosemary	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Betula sp</i>	birch species	1
		<i>Ledum groenlandicum</i>	Labrador tea	5
		<i>Myrica gale</i>	sweet gale	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	2
		<i>Vaccinium uliginosum</i>	bog bilberry	1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Rubus chamaemorus</i>	cloudberry	5
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	5
	moss	<i>Sphagnum fuscum</i>	rusty peat moss	10
		<i>Sphagnum teres</i>	thin-leafed peat moss	1
		<i>Tomentypnum nitens</i>	golden moss	4
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	1
		<i>Cladina mitis</i>	green reindeer lichen	8
		<i>Cladina rangiferina</i>	grey reindeer lichen	2
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
NAV012	tall shrub	<i>Betula occidentalis</i>	water birch	15
	low shrub	<i>Betula sp</i>	birch species	40
		<i>Chamaedaphne calyculata</i>	leatherleaf	1
		<i>Ledum groenlandicum</i>	Labrador tea	15
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Salix</i> species unknown	willow species unknown	1
		<i>shrub</i> species unknown	shrub species unknown	1
	forb	<i>Potentilla palustris</i>	marsh cinquefoil	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Drepanocladus</i> species unknown	<i>Drepanocladus</i> species unknown	<1
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	<1
	epiphyte	<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	1
NAV020	low shrub	<i>Betula sp</i>	birch species	15
		<i>Larix laricina</i>	tamarack	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Salix</i> species unknown	willow species unknown	5
		<i>shrub</i> species unknown	shrub species unknown	<1
		<i>Vaccinium</i> sp	bilberry species	5
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
	forb	<i>Equisetum arvense</i>	common horsetail	1
		<i>Potentilla gracilis</i>	graceful cinquefoil	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	30
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Sanionia uncinata</i> (also <i>Drepanocladus uncinatus</i> )	brown moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	20
		<i>Sphagnum warnstorffii</i>	Warnstorff's peat moss	<1
		<i>Tomentypnum nitens</i>	golden moss	<1
NBV009	canopy	<i>Picea mariana</i>	black spruce	1
	tall shrub	<i>Larix laricina</i>	tamarack	2
		<i>Picea mariana</i>	black spruce	3
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Arctostaphylos rubra</i>	alpine bearberry	12
		<i>Betula</i> sp	birch species	10
		<i>Larix laricina</i>	tamarack	5
		<i>Ledum groenlandicum</i>	Labrador tea	4
		<i>Picea mariana</i>	black spruce	10
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Salix alaxensis</i>	Alaska willow	<1
		<i>Salix myrtillofolia</i>	myrtle-leaved willow	<1
		<i>Salix planifolia</i>	flat-leaved willow	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	5
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
		<i>Equisetum arvense</i>	common horsetail	<1
		<i>Equisetum scirpoides</i>	dwarf scouring-rush	<1
		<i>Pyrola</i> species unknown	<i>Pyrola</i> species unknown	<1
		<i>Smilacina trifolia</i>	three-leaved Solomon's-seal	<1
	graminoid	<i>Carex aquatilis</i>	water sedge	<1
		grass species unknown	grass species unknown	5
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Tomentypnum nitens</i>	golden moss	75
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1



**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
NBV010	low shrub	<i>Betula sp</i>	birch species	40
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Salix alaxensis</i>	Alaska willow	2
		<i>Salix arbusculoides</i>	shrubby willow	2
		<i>Salix bebbiana</i>	beaked willow	2
		<i>Salix candida</i>	hoary willow	2
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	50
NBV024	low shrub	<i>Betula glandulosa</i>	bog birch	1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	5
		<i>Salix planifolia</i>	flat-leaved willow	75
	forb	<i>Caltha palustris</i>	marsh-marigold	5
		<i>Equisetum fluviatile</i>	swamp horsetail	1
		<i>Galium trifidum</i>	small bedstraw	<1
		<i>Hippuris vulgaris</i>	common mare's-tail	<1
		<i>Potentilla palustris</i>	marsh cinquefoil	25
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	2
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	1
	moss	<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Sphagnum riparium</i>	shore-growing peat moss	<1
NBV033	tall shrub	<i>Larix laricina</i>	tamarack	1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	5
	low shrub	<i>Betula sp</i>	birch species	40
		<i>Myrica gale</i>	sweet gale	<1
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	2
		<i>Salix alaxensis</i>	Alaska willow	40
		<i>Salix maccalliana</i>	velvet-fruited willow	1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
	forb	<i>Equisetum fluviatile</i>	swamp horsetail	2
		<i>Galium trifidum</i>	small bedstraw	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1
	moss	<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Campylium stellatum</i>	yellow star moss	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cinclidium stygium</i>	common northern lantern moss	<1
NAV003	canopy	<i>Picea mariana</i>	black spruce	1
	subcanopy	<i>Picea mariana</i>	black spruce	2
	tall shrub	<i>Picea mariana</i>	black spruce	20
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	<1
		<i>Betula papyrifera</i>	white birch	<1
		<i>Betula sp</i>	birch species	2
		<i>Empetrum nigrum</i>	crowberry	2
		<i>Ledum groenlandicum</i>	Labrador tea	30
		<i>Picea mariana</i>	black spruce	10
		<i>Salix</i> species unknown	willow species unknown	5
		<i>Vaccinium sp</i>	blueberry species	15
		<i>Vaccinium vitis-idaea</i>	bog cranberry	2
	forb	<i>Equisetum arvense</i>	common horsetail	1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		grass species unknown	grass species unknown	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Dicranum undulatum</i>	wavy <i>Dicranum</i>	<1
		<i>Hylocomium splendens</i>	stair-step moss	5
		<i>Pleurozium schreberi</i>	Schreber's moss	30
		<i>Sphagnum russowii</i>	wide-tongued peat moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	20
		<i>Tomentypnum nitens</i>	golden moss	<1
	lichen	<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladonia amaurocraea</i>	no common name	<1
	epiphyte	<i>Lecanora circumborealis</i>	black-eyed rim lichen	<1
		<i>Lecanora symmicta</i>	fused rim-lichen	<1
		<i>Usnea lapponica</i>	powdered beard lichen	<1
		<i>Usnea subfloridana</i>	beard lichen	<1
		<i>Usnea substerilis</i>	beard lichen	<1
NAV017	canopy	<i>Picea mariana</i>	black spruce	<1
	subcanopy	<i>Larix laricina</i>	tamarack	<1
		<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Larix laricina</i>	tamarac	5
		<i>Picea mariana</i>	black spruce	30
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Empetrum nigrum</i>	crowberry	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Larix laricina</i>	tamarack	5
		<i>Ledum groenlandicum</i>	Labrador tea	25
		<i>Ledum palustre</i>	northern Labrador tea	<1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	2
		<i>Picea mariana</i>	black spruce	10
		<i>Rosa acicularis</i>	prickly rose	1
		<i>Salix</i> species unknown	willow species unknown	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Equisetum arvense</i>	common horsetail	5
		<i>Equisetum pratense</i>	meadow horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Lycopodium annotinum</i>	stiff club-moss	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
		<i>Leymus innovatus</i> (also <i>Elymus innovatus</i> )	hairy wild rye	<1
	moss	<i>Dicranum undulatum</i>	wavy <i>Dicranum</i>	<1
		<i>Sphagnum fuscum</i>	rusty peat moss	<1
		<i>Sphagnum girgensohnii</i>	Girgensohn's moss	<1
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	40
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladina rangiferina</i>	grey reindeer lichen	2
		<i>Cladina stellaris</i>	northern reindeer lichen	1
		<i>Cladina stygia</i>	black-footed reindeer lichen	1
		<i>Cladonia amaurocraea</i>	no common name	1
	epiphyte	lichen species unknown	lichen species unknown	<1
NBV013	canopy	<i>Picea mariana</i>	black spruce	6
		<i>Populus balsamifera</i>	balsam poplar	<1
	tall shrub	<i>Picea mariana</i>	black spruce	20
		<i>Salix alaxensis</i>	Alaska willow	<1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	5
		<i>Betula</i> sp	birch species	1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Ledum groenlandicum</i>	Labrador tea	2
		<i>Picea mariana</i>	black spruce	10
		<i>Salix arbusculoides</i>	shrubby willow	<1
		<i>Salix myrtilifolia</i>	myrtle-leaved willow	<1
		<i>Epilobium angustifolium</i>	fireweed	<1
	forb	<i>Equisetum scirpoides</i>	dwarf scouring-rush	25
		<i>Pyrola</i> species unknown	<i>Pyrola</i> species unknown	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	3
		<i>Carex vaginata</i>	sheathed sedge	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	1
		<i>Pleurozium schreberi</i>	Schreber's moss	80
		<i>Tomentypnum nitens</i>	golden moss	1
	lichen	<i>Cladonia mitis</i>	green reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV016	canopy	<i>Picea mariana</i>	black spruce	6
	tall shrub	<i>Larix laricina</i>	tamarack	1
		<i>Picea mariana</i>	black spruce	5
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	1
		<i>Chamaedaphne calyculata</i>	leatherleaf	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Larix laricina</i>	tamarack	<1
		<i>Ledum groenlandicum</i>	Labrador tea	5
		<i>Picea mariana</i>	black spruce	1
		<i>Salix alaxensis</i>	Alaska willow	<1
		<i>Salix arbusculoides</i>	shrubby willow	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	4
		<i>Vaccinium vitis-idaea</i>	bog cranberry	3
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	2
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	5
		<i>Sphagnum angustifolium</i>	peat moss	60
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	5
		<i>Sphagnum squarrosum</i>	squarrose peat moss	1
		<i>Tomentypnum nitens</i>	golden moss	2

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Stereocaulon tomentosum</i>	woolly foam lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV022	canopy	<i>Picea mariana</i>	black spruce	6
	tall shrub	<i>Picea mariana</i>	black spruce	2
	low shrub	<i>Betula papyrifera</i>	white birch	<1
		<i>Empetrum nigrum</i>	crowberry	1
		<i>Ledum groenlandicum</i>	Labrador tea	20
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	5
		<i>Vaccinium vitis-idaea</i>	bog cranberry	1
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Rubus chamaemorus</i>	cloudberry	2
	moss	<i>Polytrichum juniperinum</i>	juniper hair-cap	1
		<i>Sphagnum angustifolium</i>	peat moss	9
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	2
		<i>Sphagnum fuscum</i>	rusty peat moss	60
		<i>Sphagnum riparium</i>	shore-growing peat moss	<1
		<i>Sphagnum teres</i>	thin-leafed peat moss	9
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea cavernosa</i>	old man's beard	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NAV019	canopy	<i>Larix laricina</i>	tamarack	2
	subcanopy	<i>Picea mariana</i>	black spruce	5
	tall shrub	<i>Larix laricina</i>	tamarack	1
		<i>Picea mariana</i>	black spruce	1
		<i>Salix</i> species unknown	willow species unknown	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	2
		<i>Betula sp</i>	birch species	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Larix laricina</i>	tamarack	1
		<i>Ledum groenlandicum</i>	Labrador tea	20
		<i>Picea mariana</i>	black spruce	5
		<i>Salix</i> species unknown	willow species unknown	5
		<i>Vaccinium sp</i>	bilberry species	10
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	10
	forb	<i>Equisetum arvense</i>	common horsetail	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
	graminoid	<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Pleurozium schreberi</i>	Schreber's moss	20
		<i>Sphagnum</i> species unknown	<i>Sphagnum</i> species unknown	2
	lichen	<i>Cladina stellaris</i>	northern reindeer lichen	5
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	lichen species unknown	lichen species unknown	1
NBV002	canopy	<i>Larix laricina</i>	tamarack	6
	subcanopy	<i>Larix laricina</i>	tamarack	3
		<i>Picea mariana</i>	black spruce	<1
	tall shrub	<i>Picea mariana</i>	black spruce	5
		<i>Populus tremuloides</i>	aspen	<1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	<1
		<i>Betula sp</i>	birch species	25
		<i>Larix laricina</i>	tamarack	<1
		<i>Picea mariana</i>	black spruce	7
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	5
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	10
		<i>Salix planifolia</i>	flat-leaved willow	10
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Equisetum scirpoides</i>	dwarf scouring-rush	1
		<i>Pyrola asarifolia</i>	common pink wintergreen	<1
	graminoid	<i>Calamagrostis canadensis</i>	bluejoint	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Carex aquatilis</i>	water sedge	25
		<i>Carex chordorrhiza</i>	prostrate sedge	<1
		<i>Carex</i> species unknown	<i>Carex</i> species unknown	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	2
		<i>Calliergon giganteum</i>	giant water moss	<1
		<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Philonotis fontana</i>	<i>Philonotis</i> moss	2
	lichen	<i>Cladina mitis</i>	green reindeer lichen	<1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia cervicornis</i> (also <i>C. verticillata</i> )	ladder lichen	<1
		<i>Cladonia coniocraea</i>	cup lichen	<1
		<i>Cladonia crispata</i>	organ-pipe lichen	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Cladonia gracilis</i>	smooth cladonia	<1
		<i>Cladonia sulphurina</i>	greater sulphur cup	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Melanelia septentrionalis</i>	northern camouflage lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV020	canopy	<i>Picea mariana</i>	black spruce	7
	tall shrub	<i>Picea mariana</i>	black spruce	2
		<i>Salix bebbiana</i>	beaked willow	<1
	low shrub	<i>Arctostaphylos rubra</i>	alpine bearberry	1
		<i>Empetrum nigrum</i>	crowberry	1
		<i>Larix laricina</i>	tamarack	<1
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Picea mariana</i>	black spruce	1
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Salix myrtillifolia</i>	myrtle-leaved willow	<1
		<i>Salix pedicellaris</i>	bog willow	1
		<i>Shepherdia canadensis</i>	Canada buffaloberry	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	15
		<i>Viburnum edule</i>	low-bush cranberry	<1
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
		<i>Petasites frigidus</i>	no common name	<1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Pyrola chlorantha</i> (also <i>Pyrola virens</i> )	greenish-flowered wintergreen	<1
		<i>Rubus arcticus</i> (also <i>R. acaulis</i> )	dwarf raspberry	1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Aulacomnium palustre</i>	tufted moss	<1
		<i>Hylocomium splendens</i>	stair-step moss	35
		<i>Pleurozium schreberi</i>	Schreber's moss	10
	lichen	<i>Cetraria nivalis</i> (also <i>Flavocetraria nivalis</i> )	flattened snow lichen	<1
		<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladonia borealis</i>	red pixie-cup	<1
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV028	canopy	<i>Picea mariana</i>	black spruce	10
	subcanopy	<i>Picea mariana</i>	black spruce	10
	tall shrub	<i>Larix laricina</i>	tamarack	<1
		<i>Picea mariana</i>	black spruce	<1
	low shrub	<i>Alnus viridis ssp crispa</i>	green alder	3
		<i>Empetrum nigrum</i>	crowberry	15
		<i>Larix laricina</i>	tamarack	3
		<i>Ledum groenlandicum</i>	Labrador tea	2
		<i>Picea mariana</i>	black spruce	10
		<i>Rosa acicularis</i>	prickly rose	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	5
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Hylocomium splendens</i>	stair-step moss	3
		<i>Pleurozium schreberi</i>	Schreber's moss	1
		<i>Ptilidium ciliare</i>	liverwort	1



**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Sphagnum angustifolium</i>	peat moss	<1
	lichen	<i>Cladina mitis</i>	green reindeer lichen	1
		<i>Cladina rangiferina</i>	grey reindeer lichen	2
		<i>Cladina stellaris</i>	northern reindeer lichen	2
		<i>Cladonia chlorophaea</i>	mealy pixie-cup	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Cladonia fimbriata</i>	trumpet lichen	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	1
		<i>Peltigera malacea</i>	veinless pelt	<1
		<i>Peltigera neopolydactyla</i>	carpet pelt	<1
	epiphyte	<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV034	canopy	<i>Picea mariana</i>	black spruce	10
	subcanopy	<i>Larix laricina</i>	tamarack	5
		<i>Picea mariana</i>	black spruce	5
	tall shrub	<i>Larix laricina</i>	tamarack	2
		<i>Picea mariana</i>	black spruce	1
	low shrub	<i>Betula sp</i>	birch species	1
		<i>Chamaedaphne calyculata</i>	leatherleaf	1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Larix laricina</i>	tamarack	2
		<i>Ledum groenlandicum</i>	Labrador tea	20
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	2
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Salix lucida</i> (also <i>S. lasiandra</i> )	shining willow	<1
		<i>Vaccinium uliginosum</i>	bog bilberry	<1
		<i>Vaccinium vitis-idaea</i>	bog cranberry	15
	forb	<i>Equisetum arvense</i>	common horsetail	<1
		<i>Geocaulon lividum</i>	northern bastard toadflax	<1
	graminoid	grass species unknown	grass species unknown	<1
	moss	<i>Dicranum</i> species unknown	<i>Dicranum</i> species unknown	<1
		<i>Hylocomium splendens</i>	stair-step moss	<1
		<i>Ptilidium ciliare</i>	liverwort	5
		<i>Tomentypnum nitens</i>	golden moss	1
	lichen	<i>Cladina mitis</i>	green reindeer lichen	8
		<i>Cladina rangiferina</i>	grey reindeer lichen	2

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cladonia cenotea</i>	powdered funnel lichen	<1
		<i>Cladonia cornuta</i>	bighorn cladonia	<1
		<i>Peltigera aphthosa</i>	studded leather lichen	<1
		<i>Peltigera malacea</i>	veinless pelt	<1
	epiphyte	<i>Bryoria</i> species unknown	<i>Bryoria</i> species unknown	<1
		<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Parmelia sulcata</i>	hammered shield moss	<1
		<i>Parmeliopsis ambigua</i>	green starburst lichen	<1
		<i>Tuckermannopsis americana</i> (also <i>Cetraria halei</i> or <i>C. ciliaris</i> )	fringed wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1
NBV036	canopy	<i>Larix laricina</i>	tamarack	6
		<i>Picea mariana</i>	black spruce	<1
	subcanopy	<i>Larix laricina</i>	tamarack	5
		<i>Picea mariana</i>	black spruce	1
	tall shrub	<i>Larix laricina</i>	tamarack	3
		<i>Picea mariana</i>	black spruce	5
	low shrub	<i>Andromeda polifolia</i>	bog rosemary	<1
		<i>Betula sp</i>	birch species	5
		<i>Chamaedaphne calyculata</i>	leatherleaf	<1
		<i>Empetrum nigrum</i>	crowberry	<1
		<i>Juniperus communis</i>	ground juniper	<1
		<i>Larix laricina</i>	tamarack	2
		<i>Ledum groenlandicum</i>	Labrador tea	<1
		<i>Myrica gale</i>	sweet gale	1
		<i>Oxycoccus microcarpus</i>	small bog cranberry	<1
		<i>Picea mariana</i>	black spruce	5
		<i>Potentilla fruticosa</i>	shrubby cinquefoil	<1
		<i>Salix planifolia</i>	flat-leaved willow	1
		<i>Vaccinium uliginosum</i>	bog bilberry	15
		<i>Vaccinium vitis-idaea</i>	bog cranberry	<1
	forb	<i>Equisetum sylvaticum</i>	woodland horsetail	<1
		<i>Rubus chamaemorus</i>	cloudberry	<1
		<i>Spiranthes romanzoffiana</i>	hooded ladies'-tresses	<1
	graminoid	<i>Carex aquatilis</i>	water sedge	2
	moss	<i>Brachythecium rivulare</i>	no common name	1

**Table III-2 Species List by Detailed Vegetation Plot (continued)**

Plot	Vegetation Layer	Scientific Name	Common Name	Percent Cover
		<i>Cinclidium stygium</i>	common northern lantern moss	<1
		<i>Pleurozium schreberi</i>	Schreber's moss	1
		<i>Ptilidium ciliare</i>	liverwort	1
		<i>Sphagnum angustifolium</i>	peat moss	5
		<i>Sphagnum capillifolium</i>	acute-leaved peat moss	25
		<i>Sphagnum fuscum</i>	rusty peat moss	5
		<i>Sphagnum warnstorffii</i>	Warnstorff's peat moss	5
		<i>Tomentypnum nitens</i>	golden moss	30
	epiphyte	<i>Evernia mesomorpha</i>	boreal oakmoss lichen	<1
		<i>Hypogymnia physodes</i>	monk's-hood lichen	<1
		<i>Imshaugia aleurites</i>	salted starburst lichen	<1
		<i>Tuckermannopsis sepincola</i>	chestnut wrinkle-lichen	<1
		<i>Usnea hirta</i>	shaggy beard lichen	<1
		<i>Vulpicida pinastri</i> (also <i>Tuckermannopsis pinastri</i> )	powdered sunshine lichen	<1

< = less than

## **APPENDIX IV**

### **ECOLOGICAL LANDSCAPE CLASSIFICATION TYPES: PHOTOGRAPHS**



**Photo 1**      **Bedrock Open Conifer, Plot # NBV014**



**Photo 2**      **Coniferous Pine, Plot # NBV003**





**Photo 3**      **Coniferous Spruce, Plot # NBV030**



**Photo 4**      **Deciduous Aspen-Paper Birch, Plot # NBV015**



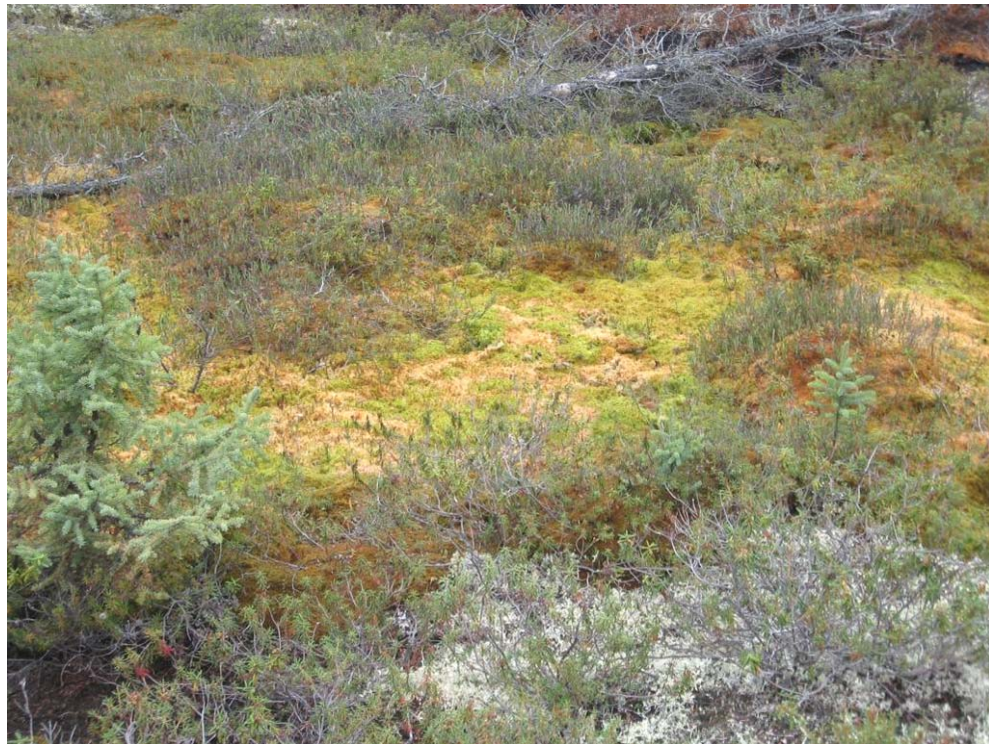


**Photo 5**     **Mixedwood Spruce-Paper Birch-Aspen, Plot # NBV037**



**Photo 6**     **Marsh/Graminoid Fen, Plot # NBV007**





**Photo 7**    **Open Bog, Plot # NBV019**



**Photo 8**    **Shrubland, Plot # NBV033**





**Photo 9** Treed Bog, Plot # NBV016



**Photo 10** Treed Fen, Plot # NBV036