# Appendix H-3

## Rare Plants

# 1.0 RARE PLANT DOCUMENTATION & HABITAT ASSESSMENT

## 1.1 Rare Plant Background Review

Background data were collected and reviewed to identify known Element Occurrences (EO) of rare species located in the Project Location, or within 120 m of the Project Location. Data was obtained from the Natural Heritage Information Center database, Ministry of Natural Resources – Sault Ste. Marie District, and past reports prepared by Natural Resource Solutions Inc. and by M.K. Ince and Associates. Eight rare vascular plant species were documented to potentially occur within the Study Area. These species were oval-leaved bilberry, woodland pine drops, boreal bedstraw, wooly beach heath, Braun's holly fern, mountain fir-moss, blue wild rye, and quill spike-rush.

In the context of vascular plants, an element occurrence can be described as an area of land or water on / in which a plant is, or was, present. It is a physical location important to the conservation of a species or community. The status ranking or conservation value (S rank) of a species or community is based on a combination of eight primary factors and is determined using the following criteria:

- Abundance
- Range
- Abundance trend (an estimate of change based on historical accounts)
- Distribution trend (species' distribution over its provincial range)
- Element occurrences (estimated number of occurrences in the province or region)
- Protected occurrences (estimated number of adequately protected occurrences in the province or region)
- Population threats
- Habitat threats (quality of surrounding area, effect on continued existence of element occurrence).

### 1.1.1 Species Literature Review

A review of relevant botanical and ecological information was conducted to:

- Review any historical records of listed (as protected under either the SARA or ESA) and/or "rare" (SH, S1, S2, S3 or combinations thereof) plant species within the Study Area, prior to conducting field surveys.
- Assess COSEWIC Status Assessments and/or *SARA* Recovery Strategies or Action Plans (if available).

- Review technical manuals (e.g. *Flora of North America*, Field Manual of Michigan Flora) for familiarization of all identifying characteristics of rare species that could be encountered.
- Review past consultant reports from local projects that discuss survey methods for similar species.

### 1.1.2 Existing Spatial Reference Data

GIS layers were used to produce a base map upon which the survey plan was developed, and included all biophysical and geospatial data needed to stratify the landscape into patches with differing likelihood of occurrence for each species, where applicable. This basemap was used to illustrate the areas to be surveyed and included sample point locations with Universal Transverse Mercator (UTM) coordinates, access routes, and any information related to natural hazards in the Study Areas. Digital layers included 2008 orthographic imagery, topographic lines, water bodies and watercourses, known wetlands, and project components. This data was uploaded onto field GPS units, carried by field surveyors. Reference maps provided by past consultant reports were also utilized.

### 1.1.3 Field Survey Methods

Rare plant surveys were completed in conjunction with Ecological Land Classification and general botanical inventories. Surveys were conducted during the 2012 growing season by various Ecologists, but predominantly completed by two Vegetation Ecologists with a specialization in plant identification and community classification.

Sexual maturity of specimens is often critical for accurate identification of certain species. As such, the timing of the surveys was strategically selected to coincide with the highest probable periods of encountering and identifying them.

At present, standardized guidelines for rare plant surveys have not been adopted by any government or regulating agency in Ontario. For this project, surveys for rare plants were established on the following principles (as adapted from Alberta Native Plant Council, 2000):

- The rare plant survey should provide adequate geographic coverage of the Study Area, including
    - Thorough assessment of vegetation communities or habitat types
    - All unique or uncommon plant associations
    - All features or biotic patterns with high probability of supporting rare plants
- Timing surveys to occur during periods when potential rare species are most visible (when diagnostic features are most identifiable), and when the probability of encountering both cool and warm season perennials is highest.
- Revisit an adequate number of sites where rare plant element occurrences have been previously recorded.

Meander search patterns were applied to the vegetation communities within the Study Area. This search pattern focused on the location of the proposed project components and a 150 meter Zone of Influence (ZOI). Patterned search methods (transects) were not used primarily due to the overall extent of the Study Area, terrain and time restrictions, and general openness of the forest understory.

### 1.1.4 Results of Plant Inventory

A total of 272 species of vascular plants were recorded from the Study Area, of which 92% were native. 85% of these native plants have a rank of S5 – indicating they are common and secure within Ontario. 35 species (14%) have a rank of S4 (apparently secure), while two species are ranked S3 (vulnerable), and one ranked S2 (Imperiled). The S2 and S3 species are considered provincially rare; these species were boreal bedstraw (Galium kamtschaticum), Braun's holly fern (Polystichum braunii), and oval-leaf bilberry (Vaccinium ovalifolium), respectively. For each specimen observed, UTM coordinates were saved on a GPS unit and generally noted in field notes. Since oval-leaf bilberry was observed frequently in suitable habitat, often covering extensive areas, single UTM coordinates were saved to indicate a population, or notes were taken on appropriate data collection cards.

No regional rarity ranking of plants is available for the Algoma District, as indicated by Mike Oldham of the MNR (personal comm. 2012). **No** nationally **or provincially listed (SARA, ESA) species were found. A complete list of all vascular plants is provided in Appendix C.**

#### 1.1.4.1 Boreal Bedstraw

This S2 herbaceous plant was most commonly associated with moist to wet soil, often organic although loamy stream-side conditions were observed. This affinity to moist conditions generally restricted the species' range to bottomland habitat, or small upland depressions where surface drainage was poor due to underlying bedrock. Although this species was observed infrequently throughout the Study Area, these observations were of small populations, often <10 specimens widely spaced apart. Specimens were most frequently observed in G058Tt communities (sugar maple – yellow birch forest), situated within small, poorly drained depressions that provided swamp microhabitat. This microhabitat was most closely associated with G129Tt communities (Organic Rich Conifer Swamp), but was not delineated as such because they were frequently less than 0.2 hectares in size. Boreal bedstraw (synonymous with northern wild licorice) was observed in delineated G129Tt communities, although despite seemingly suitable conditions, specimens were not always present.

This species was occasionally associated with seeps, although this was not an obligate condition. Many seeps throughout the Study Area did not have appropriate soil conditions as they were characterized by coble substrate. The species appeared to prefer dense beds of sphagnum moss, with infrequent observations of specimens growing alongside intermittent streams, absent of moss.

#### 1.1.4.2 Braun's Holly Fern

This S3 evergreen fern was infrequently encountered but was consistently associated with rocky ravines with intermittent streams, or steep slopes with rocky, vegetated conditions. Within the Study Area, it appeared to prefer fresh to moist soils and, when observed along slopes, it was often situated at mid to toe slope positions. The most consistent habitat requirement appeared to be moist forests with exposed rock and topographic protection. Soil texture was typically loam, often with a sand component.

Within the Study Area, Braun's holly fern was only documented to occur in G058Tt communities (sugar maple – yellow birch forest). Associate ground cover often included a high diversity of ferns including evergreen wood fern, northern lady fern, and interrupted fern.

#### 1.1.4.3 Oval-leaf Bilberry

This S3 species, synonymous with tall huckleberry, was the most commonly observed rare species within the Study Area. It preferred fresh to wet soil (loamy to organic) within mature treed deciduous to mixed coniferous communities. The species appeared to be most prolific in moist to wet conditions, although it was not uncommon in drier sties. Similar to boreal bedstraw, this species was most commonly observed growing in the small organic depressions that occurred within the larger sugar maple – yellow birch community (G058Tt). It was also commonly observed growing in the G129Tt swamp communities. While it was present in various other community types as well, its presence was consistently associated with soil moisture within treed communities. There was no evident association to canopy composition, substrate texture, elevation, slope, or aspect.

When this species was observed, it was rarely present as a single, isolated occurrence. Instead, this species was often abundant in its preferred habitat, occasionally dominating the understory. More often than not, this species was present where suitable habitat existed. A profile suggests this species prefers lowland/wetland communities where it is most abundant, and continues to persist in the adjacent transitional communities, albeit at decreased densities. As these transitional communities increase in elevation, there is an apparent decline in the abundance of bilberry and a gradual desertion. They are, however, present at higher elevations where small infiltration or seepage areas exist, or adjacent to intermittent streams.

Due to the frequent observation of this species, UTM's were not always taken for each occurrence encountered. Where a UTM was not recorded, bilberry presence was instead documented in field notes and ELC data cards. Priority was given to collecting UTM coordinates for sparse populations, specimens that occurred in small inclusion communities or unusual habitat areas where their presence deviated from the norm (e.g. dry upland habitat). As a result, the Figure illustrating occurrences of rare plants does not provide a complete representation of oval-leaf bilberry. In ideal habitat, it's presence should instead be assumed, as it was commonly present.

### 1.2 Microhabitat Characterization and Assessment

Each of the three rare species were observed at various locations throughout the Study Area, but consistently, the sugar maple – yellow birch (G058Tt) community provided suitable habitat for these species. This community type was extensive and occupied the majority of the Study

Area. Its classification was completed at the finest spatial scale of ELC, which provides site and stand level data. This level of classification, however, provides a poor depiction of the available habitat where species occurrences were documented. Ideally, microhabitat mapping within the larger ELC community type would improve the readers understanding of candidate habitat versus habitat that is actually utilized by the species in question.

The challenges associated with this are the extent of the Study Area and the absence of standardized protocol for delineating habitat boundaries of specific rare plants. Within this landscape, for example, there were frequent observations of small moist pockets within the larger sugar maple – yellow birch community, some no more than 4m² in size, but large enough to support occurrences of oval-leaf bilberry. The solution was to develop microhabitat mapping that focuses on congregated occurrences, which have been collectively identified and mapped by Stantec Consulting, Tulloch Engineering, Natural Resource Solutions Inc, M.K. Ince and Associates, and the Ministry of Natural Resources over multiple years.

Microhabitat mapping was completed by the Stantec Vegetation Ecologist responsible for ELC/FEC mapping of the Study Area, who was the technical lead for vegetation field studies on site. Microhabitat delineations were completed using ArcGIS software with 2008 orthographic imagery. Because the specific habitat of the rare species can't be readily distinguished by review of orthographic imager, natural features were used to assist with delineations. These consisted of topographic lines, watercourses, ELC units, wetland units, seep mapping, flow accumulation mapping (based on Digital Elevation Modeling), and all UTM points of rare plants. No microhabitat delineations were drawn outside of the 120m ZOI, nor were any delineations completed for seemingly suitable habitat that did not have documented occurrences of the species. These potential habitats are instead illustrated on the Candidate Significant Wildlife Habitat Figure.

### 1.2.1 Boreal Bedstraw

Mapping of this species' microhabitat was based primarily on known occurrences, topography, seep mapping, and knowledge of suitable habitat within the landscape. Since this is an S2 species, all known occurrences of boreal bedstraw were mapped within the 120m ZOI. Where this species was closely congregated, a polygon was drawn around the congregation of specimens. If this congregation was separated by a topographic line, the population was then broken into two separate polygons. This was done to account for the moist depressions, which were generally situated on level terrain. Isolated rare plant points were delineated in a similar fashion, although microhabitat size was generally restricted to 25m² to account for the typically small area that these depressions occupied. Drainage features were also an important consideration to account for potentially moist conditions.

### 1.2.2 Braun's Holly Fern

Mapping of this species' habitat were delineated with reference to known occurrences and topography, primarily, with consideration of watercourses. Since this species prefers steep slopes associated with forest cover, habitat mapping consisted of the known population and extended along the slope until either the aspect changed or the slope grade decreased.

### 1.2.3 Oval-leaf Bilberry

Unlike the other two species, the rare plants Figure does not provide a complete representation of this species. Although it is an S3 species, it was locally common throughout the Study Area where suitable habitat was observed, making it impractical to provide UTM documentation of all occurrences. During surveys, priority was instead given to collecting UTM coordinates for sparse populations, specimens that occurred in small inclusion communities or unusual habitat areas where their presence deviated from the norm (e.g. dry upland habitat).

Based on the methods used during data collection and the knowledge that suitable habitat frequently contained populations of bilberry, all ELC community types that were known to consistently support abundant populations of oval-leaf bilberry where identified as significant habitat and included in the microhabitat mapping. The exception to this was for the sugar maple – yellow birch forest as this provided habitat but often only in moist depressions, seeps, or along drainage features. For this community type and other potentially significant communities, microhabitat delineations were based around congregated occurrences, with reference to topography, seeps, and drainage features.

### References

ANPC (Alberta Native Plant Council). 2000. Guidelines for Rare Plant Surveys. Alberta Native Plant Council. Edmonton, AB.

Mike Oldham, personal communication, August 8, 2012.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 16+ vols. New York and Oxford.

Michigan Flora Online. A.A. Reznicek, E.G. Voss, & B.S. Walters. February 2011. University of Michigan. Web. 11-29-2012. http://michiganflora.net/home.aspx

677500 678000 678500 679000 679500 680000

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17

Dump Road

G135S
G058Tt
G045NH
G050Tt
G101Tt
G191X
G033Tt
G070Tt
G067Tt
G129Tt
G047S
G058Tt
G058Tt
G058Tt
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Revised: 2013-01-23 By: pworsell

## Legend

120m Zone of Investigation

**Project Components**
- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**
- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**
- Vegetation Community Boundary

*Stantec Observations*
- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*
- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*
- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*
- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**
- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

### Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
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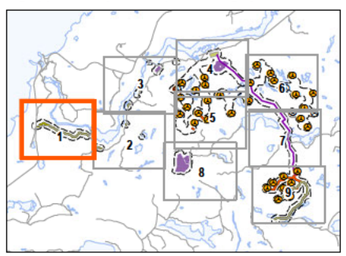


Stantec

January 2013
160960771

Client/Project
Bow Lake Wind Farm
Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through their General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan 2 GP Corp.

Figure No.
H-3.1

Title
**Rare Plants**


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## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
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- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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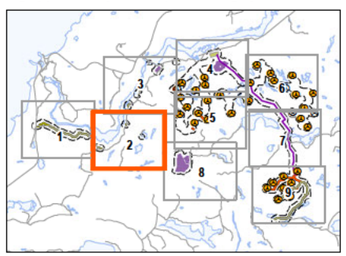


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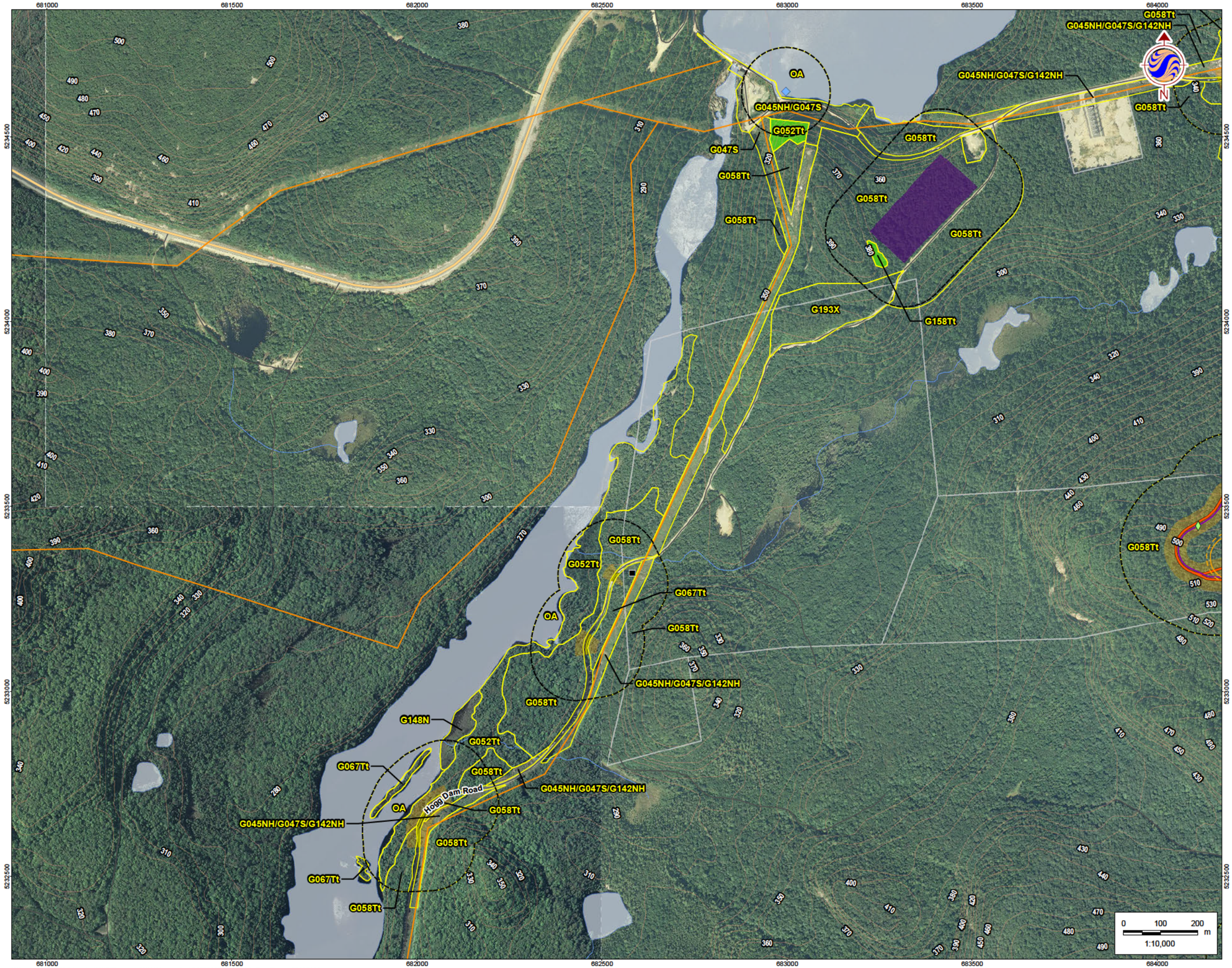
Figure No.

H-3.2

Title

**Rare Plants**

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## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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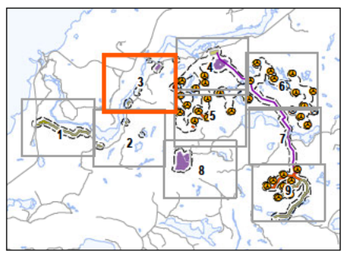

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Figure No.
H-3.3

Title
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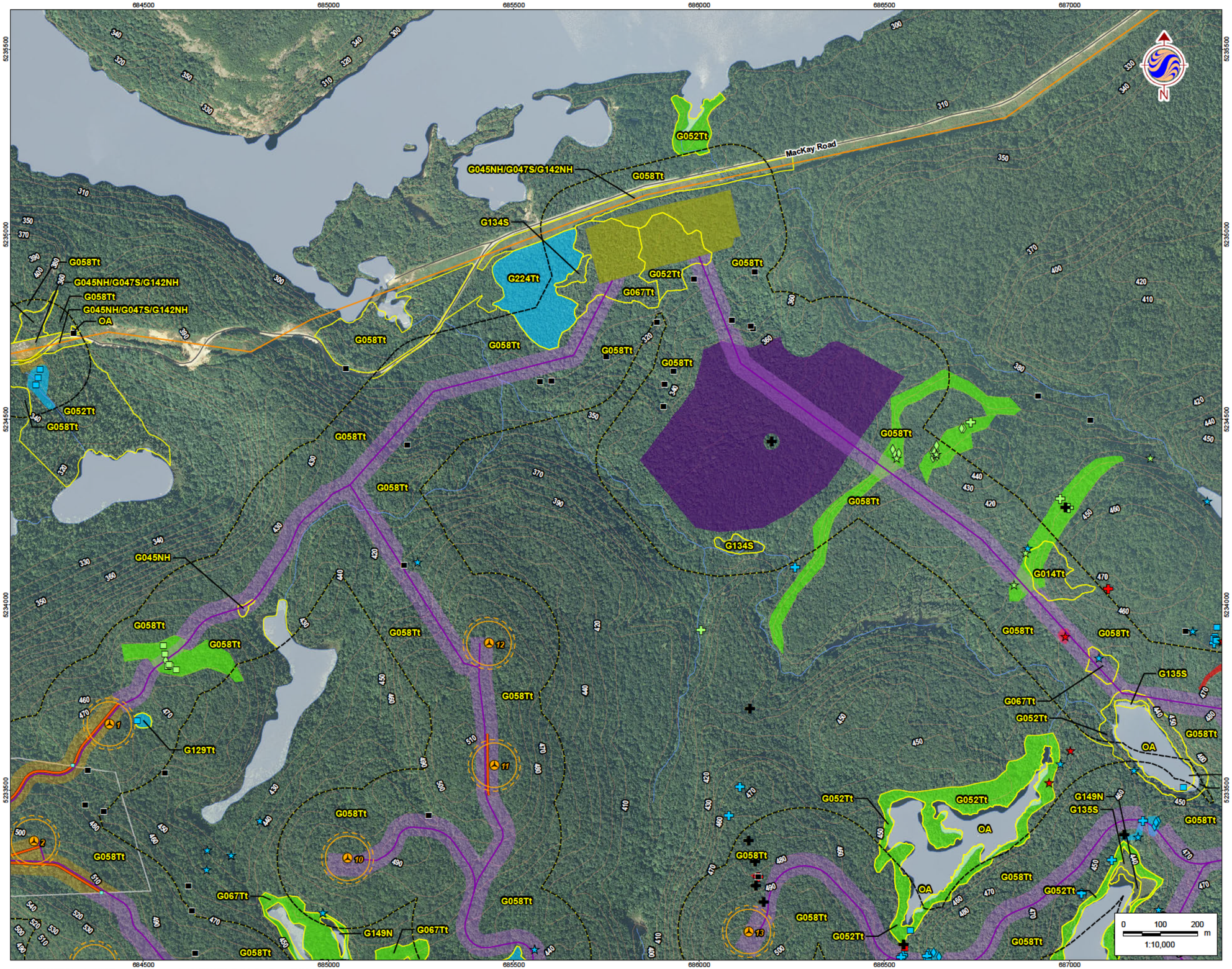


## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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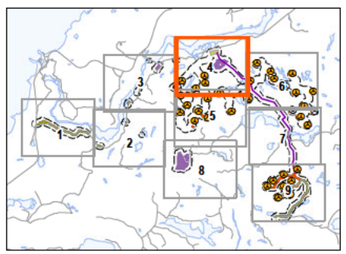


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Figure No.

H-3.4

Title

**Rare Plants**

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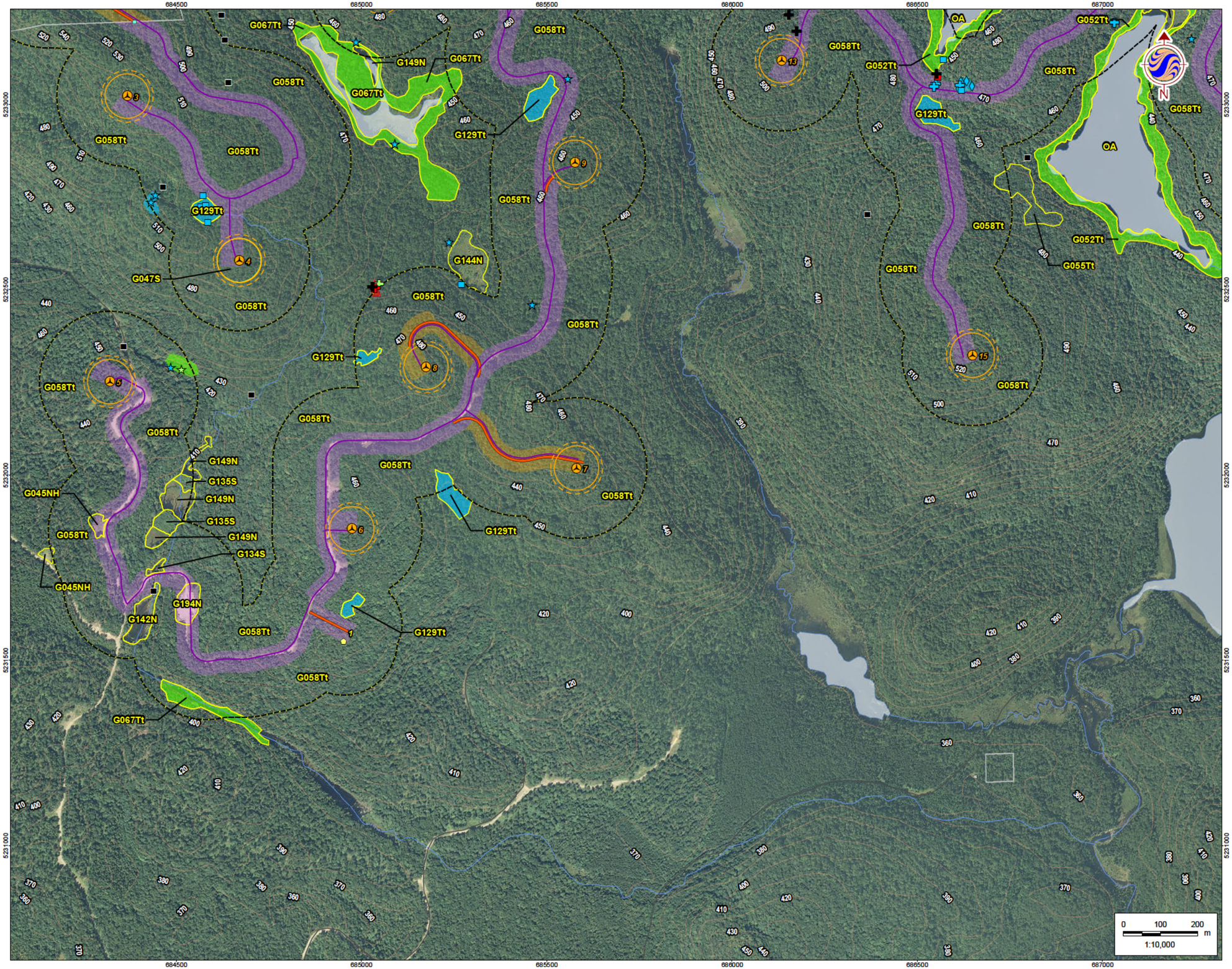


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## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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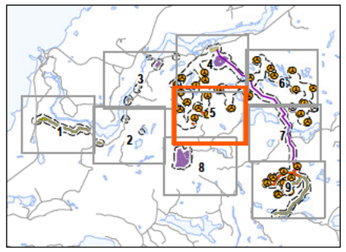


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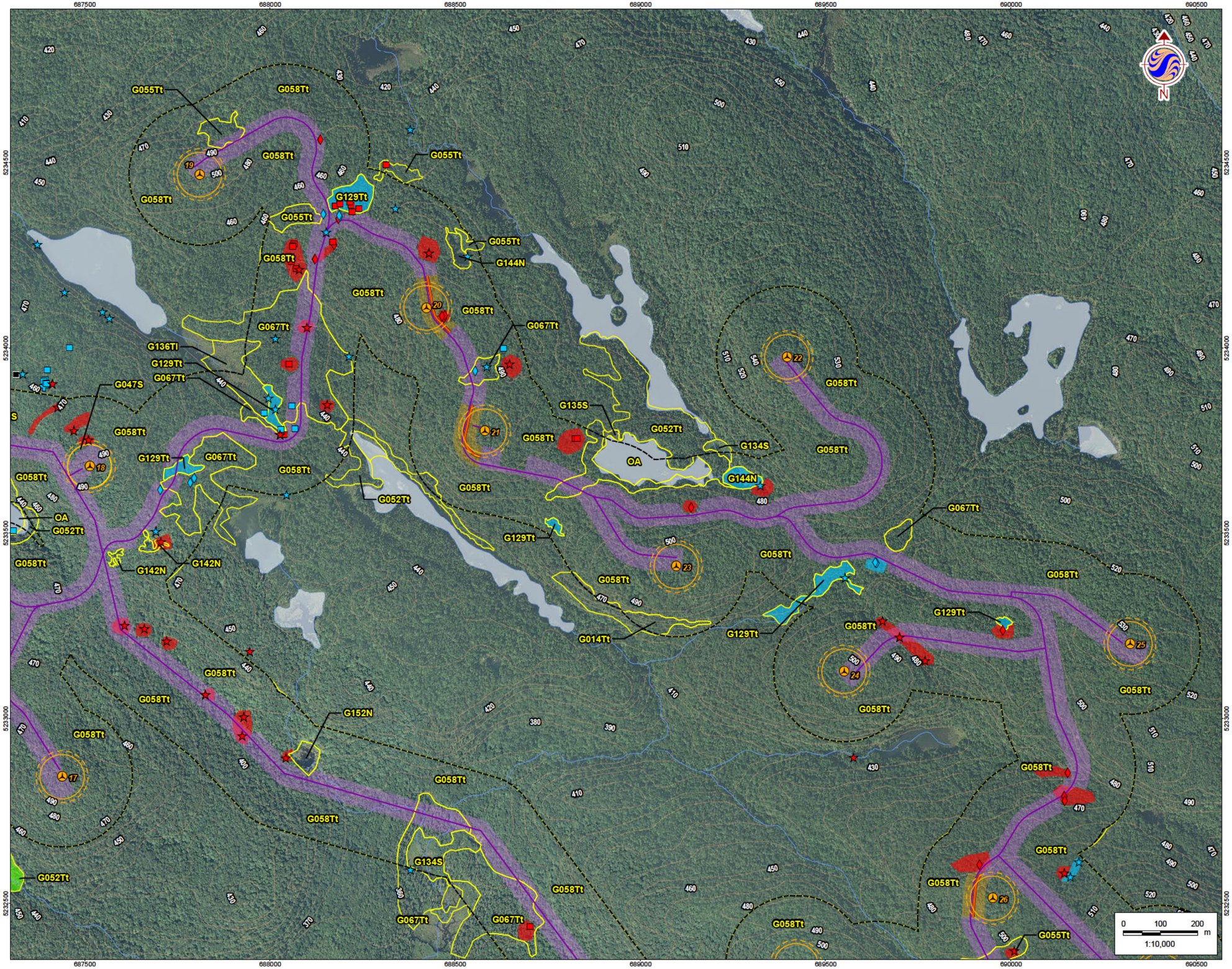
Figure No.
H-3.5

Title
**Rare Plants**

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## Legend

- 120m Zone of Investigation

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- Turbine Laydown Area
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- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

### Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
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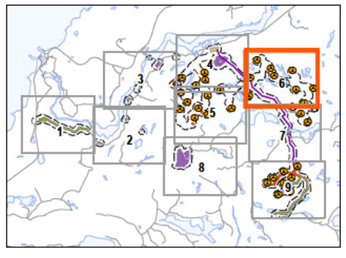


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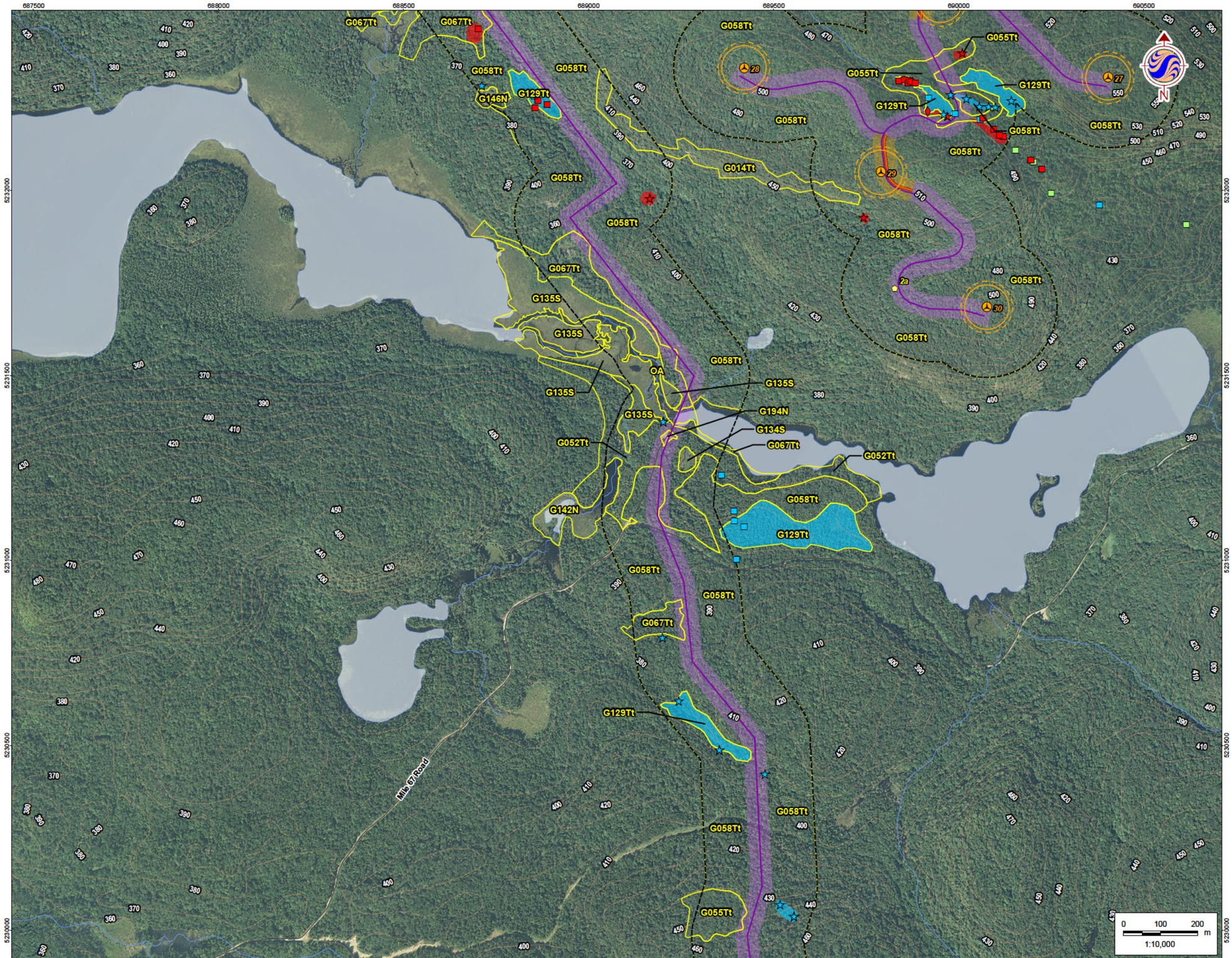
Client/Project
Bow Lake Wind Farm
Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through their General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan 2 GP Corp.

Figure No.
H-3.6

Title
**Rare Plants**




## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

### Notes

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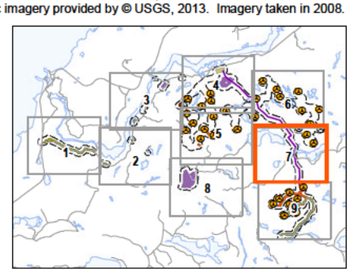

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Bow Lake Wind Farm
Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through their General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan 2 GP Corp.

Figure No.

H-3.7

Title

**Rare Plants**

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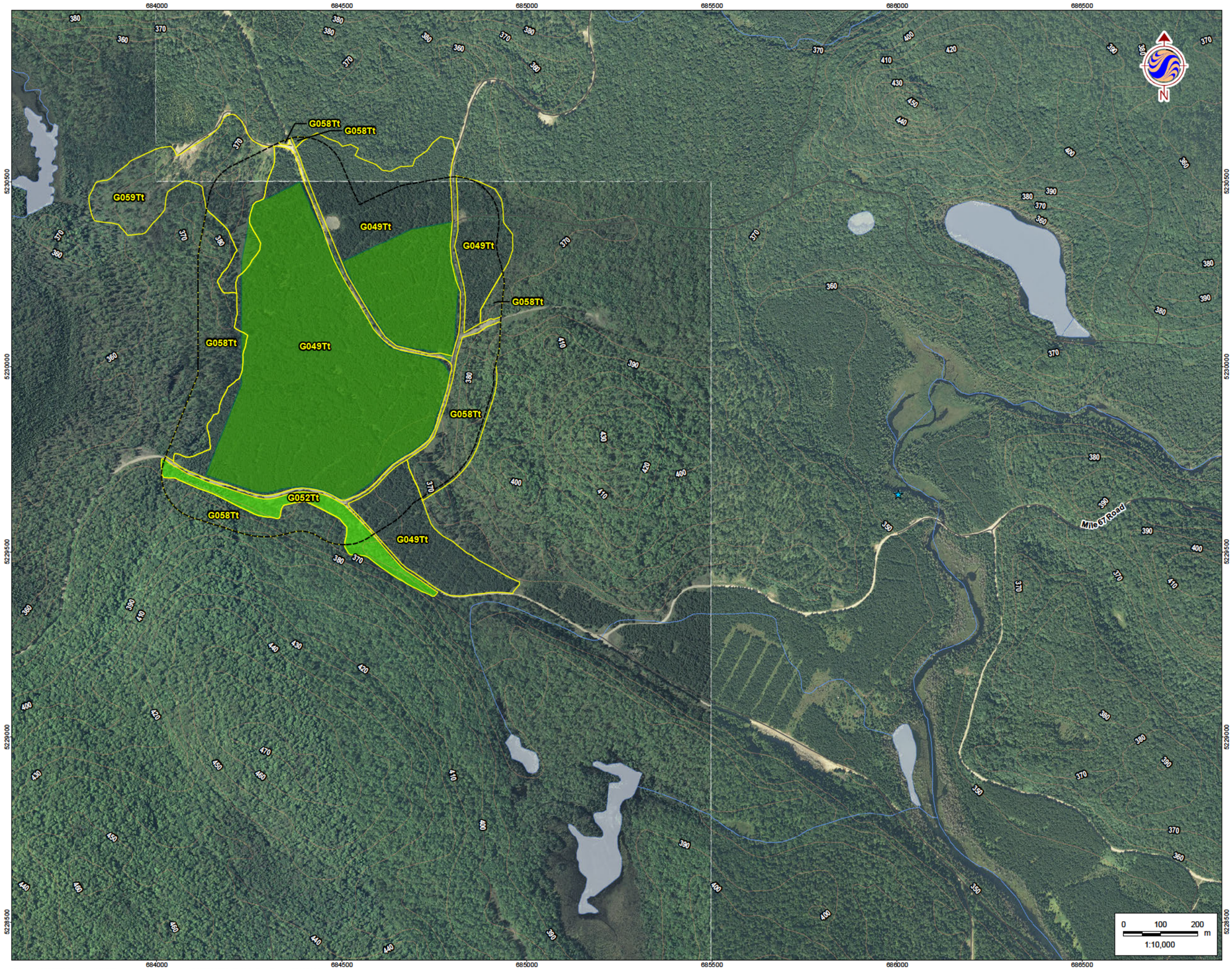
Revised: 2013-01-23 By: pworsell




## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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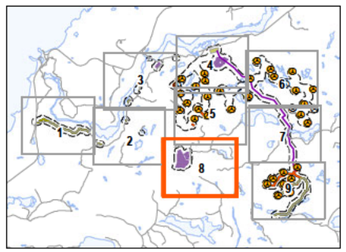


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Bow Lake Wind Farm
Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through their General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan 2 GP Corp.

Figure No.

H-3.8

Title

# Rare Plants

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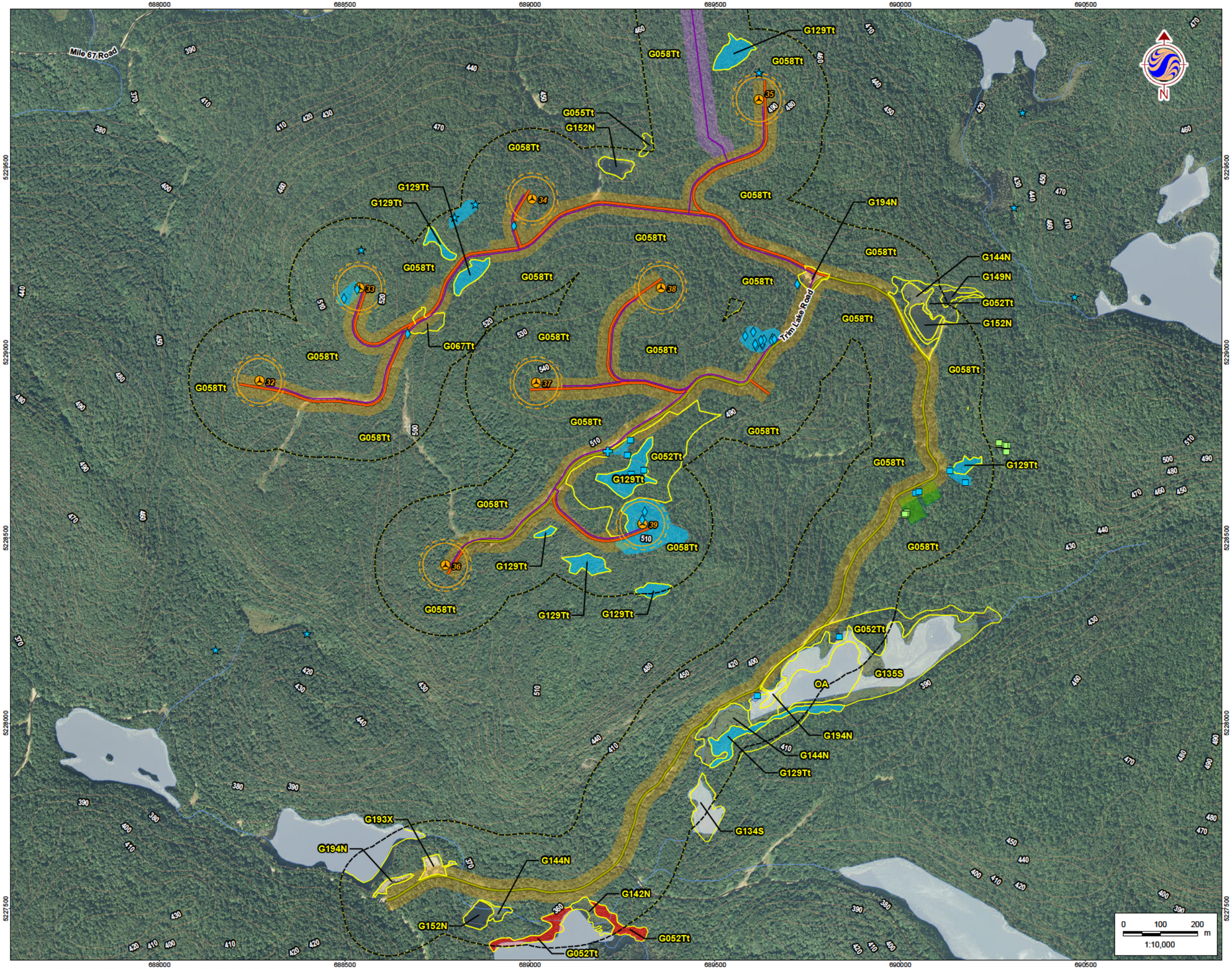


## Legend

- 120m Zone of Investigation

**Project Components**

- Turbine Location
- Gate Location
- Meteorological Tower
- Proposed Water Extraction Location
- Access Road (New)
- Access Road (Upgrade)
- Overhead/Underground Collector Line
- Access Road Corridor
- Collector Line Corridor
- Turbine Sweep Area
- Turbine Laydown Area
- Construction Compound
- Construction Compound & Welfare Building
- Construction Compound & Transformer Station/Operations & Maintenance Building

**Existing Features**

- Expressway / Highway
- Road
- Elevation Contour
- Existing Transmission Line
- Watercourse
- Waterbody
- Patent Land

**Natural Features**

- Vegetation Community Boundary

*Stantec Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*MNR Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry
- Seep

*NRSI/MKI Observations*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

*Geotech Field Study (Tulloch)*

- Boreal Bedstraw
- Braun's Holly Fern
- Oval-leaved Bilberry

**Significant Features**

- Boreal Bedstraw Habitat
- Braun's Holly Fern Habitat
- Oval-leaved Bilberry Habitat

## Notes

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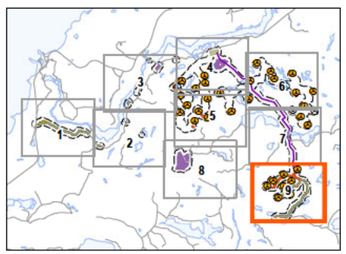


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Figure No.
H-3.9

Title
**Rare Plants**

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