Appendix J

Final Vegetation Technical Support Document

MARTEN FALLS FIRST NATION
COMMUNITY ACCESS ROAD

Vegetation Technical Support Document: Existing Conditions & Effects Assessment

February 2026

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This limitations statement is considered an integral part of this report.

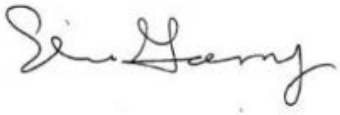
Authors

Report Prepared By:

Corey Burt, MSc
Terrestrial Ecologist

Heather Drost, BSc
Senior Ecologist

Report Reviewed By:



Erin Greenaway
Senior Principal Ecologist

Report Endorsed By:

Christine Green
Senior Environmental Planner

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Executive Summary

This Report presents the existing conditions and effects assessment for the vegetation discipline that has been prepared in support of the *Marten Falls First Nation Community Access Road Environmental Assessment / Impact Statement Report*. The Report provides a detailed assessment of potential effects of the Marten Falls First Nation Community Access Road Project (the Project) on vegetation. This assessment includes consideration of both effects from the Project and cumulative effects from the Project and other reasonably foreseeable developments. The vegetation assessment used widely accepted scientific practices and incorporated Indigenous Knowledge, where available.

- Vegetation Valued Components, including species at risk, were identified based on **Sections 8.5** (Riparian and Wetland Environments), **8.7** (Vegetation) and **8.11** (Species at Risk) of the *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020). The vegetation Valued Components and rationale for their selection are:
- Wetland Ecosystems and Riparian Ecosystems (cultural, economic and / or social importance; provides ecosystems support; provide habitat for Traditional Use and Species at Risk plants; indicator of wetland health);
- Upland Ecosystems (cultural, economic and / or social importance; provides ecosystems support; provide habitat for Traditional Use and Species at Risk plants);
- Designated Areas (Area of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations) (cultural, economic and / or social importance; indicator of ecosystem health); and
- Traditional Use Plants and Species at Risk Plant Populations (including species with special conservation status or rarity in the province) (federal or provincial species at risk; cultural, economic and / or social importance; measure of ecosystem health).

The assessment of potential effects on vegetation was informed by the assessments completed for physiography, wildlife (including birds and ungulates), hydrology, surface water quality, groundwater (Oji-Cree translation, *anamakamigwabo*) quality and quantity, and air quality. Alterations in availability and distribution of vegetation can affect ecological services (e.g., availability of plants) for people that use these resources. As such, the vegetation assessment provided information that was used to support other Valued Component assessments, such as Aboriginal and Treaty Rights and Interests; Social; Land and Resource Use; and Human Health and Community Safety.

Setting

At a regional scale, the Project would start approximately 57 kilometres (km) north of Nakina, Ontario, and end at the community of Marten Falls First Nation, approximately 175 km north of Nakina. The vegetation assessment used the same spatial boundaries as physiography, which consist of an effects assessment Local Study Area of 115,961 ha and an effects assessment Regional Study Area of 453,875 ha.

Existing Conditions

Existing conditions for vegetation were characterized based on results from desktop mapping, field studies carried out between 2021 and 2023, Indigenous Knowledge, and other available data sources (e.g., literature).

The Project intersects two of Ontario's three ecozones: the Ontario Shield and the Hudson Bay Lowlands (Crins et al., 2009). Approximately 85% of the existing conditions Local Study Area occurs in the Ontario Shield ecozone, and 15% occurs within the Hudson Bay lowlands. However, much of the existing conditions Local Study Area contained within the Ontario Shield ecozone has similar geomorphological characteristics to the Hudson Bay Lowlands.

Desktop vegetation community mapping in the existing conditions Local Study Area was conducted based on the *Ecosites of Ontario* ecosite keys (Banton et al., 2009). Vegetation community mapping in the existing conditions Regional Study Area was assembled using the Ontario Land Cover Compilation Version 2.0. Given the scale of the Project and the limitations identified in the desktop ecosite mapping exercise, for mapping and analyses purposes, ecosites in the existing conditions Local Study Area were rolled up into vegetation groupings that align with categories in the provincial dataset to allow consistent mapping, and at the same level of detail, across both study areas.

Field investigations were completed in 2021 through 2023 by ground inspections (i.e., point sample at a representative location within a desktop delineated and classified polygon) and visual checks (i.e., an assessment from helicopter as well as assessments of representative photographs taken during other field programs). A total of 481 vegetation sites were surveyed, including 90 ground inspection sites, 316 visual checks (aerial surveys) and 75 visual checks (photo interpretation). Field sites were located within the existing conditions Construction Disturbance Area (approximately 60% of the survey locations) and the existing conditions Local Study Area (approximately 40% of the survey locations). No field investigations were completed within the existing conditions Regional Study Area.

Upland, Wetland and Riparian Ecosystems

The existing conditions Local and Regional Study Areas are dominated by wetland ecosystems, with 73% (145,206.9 ha) and 68% (397,319 ha) mapped as wetland communities in each of these study areas. Upland ecosystems represent 23% (45,193.5 ha) of the existing conditions Local Study Area, with water representing a further 4% (7,506.9 ha), and anthropogenic (human-altered) lands representing <1% (53.0 ha). Within the existing conditions Regional Study Area, upland ecosystems represent 19% (112,456.9 ha), water represents 5% (31,359.3 ha) and anthropogenic lands represent 8% (46,624.1 ha). A very small proportion of the existing conditions Regional Study Area (<1% or 2.0 ha) is classified as Other.

Generally, upland and wetland ecosystems are found throughout the existing conditions Study Areas. However, upland ecosystems are more frequent south of Dusey Lake, while wetland ecosystems are more frequent in the northern portion of the Study Areas.

Within the existing conditions Local Study Area, Coniferous Forest dominates upland communities (representing 20% of the existing conditions Local Study Area), followed by Deciduous Forest (3%), Mixed Forest (<1%), Rock / Barren (<1%) and Early Successional / Sparse Treed (<1%). Fen (37%) dominates the wetland communities, followed by Swamp (33%), Marsh (2%) and Bog (1%).

Within the existing conditions Regional Study Area, Coniferous Forest also dominates upland communities (representing 14% of the existing conditions Regional Study Area), followed by Mixed Forest (3%), Deciduous Forest (2%), Rock / Barren (<1%) and Early Successional / Sparse Treed (<1%). Swamp (29%) dominates the wetland communities, followed by Fen (25%), Bog (13%) and Marsh (<1%).

Upland ecosystems provide a range of functions, including soil conservation, nutrient cycling, carbon sequestration, climate regulation and biodiversity (i.e., provide habitat for upland plant and animal species). Wetland ecosystems provide a range of functions categorized as hydrological (e.g., water storage), biogeochemical (e.g., carbon sequestration) or habitat.

Riparian ecosystems (i.e., a 30 m buffer applied to watercourses and waterbodies) include both upland and wetland communities and represent 4% (8,750.4 ha) of the existing conditions Local Study Area and 4% (24,183.7 ha) of the existing conditions Regional Study Area. Riparian ecosystems occur throughout the Study Areas, but the frequency of waterbodies / watercourses decreases towards the north part of the existing conditions Study Areas where large wetland complexes dominate the landscape.

Riparian ecosystems provide a range of functions to adjacent aquatic and terrestrial systems, including water temperature regulation, bank and channel stability, filtering of surface flow, and regulation of instream biological or algal production.

Traditional Use Plants, Species at Risk and Species of Conservation Concern

A total of 43 traditional use plant species were initially identified for the Project including plants used for medicinal or spiritual purposes, food, and / or home uses. Candidate traditional use plant habitat suitability was assessed qualitatively in terms of habitat suitability and habitat accessibility for each ecosite within the existing conditions Local Study Area. Suitable habitat is available throughout the existing conditions Local Study Area. However, there is an apparent increase in the presence of ecosites with a higher score in the southwest, central, and north portion of the existing conditions Local Study Area, mostly associated with existing roads and waterways. After the completion of the Traditional Use Plant habitat suitability and accessibility mapping exercise, additional traditional use plant species were identified by communities including Aroland First Nation, Fort Albany First Nation, Kashechewan First Nation, Marten Falls First Nation, and Weenusk First Nation (Dillon, 2024a; Firelight Research Inc., 2024; Marten Falls First Nation, 2023; MNP LPP, 2024a; Shared Value Solutions, 2024). **Although these additional species were not assessed in the mapping exercise, it is acknowledged that these species are of cultural importance**.

Three Species at Risk and / or Species of Conservation Concern have potential to occur within the Project existing conditions Local Study Area: Black Ash, Pitcher's Thistle, and Northern Marsh Violet. Candidate habitat for Black Ash represents a total area of 65,022.3 ha (33% of the existing conditions Local Study Area) and is relatively evenly distributed across the existing conditions Local Study Area. Black Ash was confirmed in the Local Study Area during field surveys. The range of Pitcher's Thistle is restricted to the shores of the Great Lakes and a preferred habitat type that is not present within the existing conditions Study Areas. Candidate habitat for Northern Marsh Violet represents a total area of 141,435.26 ha (71% of the existing conditions Local Study Area). The distribution of these ecosites increases towards the northern portion of the existing conditions Local Study Area.

Designated Areas

Two types of Designated Areas were identified in the Study Areas: Provincial Parks and Critical Landform / Vegetation Associations. There are no Areas of Natural and Scientific Interest, Conservation Reserves, Environmentally Significant Areas, or Enhanced Management Areas currently mapped within the existing conditions Study Areas. Significant Woodlands are not designated on the Canadian Shield and therefore none are present within the existing conditions Study Areas.

Ogoki River Provincial Park and Albany River Provincial Park are located within the existing conditions Local Study Area. Little Current River Provincial Park is located at the southernmost limits of the existing conditions Regional Study Area. The Ogoki River Provincial Park is located towards the south limits of the Local and Regional Study Areas. Albany River Provincial Park crosses near the middle of the existing conditions Local and Regional Study Areas. All three Provincial Parks are Waterway Class Parks that protect riparian ecosystems.

A total of 35 Critical Landform / Vegetation Associations are mapped within protected areas or proposed protected areas within the existing conditions Local and / or Regional Study Area. Critical Landform / Vegetation Associations represent a total of 23,641.7 ha (12%) of the existing conditions Local Study Area, and 36,116.8 ha (6%) of the existing conditions Regional Study Area. Critical Landform / Vegetation Associations are concentrated within the southeast, central, and northeast portions of the existing conditions Local Study Area, with a small area in the northwest. The primary function of the Critical Landform / Vegetation Associations is to contribute to the protection of the full range of natural diversity within protected areas and proposed protected areas in each respective Ecodistrict.

Invasive Plant Species

No invasive plant species were identified during field investigations. It should be noted that absence of invasive plant species in ground inspection sites does not imply that invasive plant species are absent from the entire existing conditions Construction Disturbance Area, Local Study Area, or Regional Study Area; however, existing conditions indicate negligible to low invasive plant species presence.

Anthropogenic and Natural Disturbances

A total of 649.9 ha (<1%) of anthropogenic disturbances (e.g., harvest, roads, camps) and 38,279.9 ha (19%) of natural disturbances (i.e., blowdown and fire) have occurred within the existing conditions Local Study Area. Anthropogenic disturbances are limited to the southern portion of the existing conditions Local Study Area (mostly all season and winter roads), and the northeast portion of the existing conditions Local Study Area associated with the Marten Falls First Nation community.

Potential Residual Effects and Proposed Mitigation Measures

An analysis was completed to evaluate Project components and activities and associated effects pathways that could potentially affect vegetation Valued Components. Project activities that would have the potential to affect vegetation Valued Components during the Project lifespan include:

- Mobilization of equipment and supplies;
- Temporary construction staging areas;
- Temporary access roads and trails;
- Temporary construction camps;
- Right-of-way clearing and grubbing;
- Pits and quarries;
- Temporary concrete batch plants;
- Drilling / blasting / aggregate production;
- Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching);
- Bridge and culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls);
- Construction site restoration;
- Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act*;
- Decommissioning of temporary camps, roads / trails and staging areas;
- Road usage; and
- Maintenance.

As part of the pathways analysis, proposed mitigation measures were considered to determine whether effects on vegetation Valued Components could be avoided or reduced to negligible levels. A variety of environmental design features and mitigation measures were proposed to minimize the Project's effects on vegetation, including:

- Limit vegetation clearing to the extent possible;
- Conduct clearing and construction activities in winter months where feasible;
- Adjust the Project footprint where warranted, to avoid more sensitive or difficult to restore vegetation communities;

- Restore vegetation in temporary work areas using native seed mixes;
- Prepare and implement a Vegetation Restoration Plan. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.;
- Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment;
- Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate to promote natural revegetation; and
- Install, monitor, and manage appropriate erosion and sedimentation control measures to minimize or avoid sediment mobilization from the disturbed area to drainages or waterbodies.

Additional mitigation measures outlined in other discipline reports will also serve to minimize effects on vegetation Valued Components. The reader is referred to those reports for additional mitigation measures, where applicable.

Residual Effects Assessment

A residual effects assessment was conducted to determine the potential Project effects on vegetation. After mitigation measures were considered, some of the potential pathways from the Project to the environment were removed or had effects that were predicted to be of a negligible level. However, it was identified that the Project could have residual effects on vegetation from the following residual effect pathways:

- Changes to availability, distribution, composition and function of vegetation Valued Components as a result of direct vegetation loss;
    - 2,309.3 ha (2%) of Upland Ecosystems in the effects assessment Regional Study Area.
    - 2,363.2 ha (1%) of Wetland Ecosystems in the effects assessment Regional Study Area.
    - 116.7 ha (1%) of Riparian Ecosystems in the effects assessment Regional Study Area.
    - Designated Areas as a result of direct vegetation loss totalling 5.7 ha (<1%) of Albany River Provincial Park and 491.2 ha (1%) of Critical Landform / Vegetation Associations in the effects assessment Regional Study Area.
    - 4,700 ha of Traditional Use Plant habitat in the effects assessment Local Study Area.

  - Species at Risk and Species of Conservation Concern as a result of direct vegetation loss totalling 1,643.5 ha (5%) of Black Ash suitable habitat and 2,404.1 ha (3%) of Northern Marsh Violet suitable habitat in the effects assessment Local Study Area.
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of changes in hydrology;
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of changes in groundwater;
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of introduction and spread of invasive plant species;
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of fragmentation and edge effects;
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of deposition of air contaminants; and
- Changes to availability, distribution, composition and function of all vegetation Valued Components as a result of fugitive dust emissions.

Significance Determination

Residual effects on most vegetation Valued Components were considered **not significant** as the residual effects were determined to be negligible, low or medium in magnitude, and they do not represent a substantial concern for the long-term viability of vegetation Valued Components. There is the potential for management concerns through an increased public access leading to the spread of invasive species, increased risk of human-ignited wildfire and increased pressure on timber and Traditional Use Plant harvest, however these risks are minor and manageable.

One exception to this result is for the effects of the Project on Wetland Ecosystems, resulting from changes to groundwater quantity and quality. Specifically, there is high uncertainty surrounding the “floating road” construction technique proposed through peatland ecosystems, as well as a lack of a full understanding of peatland hydrogeology in the effects assessment Local and Regional Study Areas. Given the high uncertainty and probable likelihood of occurrence, a precautionary approach has been taken and the residual effects to Wetland Ecosystems associated with groundwater (quantity and quality) are determined to be **significant** at this time. There are commitments to address gaps in knowledge during future stages of the project (See **Section 9** and **Section 10**), thereby reducing the high uncertainty that has been conservatively assigned in this assessment.

However, with an improved understanding of peatland / wetland hydrogeology in the study areas and associated refined road design within peatlands that will be developed during future stages of the Project, it is expected that the uncertainty associated with these residual effects will be lessened and peatland ecosystems / Wetland Ecosystems will continue to be self-sustaining and ecologically effective.

All other vegetation Valued Components are expected to remain to be self-sustaining and ecologically effective, and therefore, the predicted residual effects on all remaining vegetation Valued Components are assessed as **not significant.**

Prediction Confidence and Uncertainty

Overall, there is a **moderate** degree of uncertainty in the predictions related to the changes to vegetation Valued Components because there were baseline data for the effects assessment Local Study Area, the Project-related effects are mostly understood, and the level of certainty associated with the effectiveness of proposed mitigations ranges from low to high. Uncertainty was primarily addressed by rolling-up the vegetation mapping from ecosites to vegetation community groupings and completing effects assessment on these groupings and applying conservative assumptions regarding the footprint area and related Project activities that may cause disturbance or direct vegetation loss to increase confidence that the effects were not underestimated.

Cumulative Effects

Four residual effects were carried forward to the cumulative effects assessment:

- Residual changes to vegetation Valued Components through direct vegetation loss;
- Residual changes to vegetation Valued Components through changes to groundwater;
- Residual changes to vegetation Valued Components through fragmentation and edge effects; and
- Residual changes to vegetation Valued Components through fugitive dust emissions.

Overall, the vegetation ecosystems and plant populations are expected to remain self-sustaining and ecologically effective within the effects assessment Regional Study Area.

Residual cumulative effects on most vegetation Valued Components were considered **not significant** as the residual effects were assessed to be negligible, low or medium in magnitude and within the resilience limits and adaptive capacity of the existing vegetation Valued Components. Consistent with the residual effect assessment, one exception to this result was for cumulative effects to Wetland Ecosystems resulting from changes to groundwater quantity and quality. This assessment is based on the high uncertainty surrounding the “floating road” construction technique proposed through peatland ecosystems, as well as a lack of a full understanding of peatland hydrogeology in the

effects assessment Local and Regional Study Areas. As a result, a precautionary approach was applied, and the cumulative effects to Wetland Ecosystems are predicated to be **significant**.

Overall, confidence levels for the cumulative effects assessment were considered to be **moderate** because there were baseline data for the effects assessment Local Study Area, the Project-related effects are mostly understood, the level of certainty associated with the effectiveness of proposed mitigations ranged from low to high, and conservative assumptions were applied.

Monitoring and Follow-Up

Monitoring programs for the pre-construction, Construction, and Operation and Maintenance Phases of the Project will be implemented to verify effects predictions and effectiveness of mitigation measures for vegetation and apply adaptive management, if required.

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List of Attachments

Attachment A – Draft Study Plan, Workplan and Regulator Comments
Attachment B – Vegetation Technical Support Document
Attachment C – Ecosites with Habitat Suitability for Traditional Use Plant Species in the Existing Conditions Local Study Area

1. Introduction

This Report presents the existing conditions and effects assessment for the Vegetation Discipline and is being prepared in support of the *Marten Falls First Nation Community Access Road Environmental Assessment / Impact Statement Report*.

Marten Falls First Nation (Oji-Cree translation, *wegwajihwana*) is a remote First Nation community in northern Ontario, approximately 430 km from Thunder Bay, Ontario, located at the junction of the Albany River (Oji-Cree translation, *Keshijih'wano Wih Ziibih*) and Ogoki River (Oji-Cree translation, *Zakamosgwanih' Ziibih*). Marten Falls First Nation is proposing a multi-purpose Community Access Road (the Project) that will connect the community to the Ontario provincial highway network.

The Project includes the construction and operation of a Community Access Road with the following key characteristics:

- Approximately 184 km (See **Section 6** for further details on the selection of the Preferred Route) of two-lane gravel all-season road on a new right-of-way;
- Approximately 100 m wide right-of-way cleared; and
- Proposed designated speed limit of 80 km per hour.

Marten Falls First Nation is currently accessible year-round by air transportation out of Thunder Bay, Ontario and Nakina, Ontario, and by a winter access road constructed on an annual basis, if winter conditions permit. Since the 1990s, Marten Falls First Nation has received provincial funding to maintain the 140 km of winter road to the community.

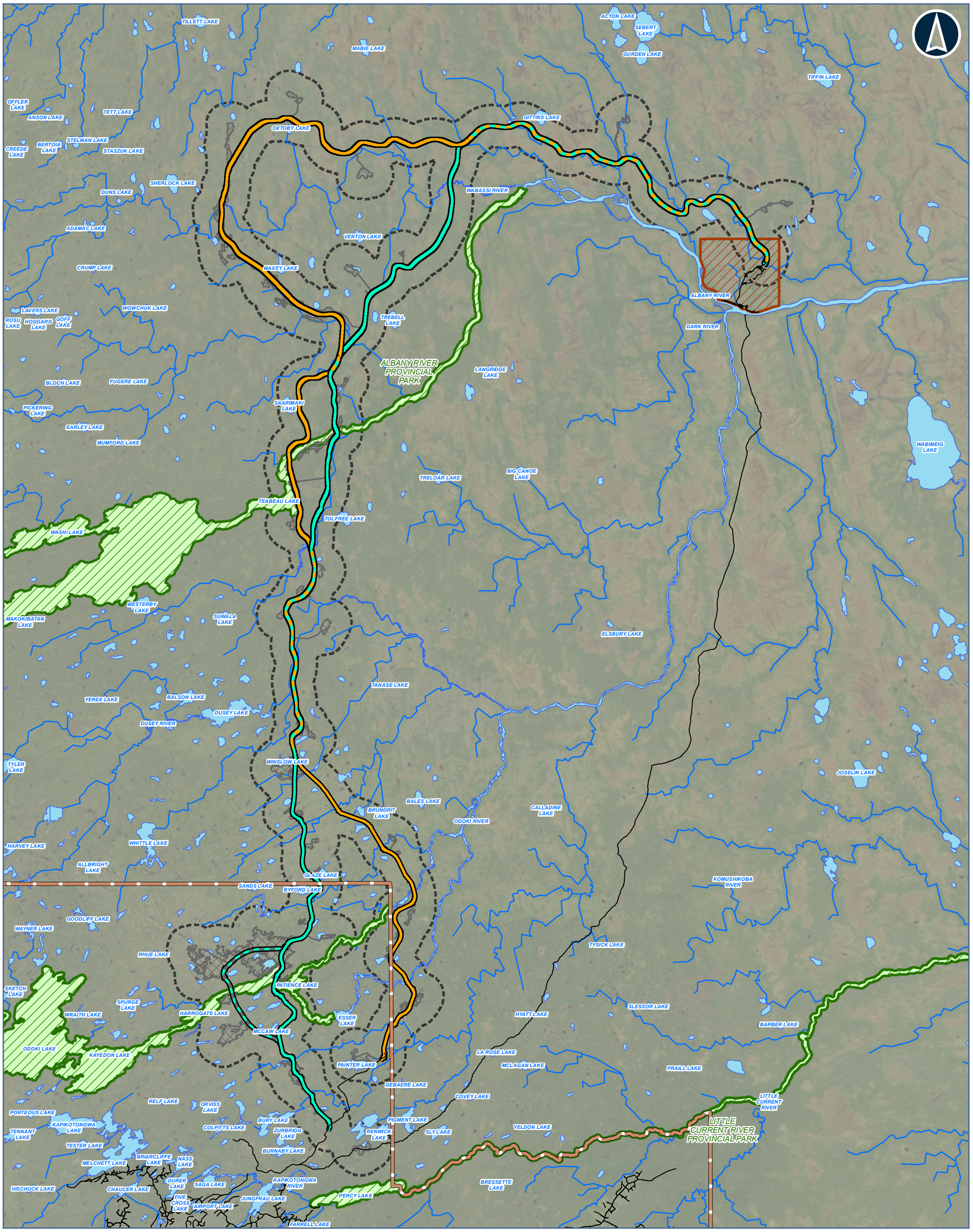
1.1 Project Overview

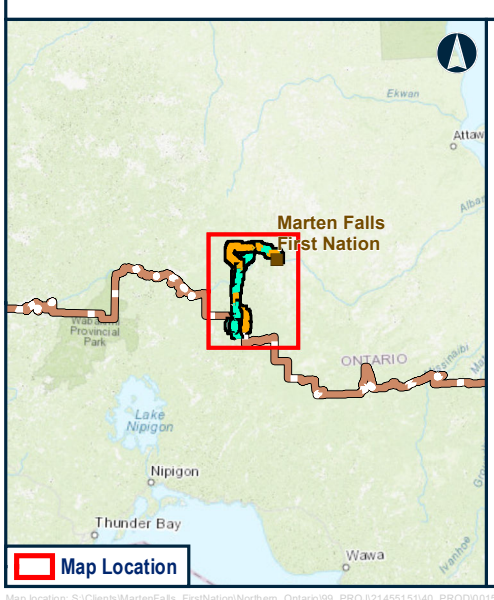
The Project consists of a new Community Access Road from Painter Lake Road located approximately 57 km north of Nakina, Ontario to the Community of Marten Falls First Nation (**Figure 1-1**). The Community Access Road will serve community access and industrial supply needs for both the community (e.g., fuel, construction supplies, water treatment supplies) and industrial proponents (e.g., mining and forestry). Therefore, to minimize infrastructure corridors in the Far North the Project will be for a multi-purpose road built to meet industrial use specifications.

In April 2018, Marten Falls First Nation signed an agreement with the Ministry of the Environment, Conservation and Parks to prepare an Environmental Assessment under the Ontario *Environmental Assessment Act* (1990), to support the development of the Community Access Road. A study under the Ontario *Environmental Assessment Act* was formally initiated by Marten Falls First Nation in March 2019 when the *Notice of Commencement for a Terms of Reference* for the Project was published.

All-season public roads that require 75 km or more of new right-of-way, as per Schedule 1 (51) of the Physical Activities Regulations under the *Impact Assessment Act*, may be subject to the Act (Government of Canada, 2019b). After considering the detailed Project Description, the Agency determined that a federal Impact Assessment is required for the Community Access Road and an Impact Statement needs to be submitted to the Agency for review and approval. The Agency prepared and released the Marten Falls Community Access Road Project: Tailored Impact Statement Guidelines in February 2020 (Impact Assessment Agency of Canada, 2020a) to outline the information and studies necessary to conduct the Impact Assessment.

The federal and provincial governments are cooperating on the assessment of the Community Access Road, in accordance with the Cooperation Plan (Impact Assessment Agency of Canada, 2020b). The Cooperation Plan allows Marten Falls First Nation to prepare one single Environmental Assessment / Impact Statement submission to satisfy both the federal and provincial processes (Government of Canada).





Legend

- ROAD
- WATERBODY
- WATERCOURSE

COMMUNITY ACCESS ROAD ALTERNATIVES CENTERLINE

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- ALTERNATIVE 4 - WESTERN OGOKI RIVER CROSSING OPTION
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- PROPOSED DEVELOPMENT AREA
- PROJECT STUDY AREA

Notes:
None

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

PROJECT LOCATION

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:450,000 * when printed 11"x17"
Rev:0	

Figure 1-1

Contains information provided by Ontario Ministry of the Environment, Conservation and Parks or by Ontario Ministry of Natural Resources and Forestry (Copyright: King's Printer of Ontario 2023), through a Sensitive Data License Agreement. This drawing has been prepared for use of AECOM client and may not be reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM express written consent. The use of Sensitive Data in this drawing does not constitute an endorsement by the Ministry for this drawing or by AECOM of the Sensitive Data.

Map location: S:\Clients\MartenFalls_FirstNation\Northern_Ontario\99_PROJ\21455151\40_PROD\0015_Aquatics_WaterCrossings\21455151-0015-RT-0001.mxd
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1.2 Report Overview

This Report includes the following:

- A summary of the Project components and activities (**Section 2, Project Description**);
- A compilation of information shared by Indigenous Peoples and other interested persons related to vegetation (**Section 3, Information Shared by Indigenous Peoples and Other Interested Persons Which Informed This Report**);
- Study methods and assessment scope (**Section 4, Study Methods and Assessment Scope**);
- A description of existing conditions for vegetation (**Section 5, Existing Conditions**);
- A summary of the selection of the Preferred Route as it relates to vegetation (**Section 6, Selection of the Preferred Route**);
- The residual effects assessment (**Section 7, Residual Effects Assessment**);
- The cumulative effects assessment (**Section 8, Cumulative Effects Assessment**);
- A summary of monitoring programs and future commitments related to vegetation (**Section 9, Monitoring Programs and Future Commitments**); and
- An overall summary and recommendations (**Section 10, Summary and Recommendations**).

As described in the *Environmental Assessment / Impact Statement Report* and in **Section 6** of this Report, the characterization of existing conditions for the Project was completed on two alternative routes (Alternative 1 and 4). The data collected through the characterization of existing conditions were used to inform the selection of the Preferred Route (**Section 6**). The residual (**Section 7**) and cumulative (**Section 8**) effects assessments were completed on the selected Preferred Route.

1.3 Qualifications of Individuals

A list of names and qualifications of the authors and technical reviewers of this Report is presented in **Table 1-1**.

Table 1-1: Qualifications of Individuals

Name	Title / Role	Years of Experience	Qualifications
Corey Burt	Terrestrial Ecologist	8	M.Sc.
Amber Sabourin	Senior Ecologist (authored Draft Report, departed WSP staff)	14	B.Sc.
Heather Drost	Senior Ecologist	23	B.Sc.
Michael Simpson	Senior Vegetation Ecologist	15	Ph.D.
Erin Greenaway	Technical Director / Project Director	26	B.Sc.

B.Sc. = Bachelor of Science; Ph.D. = Doctor of Philosophy; M.Sc. = Master of Science.

2. Project Description

2.1 Project Components

2.1.1 Community Access Road

The Project consists of an approximately 184 km all-season road within a 100 m wide right-of-way, 60 m of which will be cleared of vegetation. The Community Access Road will be approximately 11 m in width to accommodate a two-lane gravel road with culverts and two-lane bridges at water crossing locations. Traffic levels for the Project have been estimated at 700 vehicles per day for the north-south section and 100 vehicles a day for the east-west section of the Marten Falls First Nation Community Access Road. These volumes are reflective of the anticipated peak traffic in 2046.

Road embankment design mitigations are being further considered in high-suitability habitat for caribou where feasible. Operational mitigations such as lower speed limits, signage about wildlife risks, roadside vegetation management and snow berm height management will be further planned and implemented to facilitate safe wildlife crossing of the road.

The predominant building materials used to construct the Community Access Road will be blasted rockfill and composite excavation material capped with granular surface material. The majority of blasted rockfill will be obtained from rock outcrops within and / or adjacent to the right-of-way. Building materials will be primarily obtained through the pits and quarries developed specifically to support construction of the Project (**Section 2.1.3**).

Early investigations on permafrost have shown the Project is located within the isolated patches permafrost zone (Heginbottom et al., 1995), with some possible locations identified in test holes and helicopter reconnaissance by KGS Group Inc. (2019a,b). Excavation within identified permafrost areas will be avoided, whenever possible, as cutting into surface vegetation can disturb the permafrost regime resulting in thaw and unstable ground. As a precaution, the design will primarily use fill along access roads to minimize any permafrost degradation and will follow the recommendations outlined in a Permafrost Management Plan.

The proposed approach to road construction through peatlands endeavours to keep peat in place while promoting natural water flow. A permeable embankment made of quarried rock or selected granular material will be placed over the peat, supported by heavy geogrid to prevent clogging and allow settlement. To preserve peatland hydrogeology, 900-mm equalization culverts will be installed at appropriate intervals, informed by additional field programs and studies (i.e. peatlands hydrogeological monitoring, water budget study, and a field program to develop a detailed map of peat thickness), to be carried out during subsequent design phases of the Project. For further information on the proposed

construction approach, please refer to *Appendix W* under the *Final Environmental Assessment / Impact Statement Report*.

For specific details on the Preferred Route, please refer to **Section 6**.

2.1.2 Bridges and Culverts

Permanent bridges and culverts will be required for the various waterbodies to be crossed by the Community Access Road. Based on initial design and planning, the proposed waterbody crossing structure was initially determined based on bankfull width for each waterbody identified in the crossing list as follows.

- For waterbody crossings with bankfull widths less than 5 m, it was assumed that culverts would be used (requiring in-water work);
- For waterbody crossings with bankfull widths greater than 5 m and less than 30 m, it was assumed that clear span bridges would be used (no in-water work);
- For waterbody crossings greater than 30 m, it was assumed that bridges with piers and abutments would be used (requiring in-water work); and
- For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it was assumed that in-water work would be required.

The type of crossing structure for individual waterbodies may change during detailed design based on site-specific conditions.

The bridges will range in size from clear span to multi-span bridges and will accommodate two lanes of traffic with appropriate shoulder widths. The foundation supports for the bridge abutments are expected to consist of driven steel piles, drilled concrete piles or concrete spread footings. Bridges will be designed to meet the 1-in-100-year flood scenario design, fish passage requirements, and navigation requirements, as required, based on federal and provincial regulations. Where feasible, bridges will be installed above the high-water mark; however, abutments and / or reinforcement material may be installed below the high-water mark. Permanent bridges along the Community Access Road will be designed to accommodate increased flooding and rainfall under expected and anticipated climate change conditions.

For certain waterbody crossings, culverts will be constructed using either corrugated steel pipe culverts or box culverts with minimum culvert diameters of 900 mm. The culverts will either be closed or open bottom depending on fisheries sensitivities and soil conditions. The culverts will be designed to accommodate fish passage, where appropriate. Permanent culverts along the Community Access Road will be designed to withstand expected and anticipated climate change conditions, such as increased rainfall, higher temperatures, frequent freeze-thaw cycles, and heightened flooding risks.

Equalization culverts will also be installed at locations where it is determined that spring-melt or storm runoff needs to pass from one side of the Community Access Road to the other to prevent flooding and / or erosion. The purpose of equalization culverts is to maintain the existing surface water drainage patterns in the area. Culverts will be put in place as construction progresses along the Project.

Additional design measures and wildlife crossing mitigation options will be incorporated on select bridges and culverts located in high-suitability habitat for Species at Risk and road mortality vulnerable species (i.e. amphibians and reptiles). These measures will be further considered during detailed design and implemented during construction at prioritized locations to facilitate safe wildlife passage above or below the Community Access Road and reduce the risk of barriers to movement across the project area during operations.

The type of crossing structure for individual waterbodies may change during detailed design based on site-specific conditions.

2.1.3 Pits and Quarries

Pits and quarries will be developed to provide crushed rock and granular materials for the construction of the Project and temporary access roads. Most of the rock required for construction is expected to come from quarry sites adjacent to the Project. Temporary access roads will be established to connect the various Project components as required and will be limited in length to the extent feasible.

All materials will be subject to a geotechnical verification process to confirm they possess the desired physical properties for use in construction. The development and operation of all pits and quarries will be subject to the aggregate permitting process under the *Aggregate Resources Act* (Aggregate Resources of Ontario: Site Plan [2020] Standards and Technical Reports and Information [2023]). Permitted pits and quarries will follow the progressive and final rehabilitation requirements outlined in the approved site plans under the Act.

Only material that has been cleared through a geochemical verification process will be utilized for the permanent and temporary roads to avoid acid rock drainage or metal leaching. Monitoring of runoff will be conducted; further details about this specific type of monitoring will be available in the Surface Water Management Plan of which the Owner/Operator that will be responsible to follow all applicable Ontario permitting guidelines.

2.1.4 Temporary Infrastructure for Construction

The temporary infrastructure for the Project includes temporary access roads, staging areas, camps, and debris and / or timber stockpiles. Temporary access roads will be required to access the right-of-way during construction. The purpose of the temporary

access roads is to facilitate access for emergency, equipment and personnel access, and to provide access to and from pits and quarries, staging areas, camps, and debris and / or timber stockpiles. The temporary access roads will be cleared, but not grubbed, to approximately 10 m wide to accommodate equipment movement. The temporary access roads will be limited in length to the extent feasible. Temporary bridges and culverts will be required to cross the various waterbodies along the temporary access roads. Existing access roads will be used where possible; however, access is limited in the area.

Bridges and culverts will be required to cross the various waterbodies along the access roads. Based on initial design and planning, the proposed waterbody crossing structures for the *Environmental Assessment / Impact Statement Report* were initially determined based on bankfull width for each waterbody identified in the crossing list as follows:

- For waterbody crossings with bankfull widths less than 5 m, it was assumed that culverts would be used (requiring in-water work);
- For waterbody crossings with bankfull widths greater than 5 m and less than 30 m, it was assumed that clear span bridges would be used (no in-water work);
- For waterbody crossings greater than 30 m, it was assumed that bridges with piers and abutments would be used (requiring in-water work); and
- For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it was assumed that in-water work would be required.

Temporary construction camps, staging areas, and stockpile areas are anticipated to be established at various locations along the right-of-way and / or near other Project components. These components are proposed to support crews and to store equipment, vehicles, materials, and supplies.

Temporary access roads leading to temporary quarry areas will also be rehabilitated and surrendered in accordance with the *Aggregate Resources Act*. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Access roads to quarries maintained for operations will be blocked to discourage public use.

2.2 Project Activities

The Project is planned to occur in two phases: Construction, and Operations and Maintenance. The following Project activities will occur over in each phase, including:

- Construction Phase Project activities:
  - Clearing of the right-of-way for the Community Access Road and supporting access roads (e.g., remove and dispose of trees, shrubs, fallen timber, and surface litter, strip organic materials, grub);

- Blasting rock (e.g., remove rock at quarries, and as required, at specific locations in association with road and bridge construction);
- Constructing the Community Access Road (e.g., overburden excavation and removal, excavation of granular material at pits, remove unsuitable soil, place and compact rock and granular material, trim and shape the road, stockpiling of mineral soil and leaf litter [organic material], and soil handling and replacement from stockpiles at decommissioning);(e.g., remove unsuitable soil, place and compact rock and granular material, and trim and shape the road);
- Constructing bridges and installing culverts (e.g., surface water management and erosion control, dewatering of the watercourses to create ice bridges, alteration of natural drainage systems, and watercourse bank grading to improve approaches if required);
- Construction and operation of temporary infrastructure (e.g., access roads, construction camps, laydown areas and staging areas);
- Decommissioning temporary infrastructure (e.g., remove temporary culverts and bridges, remediate channels); and
- Mobilizing equipment, supplies, and personnel (e.g., haulage of materials, soil and liquid waste management, fuel storage, hazardous materials handling, sewage and effluent treatment, and water storage and effluent monitoring for temporary construction camps).

- Operations and Maintenance Phase Project activities:
  - Operating the Preferred Route.
  - Maintaining the Preferred Route, including:
    - Excavation at pits, and excavations and / or blasting at quarry sites;
    - Dewatering within pits and quarry sites;
    - Grading road surface (e.g., washout repair, correct grade);
    - Conducting erosion control (e.g., apply native seed mix);
    - Conducting dust suppression (e.g., apply environmentally friendly dust products);
    - Clearing vegetation on road shoulders (e.g., mow grass, remove brush and small trees);
    - Removing snow (e.g., plow);
    - Conducting bridge and culvert maintenance (e.g., seasonal inspections debris removal);

- Conducting ditch maintenance (e.g., maintain drainage to design standard by excavating, filling, trimming, and shaping ditches); and
- Conducting road maintenance (e.g., fix settlement, break-up of road surface, slope failures.

3. Information Shared by Indigenous Peoples and Other Interested Persons Which Informed This Report

In the course of completing the description of existing conditions and effects assessment for this Report, information provided by Indigenous Knowledge holders, Indigenous community members, regulators, and public stakeholders was used to develop the approach and assessment conducted for this study. This information and how it informed the development of this report are described in **Section 3.1**. This section does not detail all the information, comments or questions received related to the Project and is limited to the information that informed this Report. For a full description of all consultation and engagement related to the Community Access Road refer to the Record of Consultation and Engagement for the *Environmental Assessment / Impact Statement Report*. Information related to the Indigenous Knowledge Program can be found in the *Aboriginal and / or Treaty Rights and Interests Technical Support Document* (Dillon, 2026b).

3.1 Indigenous Knowledge

Indigenous Knowledge refers to Indigenous systems of knowledge as well as cultural practices related to the production of knowledge based on traditional belief systems, relationships to the environment, and community practices. It is the accumulated and living knowledge built upon the historical experiences of Indigenous Peoples living on the land and adapting to social, economic, environmental, spiritual and political change (Chiefs of Ontario, n.d.) It includes knowledge about the natural environment (e.g., locations of caribou [Oji-Cree translation, *atigwag*] seasonal use and calving areas), the relationships between environmental changes and species or ecosystems, and how potential effects on the environment can be avoided or reduced.

Indigenous land and resource use refers to specific areas and resources used for traditional purposes when Indigenous Peoples learn and practice their Indigenous Knowledge (Garvin & Northern Forestry Centre [Canada], 2001). This includes the areas and sites used for hunting, trapping, fishing, and gathering and the resources harvested, as well as cultural sites, features and practices—sometimes referred to as Traditional Land Use.

In 2019, the Marten Falls First Nation Community Access Road Project Team launched a program to collect Indigenous Knowledge. The Indigenous Knowledge Program is a critical component of the information base upon which the assessments will rely. The information generated through the Indigenous Knowledge Program has been woven with scientific approaches, and both knowledge systems will be given equal consideration in forming the

foundation for existing conditions, predicting potential Project effects, and determining appropriate mitigation and monitoring methods.

The Indigenous Knowledge Program occurs in two concurrent phases:

1. Collecting existing Indigenous Knowledge and information on Indigenous land and resource use to help inform the early stages of the assessments; and

2. Completing Project-specific Indigenous Knowledge and land and resource use studies.

The protection and confidentiality of Indigenous Knowledge and information on Indigenous land and resource use is of the utmost importance to the Project Team. To honour and respect this important information, Indigenous Knowledge Sharing Agreements were established with interested communities prior to the use of community information. The Sharing Agreement outlines how confidential and sensitive information will be woven into the Project's environmental / impact and design processes.

All Indigenous communities and groups identified by the Ministry of the Environment, Conservation and Parks and the Impact Assessment Agency of Canada through the Indigenous Engagement and Partnership Plan have had the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provides interested Indigenous communities an opportunity to: share existing Indigenous Knowledge and information on Indigenous land and resource use and cultural values that may be relevant to the Project, and / or complete Project-specific studies to collect and share Indigenous Knowledge and information on Indigenous land and resource use and cultural values. The Indigenous Knowledge Program included opportunities for Indigenous communities and groups to meet with the Proponent to discuss the program, ask questions, and share concerns and interests.

The Proponent strove to respectfully collaborate with Indigenous communities on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values were considered in reporting, and how potential impacts on Aboriginal and Treaty Rights and Interests were assessed. Measures to support this included but were not limited to:

- Engaging Indigenous communities to solicit information on Indigenous Knowledge and Indigenous land and resource use and cultural values to inform existing conditions;
- Providing Indigenous communities with draft sections of the *Environmental Assessment / Impact Statement Report*;
- Illustrating how Indigenous Knowledge and information on Indigenous land and resource use and cultural values has been integrated, and to confirm it has been presented appropriately; and

- Completing collaborative working sessions with Indigenous communities for the assessment of impacts on Aboriginal and Treaty Rights and Interests. Further information on how potential impacts on Indigenous Rights were assessed is provided in the *Aboriginal and Treaty Rights and Interests Study Plan* (Dillon, 2021).

Information provided by Indigenous Knowledge holders, recognized as such by their Indigenous community, has been obtained through literature review and shared directly by Indigenous nations in support of this Project through face-to-face meetings or receipt of Indigenous Knowledge reports. The information, some of which is confidential, that has been used to inform this reporting is described in **Table 3-1**.

Table 3-1: Indigenous Knowledge

Topic	Indigenous Community	Details	Section Reference
■ **List of traditional plants**	■ Eabametoong First Nation (Eabametoong First Nation et.al, n.d.)	■ The Eabametoong First Nation Biodiversity Atlas was used to inform the list of traditional use plants for the Project.	■ **Section 4.3.3** ■ **Section 5.7**
■ **Traditional use plant habitat suitability mapping**	■ Marten Falls First Nation (Marten Falls First Nation, n.d.a; Marten Falls First Nation, n.d.b; Marten Falls First Nation, 2017; Marten Falls First Nation, 2019; Marten Falls First Nation, 2022a; Marten Falls First Nation, 2022b)	■ Existing Anishnebek Knowledge paths and locations were considered when determining how accessible each of the mapped candidate habitat areas for traditional use plants may be. This informed the scoring of ecosites for traditional use plants habitat suitability mapping	■ **Section 4.3.3** ■ **Section 5.7**
■ **Cultural significance** ■ **Harvested species and uses**	■ Kashechewan First nation (MNP LPP, 2024a)	■ Members of Kashechewan First Nation have noted the importance of harvesting traditional use plants, including medicinal and edible plants and berries, throughout Kashechewan's traditional areas. The community has also noted that typically, harvested berries can be found along rivers or swampy areas, and the best time to gather berries is in the summer. ■ Several species of berries were identified as being harvested by Kashechewan First Nation including lowbush cranberry (Oji-Cree translation, *maashkiigominan*) (referred to as Mooseberry), blueberry (Oji-Cree translation, *miinesan / makomiinasan*), gooseberry (Oji-Cree translation, *oshabomin*), raspberry (Oji-Cree translation, *miskomaang / oshkiizhikomin-naan*) (*Rubus idaeus*), red currant berry (*Ribes rubrum*), bearberry (Oji-Cree translation, *makoominan*) (*Arctostaphylos uva-ursi*) , saskatoonberry (Oji-Cree translation, *kosihgwakaminatik*) (*Amelanchier alnifolia),* and strawberry (Oji-Cree translation, *miskomaang*) (*Fragaria* sp.). Additionally, Kashechewan First Nation	■ **Section 5.7**

Topic	Indigenous Community	Details	Section Reference
		identified Cedar, Labrador tea (Oji-Cree translation, *kakikebak*) (*Rhododendron groenlandicum* or *Ledum groenlandicum*), red willow (Oji-Cree translation, *wikobatik*) (*Alnus alnobetula ssp. crispa)*, and tamarack (Oji-Cree translation, *maaskigwatik* / *wakinagan*) (*Larix laracina*) as valued medicinal plant species that are harvested and useful for medicinal purposes (e.g., treating coughs, colds, cuts, and headaches).	
■ **Cultural significance** ■ **Harvested species and uses**	■ Fort Albany First Nation (Firelight Research Group Inc., 2024)	■ Fort Albany First Nation noted that the collection and use of plants and medicines for several purposes is a culturally important practice. One member highlighted that plants have always been used in crafting items such as snowshoes and grass hats. ■ The following vegetation / plant species are of importance to Fort Albany First Nation and that different parts of these plants and trees (e.g., fruit, sap, bark, leaves, branches) are gathered depending on their intended use: wild strawberry, wild raspberry, cranberry, red willow, labrador tea, pine, cedar, spruce, tamarack, paper birch (Oji-Cree translation, *wigwaasatik*) (*Betula papyrifera*), sage, as well as other herbs, trees, and grasses. ■ Fort Albany First Nation community members highlighted that a single plant species can have multiple traditional uses. For example, the use of cedar in both ceremonial and medicinal purposes, which highlights plants' spiritual value and role in different dimensions of culture and way of life within Fort Albany First Nation. ■ Fort Albany First Nation community members have noted that plants and medicines are harvested from different areas of their Traditional Territory including Fort Albany, coastal areas between the Albany and Moose River estuaries, and tributaries of the Albany River. One member also noted that some plant harvesting locations have been passed on across generations and has travelled to the same area to harvest sage and cranberry for 30 years. ■ Fort Albany First Nation community members have also noted a seasonality associated with plant harvesting activities. For example, one member highlighted the summer as being a time to pick sage, whereas cranberries are only harvested in September or October.	■ **Section 5.7**

Topic	Indigenous Community	Details	Section Reference
■ **Harvested species and uses** ■ **Observations related to vegetation loss**	■ Marten Falls First Nation (Dillon, 2024a; Marten Falls First Nation, 2023)	■ Comments were provided by Marten Falls first Nation noting red willow and tamarack species are used medicinally, and red willow and cedar (Oji-Cree translation, *kiishikatik*) (*Thuja occidentalis*) are observed to be lost in the south from housing developments. It was requested to avoid cutting through saskatoonberry and highbush cranberry (Oji-Cree translation, *aniibiminaatik*) (*Viburnum opulus*). ■ Marten Falls First Nation identified a number of vegetation / plant species that are / were used for a variety of purposes including for food, ceremonial, and medical purposes: ○ Tobacco, Labrador tea, sage (*Salvia sp.)*, sweetgrass, and muskrat root (sweet flag) (Oji-Cree translation, *wiikenh*) (*Acorus calamus*), which are used for ceremonial purposes. ○ Peat and moss which was often used for cleaning dishes, diapers and lining cradleboards (Oji-Cree translation, *tikinaagans*). ○ Aspen, birch, blueberry, cedar, lowbush cranberry, highbush cranberry, gooseberry, jack pine (Oji-Cree translation, *okikatik*) (*Pinus banksiana*), Labrador tea, poplar, moss, muskrat root (sweet flag), red willow, saskatoonberry, raspberry, rosehip, spruce (white and black), sweetgrass, and tamarack, wild rice (Oji-Cree translation, *manoomin*) (*Zizania palustris*), and willow (Oji-Cree translation, *wiisihkobihmagoon*).	■ **Section 4.3.3** ■ **Section 5.7**
■ **Cultural significance**	■ Aroland First Nation (Dillon, 2024b)	■ Aroland First Nation noted that the community considers wild rice (Oji-Cree translation, *manoomin*) an important staple food. ■ Aroland First Nation noted that the following vegetation species are of importance to the community: arrowhead, bear root, birch, blueberry, bulrush, cedar, cattails, cranberry, fireweed (Oji-Cree translation, *awihkabigwaan*), muskrat root (sweet flag), red willow, rock tripe lichen, sweetgrass, wild celery, wild onions, and the buds of juniper and spruce trees.	■ **Section 4.3.3** ■ **Section 5.7**
■ **Cultural Significance**	■ Nibinamik first Nation (Dillon, 2024c)	■ Nibinamik First Nation noted the importance of edible berries (e.g. Bearberry and Bunchberry), as well as Wild Rose (Oji-Cree translation, *okinii wabigwanin*; *Rosa acicularis*), acrorns, and Labrador Tea, also describing several medicinal uses for acorns, boiled bark, roots, Labrador Tea.	■ **Section 5.7**

Topic	Indigenous Community	Details	Section Reference
		■ Nibinamik First Nation also noted that community members created snowshoes, toboggans, and birch bark canoes with various plant materials. Additionally, built wigwams covered in evergreen boughs and birch bark shelters - which were made from bark cut into different sizes and held together by woven spruce roots.	
■ **Cultural Significance** ■ **Harvested species and uses**	■ Weenusk First Nation (MNP LPP, 2024b)	■ Weenusk First Nation highlighted the importance of berries to the community, noting Cloudberry (Oji-Cree translation, *machakotominun*) (*Rubus chamaemorus*), Cranberry, Blueberry as species that are found in close proximity to the community. The community also noted that other important areas for plant gathering include areas for collecting firewood, and areas around family camps that support berry growth. One community member stating the following about gathering plants: "*Just like the meat we still get medicines from the from the ground and berries*." ■ Weenusk First Nation noted that the tobacco plant may be left as an offering for harvested animals to demonstrate respect and appreciation for the land.	■ **Section 5.7**
■ **Observations related to vegetation habitat**	■ Aroland First Nation (Shared Value Solutions, 2024)	■ Aroland First Nation identified the area at Patience Lake as one utilized for gather harvested vegetation species including plants, berries, medicines, such as spruce roots (which may be utilized for fish traps and other binding uses). ■ Aroland First Nation also noted the presence of Wild Rice within the area of Ogoki Lake, Melchett Lake, Tennant Lake, Kapikotongwa Lake, Briarcliffe Lake, Nass Lake, and Durer Lake.	■ **Section 5.7** ■ **Table 5-13**
■ **Concerns Related:** ■ **Habitat availability** ■ **Herbicide use** ■ **Linear disturbances** ■ **Invasive species** ■ **Dust / Erosion** ■ **Vehicle emissions** ■ **Contamination**	■ Aroland First Nation (Dillon, 2024b; Shared Value Solutions, 2024) ■ Kashechewan First Nation (MNP LPP, 2024a) ■ Fort Albany First Nation (Firelight	■ Aroland First Nation noted interests related to the potential negative effects of spraying for highway maintenance and spraying in favour of promoting deciduous growth over coniferous growth. In particular, community members expressed concerns related to impacts on berries, one community specifically highlighting concerns relating to impacts on blueberries. ■ Aroland First Nation also noted interests related to the potential spread of invasive species. ■ Kashechewan First Nation noted that there has been an observed change to the availability of some traditionally harvested berry species	■ **Section 5.7** ■ **Section 0** ■ **Section 0** ■ **Informed Section 7.3.1.5.2** ■ **Section 0** ■ **Section 7.3.1.9.1** ■ **Section 0** ■ **Section 0**

Topic	Indigenous Community	Details	Section Reference
■ **Increased Access** ■ **Change to vegetation community composition**	Research Inc., 2024). ■ Weenusk First Nation (MNP LPP, 2024b)	over time, believed to have been attributed to the placement of hydro lines in their traditional territory associated with the Victor Diamond Mine. ■ One community member from Aroland First Nation specifically noted concerns that dust, sand, and debris would impact plants along the road, or make its way into the river system at watercourse crossings, noting *"And all that dust that, especially the summertime with all that dust that's flying around, it's going to have an impact on those plants along the road. And that's where the, they'll probably slowly die out because there's so much sand on them […] plus the water system, the bridges, on the bridges there, they'll be sand come, going into the river system, same thing. It's going to have an effect on the wildlife, and the plants even, the plants. Even the, I think it would really have an impact on insects too….and that's another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way."* ■ Fort Albany First Nation also noted similar concerns in relation to how the Project may result in pollution effects (e.g., vehicle emissions, dust) on plants and plant habitat. One community member shared past observations relating to road pollution effects associated with the Victor Diamond Mine, noting browning of roadside adjacent vegetation. "*There's a winter road that goes right through my territory, and it's been 10 years maybe it's been used. Like they had those — first they start car-vehicles, nothing heavy. ... So, maybe about since the [Victor Diamond] mine started, and when they were hauling those heavy equipment and big, big materials, like those big trucks, mining trucks, those dump trucks, those big tractors. Those trucks are hauling the semis. They're going back and forth. I noticed that fumes were killing the plants, eh. ... You know, those plants were turning brown along the road, the side of the road. Maybe about 50 feet off, you'll see the plants go brown ... I noticed that fumes [from the vehicles] were killing the plants, eh*.". ■ Weenusk First Nation noted concerns related to contamination of medicinal plants. In particular, the importance of these resources remaining uncontaminated as the community also relies on access to harvested medicines for treatments since the cost of travel south outside of Peawanuck is expensive. One community member noting,	■ **Section 0**

Topic	Indigenous Community	Details	Section Reference
		"*My father used to gather some medicine when my mother would cough or get the flu (…) they used to boil (…) pinecones. My mother used to drink that. Tastes awful but it works*."; and another community member referencing the use of Labrador Tea to combat aching bones and colds. The community also highlighted the importance of transmitting knowledge about medicines to the younger generation so that it is not lost. ■ Weenusk First Nation also noted concerns specific about: ○ The potential for impacts related to air quality as a result of fugitive dust from movement and operations of construction equipment and vehicles. ○ Impacts to harvestable species within the community's traditional territory as a result of increased access. ○ Potential impacts related to the use of herbicides. ○ Changes in the composition of vegetation communities.	

3.2 Indigenous Engagement

The content presented in **Section 3.2** reflects information that was available at the time the *Draft Environmental Assessment / Impact Statement Report* was prepared. No updates have been made to this section for the *Final Environmental Assessment / Impact Statement Report*. For the most up-to-date and comprehensive documentation of engagement, please refer to *Appendix X - Record of Consultation and Engagement* under the *Final Environmental Assessment / Impact Statement Report*, which serves as the source for all community-specific engagement input received during later phases of the Project.

In addition to the Indigenous Knowledge provided by Indigenous Knowledge holders, information was collected from all Indigenous community members with interests in this Project. The information that has been used to inform this report is described in **Table 3-2**.

Table 3-2: Indigenous Engagement

Topic	Indigenous Community	Details	Section Reference
■ **Feedback on field programs**	■ Marten Falls First Nation (Marten Falls First Nation, n.d.a; Marten Falls First Nation, n.d.b)	■ In the course of fieldwork, one of the Indigenous Field Assistants (a Marten Falls First Nation community member) provided feedback related to the vegetation, physiography, and peatlands field program(s). The field monitor noted the importance of several vegetation species including saskatoonberry, highbush cranberry, cedar, red willow, tamarack, and sphagnum moss (Oji-Cree translation, *maashkigwakamik*). The field monitor noted that these species are used for a variety of things including food / medicines.	■ **Section 4.3.3** ■ **Section 5.7**
■ **Concerns related to:** ■ **Traffic** ■ **Invasive species** ■ **Dust**	■ Métis Nation of Ontario (Métis Nation of Ontario, 2023)	■ Métis Nation of Ontario provided feedback on the Project including concerns about potential impacts on vegetation related to increased traffic, invasive species, and dust.	■ **Section 0** ■ **Section 0** ■ **Section 0**
■ **Cultural significance** ■ **Traditional Plant Names, Observations and Uses**	■ Fort Albany First Nation (Fort Albany First Nation, 2020)	■ Information contained within the letter highlights plants of importance including balsam poplar (Oji-Cree translation, *maan azaadii*) (*Populus balsamifera*), black crowberry (*Empetrum nigrum*), caribou lichen (Oji-Cree translation, *Wabakamik*) (*Cladonia rangiferina*), cedar, cottongrass, cranberry, dogwood, dwarf birch (*Betula nana*), ericaceous shrubs, northern Labrador tea, red willow, sage, sphagnum moss, sweetgrass, tamarack, and white spruce (Oji-Cree translation, *mihnaihk*).	■ **Section 4.3.3** ■ **Section 5.7**
■ **Cultural significance** ■ **Traditional Plant Names, Observations and Uses**	■ Red Sky Métis Independent Nation (Red Sky Métis Independent Nation, 2023)	■ At the room for cultural heritage at the Aboriginal and / or Treaty Rights and Interests Forum in Thunder Bay on February 7 to 8, 2023, Red Sky Métis Independent Nation representatives discussed medicinal plants, their uses and the Marten Falls First Nation Community Access Road Cultural Heritage Report approach to effective data collection.	■ **Section 4.3.3** ■ **Section 5.7**

3.3 Regulator and Public Stakeholder Input

In March 2025, the *Draft Environmental Assessment / Impact Statement Report* was submitted to Regulators, government experts and Indigenous communities for review as part of the Environmental Assessment / Impact Assessment process. Comments received on this Report during the review period have been reviewed and considered by the Marten Falls First Nation Community Access Road Project Team and this Report was updated, where warranted.

The content presented in **Section 3.3** reflects information that was available at the time the *Draft Environmental Assessment / Impact Statement Report* was prepared. No updates have been made to this section for the *Final Environmental Assessment / Impact Statement Report*. For the most up-to-date and comprehensive documentation of regulator and public stakeholder input, please refer to *Appendix X - Record of Consultation and Engagement* under the *Final Environmental Assessment / Impact Statement Report*, which serves as the source for all comments received during later phases of the Project.

The Proponent engaged with Regulators and Public Stakeholders with technical knowledge related to the Valued Components to inform aspects of this report. The information and how it informed the development of this report are described in **Table 3-3.**

Table 3-3: Public, Agency and Other Input

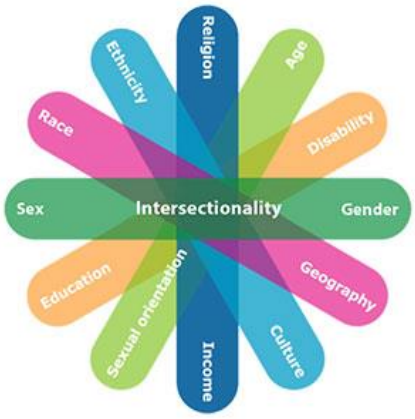
Topic	Provided By	Details	Section Reference
Study Plans	■ Impact Assessment Agency of Canada (2022) ■ Ministry of the Environment, Conservation and Parks (2022)	■ The Impact Assessment Agency of Canada noted that any edits to the Physiography, Terrain and Soils and Vegetation and Peatlands Work Plan methodology as a result of agency comments should be reflected in the Environmental Assessment. ■ Deviations were anticipated to be required as the Project evolved due to challenges encountered in the field, alternative methodologies being developed, comments from regulators, and as updated guidance became available. These deviations are captured within the study methods and assessment scope.	■ **Section 4.1** ■ **Table 4-1**

3.4 Gender-Based Analysis Plus

The *Impact Assessment Act* (Government of Canada, 2019) requires Gender-Based Analysis Plus to be applied to Impact Assessments in Canada. Gender-Based Analysis Plus is not a specific set of methods for Impact Assessments, but rather an approach that is adapted to the Project and the communities potentially affected and / or being engaged.

Gender-Based Analysis Plus is an approach to assess the inequalities and effect of policies, programs and projects on diverse groups and identities. These identities could include (but are not limited to): gender, sexual orientation, age, race, ethnicity, class, religion, and mental or physical disability (Women and Gender Equality Canada, 2022). These identities can also intersect or overlap; for example, where an individual identifies as being both Indigenous and an Elder or youth.

Figure 3-1: Gender-Based Analysis Plus Intersecting Identity Factors



Source: Canadian Institutes of Health Research (2022)

The Gender-Based Analysis Plus approach involves understanding how certain vulnerable groups such as Indigenous Peoples, women, Elders, youth, Two-Spirit, Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Intersex, and Asexual persons experience, and could be disproportionately affected by a project. Understanding how these groups could be affected by projects allow for more targeted, sensitive, and appropriate enhancement measures, mitigations, monitoring, and follow-up (Impact Assessment Agency of Canada, 2021b).

It is important to understand that vulnerability in Impact Assessment is understood primarily, but not solely, as a structural vulnerability. This means that in many cases it is the systems and power structures that make certain groups more vulnerable (Impact Assessment Agency of Canada, 2021b). For Indigenous Peoples this includes historical and ongoing colonialism, loss of lands and culture, intergenerational trauma, and the residential school system that have resulted in significant social, economic, health and

well-being disparities relative to the non-Indigenous Canadian population (Kim, 2019). Exceptions to this are where vulnerability may be associated with biological sex, pregnancy, or age in relation to environmental determinants of health and exposure to contaminants, for example.

For each discipline of the Impact Assessment, a Gender-Based Analysis Plus approach was employed. This approach and extent of its application also varied, however, depending on the type of study, and the relevance of Gender-Based Analysis Plus to that study. The details of the approach for the discipline are outlined below.

3.4.1 Vegetation Gender-Based Analysis Plus Approach

The Gender-Based Analysis Plus approach for the vegetation study involved a more limited, but still important application of Gender-Based Analysis Plus. This approach varied from the Gender-Based Analysis Plus approach in other disciplines, for example, compared to socio-economic disciplines, it primarily involved identifying how vulnerable groups that could be disproportionately affected by the Project informed the study. It included:

- Weaving Project specific Indigenous Knowledge from Indigenous Elders that has been provided, verified, and made available through the Indigenous Knowledge program into the Vegetation study (see **Section 3.1**); and
- Identifying and including interests and concerns specific to this study through the Consultation and Engagement program from groups who could be more vulnerable to, and disproportionately affected by, the Project, which include Indigenous communities (**Section 3.3** and **3.4**).

4. Study Methods and Assessment Scope

This section contains excerpts from the *Draft All Season Community Access Road: Vegetation Study Plan* (AECOM, 2021) and *All Season Community Access Road: Vegetation Field Logistics Workplan* (Golder, 2021) prepared for the Impact Assessment Agency of Canada at the outset of this Project. The original Draft Study Plan and Workplan, including comments from regulators, can be found in **Attachment A – Draft Study Plan, Workplan and Regulator Comments**.

4.1 Study and Work Plan Purpose, Objectives and Deviations

As required by the *Impact Assessment Act* (Government of Canada, 2019) and referenced in the *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020), Study Plans and Work Plans were developed for disciplines as required. The purpose of the Study Plan is to explain:

- The existing conditions study methodology that will result in a comprehensive description of the existing environment potentially affected by the Project;
- How the process for ensuring efficient and transparent data management and analysis was completed; and
- Development of the discipline specific effects assessment methodology.

Work Plans contain details on how to action the Study Plans and include information such as the location of sampling sites, scheduling, and sequencing.

As noted above, the *Draft All Season Community Access Road: Vegetation Study Plan* (AECOM, 2021) and *All Season Community Access Road: Vegetation Field Logistics Workplan* (Golder Associates Ltd., 2021) can be found in **Attachment A**.

Deviations from the *Draft All Season Community Access Road: Vegetation Study Plan* (AECOM, 2021) in **Attachment A** were anticipated to be required as the Project evolved due to challenges encountered in the field, alternative methodologies being developed, comments from regulators, and as updated guidance became available. **Table 4-1** outlines these deviations. General changes, such as changes to section headings, organization of sections and subsections, and changes to phrasing and tense have been made throughout. These administrative changes have not been documented in **Table 4-1.**

Table 4-1: Deviations from Draft Study Plan

Section Reference	Description of Change	Rationale
4.2.2 Valued Components and Indicators	The Draft Study Plan previously did not include a "Measure of Change" column in the Valued Components and Indicators Table (now **Table 4-2**).	The measure of change column provides a more detailed expression of the indicator.
4.2.2 Valued Components and Indicators	The indicators listed in the Study Plan for Traditional Use Plants and Species at Risk Plant Populations have been revised.	Indicators were revised to be measurable and more consistent with the indicators used for the other vegetation Valued Components (i.e., Diversity, Availability and Distribution).
4.2.3 Spatial Boundaries	The Draft Study Plan previously used the term "Local Study Area" to define the 5 km corridor which is being studied in the Existing Conditions section, and within which the footprint of the Project will be further refined. This area has been retitled as the "Project Study Area."	This change eliminates confusion between the Project Study Area and the Discipline Specific Local Study Area. The term "Local Study Area" in this report refers to the vegetation Local Study Area which is a 6 km corridor (i.e., 3 km either side of the centreline of the route alternatives). It also includes a 500 m buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan.
4.3.2 Field Investigations	The proportion of ground inspections (21%) to visual checks (79%) changed by 4% from proportions proposed in the Study Plan (i.e., 25% ground inspections and 75% visual checks).	Due to access constraints (i.e., no landing spots, high water levels) and fuel constraints.
4.3.2 Field Investigations	The Vegetation Study Plan includes a broad list of data to collect at ground inspection sites. Most of the data were collected as planned, with the exception of the following: Basal Area Assessment – not completed.	Basal area would add limited value to the Project relative to the time required to complete this assessment.
4.3.2 Field Investigations	The Vegetation Study Plan incorrectly referenced *Riparian Assessment and Prescription Procedures* as an Ontario Ministry document. The correct reference is (British Columbia Ministry of Environment, Lands and Parks, 1999). This revision has been made within this report.	Correcting an error from the Study Plan.

Section Reference	Description of Change	Rationale
4.3.5 Data Management	In **Section 8.1**, the Study Plan previously identified that data would be backed up on a "daily basis". This wording has been revised to state that data would be backed up "regularly".	This change provides alignment with the Proponent's various data backup policies.
4.3.5 Data Management	In **Section 8.2**of the Study Plan wording was updated to note that datasets from all survey sites will be provided upon report finalization. No timeline had been previously identified.	The revision provides added clarity around when the data would be provided.
4.3.6.1 Disturbance Analysis	An analysis of fragmentation via an "effective mesh size analysis," was not completed.	While habitat fragmentation does affect vegetation communities by introducing edge effects, effective mesh size is essentially a measure of how difficult it is for two animals / individuals to find each other in a fragmented landscape. This is a good measure for some wildlife species (e.g., large mammals) but not as important for vegetation communities. Fragmentation is discussed qualitatively and spatially in **Section 5.10**.
4.3.6.2 Wetland and Riparian Functional Assessments	The methods for undertaking the wetland and riparian functional assessments are not defined in the Vegetation Study Plan. However, data to be collected at ground inspection sites are specified and a scoring system is recommended (i.e., "*each wetland visited during Ground Inspections will be assigned a function ranking / score [i.e., high, moderate, low] based on its relative contribution to various wetland functions [i.e., habitat hydrology, biogeochemical] to the surrounding ecological systems*"). While the site-specific data specified in the Study Plan was collected during ground inspections, it was not used for the functional assessments but will remain on file. Likewise, a score for each wetland visited during ground inspections was not determined.	The data specified for collection at ground inspection sites is very site-specific and not all data were appropriate for the Project context (i.e., could not be extrapolated appropriately across the study areas). For example, determining the "width of riparian habitat" or "stream shading", while informative in a disturbed landscape, is not informative in a largely intact landscape such as the area around the Project. Similarly, documenting "vegetation density and open water components", or "disturbance indicators" while informative for a site-specific functional assessment, is not informative when the ground inspection occurs at a single point in a much larger polygon and when the number of polygons of each ecosite or community type visited is a small fraction of the entire area around the Project. Using the site-specific data collected to inform a "score" for a polygon and then extrapolating that score to all ecosites or vegetation groupings of that type was determined to be of limited value for the Project. An alternate approach to inform the wetland and riparian functional assessments was developed. See below.

Section Reference	Description of Change	Rationale
4.3.6.2 Wetland and Riparian Functional Assessments	An alternate approach for the wetland and riparian functional assessments was developed using a conservative, landscape-level framework.	A functional assessment approach that provides a meaningful and Project-specific analysis is more appropriate than following a Study Plan that was developed early in the Project. Functional assessments are most useful in disturbed landscapes where there are external pressures that act to impair functions, or where wetlands are rare on the landscape. Within the Regional Study Area, wetland and riparian ecosystems are characterized by large and highly interconnected complexes in an undisturbed landscape. A landscape-level approach recognizes the connectivity of wetland and riparian ecosystems in the Regional Study Area, as well as the cultural importance of these features.
4.4.2 Assessing Residual Effects	The Draft Study Plan noted that residual effects would be described in terms of the direction, magnitude, geographic extent, duration, frequency, likelihood, and whether effects are reversible or irreversible. In addition, the Study Plan acknowledged that Section 13.1 of the *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020) identifies additional effects characteristics for certain disciplines (e.g., wetlands, birds, terrestrial wildlife, species at risk) and that these additional effects characteristics will be described.	Project effects for vegetation were not classified using all criteria described in the *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020). Most of the criteria outlined in the *Tailored Impact Statement Guidelines* are taken from *NatureServe Conservation Status Assessment: Factors for Evaluating Species and Ecosystem Risk* (Master et al., 2012) and are useful for assessing and assigning the conservation status of species at risk from different threats. However, these criteria are less appropriate for characterizing residual effects in an Environmental Assessment. Although the criteria and method of combining criteria (i.e., matrices) outlined in *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020) were not explicitly applied in this report, the criteria are captured in the residual effects characterization for vegetation Valued Components. Magnitude is discussed in in a reasoned narrative with other categorical criteria, such as geographic extent, duration, reversibility and probability of occurrence, that are used to characterize residual effects and determine significance. Effects on wetland and riparian functions are difficult to quantify based on the data collected and therefore a reasoned

Section Reference	Description of Change	Rationale
		narrative was used to discuss the relative impacts on function based on the assessments of other disciplines. Additional details are described in **Section 0**
5.4 Wetland Ecosystems and Attachment B – Vegetation Technical Support Document	Wetland ecosites were not classified according to the *Canadian Wetland Classification System* (National Wetland Working Group, 1997). Rather *Ecosites of Ontario* (Banton et al., 2009) was used for all wetland and upland ecosystems.	There is not a 1:1 relationship between wetland ecosites described in *Ecosites of Ontario* (Banton et al., 2009) and wetlands as described in the *Canadian Wetlands Classification System* (National Wetland Working Group, 1997). Given that the desktop ecosite classification had limitations for accurate desktop delineation of ecosites (e.g., low-resolution aerial imagery), using the desktop wetland ecosite dataset to create a crosswalk to the *Canadian Wetlands Classification System* would have introduced another layer of uncertainty to the mapping. Rather, effort was put towards improving the wetland ecosite classification by overlaying the organic soils dataset and making manual ecosite corrections where appropriate.

km = kilometre; m = metre; % = percent.

4.2 Study Scoping

4.2.1 Temporal Boundaries

Project phases, which are temporal boundaries, are developed to establish the timeframes within which potential effects of the Project will be considered. As indicated in **Section 2.28** the Project is planned to occur in two phases:

- **Construction Phase–**The time from start of construction, including site preparation activities, to the start of operations and maintenance of the Community Access Road. Decommissioning of construction works is included in the Construction Phase. The Construction Phase is anticipated to take approximately three to ten years to complete; and
- **Operations and Maintenance Phase–**The Operations and Maintenance Phase starts once construction activities are complete and lasts for the life of the Project. The Operations and Maintenance Phase of the Project is considered to be permanent based on the expected timeline for when major refurbishment of road components (e.g., bridges), is anticipated.

There are currently no plans to decommission the Community Access Road as there is no expected / known end date for its need. Future suspension, decommissioning, and eventual abandonment was not considered in this report. It will be considered if and when a decommissioning or abandonment application is made for the Community Access Road.

In determining the temporal boundaries, in particular the long duration of Operations and Maintenance Phase, consideration was given to the long-term effects on the well-being of present and future generations.

4.2.2 Valued Components and Indicators

The Impact Assessment Agency of Canada describes **Valued Components** as the environmental, health, social, economic, or additional elements or conditions of the natural and human environment that may be affected by a proposed project and are of concern or value to the public, Indigenous Peoples, federal authorities and interested parties (Impact Assessment Agency of Canada, 2021a).

Indicators represent the resource, feature, or issue related to the Valued Component that, if changed, may demonstrate an effect on the environment. Indicators may be characterized quantitatively or qualitatively. For example, effects from changes to the availability and distribution of Valued Components are often expressed through quantitative assessment of direct vegetation removals as well as predicted indirect effects on retained vegetation.

For the upland ecosystems, wetland ecosystems, riparian ecosystems, and designated areas Valued Components, the following indicators are used:

- **Availability**: Availability refers to the spatial representation (amount) of the Valued Component. Ecosystem availability is primarily affected by physical changes (e.g., vegetation clearing) and is represented as the area in hectares of each ecosystem type;
- **Distribution**: Distribution refers to the way each associated Valued Component is distributed on the landscape. Distribution focuses on the spatial configuration (or arrangement) and connectivity of ecosystems rather than the amount; and
- **Composition and Function:** Ecosystem composition refers to species richness (or diversity) and abundance. Ecosystem function incorporates a variety of criteria, including wildlife habitat, hydrological functions, and biodiversity.

For Traditional Use Plants and Species at Risk or Species of Conservation Concern Plant Populations, the following indicators are used:

- **Diversity**: Refers to a measure of species richness (the number of species present) and species evenness (the abundance of each species);
- **Availability**: Refers to the availability of ecosites that support or have the potential to support Traditional Use Plants and ecosites that support or have the potential to support plant Species at Risk or Species of Conservation Concern;
- **Distribution**: Refers to the spatial distribution of ecosites that support or have the potential to support Traditional Use Plants and the spatial distribution of ecosites that support or have the potential to support plant Species at Risk or Species of Conservation Concern; and
- **Accessibility**: Refers to the spatial accessibility of ecosites that support or have the potential to support Traditional Use Plants based on proximity to existing Indigenous Knowledge paths and locations.

The Draft Study Plan presented indicators and rationale for selection known to the Proponent at the time of drafting. The draft table and the factors that influenced it can be found in *Section 9.2* of the *Draft All Season Community Access Road: Vegetation Study Plan* (AECOM, 2021) in **Attachment A**.

An updated list of Vegetation Indicators can be found in **Table 4-2**.

Table 4-2: Vegetation Indicators

Valued Component	Indicators	Rationale for Selection	Measures of Change
Wetland and Riparian Ecosystems	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and / or social implications associated with this Valued Component, where applicable. ■ Provides ecosystems support (habitat for flora, fauna, hydrological functions, air and water purification, carbon, and nitrogen storage). ■ Habitat for Traditional Use and Species at Risk plants. ■ Indicator of wetland health.	Changes in availability (area in ha) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition.
Upland Ecosystems	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and / or social implications associated with this Valued Component, where applicable. ■ Provides ecosystems support (habitat for flora, fauna, hydrological functions, air and water purification, carbon, and nitrogen storage). ■ Habitat for Traditional Use and Species at Risk Plants.	Changes in availability (area in ha) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition.
Designated Areas (Area of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations)	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and / or social implications associated with this Valued Component, where applicable. ■ Indicator of ecosystem health.	Changes in availability (area in ha) and distribution within the Local Study Area as well as qualitative assessment of changes to function and composition.
Traditional Use Plants and Species at Risk Plant Populations (including species with special conservation status or rarity in the province)	■ Availability ■ Distribution ■ Accessibility ■	■ Species at Risk (federal or provincial). ■ Cultural, economic, and / or social implications associated with this Valued Component, where applicable. ■ Measure of ecosystem health.	Changes in availability (area in ha) and distribution within the Local Study Area as well as an assessment of changes to the accessibility of traditional use species.

ha = hectare.

4.2.3 Spatial Boundaries

4.2.3.1 Project Study Areas

Study areas identify the geographic extents within which potential effects of the Project are likely to occur and will be considered in the *Environmental Assessment / Impact Statement Report*. General Project boundaries were established for scoping field programs and delineating study areas for discipline specific surveys. These general Project boundaries are described in **Table 4-3**:

Table 4-3 : Project Study Areas Definition and Description

Study Area	Definition	Description
Construction Disturbance Area	Area of expected direct disturbance	100 m wide Community Access Road right-of-way, temporary construction access roads, work areas, worker camps, and pits, quarries and permanent access roads
Project Study Area	Area where most of the direct effects of the Project are likely to occur	Area within 2.5 km (total of 5 km) of the centreline of the route alternatives

m = metre; km = kilometre.

4.2.3.2 Vegetation Study Areas

Discipline-specific Local Study Areas and Regional Study Areas have been defined for the Project. In defining these areas, the following were considered:

- Location and other characteristics of the discipline relative to the Project;
- The anticipated extent of the potential Project effects;
- Federal, provincial, regional, and local government administrative boundaries;
- Input from Indigenous Groups;
- Community knowledge and Indigenous Knowledge;
- Current or traditional land and resource use by Indigenous communities;
- Exercise of Aboriginal and Treaty Rights of Indigenous Peoples, including cultural and spiritual practices; and
- Physical, ecological, technical, social, health, economic, and cultural considerations.

As described in the *Environmental Assessment / Impact Statement Report* and in **Section 6** of this Report, the characterization of existing conditions for the Project was completed on two alternative routes (Alternative 1 and 4). The data collected through the characterization of existing conditions were used to inform the selection of the Preferred Route. The existing conditions Local and Regional Study Areas considered the two

alternative routes (Alternative 1 and 4). As the residual and cumulative effects assessment was completed on just the selected Preferred Route, the Local and Regional Study areas for the effects assessment only considered one route.

4.2.3.2.1 Existing Conditions Study Areas

The existing conditions spatial boundaries for vegetation are defined by a Local Study Area and Regional Study Area. These spatial boundaries were applied to each alternative, considering the Project components within the Construction Disturbance Area. The existing conditions study areas cover the extent to which readily available information suggests the Project may have noticeable effects on the environment. The size, nature, and location of past, present and reasonably foreseeable projects will be taken into consideration in the development of the cumulative effects assessment study area(s) and are further discussed in **Section 8**.

The **Construction Disturbance Area** includes the Project footprint, which encompasses a 100 m wide right-of-way for each Route Alternative (i.e., Alternative 1 and Alternative 4). The right-of-way is only expected to be cleared to a width of 60 m for permanent use with the remaining 40 m to be temporarily cleared to accommodate activities such as the excavation of pits and quarries, construction of temporary laydown areas, and the implementation of debris and / or timber stockpiles. Alternative 1 includes approximately 226 km of new all-weather road, while Alternative 4 comprises approximately 194 km in length of new all-weather road. The Construction Disturbance Area was designed to capture the potential direct effects of the Project at the immediate local scale.

The **Local Study Area** for the vegetation assessment consists of the area within 3 km on either side of the centreline of the Community Access Road route alternatives. It also includes a 500 m buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan. The total area of the Local Study Area for the vegetation assessment is 197,960 ha.

The extent of the Local Study Area is designed to allow for the documentation of existing conditions and to address the areas where direct and indirect effects of the Project are likely to occur beyond the Construction Disturbance Area. A 6 km wide study area also allows for route refinement during the development of Project design (e.g., adjustment of the alignment to avoid sensitive features).

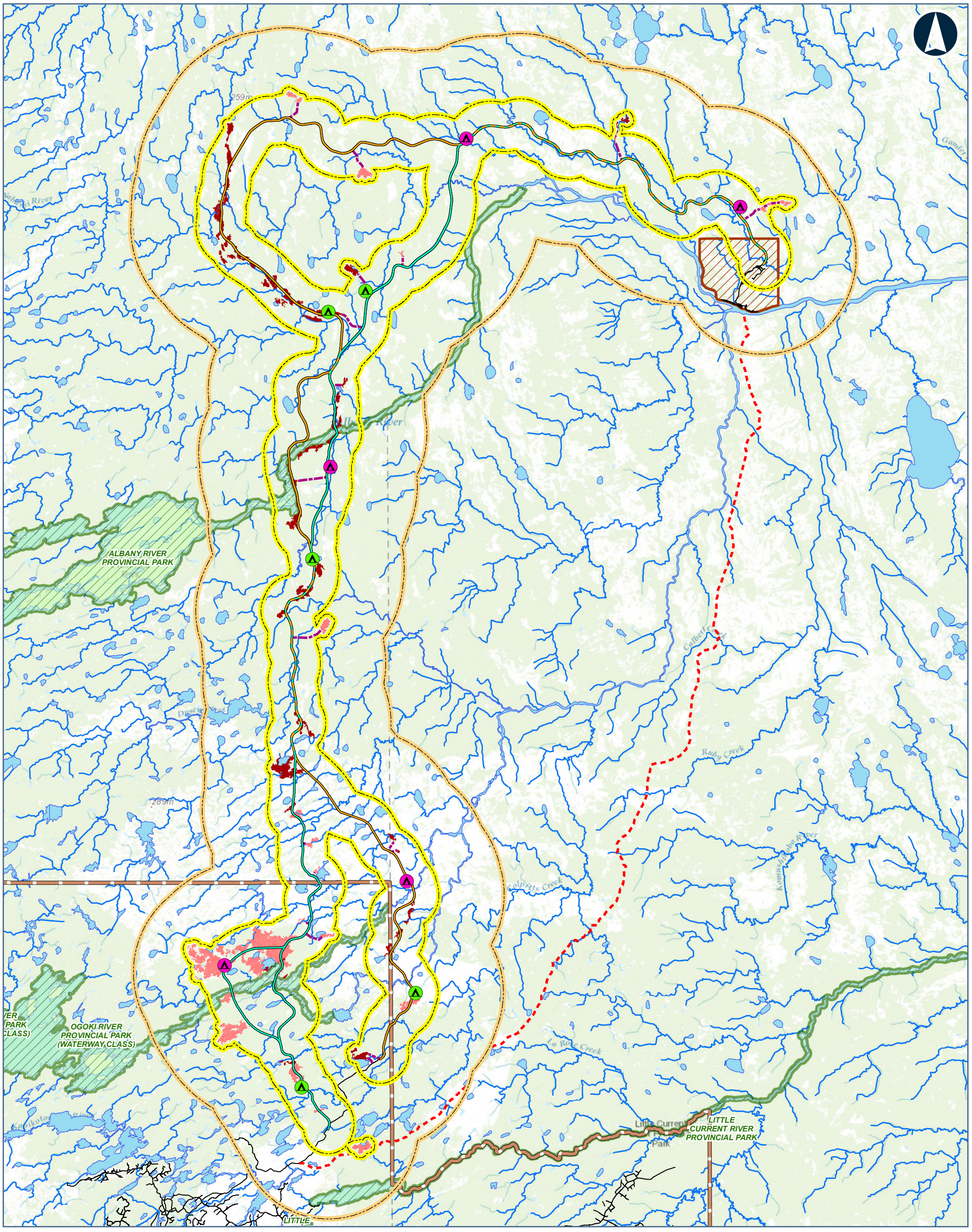
The **Regional Study Area** for vegetation encompasses 11 km on either side of the centreline of the Community Access Road route alternatives. The Regional Study Area represents the area where incremental and cumulative effects of the Project and other developments are likely to occur on vegetation Valued Components. The Regional Study Area is 587,762 ha.

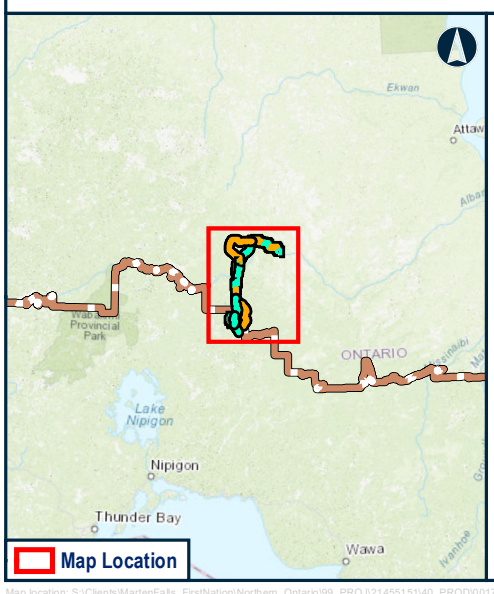
The existing conditions spatial boundaries of the vegetation Local Study Area and Regional Study Area are summarized in **Table 4-4** and illustrated in **Figure 4-1**.

Table 4-4: Vegetation Existing Conditions Study Areas Description and Rationale

Study Area	Geographic Extent	Rationale	Area (ha)
Construction Disturbance Area	■ 100 m wide Community Access Road right-of-way and associated infrastructure (i.e., temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads)	■ Area of direct disturbance	12,665
Local Study Area	■ 3 km buffer on either side of the centreline of the Community Access Road route alternatives ■ 500 m buffer around areas of the associated infrastructure falling outside of the original Local Study Area defined in the Study Plan	■ Designed to address the area where direct effects of the Project are likely to occur beyond the Project footprint ■ Allows for route refinement during the Project design (e.g., adjustment of the alignment to avoid sensitive features)	197,960
Regional Study Area	■ 11 km buffer on either side of the centreline of the Community Access Road route alternatives	■ Will allow for assessment of cumulative and indirect effects of the Project on the broader landscape, while remaining representative of the types of habitats found within the Project Study Area	587,762

m = metre; ha = hectare; km = kilometre.





Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Vegetation Existing Conditions Local and Regional Study Area

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:450,000 * when printed 11"x17"
Rev:0	

Figure 4-1

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Date Saved: 10/11/2024 3:13:23 PM User Name: INGU06951

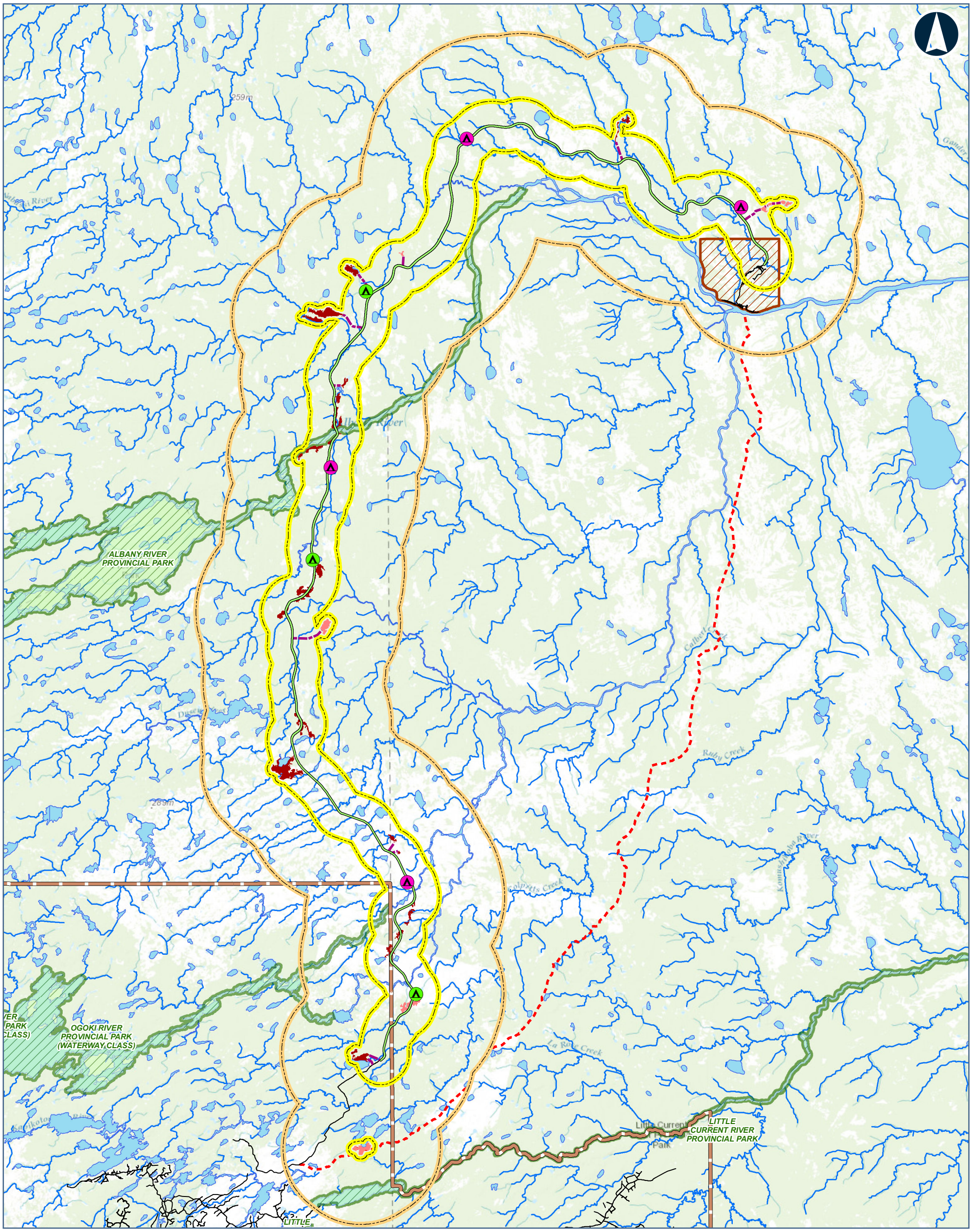
4.2.3.2.2 Effects Assessment Study Areas

The selection of a Preferred Route resulted in refined study areas that represent the same geographic extents of the existing conditions study areas; however, they are only applied to one route corridor instead of two. The revised study areas that will be used for the effects assessment are described in **Table 4-5**. These areas include temporary features such as pits and quarries, temporary access roads and worker camps.

Table 4-5: Vegetation Effects Assessment Study Areas Description and Rationale

Study Area	Geographic Extent	Rationale	Area (ha)
Construction Disturbance Area	■ 100 m wide Community Access Road right-of-way and associated infrastructure (i.e., temporary construction access roads, work areas, worker camps, and pits, quarries, and temporary access roads) of the Preferred Route	■ Area of direct disturbance	4,700
Local Study Area	■ 3 km buffer on either side of the centreline of the Community Access Road Preferred Route ■ 500 m buffer around areas of the Preferred Route associated infrastructure falling outside of the original Local Study Area defined in the Study Plan	■ Designed to address the area where direct effects of the Project are likely to occur beyond the Project footprint ■ Allows for route refinement during the Project design (e.g., adjustment of the alignment to avoid sensitive features)	115,961
Regional Study Area	■ 11 km buffer on either side of the centreline of the Community Access Road Preferred Route	■ Will allow for assessment of cumulative and indirect effects of the Project on the broader landscape, while remaining representative of the types of habitats found within the Project Study Area	453,875

m = metre; ha = hectare; km = kilometre.



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- PREFERRED ROUTE
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Vegetation Effects Assessment Local and Regional Study Area

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:450,000 * when printed 11"x17"
Rev:0	

Figure 4-2

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Date Saved: 10/11/2024 3:15:16 PM User Name: INGU06951

4.3 Existing Conditions Study Design and Methods

Characterization of the existing vegetation conditions was completed by undertaking a desktop background information review and desktop mapping exercise for the Project, supplemented by a multi-year field program to assess a subset of the ecosites and to collect soil and botanical data to characterize plant community composition in a subset of each ecosite type.

4.3.1 Desktop Assessment

A desktop review of existing information sources was completed to identify information gaps that needed to be addressed through further study. A preliminary list of applicable information sources including federal and provincial guidance was reviewed in development of this approach.

Existing data were used to support the characterization of existing conditions in the Regional Study Area, Local Study Area, and Construction Disturbance Area. The data were gathered from provincial databases, provincial mapping resources, provincial guidance documents, published maps and reports, previous investigations, and publicly available literature. Key resources are outlined below. A full list of references is provided in **Section 11**.

4.3.1.1 Information Sources

For the purpose of characterizing the existing vegetation conditions within the Regional Study Area, Local Study Area, and Construction Disturbance Area, the following mapping sources were reviewed:

- Land Information Ontario base mapping data including the following datasets;
  - Provincial Parks (Government of Ontario, 2013a);
  - Waterbodies and Watercourses (Government of Ontario, 2013b);
  - Areas of Natural and Scientific Interest (Government of Ontario, 2015a);
  - Ecodistricts, Ecoregions, and Ecozones (Government of Ontario, 2015b);
  - Ontario Land Cover Compilation version 2.0 (Government of Ontario, 2020a), which is a compilation of Far North Land Cover v 1.4 and Provincial Land Cover 2000 Edition;
  - Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario, 2020b); and
  - Digital terrain and soils mapping prepared for the current Project by WSP Canada Inc. terrain and soils scientists. Refer to the *Physiography, Terrain and Soils Technical Support Document* (WSP, 2024d) for detailed methodology and data sources that were used to develop this mapping.

- For the purposes of determining the potential presence of Species at Risk flora and rare flora species, the following data sources were reviewed:
  - Natural Heritage Information Centre Make-a-Map: Natural Heritage Areas and Rare Species Records (Ministry of Natural Resources and Forestry, 2023);
  - Species Recovery and Restoration Plans (specifically for Black Ash [(Oji-Cree translation, *agimagwatik)* (*Fraxinus nigra*) (Catling et al., 2022)] and Pitcher's Thistle [(Oji-Cree translation, *gaachiichiyaag waabigwanii)* (*Cirsium pitcher*) (Parks Canada Agency, 2011)]);
  - Committee on the Status of Endangered Wildlife in Canada *Assessment and Status Reports for Black Ash* (2018) and *Pitcher's Thistle* (2010); and
  - Species at Risk in Ontario website (Ministry of the Environment, Conservation, and Parks, 2023d).
- Other data sources reviewed included:
  - *Ecosystems of Ontario, Part 1: Ecozones and Ecoregions* (Crins et al., 2009);
  - *Ecosystems of Ontario, Part 2: Ecodistricts* (Wester et al., 2018);
  - *Ecosites of Ontario* (operational draft) (Banton et al., 2009);
  - *Forest Regions of Ontario* (Rowe, 1972);
  - *Ramsar Canada Sites* (Ramsar Canada, 2020);
  - *Far North Biodiversity Project* (Ontario Biodiversity Council, 2020);
  - Ogoki Forest 2020-2030 Forest Management Plan and supporting maps (GreenForest Management Inc., 2020); and
  - *Alberta Wetland Policy* (Ministry of Environment and Protected Areas of Alberta, 2020); *The Wetland Ecological Functions Assessment* (Environment Canada, 2008); and the *Wetland Network* (2020).

4.3.1.2 Desktop Vegetation Community Mapping Methodology

An iterative process was used to develop the desktop vegetation community mapping for the Construction Disturbance Area and the Local Study Area. The process first involved the development of the preliminary terrain mapping (as described in **Attachment B – Vegetation Technical Support Document**, and further detailed in the *Physiography, Terrain, and Soils Technical Support Document: Existing Conditions and Effects Assessment [WSP, 2026]*). This preliminary terrain mapping informed the ecosite mapping completed by KBM Resources Group (2021), as described below.

Vegetation community mapping in the Regional Study Area was assembled using the Ontario Land Cover Compilation Version 2.0. Ecosites in the Local Study Area were rolled up into vegetation groupings that align with categories in the provincial dataset to allow

consistent mapping, and at the same level of detail, across both study areas (**Section 5.2.2**).

All descriptions and assessments of land cover on the landscape for both the existing conditions (**Section 5**) and effects assessment (**Section 7**) are based on this desktop mapping. Given the uncertainties about mapping accuracy (**Section 4.3.1.3.1**) it should be noted that these assessments have limitations.

4.3.1.3 Ecosite Classification

Preliminary terrain mapping was provided in digital format to KBM Resources Group, who assigned ecosite types to each of the polygons identified in the terrain mapping (the ecosite-typing process is further described below). The original intent was to provide KBM Resources Group with a completed preliminary terrain mapping dataset for the full existing conditions Local Study Area, to inform the desktop ecosite classification process. However, due to time constraints the polygon delineation and ecosite classification became an iterative process whereby KBM Resources Group also completed some of the polygon delineation which WSP Canada Inc.'s soils and terrain specialists then integrated into their terrain mapping dataset. The mapping dataset was updated and expanded by both teams until all polygons were delineated and classified within the existing conditions Local Study Area.

The ecosite mapping product that formed the basis of the vegetation mapping was completed by KBM Resources Group in September 2021. The desktop photo interpretation mapping exercise completed by KBM Resources Group included assessment using two imagery sources viewed in 3D, using software called Summit Evolution (S. Audet, personal communication, 2023):

- 1:60,000 scale black and white aerial photos acquired in 1973, 1975, and 1976 from the National Air Photo Library in Ottawa, Ontario (covering the Local Study Area); and
- 1:33,000 scale 20-cm resolution colour aerial photographs acquired in 2019 by KBM Resources Group's aerial survey division (within 1 km either side of the Project centreline).

The vegetation mapping was completed using the specifications outlined in the *Ontario Forest Resources Inventory Photo Interpretation Specifications* (Ministry of Natural Resources, 2012b) and all polygon attribution was completed by experienced Ontario Boreal Certified photo interpreters (S. Audet, personal communication, 2023). Where not already delineated by WSP Canada Inc.'s soil and terrain specialists, polygons were delineated by KBM Resources Group (2021) based on the defined criteria for forested and non-forested land types.

All the delineated polygons (excluding water) were assigned a primary ecosite code (PRI_ECO) based on the *Ecosites of Ontario* ecosite keys (Banton et al., 2009). An ecosite is defined as "*an ecological unit comprised of relatively uniform geology, parent material, soils, topography, and hydrology and consists of related vegetation conditions*" (Ministry of Natural Resources, 2012b). Where a secondary ecosite represents at least 20% of the area of a polygon and is not equal to or greater than 8 ha, a secondary ecosite was assigned (SEC_ECO) to the polygon.

Polygons were first divided into upland vs lowland (wetland) polygons. Polygons were then grouped into areas with similar species, height, age, densities, and crown closures. Forested polygons were typed based on standard forestry inventory metrics including species composition, stocking, stand height, site class, year of origin, depletion type, and development stage. The *Ecosites of Ontario* (Banton et al., 2009) ecosite keys were then used to choose an appropriate ecosite for each polygon. Given the limitations of desktop ecosite classification, some default ecosite key selections were made based on interpreter experience and expected conditions within the existing conditions Local Study Area, as follows (S. Audet, personal communication, 2023):

- Key 5: Fresh, Sandy or Dry to Fresh Coarse Loamy Ecosites was the default key used for upland ecosites. Exceptions to this rule were:
  - Key 4: Dry, Sandy Ecosites was used for areas that appeared dry and sandy;
  - Key 6: Moist, Sandy to Coarse Loamy Ecosites was used for areas that appeared moist: and
- Key 10: Permanently Flooded or Hydric Ecosites was used for wetlands.

Additionally, ecosites were further refined in 2023 using a combination of data from field investigations described in **Section 4.3.2,** soils data from field-verified borehole locations, and light detection and ranging mapping. This work was undertaken by the soils and terrain and peatlands teams, as further detailed in the *Peatlands Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

4.3.1.3.1 Desktop Mapping Limitations

It must be recognized that there are limitations to desktop ecosite typing, particularly when using older, low-resolution imagery. Key assumptions and limitations are:

- A higher confidence should be applied to ecosite typing within 1 km of the Community Access Road route alternatives centreline where higher resolution 2019 colour imagery was available;
- A lower confidence should be applied to ecosite typing within the outer 2 km of the Local Study Area where only low resolution black and white imagery from the mid-1970s was available;

- A typical Forest Resource Inventory desktop mapping approach involves a process of ground-truthing / calibration according to the Calibration Plot Specifications (Ministry of Natural Resources, 2012a). No field verification occurred during the desktop ecosite typing exercise to validate the desktop mapping process; and
- The default ecosite key selection for upland ecosites (i.e., Keys 4, 5, and 6), was a decision by KBM Resources Group based on the dominate substrate conditions across the province and is a typical process when ground truth data is not available at the time of desktop ecosite-typing. As a result, ecosites on silty, fine loamy, or clay soils (i.e., Keys 7, 8, and 9) may be under-represented in the existing conditions Local Study Area.

Field Verification of Upland Ecosites and Field Verification of Wetland Ecosites sections in **Attachment B** provide an assessment of the accuracy of desktop upland and wetland ecosite typing based on the field verified sites that were completed once the desktop ecosite-typing was complete. This is also summarized in **Section 5.2.2**.

4.3.2 Field Investigations

Field investigations in 2021 through 2023 were completed to assess a subset of the pre-typed ecosites. Pre-typed ecosites refer to the ecosites assigned by KBM Resources Group to each of the desktop-delineated polygons (2021). Soil and botanical data were collected to characterize plant community composition in a subset of each ecosite type. Field surveys were conducted during the appropriate season (i.e., leaf-on season which typically occurs from June through September). Field sites were located within the Construction Disturbance Area and the existing conditions Local Study Area. No field investigations were completed within the existing conditions Regional Study Area.

Field sites were divided between upland, wetland, and riparian ecosystems. While all ecosites were mapped as either a wetland or upland ecosite, those that were within 30 m of a watercourse or waterbody were also identified as riparian ecosystems. Riparian communities were identified by buffering all watercourses and waterbodies by 30 m. This was completing using provincial layers (i.e., Ontario Hydro Network_Waterbody and Ontario Hydro Network_Watercourse) intersected with the mapped ecosites.

Two types of field surveys were conducted: ground inspections and visual checks. Ground inspections consisted of a point sample at a representative location within a desktop delineated and classified vegetation community polygon. The purpose of ground inspections was to confirm or correct the desktop ecosite classification and to collect data to inform the riparian, wetland, and peatland functional assessments. Visual checks consisted of an assessment from helicopter as well as assessments of representative photographs taken during other field programs (e.g., bird surveys).

4.3.2.1 Site Selection

Field verification survey plot site selection considered both access (i.e., proximity to existing helipad locations) and the objective to survey all ecosite types present within the existing conditions Local Study Area, based on the pre-typed ecosite mapping. The following sections describe the process for selecting sites for vegetation field surveys, ensuring coverage in both the Construction Disturbance Area and the Local Study Area.

The field study design for the existing conditions Local Study Area generally followed the *Standard for Terrestrial Ecosystem Mapping in British Columbia* (Ecosystems Working Group, 1998). Although these guidelines originate in British Columbia, a similar guideline to provide consistency across projects has not been developed for Ontario and therefore is considered to be an acceptable approach. Establishing the field survey intensity varies depending on the purpose of the surveys, size of the Study Area, project objectives, and funding; the British Columbia standards describe six survey intensity levels (Ecosystems Working Group, 1998). Based on the size of the Vegetation existing conditions Local Study Area (197,960 ha), the survey intensity for the Project falls within the “reconnaissance level” intensity range with the percentage of polygon inspections falling between 0% and 4%, and a ground inspection to visual check ratio of 25:75 (Ecosystems Working Group, 1998).

Although every effort was made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the existing conditions Local Study Area was only available by air, therefore survey locations were limited to within 1 km of where a helicopter was capable of landing (e.g., cut helicopter landing pads, open grassy riparian areas). Considering that not all randomly selected points were accessible, a number of oversample sites were also selected. The intent was to provide the best chance of obtaining a robust sample size but also with the objective of visiting a sub-set of each pre-typed ecosite.

As outlined in the Vegetation Study Plan, vegetation field surveys were selected to be most intensive within the Construction Disturbance Area (approximately 60% of the survey locations), with a reduced level of effort within the existing conditions Local Study Area (approximately 40% of the survey locations). No field surveys were completed within the Regional Study Area.

Field sites were also divided between upland, wetland, and riparian ecosystems. While all ecosites were mapped as either a wetland or upland ecosite, those that were within 30 m of a watercourse were also identified as riparian ecosystems. Riparian communities were identified by buffering all watercourses and waterbodies by 30 m.

4.3.2.2 Field Surveys

Two types of field surveys were conducted: ground inspections and visual checks. Each survey type is described in more detail in the bullets that follow.

- **Ground Inspections**—Ground inspections consisted of a point sample at a representative location within a desktop delineated and classified vegetation community polygon. The purpose of ground inspections was to confirm or correct the desktop ecosite classification and to collect data to inform the riparian, wetland, and peatland functional assessments. Ground inspection methodologies are described in more detail for each ecosystem type below (**Upland Ecosystems**, **Wetland Ecosystems**, and **Riparian Ecosystems**); and
- **Visual Checks**—Visual checks consisted of an assessment from helicopter as well as assessments of representative photographs taken during other field programs (e.g., bird surveys). Visual checks were also completed on the ground, where possible (e.g., while walking from one ground plot to another). The purpose of visual checks was to assess whether the desktop ecosite mapping was accurate or needed to be revised to the proper classification.

Where visual checks were completed by helicopter, data collected consisted of (where possible): location (Universal Transverse Mercator coordinates), photos, dominant species (those that could be identified from air), estimate of community relative age (i.e., mature, semi-mature, immature, or recent burn), and stand composition.

Where visual checks were completed by photo interpretation, surveyors photographically documented the vegetation community with 13 photos. At each cardinal direction: one photo at shoulder height with arm and camera extended parallel to ground, one photo with arm at 45° (from body position) pointing down, and one photo with arm extended at 135° (from body position) pointing up, and one photo with arm extended straight up (i.e., vertically). The photos were interpreted (where possible) to confirm the pre-typed vegetation community, estimate of community age and stand composition, and estimate of soil moisture regime.

4.3.2.3 Upland Ecosystems

Ground inspections in upland ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants, when encountered. As part of the Ecological Land Classification method, the following data were gathered to the extent possible:

- Photographs;
- Dominant plant form and canopy height;
- Soil texture, moisture regime, and degree of decomposition using a soil pit or auger;
- Stand description (dominant species, height, and % cover);
- Abundance of standing snags and deadfall;
- Estimate of community age;
- Basal area calculation; and
- Ecosite classification according to *Ecosites of Ontario* (Banton et al., 2009).

Key habitat information for species important to existing land use and resources for traditional purposes were collected. Where a Species at Risk, rare species, or rare vegetation community was identified, their locations (Universal Transverse Mercator coordinates) and boundary delineation, abundance (% cover), and habitat conditions (microclimate characteristics such as shade and slope) were recorded to the extent possible.

4.3.2.4 Wetland Ecosystems

The data collection protocol for Wetland Communities was adapted from the *Wisconsin Rapid Assessment Methodology* (Wisconsin Department of Natural Resources, 2001), *Ontario Wetland Evaluation System* (Ministry of Natural Resources and Forestry, 2013), and the *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson et al., 2008) which are complementary of recommended approaches from Environment and Climate Change Canada.

Ground inspections in wetland ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants. Specifically, the following data were gathered in wetland ecosystems, to the extent possible:

4.3.2.4.1 General Information

- Photographs;
- Dominant vegetation type;
- Community composition; and
- Ecosite classification according to *Ecosites of Ontario* (Banton et al., 2009).

4.3.2.4.2 Habitat Function Information

- Presence of invasive species or species of special interest (Indigenous importance or Species of Conservation Concern or Species at Risk);
- Habitat suitability (emergent vegetation for waterfowl nesting, standing water for amphibian breeding, vegetation suitable for ungulate grazing); and
- Incidental wildlife observations and evidence of wildlife activity.

4.3.2.4.3 Hydrological Function Information

- Geomorphology of the wetland (e.g., depressional, riverine, lake fringe, extensive peatlands [Oji-Cree translation, *maashkiigwabo*]);
- Presence of surface water, flow patterns, connectivity, inputs, outputs, water depth, and evidence of ground water influence;
- Existing hydrology alterations (e.g., ditching, beaver [Oji-Cree translation, *amikwag*] activity);
- Biogeochemical function information;
- Soil moisture regime;
- Substrate composition (mineral or organic); and
- Substrate decomposition rates described using the von Post scale (Ekono, 1981).

4.3.2.5 Riparian Ecosystems

The data collection protocol for riparian ecosystems was adapted from *Riparian Assessment and Prescription Procedures* (British Columbia Ministry of Environment, Lands and Parks, 1999). Data collected in riparian communities will be used to inform the functional assessment and effects assessment.

Ground inspections in riparian ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants. As part of the Ecological Land Classification method, the following data were gathered to the extent possible:

- Overstory vegetation characteristics (tree species, densities, and heights, % cover);
- Understorey vegetation characteristics (shrub, herb, and moss species, % cover, and height);
- Soil properties (horizon depths, textures, degree of decomposition, % coarse fragments);

- Indicators of disturbance;
- Site gradient and aspect;
- Stream gradient and width; and
- Ecosite classification according to *Ecosites of Ontario* (Banton et al., 2009).

4.3.3 Traditional Use Plants

Representative traditional use plant species were selected based on the *Eabametoong First Nation's Biodiversity Atlas* (Eabametoong First Nation, et.al n.d.) and species listed in the *Tailored Impact Statement Guidelines*, combined with oral and written Marten Falls First Nation Indigenous Knowledge and community knowledge.

To address each Valued Component indicator, the representative traditional use plant species were assessed using two major criteria: (1) the reasonable likelihood of each species being present within a given ecosite (i.e., "habitat suitability"), and (2) the accessibility of a given ecosite for traditional plant harvest (i.e., "habitat accessibility"). A score to determine habitat suitability and habitat accessibility were weighed equally, and each criterion was scored using an index of 0 to 1, as further described below.

To assess habitat suitability, each traditional use plant species was qualitatively assessed as reasonably present or reasonably absent within each ecosite mapped within the Local Study Area by referencing the species habitat requirements from a variety of reputable botanical resources (Flora of North America Editorial Committee, 1993+; Ministry of Natural Resources and Forestry, 2022a; Reznicek et al., 2011; Native Plant Trust, 2023; Semple, 2023). Habitat requirements were compared to the conditions of each ecosite within the Local Study Area. A traditional use plant species that was included in an ecosite vegetation description was automatically assumed to be reasonably present since listed species are considered key floristic components or indicator species of the respective ecosite (Banton et al., 2009). Traditional use plant species that were not included in an ecosite vegetation description were assessed as reasonably present or reasonably absent by comparing each ecosite description and (if necessary) substrate description with the habitat requirements of that species.

Each ecosite was ranked in terms of potential habitat suitability for each traditional use plant species, using an index between zero and one. This index was generated by dividing the total number of species that are assumed to be reasonably present within a given ecosite by the total number of plant species assessed. Given that plant species are often wetland-associated or upland-associated (i.e., rarely found in both wetlands and uplands), the initial index calculation would be unlikely to approach a "1" on the index. A secondary assessment was incorporated into the habitat suitability index to account for a subset of the traditional use plant species that are associated with riparian habitats. Since riparian habitats (i.e., watercourse and waterbody banks) can occur in both upland and wetland

environments, any ecosite that intersected with a watercourse and / or a waterbody were treated as “riparian habitat.” A secondary score was added to the index for these riparian ecosites. It should be noted that traditional use plant species associated with riparian habitats were not “double-counted” in terms of habitat suitability. In other words, in a situation where a species was assessed as reasonably present within an ecosite and would also be reasonably present in a riparian habitat, that species would only score once for that ecosite if the ecosite intersected a watercourse or waterbody. For example, Broad-leaved Cattail (Oji-Cree translation, *paskakannoog*) may be reasonably present in both riparian habitats and in marsh habitats; however, it would only be scored once in a Mineral Meadow Marsh ecosite that is bisected by a river. Therefore, no individual ecosite could score higher than one in terms of habitat suitability index.

To assess habitat accessibility, Existing Anishnebek Knowledge paths and locations from Marten Falls First Nation were considered when determining how accessible each of the mapped candidate ecosites for traditional use plants harvest may be (Marten Falls First Nation 2019). The following Indigenous Knowledge layers were assumed to be potential locations for traditional use plant harvest, and were incorporated into the habitat accessibility assessment:

- Animal Harvest;
- Fish Harvest;
- Plant Harvest;
- Cultural, Spiritual, and Sacred;
- Habitation;
- Travel;
- Points of Interest;
- Fish and Wildlife Use Areas;
- Shared Area;
- Other; and
- Existing Roads.

Any ecosite that intersected or was within 500 m of any Indigenous Knowledge point or path received a score of 1. Ecosites that did not intersect with any Indigenous Knowledge location, or the 500 m buffer scored 0 in terms of habitat accessibility.

Finally, habitat suitability and habitat accessibility scores were combined for each individual ecosite within the existing conditions Local Study Area, and each overall score between 0 and 2 was spatially displayed using a colour gradient where green represents low suitability and red represents high suitability.

4.3.4 Species at Risk and Species of Conservation Concern

For the purpose of this study, definitions of Species at Risk and Species of Conservation Concern follow.

- **Species at Risk:**
  - Any species listed under Schedule 1 of the federal *Species at Risk Act*, S.C. 2002, c. 29 as Threatened, Endangered, or Extirpated.
  - Any species listed under the provincial *Endangered Species Act*, 2007, S.O. 2007, c. 6 as Threatened, Endangered, or Extirpated.
- **Species of Conservation Concern:**
  - Any species listed under Schedule 1 of the federal *Species at Risk Act* as Special Concern.
  - Any species designated Threatened, Endangered, or Extirpated by the Committee on the Status of Endangered Wildlife in Canada (unless otherwise listed as Species at Risk under the *Species at Risk Act* or the *Endangered Species Act*).
  - Any species listed under the *Endangered Species Act* as Special Concern (unless otherwise listed as Species at Risk under *Species at Risk Act*).
  - Any species with a subnational rank (S-rank) of S1 – S1 as designated by the Natural Heritage Information Centre. A Subnational rank or S-Rank is a conservation status of a species or plant community within Ontario considering factors such as abundance, distribution, population trends, and threats. S1 (Critically Imperiled) species usually have five or fewer occurrences, or very few remaining individuals and are often especially vulnerable to extirpation. S2 (Imperiled) species usually have 6-20 occurrences or many individuals in fewer occurrences and are often susceptible to extirpation.

During the desktop review, two Species at Risk, Black Ash and Pitcher's Thistle, and one Species of Conservation Concern, Northern Marsh Violet (Oji-Cree translation, *gaamiskwaadoogaag waabigwanii*) (*Viola epipsila*) were determined to have the potential to occur in the Local Study Area.

To assess candidate habitat for Black Ash, the habitat description provided in the *Black Ash Recovery Strategy* (Catling et al., 2022) was used as criteria to characterize the suitability of all ecosites mapped within the Local Study Area. Additionally, any ecosite listing Black Ash as a characteristic tree species in the vegetation description was included (Banton et al., 2009).

To assess candidate habitat for Pitcher's Thistle, the habitat description provided in the *Pitcher's Thistle Recovery Strategy* (Parks Canada Agency, 2011) was used as criteria to characterize the suitability of all ecosites mapped within the Local Study Area.

To assess candidate habitat for Northern Marsh Violet, the habitat descriptions provided from a variety of sources (McKinney et al., 1993; Douglas et al., 2002; Michigan State University, 2023) were reviewed and used as criteria to characterize the suitability of all ecosites mapped within the Local Study Area.

Rare plants including Species at Risk and Species of Conservation Concern were also documented during vegetation surveys (i.e., ground inspections), if encountered. When encountered, their locations, population size, and habitat conditions were recorded, and used to verify the habitat suitability mapping exercise.

4.3.5 Data Management

Data management, including quality assurance and quality control, was employed to minimize the potential for data entry and analysis errors, prepare datasets for analysis, and limit sensitive data distribution in accordance with established agreements.

4.3.5.1 Field Investigations

To maintain consistency and for quality assurance / quality control of the data collected, standardized datasheets paired with mapping software were used in the field. Field studies followed technical protocols that outlined specific work instructions were developed to follow provincially acceptable methods. Completeness and accuracy of field data was verified daily during field verification, and field photos and coordinate information were backed up regularly. Field datasheets were scanned and filed digitally in the appropriate Project folder.

4.3.5.2 Data Management

Field data were manually entered into excel spreadsheets for future collation and analysis. When the data analysis and reporting was undertaken, any data anomalies were cross-checked back with the field datasheets and / or field mapping to correct the anomaly. Pre-typed ecosites that were determined to be a different ecosite during the field verification process were updated in the digital mapping.

4.3.6 Data Analysis

4.3.6.1 Disturbance Analysis

The anthropogenic and natural disturbance analysis included overlaying a "disturbance layer" that was prepared for the Ungulate habitat modelling exercise with vegetation community mapping. The "disturbance layer" was created by using several provincial datasets including:

- Ontario Far North Land Cover (available from Land Information Ontario);
- Ontario Provincial Land Cover 2000 Edition (PLC 2000; available from Land Information Ontario);
- Ontario Fire Disturbance Area (available from Land Information Ontario);
- Forest Resource Inventory (available from Land Information Ontario);
- Crown Land Use Policy Atlas (available from Land Information Ontario);
- Abandoned Mines Information System Sites (available from Geology Ontario);
- Abandoned Mines Information System Features (available from Geology Ontario);
- Recreation Points (available from Land Information Ontario);
- Trail Segments (available from Land Information Ontario);
- Ontario Railway Network (available from Land Information Ontario);
- Ontario Road Network (available from Land Information Ontario); and
- Geographic Names Ontario (available from Land Information Ontario).

Natural disturbances were based on depletions (e.g., due to cutting / forestry, fires / burns, disease, pests, or weather events), which were obtained from the Ontario Fire Disturbance Area and Forest Resources Inventory datasets. Fire, harvest, and "other" depletions were "stamped" onto the landcover layer and categorized into one of four categories based on the approximate time since depletion: ≤ 5 years, 5 – 20 years, 20 – 40 years, and ≥ 40 years. Depletions ≥ 40 years were excluded from the disturbance layer. Where a depletion date was not available (i.e., the date was "9999"), the overstory year of origin was used to categorize the approximate time since depletion. Depletions that were not classified as either "harvest" or "fire," such as depletions due to pests, disease, or weather events, were categorized into the "other" depletion category.

Note that "Disturbed - Non and Sparse Woody" and "Disturbed - Treed and / or Shrub" landcover categories appeared to represent clearings but it was not obvious whether the clearings arose due to cutting, burning, or another cause. In areas where information on depletion type was lacking, these landcover categories were reclassified as "Anthropogenic Disturbance – Clearing" to conservatively retain potential anthropogenically disturbed areas. For disturbance summaries, the "Anthropogenic Disturbance – Clearing" landcover class was considered a cut (i.e., "harvest") within Forest Management Units.

Anthropogenic disturbances were based on linear and point disturbances that were buffered and then "stamped" onto the landcover layer to create physical footprints and account for disturbances that may not be captured by the Far North Land Cover or Provincial Land Cover 2000 datasets. Point features including mines, communities, and

recreation areas, and linear features including roads, railways, utility lines, and trails, were obtained from either Land Information Ontario or Geology Ontario then buffered to account for the direct disturbance footprint of these features. Buffer distances were based on those used in Berglund et al. (2014; see page 111) and are presented in **Table 4-6**. Buffered recreation and community anthropogenic disturbances were "stamped" only onto terrestrial landcover classes. Buffered mine, road, railway, utility line, and trail anthropogenic disturbances were "stamped" onto both terrestrial and water landcover classes.

Table 4-6: Anthropogenic Disturbance Types and Associated Buffers

Reclassified Disturbance Type	Disturbance Type	Feature Type	Buffer Applied (m)	Source Dataset
Mines	Mines	Point	500	Abandoned Mines Information System (Geology Ontario)
Community	Community	Point	500	Geographic Names Ontario (Land Information Ontario)
All Season Road	All Season Road	Line	50	Ontario Road Network (Land Information Ontario)
Railway	Railway	Line	50	Ontario Railway Network
Utility Line	Utility Line	Line	50	Utility Line (Land Information Ontario)
Recreation	Camp - Other	Polygon	N/A	Crown Land Use Policy Atlas (Land Information Ontario)
	Commercial Outpost Camp	Polygon	N/A	Crown Land Use Policy Atlas (Land Information Ontario)
	Access Point	Point	200	Recreation Point (Land Information Ontario)
	Boat Cache	Point	200	Recreation Point (Land Information Ontario)
	Campground	Point	200	Recreation Point (Land Information Ontario)
	Cottage	Point	200	Cottage Residential Site (Land Information Ontario)
	Trapper Cabin	Point	200	Provided by AECOM Canada Ltd.
Trail	Trail	Line	25	Trail Segment (Land Information Ontario)
Winter Road	Winter Road	Line	25	Ontario Road Network (Land Information Ontario)

m = metre; N/A = not applicable.

Anthropogenic disturbances and natural disturbances present within the existing conditions Local Study Area and existing conditions Regional Study Area and have been incorporated into the disturbance analysis. In two cases, data were excluded, specifically, where trails and fire disturbances occurred over waterbodies. The total area of disturbance was quantified in the existing conditions Local Study Area and in the existing conditions Regional Study Area, and in terms of wetland versus upland communities by overlaying disturbance layers on to the vegetation mapping.

4.3.6.2 Wetland and Riparian Functional Assessments

A functional assessment identifies the capacity of a particular wetland or riparian community to perform hydrological, biogeochemical, climate and habitat functions and typically measures the differences in that capacity among all the wetland or riparian communities present in the assessment area. Functional assessments are often undertaken in disturbed landscapes, or where wetlands are rare in the landscape, as a means of assessing the effects of wetland alteration, setting appropriate mitigation measures, and identifying management goals (Committee on Characterization of Wetlands et al., 1995). Similarly, riparian functional assessments are typically used to identify where impairments to riparian functions are present (often as it relates to forestry activities) and identifying management goals and opportunities for restoration (Washington Forest Practices Board, 2011).

Within the existing conditions Local Study Area and existing conditions Regional Study Area, wetland and riparian communities are characterized by large and highly interconnected complexes in a relatively undisturbed landscape. Because of this high connectivity and similarity in ecological setting, wetland and riparian communities function at a broad scale as part of these large complexes.

Assessing individual functional performance of each wetland community in isolation would be confounded because the spatial extent of each function is not discrete (i.e., confined to the boundary of the particular ecosite), but rather shared and interdependent among numerous wetland communities within the complex. Defining and implementing a scale to compare the relative importance of each individual community therefore becomes less useful in the effects assessment.

Limitations in the desktop mapping (**Section 4.3.1.3**) combined with the small sample size used for field investigations (**Section 4.3.2.1**) also means characterizing functions of a community by ecosite type based on field data and extrapolating for the entire existing conditions Local and Regional Study Areas would be of low accuracy and therefore of limited value. For example, the site-specific data collected from a single B139 ecosite or Fen vegetation community in the field does not necessarily mean all other B139 ecosites or Fen vegetation communities mapped in the existing conditions Local and Regional Study Areas share the same site-specific influences. The results of any functional

comparison between ecosite or vegetation community types would therefore be of low value in the effects assessment.

Based on the above factors, ranking the functional contributions (i.e., relative importance) of individual communities would be difficult, of limited accuracy, value, and usefulness, and risks underestimating the ecological functions of the large wetland complexes and riparian ecosystems on the landscape. Further, Marten Falls First Nation has highlighted the importance of water and highlighted that water is life-giving to the land and all species of life. This reinforces that all wetland and riparian communities are important and interconnected in this landscape.

Therefore, a conservative landscape-level approach was taken for the functional assessment whereby all wetland and riparian ecosystems were treated as high-functioning and equally important ecologically. General wetland and riparian functions were described and differentiated on a finer scale where possible (e.g., by the four wetland vegetation community groupings [fen, marsh, swamp, bog]). The assessment then focused on characterizing the relationship of wetland and riparian ecosystems and their functions to the landscape rather than an individual functional analysis resulting in rankings. This approach recognizes the connectivity of these ecosystems and is consistent with guidance provided by Environment and Climate Change Canada (Hanson et al., 2008) following a tiered monitoring and assessment framework.

4.4 Effects Assessment

The following is a broad overview of the approach for the identification, assessment and evaluation of the potential effects:

- Review construction and operations activities to identify potential interaction(s) that could result in environmental effects;
- Characterize the existing environment for both route alternatives which considers past, present and approved projects;
- Identify potential environmental effects of the Preferred Route and recommend mitigation measures to avoid or minimize identified effects, as well as identify opportunities to enhance benefits to the environment;
- Predict and assess potential environmental effects remaining after taking into consideration the recommended mitigation measures (i.e., residual effects) using direction, magnitude, geographic extent, duration, frequency, reversibility and likelihood;
- Predict cumulative effects that may result from a combination of the residual effects of the Preferred Route with the effects of other past, present and reasonably foreseeable projects; and

- Identify a follow-up program for the Preferred Route that includes monitoring to verify the prediction of the effects assessment and effectiveness of the mitigation measures, and a requirement for monitoring of the commitments made in the *Terms of Reference* and *Environmental Assessment / Impact Statement Report*.

The following sections provide wildlife specific input and considerations as they pertain to the methodology for the effects assessment. For detailed descriptions of the methodology used to inform this study refer to the *Environmental Assessment / Impact Statement Report*. Refer to **Section 6** for details related to the Preferred Route, including the revised study areas that have been used in the effects assessment.

4.4.1 Project-Environment-Interactions

Considering the Project components and activities presented in **Section 2**, interactions were identified between the Project components and activities to the existing conditions of vegetation Valued Components. These interactions support the identification of potential effects, both direct and indirect, that may result in changes to vegetation. The likely Project–environment interactions were identified based on professional judgment, activities planned to occur, and as described in the *Marten Falls Community Access Road Project Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020). **Table 4-7** provides the preliminary analysis of Project–environment interactions for vegetation that was presented in the *Draft All Season Community Access Road: Vegetation Study Plan* (AECOM, 2021). The analysis of Project–environment interactions for vegetation that are likely to have a potential effect is provided in **Section 7.2**.

Table 4-7: Project–Environment Interactions

Project Phases	Project Activities	Vegetation
Construction	Mobilization of equipment and supplies	**X**
	Temporary construction staging areas[(a)]	**X**
	Temporary access roads and trails[(a)]	**X**
	Temporary construction camps[(a)]	**X**
	Right-of-way clearing and grubbing	**X**
	Brush and timber disposal	**X**
	Pits and quarries[(a)]	**X**
	Drilling / blasting / aggregate production	**X**
	Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	**X**
	Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	**X**
	Construction site restoration	**X**
	Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act*	**X**
	Decommissioning and reclamation temporary camps, roads / trails and staging areas	**X**
Operation and Maintenance	Road usage	**X**
	Maintenance[(b)]	**X**

Notes:
(a) I*ncludes construction and use of*
(b) Includes General Maintenance (e.g., grading, erosion control, quarrying, borrow pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance), and Special Maintenance (e.g., slope failures, road settlement / break-up).

4.4.2 Assessing Residual Effects

4.4.2.1 Potential Effects

Following the identification of the Project–environment interactions, the existing conditions for the Preferred Route were reviewed to determine the potential effects of the Project. The potential effects on vegetation are described as either direct or indirect, and the potential effects on other disciplines are described as Discipline Interactions. The potential direct and indirect effects resulting from the Project–environment interactions were based on input received through the Indigenous Knowledge Program and Consultation and Engagement Program, regulatory agency guidance, and professional judgement.

A **direct effect** is an immediate change to an environmental component caused by a project activity at the same time and place as the activity. An **indirect effect** occurs when a change resulting from a project activity leads to subsequent changes in other environmental component, which may occur later in time or at a different location but are reasonably foreseeable.

Residual effects are the effects that remain after the application of mitigation measures. These effects are described in **Section 7** and include descriptions in detail of the potential adverse and positive residual effects in relation to each temporal phase of the Project as outlined in **Section 4.2.1**.

Discipline interactions occur when a change to one Valued Component resulting from a Project activity causes a change to another Valued Component in another discipline (e.g., changes in vegetation community availability or distribution could indirectly affect the wildlife habitat availability).

Vegetation may be indirectly affected by changes to other environmental disciplines. For example, the Atmospheric Environment can affect vegetation by aerial deposition of dust and pollutants from Project activities. Changes to Physiography, Geology, Terrain and Soils, and Surface Water, can alter flow patterns and the interaction of water with soils and vegetation potentially resulting in changes to vegetation community composition and function. Land and Resource Use that may be affected by the Project, such as expansion of industry can affect vegetation due to increased access for timber harvesting.

Direct effects of the Project to vegetation can cause indirect changes to other disciplines. Changes in vegetation community availability and distribution can affect the quantity and quality of wildlife habitat.

Table 4-8 provides a preliminary identification of how changes to other environmental disciplines may result in indirect effects on vegetation.

Table 4-8: Potential Discipline Interactions

Indirect Interactions Vegetation	Discipline and Associated Valued Components																
	Aboriginal and Treaty Rights and Interests	Atmospheric Environment	Climate Change	Acoustic and Vibration Environment	Physiography, Geology, Terrain and Soils	Surface Water	Groundwater and Geochemistry	Vegetation	Peatlands	Wildlife	Fish and Fish Habitat	Social	Economy	Land and Resource Use	Human Health and Community Safety	Visual Aesthetics	Archaeological and Cultural Heritage
Indirect effects on vegetation as a result of changes in other disciplines	X	X	X	-	X	X	X		X	X	-	X	X	X	-	X	X

X = Potential pathway for indirect effect as a result of the Project
- = No pathway for indirect effect is anticipated as a result of the Project

4.4.2.2 Mitigation Measures

Following the identification of potential effects, the effects assessment explores technically and economically feasible mitigation measures to avoid or minimize the identified negative effects. These measures consisted of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, Indigenous and community recommendations and recommendations from environmental professionals based on expertise, scientific publications, experience, and judgement.

It is important that mitigation measures are achievable, measurable, verifiable, and monitored for compliance and effectiveness during all temporal phases as part of the Project follow-up monitoring plan. Recommended environmental monitoring will verify the potential environmental effects predicted, evaluate the effectiveness of mitigation measures, and identify the process the Proponent will follow if mitigation measures are not effective.

The *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020) Section 20 Requirements and *Terms of Reference* Requirements (AECOM, 2020) for Vegetation are provided in **Table 4-9.** The applicability of these requirements has been evaluated and will be adapted to the needs of the site, environment, and Project activities.

Table 4-9: *Tailored Impact Statement Guidelines* Section 20 Requirements and *Terms of Reference* Requirements

Tailored Impact Statement Guidelines Section 20 Requirement	Section Addressed In
Include measures to prevent the Community Access Road from being a conduit for the spread of invasive species such as European Common Reed (*Phragmites australis*).	**Section 7.3.1**
Provide best technically and economically feasible mitigation approaches to habitat mitigation that follow the hierarchy: ■ Avoid potential impact; ■ Minimize potential impact; ■ Restore the potential impact; ■ Provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and ■ Provide justification for moving from one mitigation alternative to the next.	**Section 7.3.1**
Provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and provide justification for moving from one mitigation alternative to the next.	**Section 9** and Preliminary Biodiversity Offset Plan
Provide offsetting or compensation plans to address all residual effects on species at risk, and their critical habitat, migratory birds, fish and fish habitat and / or wetland functions (if applicable) for review during the impact assessment process; the plans should include the following: ■ Describe the existing condition of the wetland functions potentially impacted by the Project; ■ Apply the mitigation hierarchy;	**Section 9** and Preliminary Biodiversity Offset Plan

Tailored Impact Statement Guidelines Section 20 Requirement	Section Addressed In
■ Identify and describe residual effects; ■ Identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial authorities and Indigenous Groups have been considered; ■ Identify the location and timing of implementation of compensation projects (where feasible); ■ Identify and describe the success criteria; ■ Identify and detail non-habitat measures; ■ Describe how the proposed measures align with published federal and provincial recovery, management, or action plans and strategies for species at risk; ■ Identify the parties responsible for implementation, including monitoring and review; ■ Identify indicator species for setting compensation objectives. Identification should be based on baseline data, Bird Conservation Strategies, and other information where available (note: species at risk should not be used as indicator species; compensation efforts need to be directed specifically to these species); ■ Describe the functions gained at the compensation site(s); ■ Provide evidence that functions can be replaced by the proposed offset activities; ■ Describe the process of selecting proposed compensation site(s) and associated existing condition(s); and ■ Provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities.	
Terms of Reference **Requirement**	**Section Addressed In**
■ Potential effects on vegetation and ecological communities include changes to community diversity (including community loss), changes to wetland quantity and function and changes to species diversity, including SAR and traditional use plants.	■ **Sections 7** and **8**

4.4.2.3 Predicting Residual Effects

Following the identification of direct and indirect effects on vegetation and identification of mitigation measures, residual effects were predicted. Once predicted, residual effects were characterized by residual effects characteristics, which are described in **Section 4.4.2.4**. Any predicted residual effects (i.e., all residual effects greater than “negligible”) are also carried forward into the cumulative effects assessment which is described in **Section 4.4.3**.

4.4.2.4 Characterization of Predicted Residual Effects

Predicted residual effects, if identified, will be described in terms of the effects assessment characteristics presented in **Table 4-10.** These effect characteristics were described in detail in the *Environmental Assessment / Impact Statement Report*. The section that follows outlines how these characteristics were applied as well as any discipline-specific characteristics, if applicable.

Table 4-10: Residual Effects Characteristics

Effects Characteristic	Definition	Description
Context	■ Ecological and social context ■ Timing of effect in relation to sensitive activities	■ Qualitative discussion ■ See description in **Discipline-Specific Characteristics**
Direction	■ Direction of change from existing conditions	■ Positive: net gain or positive effect ■ Neutral: no change to existing condition ■ Negative: net loss or adverse effect
Magnitude	■ Magnitude is the expected change from existing conditions	■ Negligible, low, medium, high ■ See description in **Discipline-Specific Characteristics**
Geographic Extent	■ The spatial area in which the effect is expected to occur	■ Construction Disturbance Area: effect is confined within the direct physical disturbance of the Project ■ Local: effect extends into the Local Study Area ■ Regional: effect extends into the Regional Study Area ■ Beyond Regional: effect extends beyond the Regional Study Area
Duration	■ The period of time in which the effect is expected to occur	■ Short-term: effect ends before the end of construction ■ Medium-term: the effect occurs during construction and ends soon after operation begins and / or maintenance ends soon after the activity causing the effect ends ■ Long-term: the effect occurs during construction and persists into operation and / or the effect is considered permanent or the likelihood of reversibility is low or uncertain
Frequency	■ How often the effect is expected to occur	■ Infrequent: the effect is expected to occur rarely ■ Frequent: the effect is expected to occur intermittently ■ Continuous: the effect is expected to occur continuously
Reversibility	■ The ability to return to existing conditions	■ Reversible: the effect is not permanent ■ Irreversible: the effect is permanent
Likelihood	■ Probability that the effect will occur	■ Unlikely: the effect is not likely to occur ■ Possible: the effect may occur, but is not likely ■ Probable: the effect is likely to occur ■ Certain: the effect will occur
Uncertainty	■ The potential for observed results to deviate from predictions	■ See description under **Section 4.4.2.7**

Effects Characteristic	Definition	Description
Direct / Indirect	■ Nature of the pathway through which the effect occurs.	■ Direct effects are typically immediate and spatially aligned with the activity. Indirect effects may be delayed or spatially removed but are causally linked and predictable.

4.4.2.5 Discipline-Specific Characteristics

In addition to the residual effects characteristics described in **Table 4-10**, the following discipline-specific characteristics were used to characterize the residual effects of the Project on and determine the significance of those effects on vegetation.

4.4.2.5.1 Ecological and Social Context

The context within which the Project's potential effects may occur was taken into account when considering the effects criteria. Effects criteria considered the physical characteristics of an effect (e.g., magnitude, geographical extent, duration), as well as the context-specific value characteristics (e.g., environmental, health, social and economic conditions). Context is considered one of the most critical factors when evaluating effects, and the effects assessment has considered potential or existing effects or pressures on social, economic, and health conditions affecting the sensitivity or resilience of a Valued Component.

Context for vegetation Valued Components considers plant species or ecosystem sensitivity and resilience, current status and trends, and applicable legislation and best management practices. The current and future sensitivity and resilience of vegetation Valued Components to change caused by the Project are considered and includes Indigenous Knowledge, where available. Context also informs whether the residual effect would alter the ability of the vegetation Valued Component population or ecosystem to be self-sustaining and ecologically effective (i.e., the determination of significance). Ecological context is discussed in a reasoned narrative with other characteristics such as magnitude, geographic extent, duration, reversibility, and probability of occurrence used to characterize residual effects (**Table 4-10**) and determine significance (**Section 4.4.2.6**).

4.4.2.5.2 Magnitude

Magnitude refers to the amount of change in an indicator relative to the existing conditions of a Valued Component and / or to known thresholds, standards or guidelines. Magnitude is categorized as negligible, low, moderate, or high using numeric quantification or qualitative expression and supported by the literature through a reasoned narrative. Integrating ecological context to understand the point at which a given magnitude is large enough to be critical for a Valued Component is directly linked to the self-sustaining and

ecologically effective status (i.e., function) of the ecosystem or population and therefore directly linked to significance (**Section 4.4.2.6**).

For magnitude, environmental discipline-specific descriptions are required and are provided in **Table 4-11**. These descriptions informed the reasoned narrative magnitude discussions. Magnitude of effects are Project-related and exclude variations due to climate change.

Table 4-11: Vegetation Magnitude Descriptions

Magnitude Level	Description	Rationale
Negligible	Limited to no variation predicted in the measurement indicators for vegetation Valued Components	Changes to ecosystems or populations are minor and largely **indiscernible**; therefore, no effect on ecosystem or population resilience.
Low	A small variation predicted in the measurement indicators for vegetation Valued Components	Minor incremental effects on ecosystems or populations are anticipated to be **discernible** but remain within the limits of ecosystem or population resilience.
Medium	A moderate variation predicted in the measurement indicators for vegetation Valued Components	Incremental effects on ecosystems or populations are anticipated to be **measurable** but is inferred to remain within the limits of ecosystem or population resilience.
High	A large variation predicted in the measurement indicators for vegetation Valued Components	Effects on ecosystems or populations are anticipated to be **severe** and likely to impair ecosystem or population resilience.

4.4.2.5.3 Wetland and Riparian Functional Assessment

Effects on wetland and riparian functions are difficult to quantify based on the data collected and the sizes of the Local Study Area and Regional Study Area. Therefore, a reasoned narrative was used to discuss the relative impacts on function based on the assessments of other disciplines, including physiography, surface water, groundwater, fish and fish habitat, wildlife, birds and ungulates.

4.4.2.6 Determination of Significance

A conclusion on significance was made using the characteristics described in **Section 4.4.2.4** and **Section 0** as well as by taking professional judgement into consideration.

The assessment of significance of residual effects of the Project was informed by the interaction between the residual effects characteristics, with magnitude, duration, and geographic extent being the most important factors, along with consideration of context. Consideration was also given to concerns of Indigenous communities, interested agencies, groups, and individuals raised during engagement.

The significance of adverse residual effects on vegetation Valued Components was evaluated using the assessment endpoints of self-sustaining and ecologically effective ecosystems and populations as significance thresholds. The significance of effects was predicted as a binary response, with effects classified as significant or not significant. Adverse residual effects were determined to be significant if the vegetation Valued Component is not expected to be self-sustaining or ecologically effective at the scale of the effects assessment Regional Study Area. The effects assessment Regional Study Area was defined at a scale suitable for the application of cumulative effects and management strategies for most terrestrial Valued Components; it is therefore an appropriate and relevant scale for evaluating ecosystem and population integrity for vegetation Valued Components.

Self-sustaining ecosystems are ecosystems that will be maintained into the future. They are healthy, functioning, and robust ecosystems that are capable of withstanding environmental change and accommodating stochastic processes (i.e., random or unpredictable changes in variables). Similarly, self-sustaining populations are not populations on the brink of extirpation (i.e., becoming locally extinct); they are healthy, robust populations with an ability to remain viable under changing environmental conditions and population processes (Reed et al., 2003). Ecologically effective ecosystems are those that can support the range of native species and ecological and evolutionary processes normally provided by the ecosystem (Noss, 1990). These processes vary by ecosystem type and are not easily quantified.

Most ecosystems can adapt to, or otherwise accommodate, some changes without altering the functional state of the system, and some changes, positive or negative, to ecosystem availability, distribution, or composition would have little effect on self-sustaining and ecologically effective ecosystems at scales typically considered for conservation planning (Swift and Hannon, 2010). However, the amount of change required to cause a significant adverse effect is heavily dependent on context, including ecological resilience and the effects of previous and existing developments on ecosystems. Both factors (i.e., adaptability and context) were considered when determining significance of the effects on vegetation Valued Components.

Ecosystem resilience is the capacity of an ecosystem to cope with disturbances without shifting into a qualitatively different state (Holling, 1973). A resilient ecosystem can tolerate change and, if disturbed, can renew itself. This renewal can be accelerated with reclamation practices. If an ecosystem has limited resilience, it is vulnerable to the effects of disturbance such that it may shift into a different state and become functionally different (Folke et al., 2004). Ecosystem resilience can vary by Valued Component, and this variation has important implications for assessing effects on ecosystem function (Peterson et al., 1998; Folke et al., 2004; Thompson et al., 2009).

Like ecosystems, plant populations can also adapt to disturbance through changes in physiology or reproductive characteristics (e.g., increased seed production) such that the integrity of the population remains unchanged. Adaptable species can accommodate substantial disturbance and sometimes thrive in highly modified environments, whereas species with low adaptability can accommodate little or no disturbance (Clarke et al., 2013; Elmqvist et al., 2003). As with ecosystems, plant populations exhibit variation in resilience or the ability to recover from disturbance. Highly resilient plant species may recover quickly, whereas species with low resilience recover more slowly or may not recover at all.

Resilience, adaptability, and existing conditions provide important ecological context for the determination of significance. Existing conditions represent the combined effects of previous and current human activities and natural factors that have shaped the observed condition or patterns of each Valued Component in the effects assessment Local Study Area and effects assessment Regional Study Area. These conditions represent the starting point for assessing Project effects and were considered as context to help define how close each Valued Component may be to its resilience limits when making the significance determination for the Project and reasonably foreseeable developments.

Critical thresholds, such as the amount or distribution of ecosystems required to maintain ecosystem function or the ability of an ecosystem to accommodate changes in condition, are rarely known with certainty for ecosystem Valued Components. Similar challenges exist in defining the threshold for the amount and distribution of habitat required for self-sustaining traditional use plant populations. Moreover, ecological thresholds vary by community composition, landscape type, and spatial scale (Environment Canada, 2013; Swift and Hannon, 2010).

A detailed and transparent account of whether the predicted effects from the Project and other developments would cause the defined significance threshold to be exceeded was prepared for each Valued Component by combining residual effects criteria, available scientific literature, data collected in the study areas, and logical reasoning (i.e., a weight of evidence or reasoned narrative approach). Using ecological context combined with residual effects criteria in a reasoned narrative, or rationale, to determine significance is a method accepted by the Impact Assessment Agency of Canada (IAAC, 2018).

Although significance was assigned to each interaction and associated measurement indictor(s), an overall determination of significance was provided. The relative and combined contribution of the effects from each interaction was used to determine the significance of potential adverse effects of the Project and other developments on a Valued Component in context of the associated assessment endpoint(s). The approach was based on a “weight of evidence” or an evaluation of the collective evidence considering the concepts described above, including the magnitude, geographic extent, duration, and likelihood of the effect, as well as resilience and adaptive capacity. Effects were predicted to be less harmful if the likelihood of the effect was unlikely as supported

by the assessment results and scientific studies. The relative effect from each interaction on a Valued Component and the assessment endpoint is discussed; however, interactions that were predicted to have the largest influence on the assessment endpoint were assumed to contribute the most to the determination of significance for the Valued Component. The weight-of-evidence approach included the process of assembling, weighing, and evaluating information to come to a scientifically defensible conclusion. Significance was generally as follows (with consideration of context):

- **Significant**: Residual effects are measurable at the ecosystem level and are likely to decrease resilience and increase the risk to the maintenance of a self-sustaining and ecologically effective ecosystem. Loss of habitat that causes permanent adverse changes at the ecosystem level would likely be significant. A significant effect may also result from direct loss and fragmentation of an ecosystem that reduces its function to the point that it disrupts (breaks) the connectivity of larger ecosystems. This approach applies to upland, wetland and riparian ecosystems. A population approach is applied for Traditional Use Plants, Species at Risk and Species of Conservation Concern Valued Components. Loss of habitat that causes permanent adverse changes to the survival and reproduction at the plant population level would likely be significant.
- **Not Significant:** Residual effects are measurable at the individual vegetation community and plant population level and are detectable at the ecosystem level, but are not likely to decrease resilience and increase the risk to a self-sustaining and ecologically effective Valued Component.

Confidence in the significance prediction was identified and discussed for vegetation Valued Components as part of the reasoned narrative. If the threshold for where a significant effect would occur in the range of potential values had high uncertainty (low prediction confidence), and if the effect could be assessed as significant or not significant, a precautionary approach was applied, and the effect was identified as significant. The greater the uncertainty, the earlier a significant effect would be identified on the continuum of cumulative change from the Project and Reasonably Foreseeable Developments, where applicable.

Considering the significance for each residual effect along with the context, an overall significance determination was completed for vegetation Valued Components.

4.4.2.7 Prediction Confidence and Uncertainty

Prediction confidence refers to the degrees of certainty in the predicted residual effects and associated determination of significance. All Impact Assessments involve some level of uncertainty, often over many geographic, biophysical, and social dimensions, and observed results may deviate, to some degree, from predictions made in the assessment. Therefore, the residual effects predictions vary in their level of certainty, which could be related to a number of factors such as Project design and components, existing conditions,

spatial and temporal scope, Valued Component response, effectiveness of mitigation measures, overall scope of factors considered, and natural and human-induced influences on the biophysical and human environment. Accuracy of the data (e.g., vegetation mapping) used for the assessment also influences prediction confidence and has been considered for this assessment.

Transparency in describing sources of uncertainty is critical to understanding the confidence that can be attributed to the analysis of effects and is important to decision-making. Efforts to address uncertainties have been focused on those uncertainties that are most meaningful to decision-making, such as how the biophysical and human environment will respond to changes and the efficacy of mitigation measures. Each potential residual effect was assigned a confidence level as a means of ranking potential effects and vegetation Valued Components.

The confidence levels are defined as:

- **Low**: Confidence levels were considered to be low if there were no baseline data available and the ecology of the Valued Component is poorly understood, habitat models are based on assumptions with little to no field data or scientific literature, the Project-related effects are poorly understood, and the level of certainty associated with the effectiveness of proposed mitigations is low or unknown;
- **Moderate**: Confidence levels were considered to be moderate if there were baseline data for much of the study area and the ecological knowledge of the Valued Component is adequate to generate habitat models with confident assumptions and predictions supported by literature, the Project-related effects are mostly understood, and the level of certainty associated with the effectiveness of proposed mitigations is moderate to high; and
- **High**: Confidence levels were considered to be high if there were baseline data for almost all of the study area and the ecology of the Value Component is well known generating statistically and ecologically robust habitat models and effects predictions, the Project-related effects are clearly understood, and the level of certainty associated with the effectiveness of proposed mitigations is high.

Uncertainty in the assessment was reduced by:

- Rolling-up the vegetation mapping from ecosites to vegetation community groupings for ecosystem-level indicators where possible (i.e., uplands and wetlands) and completing the cumulative effects assessment on these groupings;
- Completing quality assurance and quality control of baseline data; and
- Comparing assessment results to relevant published scientific literature.

These uncertainties were managed using a number of conservative assumptions including:

- Applying conservative assumptions regarding the footprint area and related project activities that may cause disturbance or direct vegetation loss to increase confidence that the effects were not underestimated.

The levels of uncertainty are defined as:

- **Low:** Uncertainty was considered to be low if there was baseline data for almost all of the study area and the ecology of the Valued Component is well known, generating statistically and ecologically robust habitat models n effects predictions, the Project-related effects are clearly understood, and the level of certainty associated with the effectiveness of proposed mitigations is high;
- **Moderate**: Uncertainty levels was considered to be moderate if there were baseline data for much of the study area and the ecological knowledge of the Valued Component is adequate to generate habitat models with confident assumptions and predictions supported by literature, the Project-related effects are mostly understood, and the level of certainty associated with the effectiveness of proposed mitigations is moderate to high; and
- **High**: Uncertainty was considered to be high if there were no baseline data available and the ecology of the Valued Component is poorly understood, habitat models are based on assumptions with little to no field data or scientific literature, the Project-related effects are poorly understood, and the level of certainty associated with the effectiveness of proposed mitigations is low or unknown.

Discussion is provided on how uncertainty was addressed to increase the level of confidence so that residual effects will not be worse than predicted.

4.4.2.8 Deviations from Tailored Impact Statement Guidelines

Project effects for vegetation were not classified using all criteria described in the *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada 2020). Most of the criteria outlined in the *Tailored Impact Statement Guidelines* are obtained from *NatureServe Conservation Status Assessment: Factors for Evaluating Species and Ecosystem Risk* (Master et al., 2012). Although the criteria presented in NatureServe (Master et al., 2012) are useful for assessing and assigning the conservation status of species at risk from different threats, these criteria are less appropriate for characterizing residual effects in an Environmental Assessment. For example, characterizing magnitude using an ordinal scale (i.e., low, moderate, or high) in a manner meaningful for vegetation Valued Components requires that the effect size be placed in the ecological context of the criterion, such as resilience, adaptability, and amount of existing disturbance. Universal effect size boundaries, such as a 20% change at the effects assessment Regional Study

Area scale used to define a high magnitude effect, work poorly because they fail to consider ecological context. A 20% additional habitat loss from the Project relative to existing conditions in the effects assessment Regional Study Area may be required to cause a high magnitude effect on some vegetation Valued Components, whereas a 2% habitat loss may be sufficient for others, depending on ecological context (British Columbia Environmental Assessment Office, 2013).

It is important to note that although not all the criteria and methods of combining criteria (i.e., matrices) outlined in *Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020) were not explicitly applied in this Report, the criteria are captured in the residual effects characterization for vegetation Valued Components. For example, elements of "scope" and "severity" are used in the characterization of magnitude, geographic extent, and duration (**Table 4-10**). In addition, severity is captured through the inclusion of resilience and adaptive capacity of Valued Components, which provide necessary context for understanding the damage or disruption to species and ecosystems. Irreversibility / permanence is also a criterion used to describe and assess residual effects in this report (**Table 4-10**). The "degree of effect" criterion in the *Tailored Impact Statement Guidelines* is not classified in this report but is incorporated into the reasoned narrative for the characterization of residual effects and determination of significance (**Section 0**).

4.4.3 Assessing Cumulative Effects

4.4.3.1 Definitions

The Impact Assessment Agency of Canada defines **Cumulative effects** as "changes to the environment, health, social and economic conditions, as a result of the Project's residual environmental, health, social and economic effects combined with the existence of other past, present and reasonably foreseeable physical activities, as well as within activities of the Project itself from multiple emissions and discharges (e.g., simultaneous operations) to understand synergistic or additive effects" (Impact Assessment Agency of Canada, 2020). Cumulative effects may result if:

- The implementation of the Project has the potential to cause direct residual adverse effects on the Valued Components, considering the application of technically and economically feasible mitigation measures; and
- The same Valued Component may be affected by other past, present and future physical activities.

A cumulative effect on an environmental, health, social, or economic component may be important even if the Project's effects on this component by themselves are minor. The method for assessment of cumulative effects is consistent with the *Tailored Impact Statement Guidelines*, *Operational Policy Statement: Assessing Cumulative Environmental Effects* under the *Canadian Environmental Assessment Act*, 2012 (Canadian

Environmental Assessment Agency, 2013), and the *Interim Technical Guidance for Assessing Cumulative Environmental Effects* under the *Canada Environmental Assessment Act*, 2012 (Canadian Environmental Assessment Agency, 2018). The identification and assessment of cumulative effects will be undertaken as follows:

- Identify and assess the residual effects of the Project;
- Define the spatial and temporal boundaries for cumulative effects based on the residual effects predicted;
- Identify other past, present, and reasonably foreseeable activities with effects likely to overlap in type of effect (i.e., Valued Component), temporally, and spatially with the predicted residual effects of the Project; and
- Predict potential cumulative effects and identify additional mitigation.

4.4.3.2 Cumulative Effects Scoping

4.4.3.2.1 Valued Components with Residual Effects

The cumulative effects assessment builds on the results of the residual effects assessment described in **Section 4.4.2** and will consider the incremental changes that are predicted to have a likely residual adverse effect on a Valued Component. The Valued Components that do not have a residual effect predicted, or the residual adverse effect is of negligible magnitude and unlikely or possible to occur, or positive in direction, will not be carried forward into the cumulative effects assessment. All residual effects on Valued Components identified will be brought into the cumulative effects assessment. The rationale for the exclusion of Valued Components from the cumulative effects assessment will be provided.

4.4.3.2.2 Temporal and Spatial Boundaries

Temporal boundaries, as described in **Section 4.2.1,** correspond to the duration that the likely residual adverse effects of the Project are predicted to occur. *The Tailored Impact Statement Guidelines* (Impact Assessment Agency of Canada, 2020) indicate the cumulative effects assessment should look at potential effects throughout the life cycle of the Project, including decommissioning and abandonment; however, there are currently no plans to decommission the Project. Therefore, this assessment is limited to identifying and assessing cumulative effects during the Project Construction and Operations and Maintenance Phases.

Spatial boundaries, which are the study area(s) within which the geographic extent of cumulative effects will be studied, may vary by each Valued Component selected (e.g., caribou). Finalization of the boundaries were informed through consultation with Indigenous communities, agencies and interested persons. The spatial boundaries used to assess cumulative effects are described in **Section 8.1.2**.

The Characteristics described in **Section 4.4.2** for the residual effects assessment have also been used to determine significance of cumulative effect, a summary of these is described in **Table 4-10**.

4.4.3.2.3 Identification of Past, Present, and Reasonably Foreseeable Developments

Activities that will be considered in the cumulative effects assessment will include other past and existing anthropogenic (i.e., human-made) developments and future activities that are reasonably foreseeable. For an activity to be considered foreseeable and included in the cumulative effects assessment, sufficient information about the activity must be available to make a reasonable assessment of its potential effects (i.e., in the planning / approvals / design stage). This included induced development that is certain or reasonably foreseeable and activities with additive effects where appropriate (Canadian Environmental Assessment Agency, 2018). Reasonably foreseeable activities that will not be considered are those for which formal plans have not been publicly disclosed and information is not available.

For a potential future project to be considered in the cumulative effects assessment, preliminary information such as activity description, activity size, footprint, project components, and anticipated timelines need to be identified. This information will help to evaluate if the Project and the potential future project will overlap. The full list of past, present and reasonably foreseeable developments considered in the cumulative effects assessment is presented in the *Environmental Assessment / Impact Statement Report.*

To determine which past, present and reasonably foreseeable developments and their activities should be considered in the vegetation cumulative effects assessment, the following questions will be answered. If effects of the activities of the Projects are expected to overlap in type, time, and space with the residual effects of the identified Valued Components, it will be assumed that those activities will act cumulatively and be assessed for cumulative effects with the Project.

- Do the project's activities overlap in the type of effects (e.g., permanent removal of vegetation)?
- Do the project's activities overlap in the timing of effects (i.e., do they overlap with the cumulative effect spatial boundaries with the identified residual effects)?
- Do the project's activities overlap in the location of effects (i.e., do they overlap with the cumulative effect temporal boundaries)?

Furthermore, Valued Components that did not have a residual effect predicted, or the residual effect is of negligible magnitude, unlikely or possible to occur, or positive in direction, the effect was not carried forward into the cumulative effects assessment.

4.5 Identify Monitoring Programs and Future Commitments

Following the residual and cumulative effects assessments, effects monitoring programs are recommended to verify the prediction of the effects assessment and the effectiveness of the mitigation measures presented in this report. Commitments made in this report are also presented to support compliance monitoring to evaluate whether the Project has been constructed, implemented, and operated in accordance with the commitments made.

4.6 Predicting Future Conditions

To predict future conditions for the vegetation Valued Components, an assessment of the level of pre-existing disturbance versus new disturbance has been assessed. Both natural and anthropogenic disturbances were included as existing disturbance. Natural disturbances included fire and blowdown areas while anthropogenic disturbances included harvest areas, roads, camps, and trails (**Section 5.10**). This assessment has included a qualitative review of landscape fragmentation prior to Project development and predicted effects post-development.

4.7 Data Management and Analysis

Data management including quality assurance / quality control has been employed to minimize potential for data entry and analysis errors, prepare datasets for analysis and limit sensitive data distribution in accordance with established agreements.

4.7.1 Field Surveys

To maintain consistency and for quality assurance / quality control of the data collected, standardized datasheets (either digital or paper) paired with mapping software were used in the field. Field studies followed technical protocols that outlined specific work instructions and were developed to follow federally and provincially acceptable methods. Completeness and accuracy of field data were verified daily during field verification and field photos, and coordinate information was backed up regularly.

4.7.2 Geographic Information Systems

Where existing conditions data are available in Geographic Information Systems format, this information will be provided to the Impact Assessment Agency of Canada as electronic geospatial data file(s) compliant with the International Organization for Standardization 19115 standard. This will support the Government of Canada’s commitment to Open Science and Data and will facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government’s Open Science and Data Platform. The Impact Assessment Agency of Canada intends to make the

geospatial data files available to the public under the terms of the Open Government Licence – Canada as applicable with exclusion of sensitive species at risk and Indigenous Knowledge.

Complete datasets from all survey sites will be provided upon finalization of this report. They will be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation / visit information and with observations and measurements in un-summarized form. Databases and Geographic Information Systems files will be accompanied by detailed metadata that meets International Organization for Standardization 19115 standards. Documentation and digital files will be provided for all results of analyses that allow for a clear understanding of the methods and a replication of the results. All geographic data, along with accompanying metadata, pertaining to species at risk will be provided to Natural Heritage Information Centre and the Ministry of the Environment, Conservation and Parks - Species at Risk Branch.

5. Existing Conditions

The existing conditions are described based on a combination of information obtained through engagement and consultation, desktop assessment, field investigation, and modelling.

5.1 Landscape Ecology

The Project intersects two of Ontario's three ecozones: the Ontario Shield and the Hudson Bay Lowlands (Crins et al., 2009). The western portion of the existing conditions Local Study Area occurs within the Ontario Shield ecozone which extends north beyond the existing conditions Local Study Area by approximately 250 km, west approximately 585 km to Manitoba, southeast 200 km, and east to Quebec. The northeastern portion of the existing conditions Local Study Area occurs in the Hudson Bay Lowlands ecozone which extends north to Hudson Bay, west to northern Manitoba, and east to James Bay (Oji-Cree translation, *wee-nee-peg-kook;* **Figure 5-1**).

Separating the two ecozones is the interface between the Precambrian Shield underlying the Ontario Shield ecozone and the Paleozoic bedrock of the Hudson Bay basin underlying the Hudson Bay ecozone (ESWG, 1996; Crins et al., 2009). Approximately 85% of the existing conditions Local Study Area occurs in the Ontario Shield ecozone, and 15% occurs within the Hudson Bay lowlands. However, much of the existing conditions Local Study Area contained within the Ontario Shield ecozone has similar geomorphological characteristics to the Hudson Bay Lowlands as outlined below.

5.1.1 Ontario Shield Ecozone, Ecoregions, and Ecodistricts

The Ontario Shield Ecozone is subdivided into nine ecoregions. The majority of the existing conditions Local Study Area is located within Ecoregion 2W (Big Trout Lake) (**Figure 5-1**)**.** Ecoregion 2W (Big Trout Lake) has a cold and dry climate with long winters and cool summers. The underlying geology in 2W is characterized as granite or gneiss of the Precambrian Shield. The surficial geology is a result of glacial processes that produced numerous moraines, exposed bedrock, as well as silt and clay deposits associated with glacial Lake Agassiz. The resulting topography is relatively flat with low ridges. The soil layer in 2W is largely organic in nature, consisting of peat and organic materials where drainage is poor, while a small proportion of well drained areas consist of brunisols (Crins et al., 2009). Sparse forest, conifer (Oji, Cree translation, *shigobiig*) forest, and mixedwood dominates the landcover in 2W with small pockets of hardwood forest occurring naturally along large river valleys (Crins et al., 2009). Almost a third of 2W is covered by wetlands or waterbodies consisting mainly of open water and treed bog. Burns make up nearly a tenth of 2W, the highest proportional percentage in Ontario (Crins et al. 2009). Extensive tracts of upland and lowland Black Spruce (Oji-Cree translation, *shikobaatik*) (*Picea mariana*)

occur in this ecoregion; however, in stands with adequate drainage Jack Pine forms monocultures or mixedwood stands often with Trembling Aspen (Oji-Cree translation, *apijih pakoosh*) (*Populus tremuloides*) and White Birch (Rowe, 1972).

At a finer scale, the existing conditions Local Study Area intersects Ecodistricts 2W-2 and 2W-3. The existing conditions Local Study Area lies mostly within the southern portion of 2W-2 (Kasabonika Lake) which is dominated by conifer forests and the primary substrate is organic deposits over calcareous material (Crins et al., 2009; Wester et al., 2018). The southern end of 2W-3 (Wunnumin Lake) is characterized as having exposed bedrock occasionally covered in a thin layer of mineral material; conifer forest is dominant (Crins et al., 2009; Wester et al., 2018).

5.1.2 Hudson Bay Lowlands Ecozone, Ecoregions, and Ecodistricts

The Hudson Bay Lowlands Ecozone is subdivided into six ecoregions. The existing conditions Local Study Area bisects a portion of the western corner of Ecoregion 2E (James Bay Ecoregion) of the Hudson Bay Lowlands Ecozone (**Figure 5-1**). Ecoregion 2E is characterized by its cold and humid climate, high proportion of wetlands, and limited productive forest (Crins et al., 2009). Peatlands, including treed and open fen and bog, dominate more than half of the 2E landscape. Productive forest within the ecoregion is predominantly limited to conifer stands near large watercourses that contribute to the accumulation of mineral soils (Crins et al., 2009). Open water features are not prominent in 2E and are mainly represented as rivers and streams. Fires in this ecoregion tend to be small and low in frequency and distribution due to the predominance of wet organic substrates and an inherently cool humid climate (Crins et al., 2009). Vegetation cover is dominated by Black Spruce with scattered occurrences of Tamarack (*Larix larincina*) in intermediate to rich fen ecosites (Crins et al., 2009).

At a finer scale, the northeastern portion of the existing conditions Local Study Area enters Ecodistrict 2E-1 (Albany River) and just touches the northwestern border of 2E-4 (Lower Kenogami River) in the western portion of 2E. Ecodistrict 2E-1 is a level landscape composed mostly of fen and bog complexes, occasionally interspersed by conifer dominant forests. 2E-4 is relatively uniform with peatlands and little topographic relief (Wester et al., 2018).

2E-1

2E

2W-2

2E-4

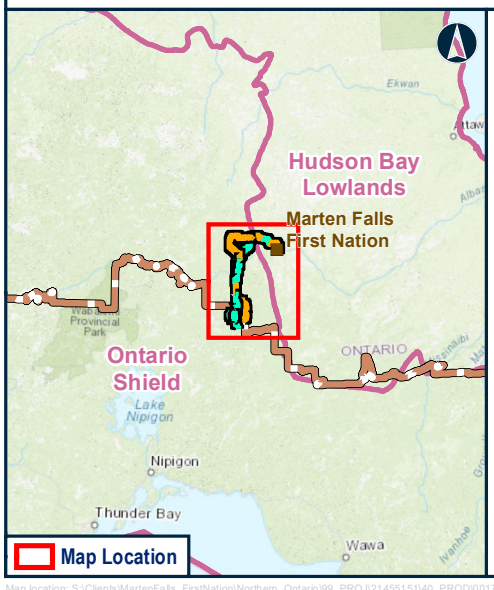
2W

2W-3

ALBANY RIVER PROVINCIAL PARK

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE
- ECOREGION

Ecodistrict

- 2E-1
- 2E-4
- 2W-2
- 2W-3

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Landscape Context: Ecozones, Ecoregions and Ecodistricts

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:450,000 * when printed 11"x17"
Rev:0	

Figure 5-1

Contains information provided by Ontario Ministry of the Environment, Conservation and Parks or by Ontario Ministry of Natural Resources and Forestry (Copyright: King's Printer of Ontario 2023), through a Sensitive Data License Agreement. This drawing has been prepared for use of AECOM client and may not be reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM express written consent. The use of Sensitive Data in this drawing does not constitute an endorsement by the Ministry for this drawing or by AECOM of the Sensitive Data.

Map location: S:\Clients\MartenFalls_FirstNation\Northern_Ontario\99_PROJ\21455151\40_PROD\017_Vegetation_EC_Reporting\21455151-0017-RT-0005_5-1.mxd
Date Saved: 10/11/2024 3:33:09 PM User Name: INGU06951

5.1.3 Desktop Vegetation Community Mapping

The desktop vegetation community mapping prepared by KBM Resources Group (2021), in association with the WSP soils and terrain specialists, produced a digital map for Project use. The full existing conditions Local Study Area was delineated to ecosite level, with a total of 15,027 polygons delineated and classified to ecosite (including water and anthropogenic polygons). Ecosites were refined from the initial desktop vegetation community mapping through a combination of field investigations as described in **Section 4.3.2,** and from field and desktop investigations further detailed in the *Peatlands Existing Conditions & Effects Assessment Report* (WSP & AECOM 2026).

5.1.4 Field Investigation Distribution and Coverage

A detailed summary of the distribution and coverage of the vegetation survey sites completed during the 2021 through 2023 field programs is outlined in **Table 5-1** through

Table 5-3 and can be found in **Attachment B**. These tables provide the level of effort for ecosite verification at ground inspection sites, visual checks completed during aerial (helicopter) surveys, and visual checks completed through photo interpretation from site photos taken during wildlife surveys. There was a total of 481 vegetation survey sites visited, including 90 ground inspection sites, 316 visual checks (aerial surveys) and 75 visual checks (photo interpretation). Survey sites were distributed between the existing conditions Construction Disturbance Area and existing conditions Local Study Area, and included representative ecosites within upland, wetland, and riparian ecosystems. No field surveys were completed in the existing conditions Regional Study Area.

Table 5-1: Vegetation Field Investigations – Ground Inspections

Year	Field Dates	Upland	Wetland	Riparian	Total
2021	September 19, 21-29 (10 days)	10	6	8	**16**
2022	July 13-18 and 22 (7 days)	14	5	11	**30**
2023	June 15, 17 and 18 (3 days)	1	10	0	**11**
2023	August 3-5 (3 days)	0	18	7	**25**
Total		**25**	**39**	**26**	**90**

Table 5-2: Vegetation Field Investigations – Visual Checks (Aerial)

Year	Field Dates	Upland	Wetland	Riparian	Total
2021	September 19, 21-29 (10 days)	34	32	32	**98**
2022	July 13-18 and 22 (7 days)	43	33	22	**98**
2023	June 15, 17 and 18 (3 days)	28	52	9	**89**
2023	August 3-5 (3 days)	3	27	1	**31**
Total		**108**	**144**	**64**	**316**

Table 5-3: Vegetation Field Investigations – Visual Checks (Photo Interpretation)

Year	Photograph Dates	Upland	Wetland	Riparian	Total
2022	June 1-10 and August 10-13	34	41	0	**75**

5.2 Vegetation Communities

5.2.1 Upland / Wetland Ecosystems Overview

The existing conditions Local Study Area is dominated by wetland ecosystems, with 73% (145,206.9 ha) mapped as wetland communities. Upland ecosystems represent 23% (45,193.5 ha) of the existing conditions Local Study Area, with water representing a further 4% (7,506.9 ha), and anthropogenic (human-altered) lands representing <1% (53.0 ha). It should be noted that a larger number of hectares (411.7 ha) of anthropogenic disturbance was identified during the disturbance analysis using a separate set of desktop data sources (**Section 5.10**); however, both methods yielded a result of <1% of the total existing conditions Local Study Area. **Figure 5-2** presents the availability of uplands and wetlands within the existing conditions Local Study Area and in the existing conditions Regional Study Area for broader context. **Figure 5-2** displays the distribution of wetland and upland ecosystems within the existing conditions Local Study Area.

As can be seen by the predominance of blue shading on **Figure 5-2, plates 3** through **7**, the highest concentration of wetlands is in the northern portion of the existing conditions Local Study Area, north of Dusey Lake (Oji-Cree translation, *atikameko zakaihkan*), which is close to the boundary between Ecodistricts 2W-2 and 2W-3. Likewise, **Figure 5-2, plates 1** and **2** have more green shading, illustrating greater prominence of upland ecosystems south of Dusey Lake (i.e., within Ecodistrict 2W-3). This is consistent with the characteristics of Ecodistrict 2W-3 which is dominated by coniferous forests in the south

part of the Ecodistrict, in contrast with Ecodistricts 2W-2, 2E-2, and 2E-4, which are dominated by wetlands (Wester et al., 2018).

The transition between Ecodistricts 2W-3 and 2W-2 is also marked by a transition from shallow mineral substrates in 2W-3 to deeper, typically organic substrates in 2W-2 (Wester et al., 2018).

Table 5-4: Availability of Upland and Wetland Ecosystems Within the Existing Conditions Study Areas

Ecosystem	Local Study Area (ha)	% Local Study Area	Regional Study Area (ha)	% Regional Study Area
Upland	45,193.5	23%	112,456.9	19%
Wetland	145,206.9	73%	397,319.8	68%
Water	7,506.9	4%	31,359.3	5%
Anthropogenic	53.2	<1%	46,624.1	8%
Other	N/A	N/A	2.0	<1%
Total	**197,960.5**	**100%**	**587,762.0**	**100%**

ha = hectare; % = percent; < = less than; N/A = not applicable. Note: The Far North Land Cover Data Specification Version 1.4 document (Ministry of Natural Resources and Forestry, 2014) defines “Other” as “cover features that were not classified for a variety of reasons”.

5.2.2 Ecosite and Vegetation Community Mapping Accuracy

Upland and wetland ecosystem mapping is based on a combination of desktop pre-typed polygons and field-verified polygons. Ecosite classifications that were changed based on visual and ground investigations were updated in the digital mapping. Although the field-verified ecosites represent a very small proportion of the polygons in the existing conditions Local Study Area, these corrections helped to ensure that revised mapping and analyses would be based on the best available information.

As noted in **Attachment B**, based on a confusion matrix analysis of the field-verified sites, the following was determined:

- 75% of the desktop communities mapped as upland were field verified as upland;
- 30% of desktop pre-typed upland ecosites were correct based on field verification (i.e., exact ecosite match);
- For incorrect upland ecosite matches that were still field verified as upland communities:

  - 58% had the correct cover type (e.g., conifer vs. conifer) but differing species composition, or soil moisture.
- 95% of polygons that were pre-typed as wetland were confirmed to be wetland;
- 35% of polygons that were pre-typed as wetland were correct based on field verification (i.e., exact match); and
- For incorrect ecosite matches that were still field verified as wetland communities:
  - 56% had the correct wetland type (i.e., communities mapped as either bog, fen, or marsh at desktop were field verified as one of these communities as well).

Given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analysis purposes, ecosites were rolled up into five upland vegetation community groupings (i.e., coniferous forest, deciduous forest, mixed forest, rock / barren, and early successional / sparse treed ecosites) and four wetland vegetation community groupings (i.e., swamp, marsh, bog, and fen). The results of the field-verification process summarized above, further support the decision to roll up the ecosites to broader vegetation community groupings. Rolling up to the broader groupings also allowed the existing conditions Regional Study Area to be mapped consistently with, and at the same level of detail as, the existing conditions Local Study Area since the vegetation community groupings correspond to categories in the Ontario Landcover Compilation Version 2.0.

Ecosites were further refined in 2024 through a combination of field and desktop investigations further detailed in the *Peatlands Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP & AECOM, 2026). This resulted in an additional 267 changes in ecosite type for upland ecosystems and 2052 changes in ecosite type for wetland ecosystems.

For greater confidence in the existing conditions results, these are primarily reported based on vegetation community groupings rather than ecosites. However, Traditional Use Plants, Species at Risk and Species of Conservation Concern habitat suitability assessments are based on ecosite types. As a result, prediction confidence in these later assessments is generally lower. As discussed in **Attachment B**, mapping accuracy was high for swamps and deciduous forest (i.e., greater than 70%), so habitat assessments for species with swamp or deciduous forest habitat preferences have higher confidence than for species with bog, marsh or mixed forest habitat preferences, which had low mapping accuracy (i.e., less than 35%). Coniferous forest and fen had a moderate mapping accuracy (i.e., 45-60%), and prediction confidence of habitat assessments for species with coniferous forest or fen habitat preferences is considered as moderate.

HARROGATE LAKE
MCCAW LAKE
OGOKI RIVER
ESSER LAKE
PAINTER LAKE
DEBAERE LAKE
ORVISS LAKE
COLPITTS LAKE
BURY LAKE
PIGMENT LAKE
CRONY LAKE
RENWICK LAKE
ZURBRIGG LAKE
BURNABY LAKE
KAPIKOTONGWA RIVER
SAGA LAKE
PERCY LAKE
LITTLE CURRENT RIVER
JUNGFRAU LAKE
LITTLE JUNGFRAU LAKE
FARRELL LAKE
MURIEL RIVER
RUNWAY LAKE

Hudson Bay Lowlands
Ontario Shield
Ekwan
Attawapiskat
Albany
Wabakimi Provincial Park
ONTARIO
Lake Nipigon
Nipigon
Thunder Bay
Wawa
Map Location

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-2.1

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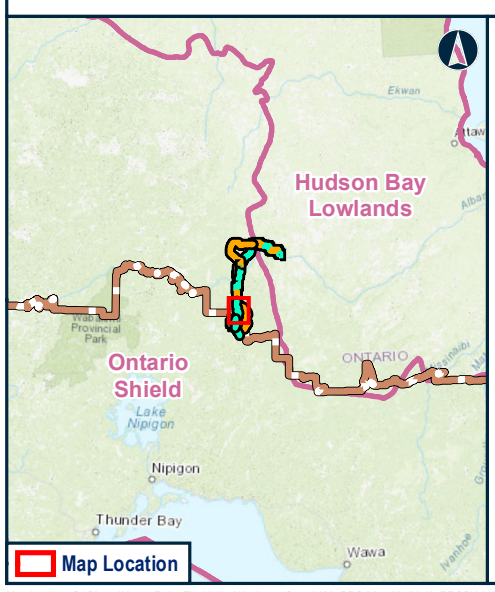
Date Saved: 10/11/2024 3:32:02 PM User Name: INGU06951

DUSEY LAKE
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
PATIENCE LAKE
OGOKI RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

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Figure 5-2.2

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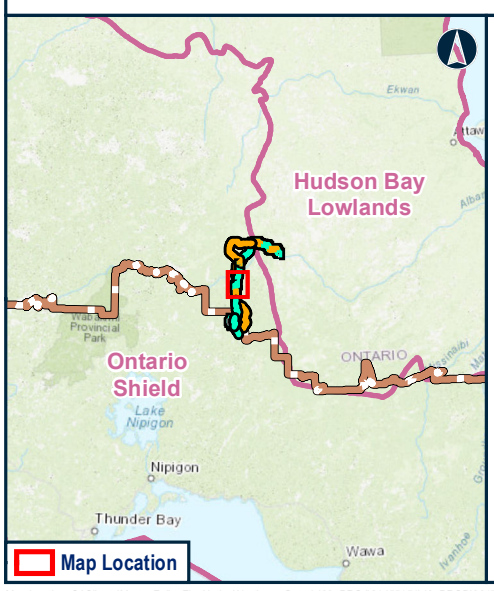
TEABEAU LAKE
ALBANY RIVER
TOLFREE LAKE
SUWALA LAKE
DUSEY LAKE
DUSEY RIVER
TANASE LAKE



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

0 — 2.25 — 4.5
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Figure 5-2.3

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WABASSI RIVER

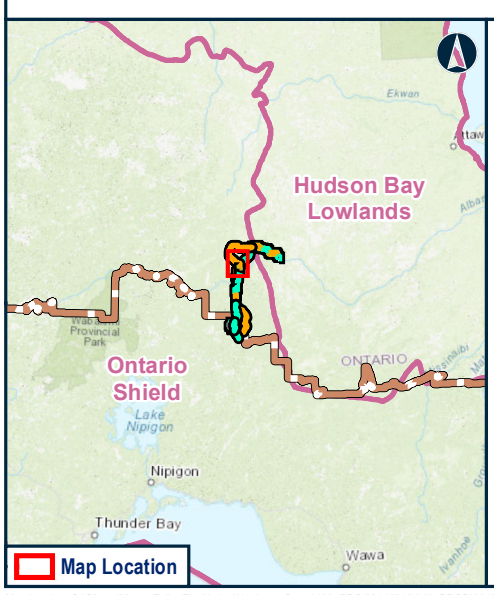
VENTON LAKE

MAXEY LAKE

TREBELL LAKE

SAARIMAKI LAKE

ALBANY RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

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Figure 5-2.4

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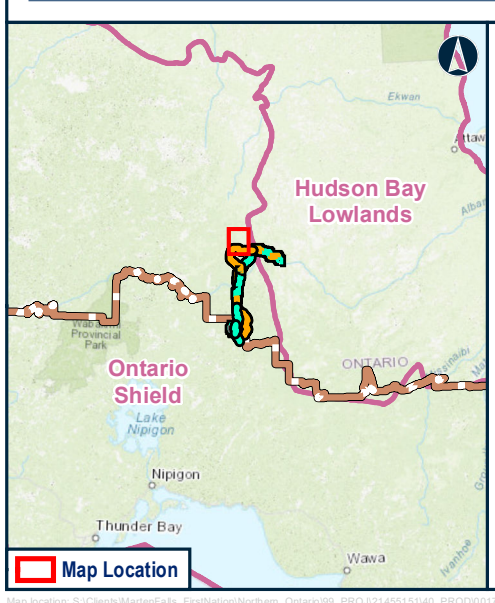
GARVEY LAKE

SLADE LAKE

MABIE LAKE

OXTOBY LAKE



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CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

0 — 2.25 — 4.5
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Figure 5-2.5

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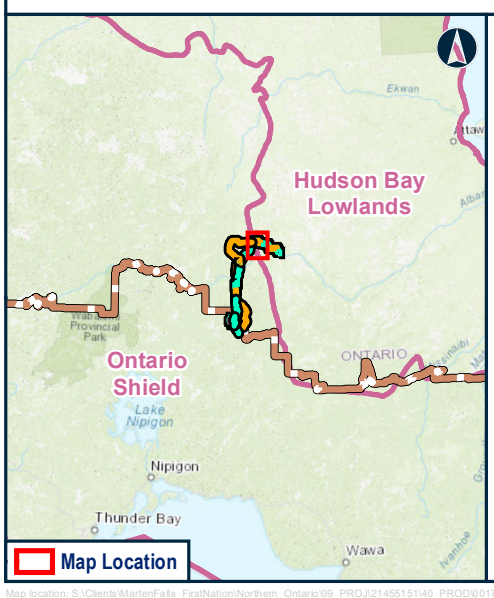
GURDEN LAKE

GITTINS LAKE

WABASSI RIVER

ALBANY RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

0 — 2.25 — 4.5
Kilometres

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Figure 5-2.6

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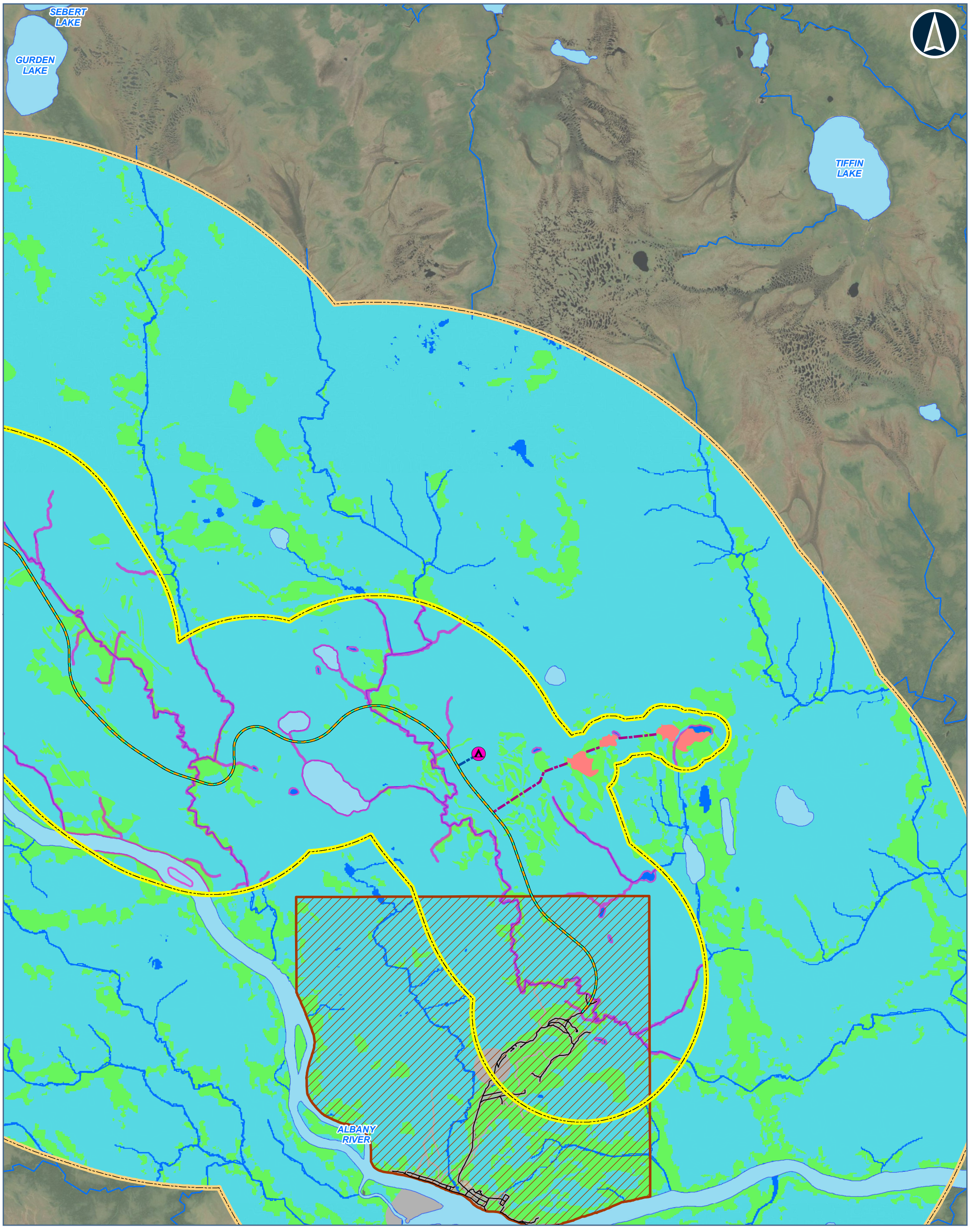

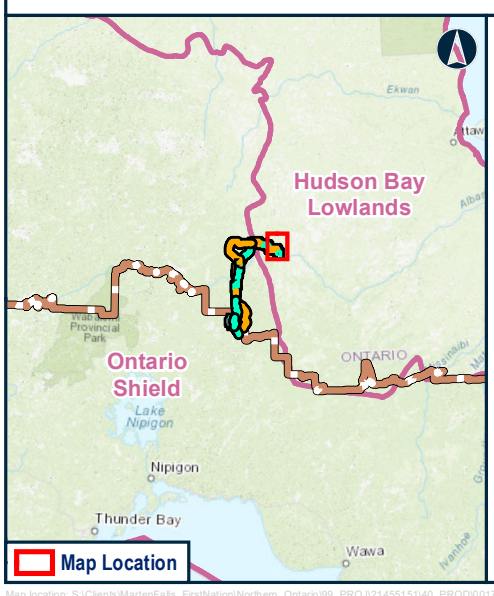

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA
- REGIONAL STUDY AREA

Data Source:
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Aerial photography provided by:
Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Upland Ecosystems, Wetland Ecosystems and Riparian Ecosystems

0 — 2.25 — 4.5
Kilometres

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Figure 5-2.7

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5.3 Upland Ecosystems

Through the desktop ecosite mapping and field verification, a total of 31 upland ecosite types were identified within the existing conditions Local Study Area. Ecosite count does not include ecosite modifiers. For example, B055Tt is not counted separately from B055Tl. Given the scale of the Project and the limitations identified in the desktop ecosite mapping exercise, for mapping and analyses purposes, ecosites have been rolled up into five upland vegetation community groupings as outlined below. See **Attachment B** for further information about the ecosites in each of these five upland vegetation community groupings:

- Coniferous forests;
- Deciduous forests;
- Mixed forests;
- Rock / barren; and
- Early successional / sparse treed.

5.3.1 Availability

The availability (i.e., area) of the five upland vegetation groupings within the existing conditions Local Study Area and the existing conditions Regional Study Area is summarized in **Table 5-5** and illustrated on **Figure 5-2**.

Table 5-5: Upland Vegetation Groupings in the Existing Conditions Study Areas

Upland Community	Local Study Area (ha)	% Local Study Area uplands	% Local Study Area	Regional Study Area (ha)	% Regional Study Area Uplands	% Regional Study Area
Coniferous Forest	39,212.8	87%	20%	83,886.2	75%	14%
Deciduous Forest	5,408.4	11%	3%	11,927.5	11%	2%
Mixed Forest	312.6	<1%	<1%	15,383.4	14%	3%
Rock / Barren	182.6	<1%	<1%	194.6	<1%	<1%
Early Successional / Sparse Treed	77.1	<1%	<1%	1,065.1	<1%	<1%
Total	**45,193.5**	**100%**	**23%**	**112,456.9**	**100%**	**19%**

ha = hectare; % = percent; < = less than.

Coniferous Forest communities dominate both the existing conditions Local Study Area and Regional Study Area upland vegetation groupings at 87% and 75%, respectively, which represents 20% of the existing conditions Local Study Area and 14% of the existing conditions Regional Study Area. Deciduous Forests are the next most common upland community in the existing conditions Local Study Area at 11% of the upland vegetation groupings and 3% of the existing conditions Local Study Area. The remaining three upland vegetation groupings each comprise less than 1% of the upland communities, and together represent less than 1% of the Local Study Area. A description of the dominant upland ecosites in the existing conditions Local Study Area is found in **Attachment B**.

In the existing conditions Regional Study Area, Mixed Forests are the second most common upland community at 14% of the upland vegetation groupings (representing 3% of the existing conditions Regional Study Area), followed by Deciduous Forest at 11% of the upland vegetation groupings (representing 2% of the existing conditions Regional Study Area). The remaining two upland vegetation groupings each comprise less than 1% of the upland communities, and together represent less than 1% of the existing conditions Regional Study Area.

Upland vegetation cover within the existing conditions Study Areas is generally representative of upland vegetation cover within Ecoregions 2E (James Bays) and 2W (Big Trout Lake). Coniferous forests are a large component of the upland ecosystems in those ecoregions, specifically, they are the most abundant forest class comprising 13% of Ecoregion 2E and 19% of Ecoregion 2W. However, sparse forests and mixed forests are generally more common in these two ecoregions than has been mapped in the existing conditions Study Areas. For example, sparse forest covers 7% of Ecoregion 2E and 21% of Ecoregion 2W, while mixed forests cover 8% of Ecoregion 2W (Crins et al., 2009)[1].

5.3.2 Distribution

The Distribution of upland ecosystems within the existing conditions Study Areas is illustrated in **Figure 5-2** and **Figure 5-3**. Generally, upland ecosites are found throughout the existing conditions Study Areas, but are more frequent south of Dusey Lake, as can be seen at a glance by the dominance of green shading on **Figure 5-2**, **plate 1** and **plate 2**. Likewise, coniferous forest communities are most common in the southern portion of the existing conditions Local Study Area, with deciduous forest communities also present (See **Figure 5-3**, **plate 1** and **plate 2**).

[1] Comparison between vegetation community availability within the Local Study Area with the vegetation community availability of the corresponding Ecoregion and Ecodistrict must take into consideration that the Local Study Area falls within a very small proportion of each of the Ecoregion and Ecodistricts being discussed. Therefore, variation is expected.

The southern portion of the existing conditions Local Study Area is characteristic of Ecodistrict 2W-3, which is dominated by coniferous forests in the south part of the Ecodistrict (Wester et al., 2018). The southern part of Ecodistrict 2W-3 is also characterized by shallow mineral substrates or exposed bedrock, which transitions to deeper, typically organic substrates in 2W-2 (Wester et al., 2018).

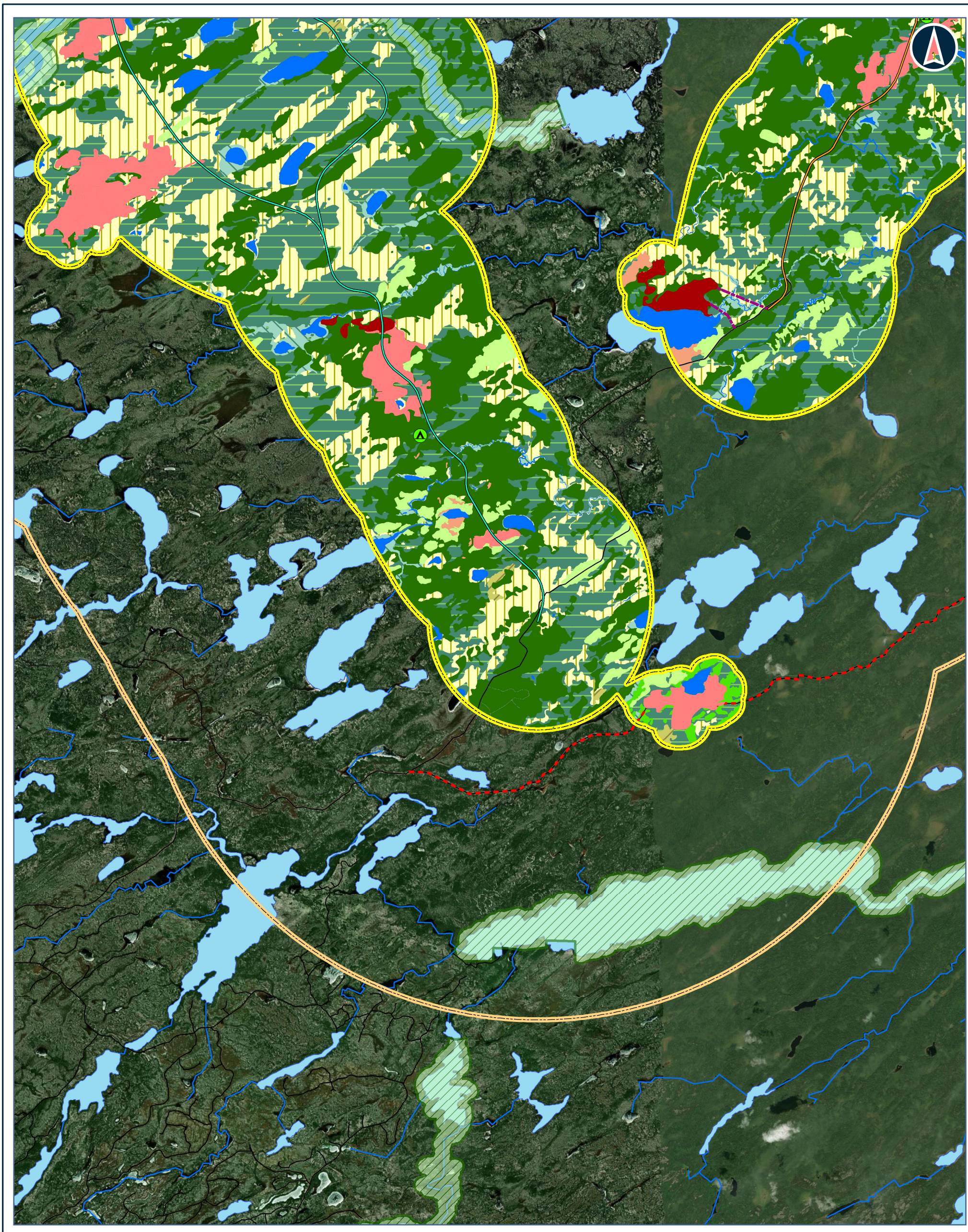
Although human development activities that typically fragment the landscape in southern Ontario (e.g., road, rail and other linear infrastructure, agriculture, and land development) are absent from the majority of the Project Study Areas, some forestry operations, camps, communities, and road development is present towards the south limits of the Project. This has resulted in some limited fragmentation of the landscape. Otherwise, the landscape generally remains intact, influenced primarily by natural disturbances (e.g., fire). A summary of disturbance analysis (including fire and harvest disturbance data) within uplands is presented in **Section 5.10.**

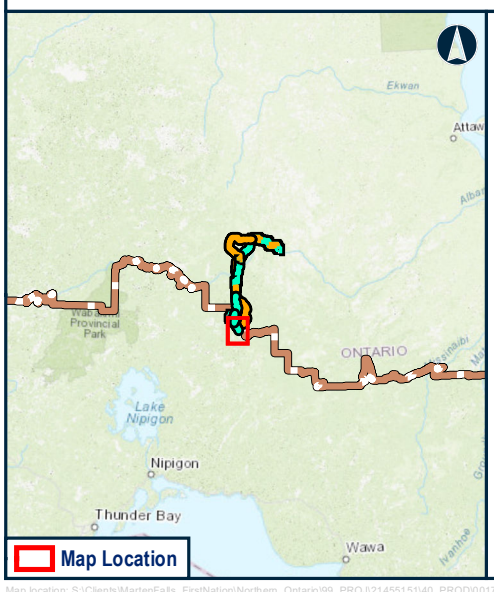
5.3.3 Composition and Function

A total of 31 upland ecosites have been mapped within the existing conditions Local Study Area, with the composition of the most abundant ecosites described in more detail in **Attachment B**. The ecosite descriptions include the dominant canopy and understory plant species, ground cover composition, and soil characteristics. As noted above, upland ecosystems in the existing conditions Study Areas are dominated by Coniferous Forest ecosites (i.e., 87% of the upland ecosystems are Coniferous Forest ecosites in the existing conditions Local Study Area, and 75% in the existing conditions Regional Study Area).

One measure of upland ecosystem function is whether the vegetation community / ecosite provides suitable habitat for Traditional Use Plants, and / or Species at Risk and Species of Conservation Concern. Occurrences of these species and the presence of suitable habitat for them is discussed in the context of the existing conditions Local Study Area in **Section 5.7** and **Section 5.8**.

Upland ecosystems in the existing conditions Study Areas also provide a range of functions generally, including soil conservation, nutrient cycling, carbon sequestration, and climate regulation. Furthermore, upland ecosystems support biodiversity by providing habitat for upland plant and animal species In addition, upland ecosystems provide recreational opportunities, opportunities for hunting and trapping, fuel and raw materials for local communities, and timber for the forest industry (i.e., human values). However, commercial forestry is currently limited to the south portion of the existing conditions Local Study Area that overlaps with the Ogoki Forest - Forest Management Unit (GreenForest Management Inc., 2020).





Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- ROCK / BARREN
- BOG
- FEN
- SWAMP
- MARSH
- WATER
- ANTHROPOGENIC

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

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Figure 5-3.1

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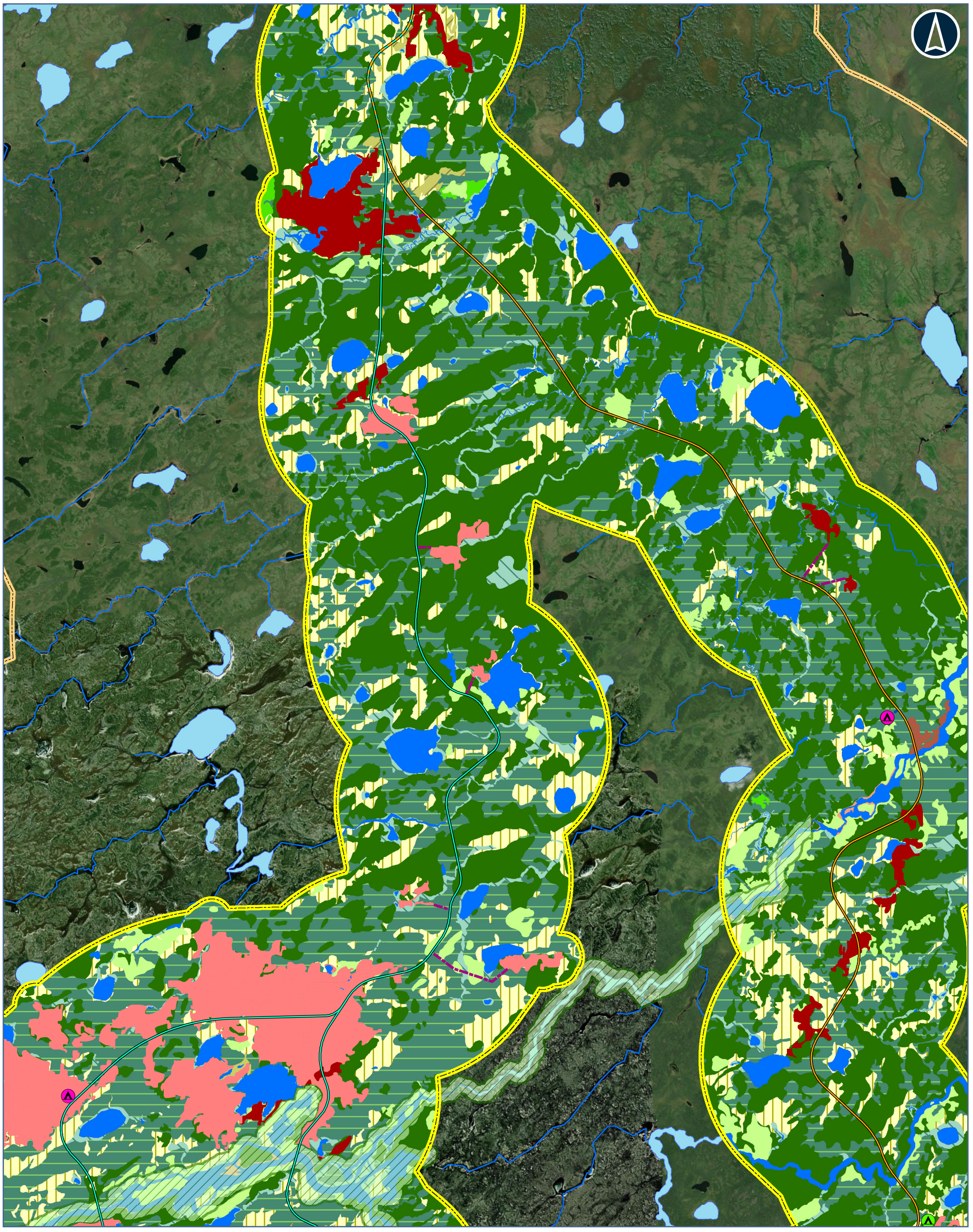

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- EARLY SUCCESSIONAL / SPARSE TREED
- ROCK / BARREN
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
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Figure 5-3.2

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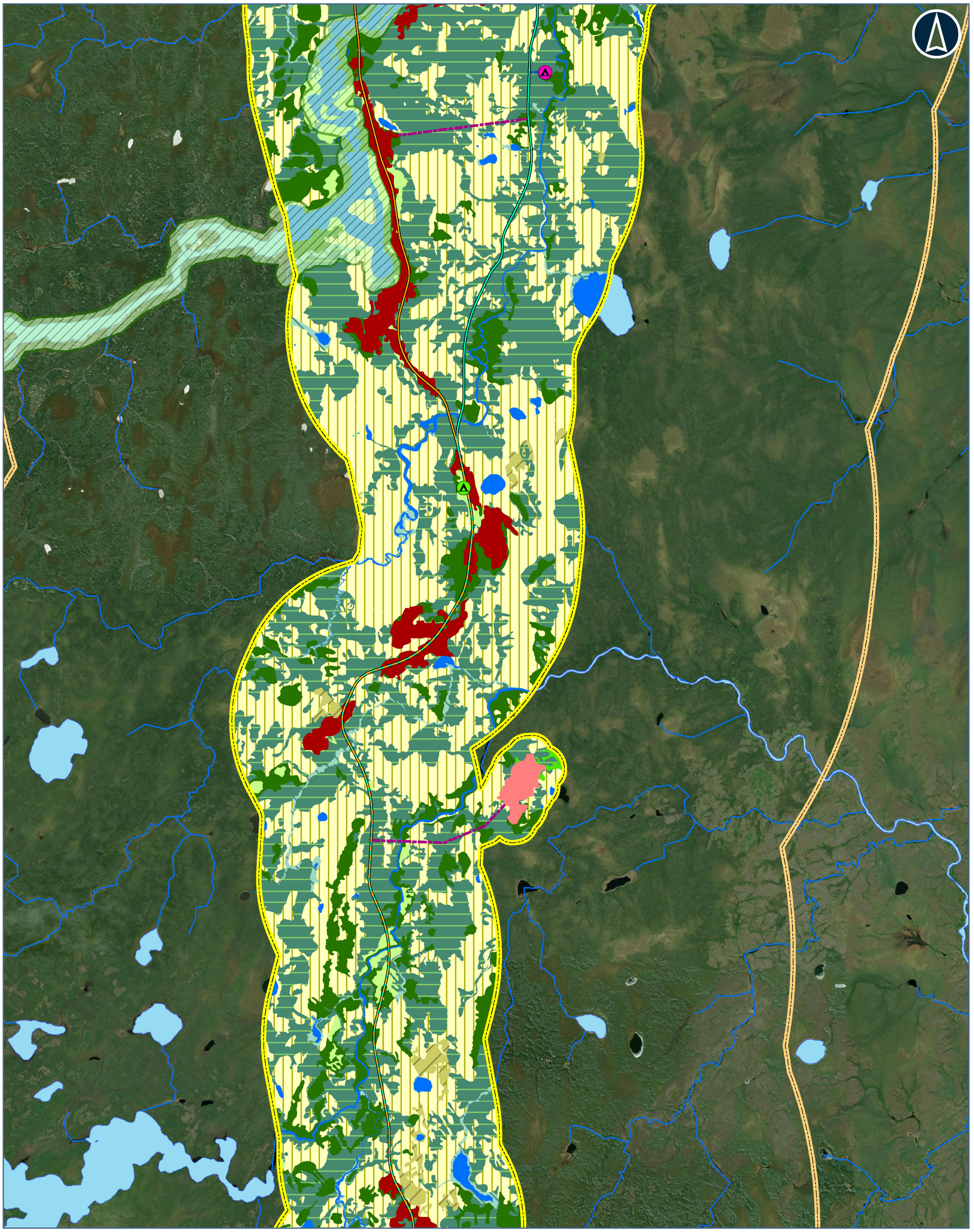

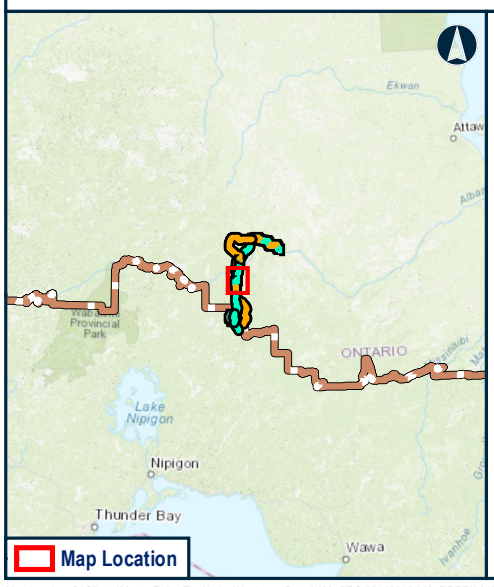

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

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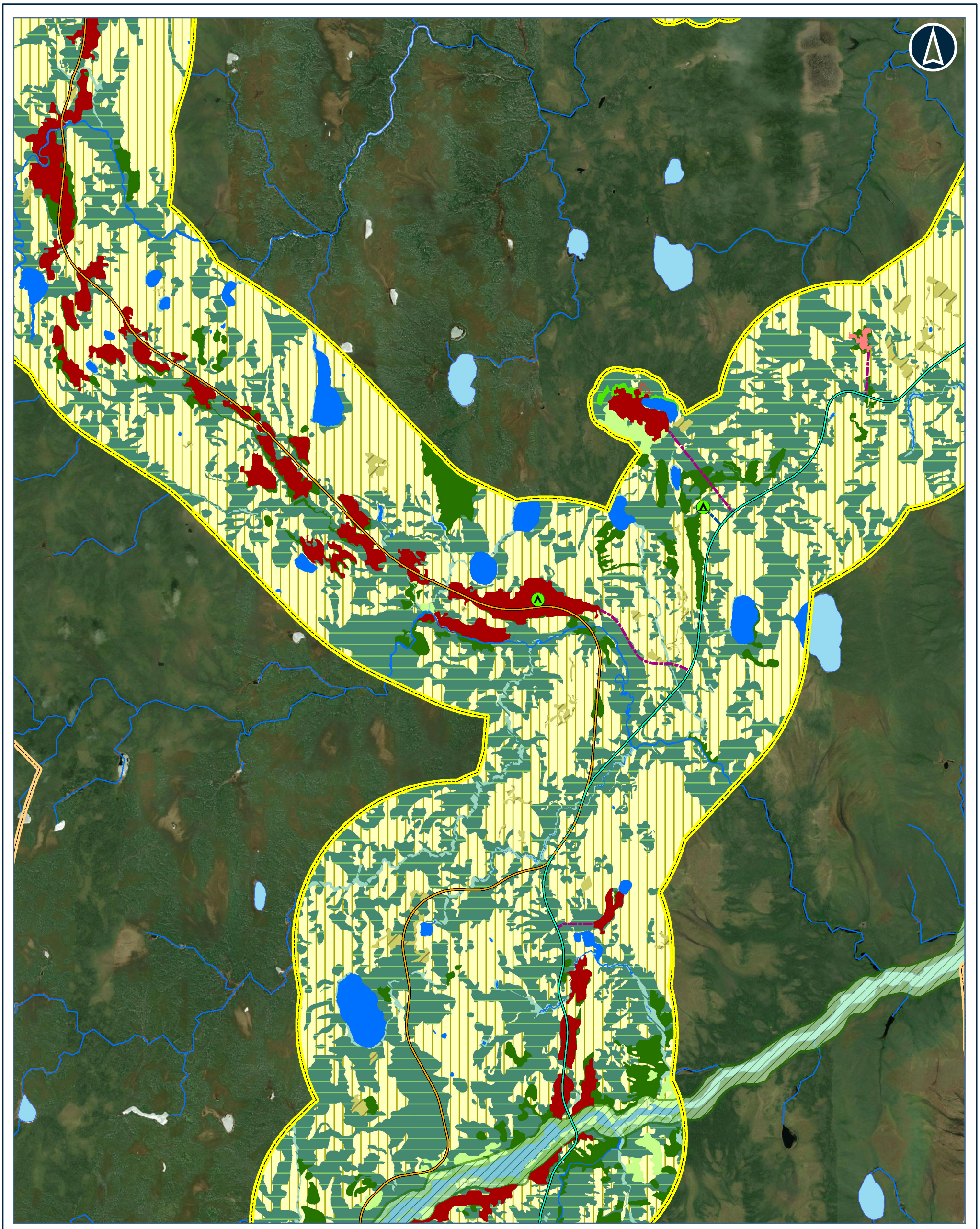

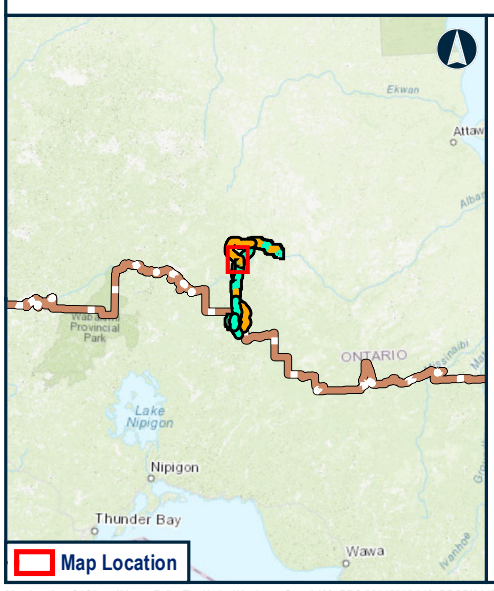

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- EARLY SUCCESSIONAL / SPARSE TREED
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

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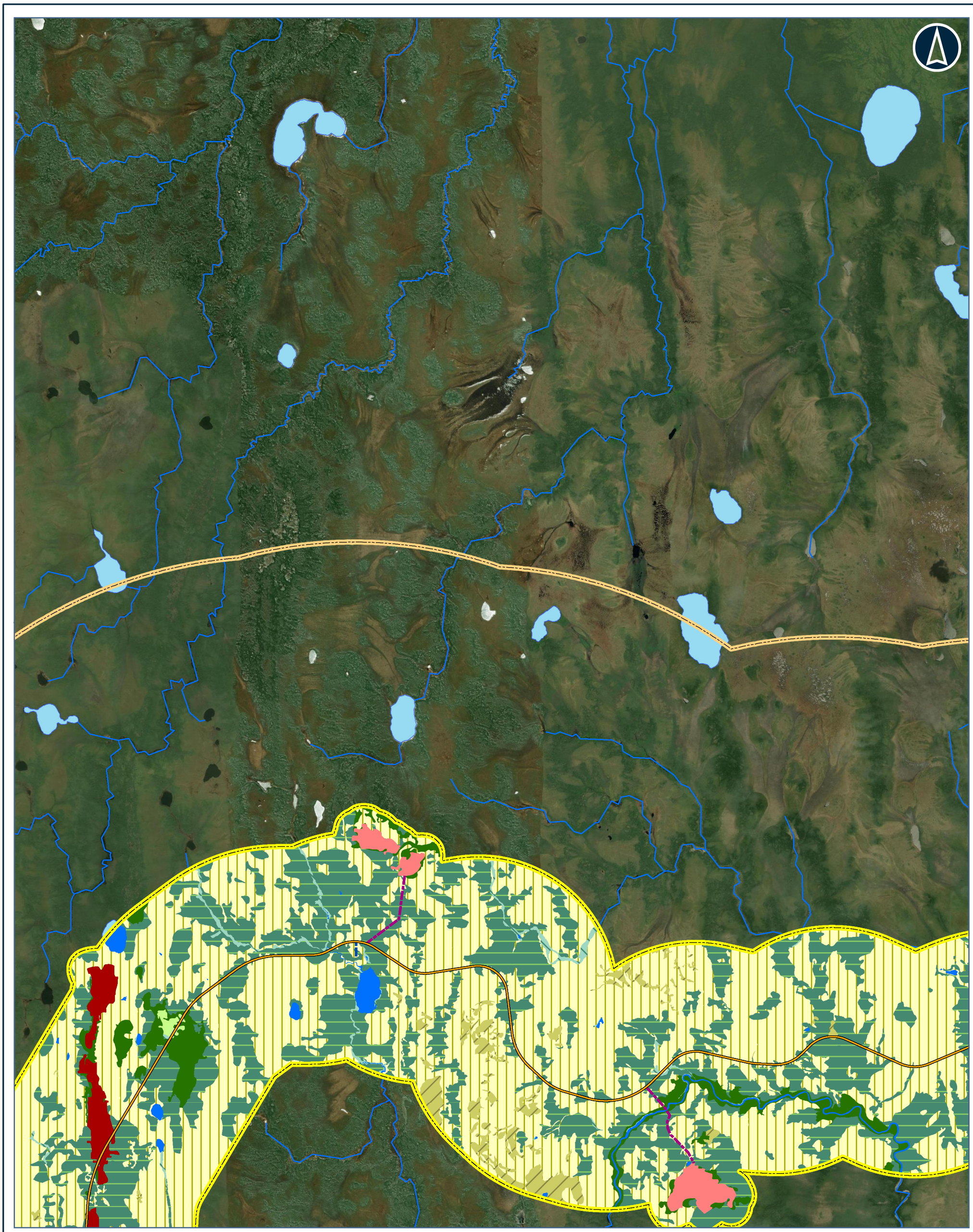

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CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

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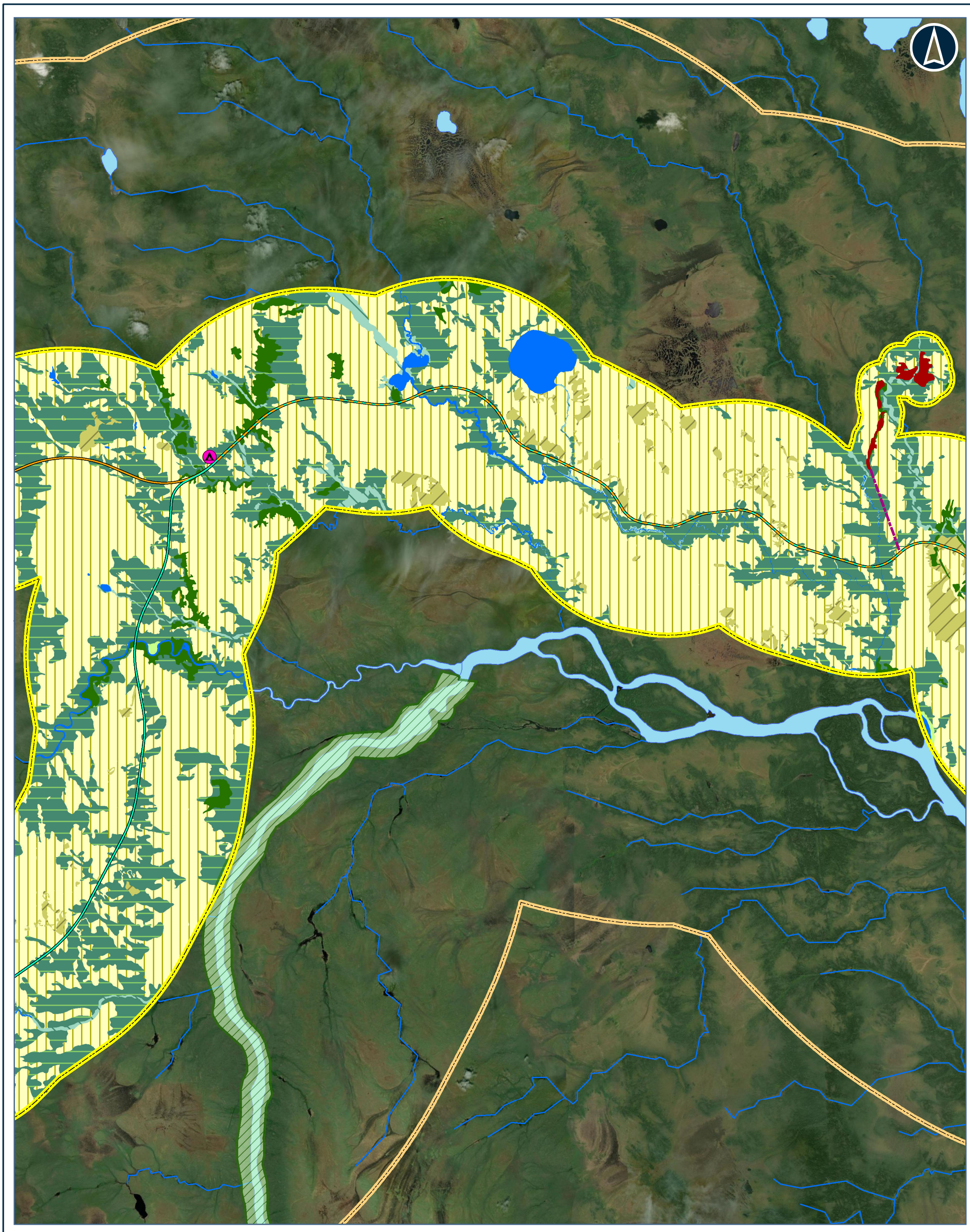

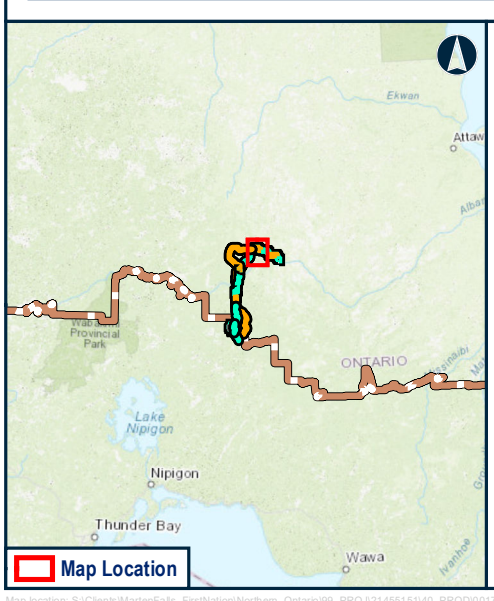

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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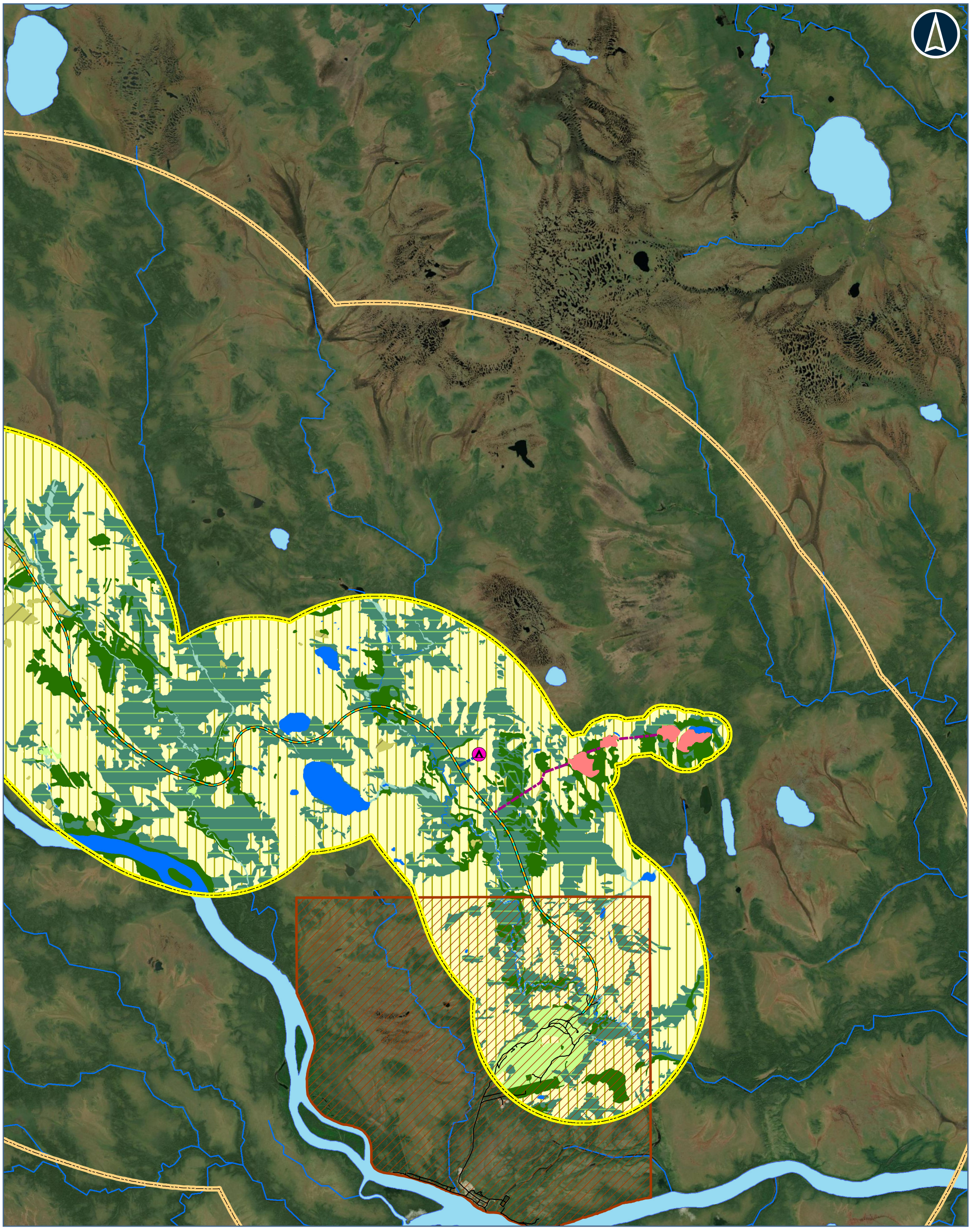

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-3.7

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5.4 Wetland Ecosystems

Through desktop ecosite mapping and field verification, a total of 23 wetland ecosite types were identified within the existing conditions Local Study Area. Given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analyses purposes, ecosites have been rolled up into four wetland vegetation community groupings as outlined below. See **Attachment B** for further information about the ecosites in each of these four wetland vegetation community groupings:

- Swamp ecosites;
- Marsh ecosites;
- Fen ecosites; and
- Bog ecosites.

5.4.1 Availability

The availability (i.e., area) of the four wetland vegetation communities within the existing conditions Local Study Area and existing conditions Regional Study Area is summarized in **Table 5-6** and illustrated in **Figure 5-3**.

Table 5-6: Wetland Vegetation Groupings in the Existing Conditions Study Areas

Wetland Community	Local Study Area (ha)	% Local Study Area Wetlands	% Local Study Area	Regional Study Area (ha)	% Wetlands in Regional Study Area	% Regional Study Area
Swamp	65,084.6	45%	33%	171,013.8	43%	29%
Marsh	3927.5	3%	2%	3928.8	1%	<1%
Fen	73,917.2	51%	37%	145,917.4	37%	25%
Bog	2277.6	2%	1%	76,459.7	19%	13%
Total	**145,206.9**	**100%**	**73%**	**397,319.8**	**100%**	**68%**

ha = hectare; % = percent

Within the existing conditions Local Study Area, fen communities dominate the wetland communities at 51%, representing 37% of the existing conditions Local Study Area. Swamp communities are the next most abundant wetland community type at 45% of the wetland communities, representing 33% of the existing conditions Local Study Area. Marsh and Bog communities comprise just 3% and 2% of the wetland communities, respectively, and together comprise less than 3% of the existing conditions Local Study Area.

Similar to the existing conditions Local Study Area, swamp and fen communities dominate the wetland communities within the existing conditions Regional Study Area at 43% (representing 29% of the existing conditions Regional Study Area) and 37% (representing 25% of the existing conditions Regional Study Area), respectively. Compared to the existing conditions Local Study Area, bog communities are more abundant and account for 19% of the wetland communities (representing 13% of the existing conditions Regional Study Area). Marsh communities comprise only 1% of the wetland communities and represent <1% of the existing conditions Regional Study Area.

Further information, including a description of the dominant wetland ecosites in the existing conditions Local Study Area is found in **Attachment B.** Wetland vegetation cover within the existing conditions Study Areas is generally representative of Ecoregions 2E (James Bay) and 2W (Big Trout Lake). Ecoregion 2E is dominated by Fen (27%) and Bog (39%) communities, while Ecoregion 2W has a greater proportion of upland forest (49%).

5.4.2 Distribution

The Distribution of wetland ecosystems within the existing conditions Study Areas is illustrated on **Figure 5-2** and **Figure 5-3**. Generally, wetland ecosites are more frequent in the northern portion of the existing conditions Study Areas, north of Dusey Lake, as can be seen at a glance by the dominance of blue shading on **Figure 5-2, plates 3** through **7**. Likewise, fen and swamp communities are most common in the northern portion of the existing conditions Local Study Area (See **Figure 5-3, plates 3** through **7**).

The northern portion of the existing conditions Local Study Area is characteristic of Ecodistricts 2W-2 and 2E1 which are both dominated by wetlands on organic substrates (Wester et al., 2018).

Although human development activities that typically fragment the landscape in southern Ontario (e.g., road, rail and other linear infrastructure, agriculture, and land development) are absent from the majority of the Project Study Areas, some forestry operations, camps, communities, and road development are present towards the south limits of the existing conditions Local Study Area, as well as associated with the First Nation Community in the northern-most limit of the existing conditions Local Study Area. This has resulted in some limited fragmentation of the landscape. Otherwise, the landscape generally remains intact, influenced primarily by natural disturbances (e.g., fire). A summary of disturbance analysis (including fire and harvest disturbance data) within wetlands is presented in **Section 5.10.**

5.4.3 Composition and Function

A total of 23 wetland ecosites have been mapped within the existing conditions Local Study Area, with the composition of the most abundant ecosites described in more detail in **Attachment B**.

Wetland ecosystems in the existing conditions Local Study Area and existing conditions Regional Study Area provide a range of functions that are categorized as hydrological, biogeochemical or habitat. The ability of each wetland vegetation community (i.e., swamp, marsh, fen, bog) to perform the associated function varies depending on characteristics such as landscape position (e.g., riparian, basin), soil type (i.e., mineral or organic), and size. The relative importance of each function also varies and may be related to the type and proximity of other vegetation communities. A summary of wetland functions, as well as a general classification of the level of performance by each wetland vegetation community, is provided in **Table 5-7** (Hanson et al., 2008; Committee on Characterization of Wetlands et al., 1995; Ducks Unlimited , 2018). As discussed in **Section 5.4.1**, fen and swamp are the most abundant wetland community types within the existing conditions Study Areas, representing 96% of wetland ecosystems. A discussion of wetland functions as they relate to the landscape in the existing conditions Study Areas follows.

Table 5-7: Summary of Wetland Functions in the Existing Conditions Study Areas

Function Category	Function	Description	Function Performance by Wetland Community Type			
			Swamp	Marsh	Fen	Bog
Hydrological	Water storage	Storage of surface water, both short term and long term. Capacity depends on wetland location within the landscape, size, and normal water level. May contribute to maintenance of base flows and seasonal flow distribution.	Low to High	Low to High	Moderate	Low
	Groundwater recharge	Dependent on location within the landscape and watershed, as well as local groundwater gradients.	Low	Variable	Variable	Variable
	Local climate regulation	Evapotranspiration rates provided by emergent herbaceous plants and shrubs.	Moderate	High	Moderate	Low
Biogeochemical / Climate	Water quality treatment	Treatment of physical, chemical and biological inputs. Dependent on loading rates, hydroperiod, substrate and vegetation assemblage. Possible benefits for downstream aquatic life (e.g., fish).	High	High	High	Low
	Nutrient / organic export	Export of nutrients and organic carbon to streams may influence bacteria growth, which can affect the aquatic food chain.	Variable	Variable	High	Variable
	Carbon sequestration / storage	Related to the volume of peat, as well as woody and acidic biomass.	Moderate to High	Moderate to High	High	High
Habitat	Biodiversity and biological productivity	Support habitat for wildlife or significant species, such as species at risk, rare species, commercially or traditionally valued species.	High	Moderate to High	Moderate to High	Moderate
		Support habitat for significant vegetation species, such as species at risk or rare species, or traditionally valued species	High	Moderate	High	Moderate

5.4.3.1 Hydrological

The hydrology, or water flows and levels, of a wetland are dynamic and directly influence its chemical and physical processes (Mitsch & Gosselink, 2015). The duration and timing of when a wetland holds water are referred to as a hydroperiod (Mitsch & Gosselink, 2015). Water levels within wetlands are maintained by very low gradients, low substrate permeability, topography or adjacent aquatic systems (Ministry of Natural Resources and Forestry, 2022b). Hydrological functions of a wetland are therefore closely connected to the basin that provides their water source (Ministry of Natural Resources and Forestry, 2022b). As detailed in the *Physiography, Terrain and Soils Existing Conditions and Effects Assessment Report* (WSP, 2024d), much of the existing conditions Local Study Area is characterized by subdued topography and level organic areas. Further, the *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026c) indicates that across much of the existing conditions Local Study Area the groundwater table is nearly flat and horizontal groundwater velocities are slow (WSP, 2026c). Therefore, wetlands in the existing conditions Local Study Area are situated in a large, flat basin with hydrological functions connected across individual wetlands, resulting in a large wetland complex.

The subdued topography and large, flat basin play an important role in creating and maintaining peatland systems by providing areas where vegetation is in a continuously water-logged state, slowing down the decomposition of organic matter by inhibiting oxidation and allowing the organic matter to build up over time as peat (Craft, 2022). A peatland's position in the landscape and its connection to adjacent surface water and groundwater inputs and outputs largely drives its form and function. Indigenous communities including Fort Albany First Nation have also highlighted observations relating to the role of peatlands in hydrological function, noting the overall importance of peatland systems in relation to water storage, filtration, streamflow, and groundwater conditions throughout seasonal cycles (Fort Albany First Nation, 2024).

Fens have a complex hydrology interacting with surface, sub-surface and groundwater flows resulting in slow, lateral water movement capable of connecting wetland systems over large distances (Cohen et al., 2024). Persistent groundwater inputs mean fens are less dependent on surface inputs compared to other wetland types which helps to stabilize a fen systems water table throughout the year (Price et al., 2023). Swamps are characterized by fluctuating water levels influenced by surface run-off, precipitation, and / or groundwater resulting in standing or flowing water that may be seasonal with systems experiencing a large decrease in their water table during drier seasons or persisting for longer periods depending on the source of water and rate of transpiration from the local vegetation (Ministry of Natural Resources and Forestry, 2022b, Price et al., 2023).

Given the topographic and groundwater conditions of the existing conditions Local Study Area, it is not surprising that these two wetland community types are the most common in the landscape. Other peatland types such as raised bogs only rely on inputs from precipitation events (rain and snowmelt) to maintain a flow of water to the lower levels of peat (Fraser et al., 2001; Devito et al., 1997; Price et al., 2023). During periods where output (i.e., evapotranspiration) exceeds inputs (i.e., precipitation) in these systems, reverse flow conditions can occur in where water from the lower levels of peat discharges to the higher levels, helping to maintain moist or wet conditions throughout the upper and lower peat layers through capillary processes (Devito et al., 1997; Price et al., 2023).

Storage of water in wetland ecosystems, combined with slow release of water and the physical barrier of wetland vegetation, moderates the flow and distribution of water within the catchment and floodplain. This flow moderation reduces erosion of adjacent terrestrial systems, particularly during periods of high flow (e.g., spring freshet, storms) (United States Environmental Protection Agency, 2016). The protection of shorelines and stream banks by wetlands in riparian zones is discussed further in the riparian functional assessment in **Section 5.3.3**. Long-term storage of surface water can also contribute to maintenance of stream base flow (Committee on Characterization of Wetlands et al., 1995). Because the wetlands in this landscape are characterized as a large, interconnected complex, the storage capacity in the existing conditions Study Areas is expected to be large.

Wetlands can maintain stream flow during dry periods or recharge groundwater systems (United States Environmental Protection Agency, 2016). Based on the *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026c), most groundwater recharge is expected to occur in areas with permeable surficial geology, which is concentrated in the south portion of the existing conditions Local Study Area where wetland cover is lower. As described in the *Physiography Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026d), the northern portion of the existing conditions Local Study Area has a high cover of organic soils with poor drainage indicating that wetlands in this landscape make a low contribution to groundwater recharge.

5.4.3.2 Biogeochemical

Wetlands play an important role in creating suitable conditions for biogeochemical cycling, or transformation of nutrients, especially of nitrogen, carbon and phosphorus (United States Environmental Protection Agency, 2016). Wetlands filter the water that passes through, trapping suspended sediment and retaining or processing inorganic nutrients and organic wastes. This filter function improves downstream water quality and protects aquatic habitats from degradation associated with nutrient loading, such as algal blooms, dead zones and fish kills (United States Environmental Protection Agency, 2016).

In wetlands with flowing water or inflows from seasonal flooding, production and decomposition rates tend to be high resulting in rapid nutrient cycling. Conversely, in nutrient-poor wetlands, such as bogs or nutrient-poor fens, nutrient cycling is slower (Committee on Characterization of Wetlands et al., 1995).

Both fens and swamps have the potential to perform these biogeochemical functions at a high level due to a combination of physical processes, high interaction between water and root-bacteria assemblages, flow through the substrate and heterogeneity in oxidation. Fens and swamps may act as a sink for nutrients, reducing export to downstream environments. Performance is dependent on inflow and outflow, loading rates and the particular constituents of concern (Hanson et al., 2008). In general, the landscape in the existing conditions Study Areas is characterized as relatively undisturbed with low anthropogenic inputs (e.g., agricultural run-off, industrial or wastewater discharge). Therefore, sediment and nutrient loading are expected to be low. As described in the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e), the lakes and watercourses at the waterbody crossing locations within the existing conditions Local Study Area, when sampled, generally met applicable water and sediment quality guidelines, standards and objectives.

A more detailed assessment of carbon sequestration and storage functions is provided in the *Peatlands Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP, 2026).

5.4.3.3 Habitat

Habitat functions for vegetation and wildlife are summarized at a high-level in **Table 5-7**. The habitat functions of each wetland community type are broken out further for the wildlife Valued Components in **Table 5-8.** A more detailed characterization and assessment of wetland functions related to wildlife habitat is provided in the *Birds Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026a), *Ungulates Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026f), and *Wildlife Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026g). Wetland functions related to fish habitat are characterized and assessed in the *Fish and Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026b).

Indigenous Knowledge provided by the Marten Falls First Nation noted the importance of vegetation (e.g., moss) as a food source for caribou spotted along the northern sections of the proposed Marten Falls First Nation Community Access Road route(s), between the proposed route(s), and Marten Falls First Nation (Marten Falls First Nation, 2023). In addition, Marten Falls First Nation noted concerns related to the Indigenous / traditional use and conservation of valuable resources, including vegetation species, in peatlands. One of these species is muskrat root (sweet flag), which can be found in swampy areas (Marten Falls First Nation, 2023). Fort Albany First Nation has also noted an overall

importance of peatlands to their community and Indigenous Peoples throughout the region. The community highlighted this by stating that the meaning of *Omushkegowuk* (the people of the muskeg) speaks to the central importance of the peatlands to the community's culture and well-being (Fort Albany First Nation, 2020).

In general, swamps were assessed to support the highest diversity of wildlife in the existing conditions Study Areas. Swamps have higher structural complexity (i.e., different vegetation layers, such as canopy, subcanopy, shrub and groundcover) and a greater variety of microhabitats than the other wetland types, which are more homogenous. Bogs tend to have the simplest habitat structure and support a less diverse wildlife community. However, they do support certain habitat functions not provided by other wetland types and represent important habitat in the landscape for species such as caribou.

Table 5-8: Summary of Habitat Functions by Wetland Community Type in the Existing Conditions Study Areas

Function Category	Wildlife Valued Component	Function Performance by Wetland Community Type			
		Swamp	Marsh	Fen	Bog
Habitat	Wetland Birds (including species at risk)	Moderate	High	High	Low
	Caribou	Moderate	Low	High	High
	Moose	High	Moderate	Moderate	Low
	Beaver	Low	High	High	Low
	Amphibians	High	High	High	High
	Bats	High	Low	Low	Low
	Marten	High	Low	Low	Low
	Wolverine	High	High	High	Moderate
	Overall	**High**	**Moderate to High**	**Moderate to High**	**Moderate**

Another measure of wetland ecosystem function is whether the vegetation community / ecosite provides suitable habitat for Traditional Use Plants, and / or Species at Risk and Species of Conservation Concern. The presence of these species and habitat suitability are discussed in the context of the existing conditions Local Study Area in **Section 5.8** and **Section 5.9**.

5.5 Riparian Ecosystems

Riparian habitat is a transition zone between aquatic and terrestrial ecosystems (Austin et al., 2008) and is defined as areas adjacent to rivers and lakes, or ephemeral, intermittent, or perennial streams that differ from surrounding uplands in plant and animal diversity and productivity (Environment Canada, 2013). Riparian areas support important biodiversity functions as they provide unique habitat for plants, invertebrates, fish, amphibians (Oji-Cree translation, *ginebigoya'haag omakakiiwiiya'haag*), birds, and mammals. Riparian Ecosystems include both wetland and upland vegetation communities within a specified distance from a watercourse or waterbody. According to the Vegetation Study Plan, and for the purposes of this study, Riparian Ecosystems are defined as the vegetation assemblage (i.e., both wetland and upland communities) that are located within 30 m of a watercourse or waterbody (e.g., stream or lake).

5.5.1 Availability

The riparian zone analysis (i.e., a 30 m buffer applied to watercourses and waterbodies) determined that a total of 8,750.4 ha of the existing conditions Local Study Area and 24,183.7 ha of the existing conditions Regional Study Area fall within this zone and can be characterized as riparian ecosystems. This represents approximately 4% of the existing conditions Local Study Area and 4% of the existing conditions Regional Study Area. **Table 5-9** provides a breakdown of the total area of Riparian Ecosystems in the existing conditions Local Study Area and the percentage of each upland and wetland vegetation community that includes riparian habitat. Within the existing conditions Local Study Area, 75% of the riparian zone is composed of wetland vegetation communities, and 17% is upland vegetation. **Table 5-10** gives the breakdown for the existing conditions Regional Study Area, within which 48% of the riparian zone is wetland vegetation, and 15% is upland.

Only small proportions of the riparian zones in the existing conditions Local Study Area (<1%) and Regional Study Area (5%) are mapped as Anthropogenic. In a more developed landscape, it would be expected that a much larger proportion of the riparian zone would be Anthropogenic, given the tendency for settlements to occur along watercourses and waterbodies.

Approximately 8% of the riparian zone within the existing conditions Local Study Area and 32% of the riparian zone within the existing conditions Regional Study Area are mapped as Water. The presence of water within the riparian zone is a mapping anomaly as the Ontario Hydro Network Waterbody layer, which was one of the layers used to create the 30 m riparian buffer, does not correspond directly to the polygons mapped as "Water" during desktop vegetation community mapping. The differences can be seen on **Figure** 5-4, which shows an example of riparian zone mapping at a scale of 1:5000.

Table 5-9: Vegetation Communities within the Riparian Zones of the Existing Conditions Local Study Area

Vegetation Community Grouping	Area (ha)	% Riparian	Wetland-Upland	Area (ha)	% Riparian
Coniferous Forest	1,215.3	14%	Upland	1,481.0	17%
Deciduous Forest	231.8	3%			
Early Successional / Sparse Treed	4.3	<1%			
Mixed Forest	7.7	<1%			
Rock / Barren	22.7	<1%			
Fen	1,314.7	15%	Wetland	6,554.6	75%
Bog	18.6	<1%			
Marsh	2,305.3	26%			
Swamp	2,915.9	33%			
Anthropogenic	1.3	<1%	Upland	1.3	<1%
Water	712.8	8%	Water	712.8	8%
Total	**8,750.4**	**100%**		**8,750.4**	**100%**

ha = hectare; % = percent

Table 5-10: Vegetation Communities within the Riparian Zones of the Existing Conditions Regional Study Area

Vegetation Community Grouping	Area (ha)	% Riparian	Wetland-Upland	Area (ha)	% Riparian
Coniferous Forest	2,348.4	10%	Upland	3,727.0	15%
Deciduous Forest	523.3	2%			
Early Successional / Sparse Treed	74.8	<1%			
Mixed Forest	757.8	3%			
Rock / Barren	22.7	<1%			
Fen	3,433.7	14%	Wetland	11,565.8	48%
Bog	399.3	2%			
Marsh	2,305.7	10%			
Swamp	5,427.1	22%			
Anthropogenic	1,217.4	5%	Upland	1,217.4	5%
Water	7,673.2	32%	Water	7,673.2	32%
Other	0.3	<1%	Other	0.3	<1%
Total	**24,183.7**	**100%**		**24,183.7**	**100%**

Note:
The Far North Land Cover Data Specification Version 1.4 document (Ministry of Natural Resources and Forestry, 2014) defines “Other” as “cover features that were not classified for a variety of reasons”.
ha = hectare; % = percent. Distribution

There are waterbodies and watercourses throughout the existing conditions Study Areas. However, the frequency of these features decreases towards the north part of the existing conditions Study Areas where large wetland complexes dominate the landscape. This decrease in riparian area frequency can be seen on **Figure 5-2**, where **plates 1** and **2** show a noticeably higher density of riparian areas, relative to **plates 3** through **7**. This is consistent with the relatively high frequency of lakes and rivers with complex drainage patterns in the Ontario Shield Ecozone when compared with the Hudson Bay Lowlands Ecozone, which is extremely flat, with vast wetlands and only a few large rivers (e.g., Albany River and Winisk River) that cut channels across the landscape (Crins et al., 2009).

5.5.2 Composition and Function

In general, riparian ecosystems provide a range of functions to adjacent aquatic and terrestrial systems, including water temperature regulation, bank and channel stability, filtering of surface flow (e.g., nutrient and sediment transport), regulation of instream biological production, and regulation of instream algal production (British Columbia Ministry of Environment, Lands and Parks and Ministry of Forests, 1999). Treed communities, in particular, provide a higher level of habitat complexity, stream shading and a higher potential for large woody debris recruitment, which contributes to instream channel complexity, cover and refuge habitats, sediment storage, nutrient dynamics, and macroinvertebrate food supply (Washington Forest Practices Board, 2011).

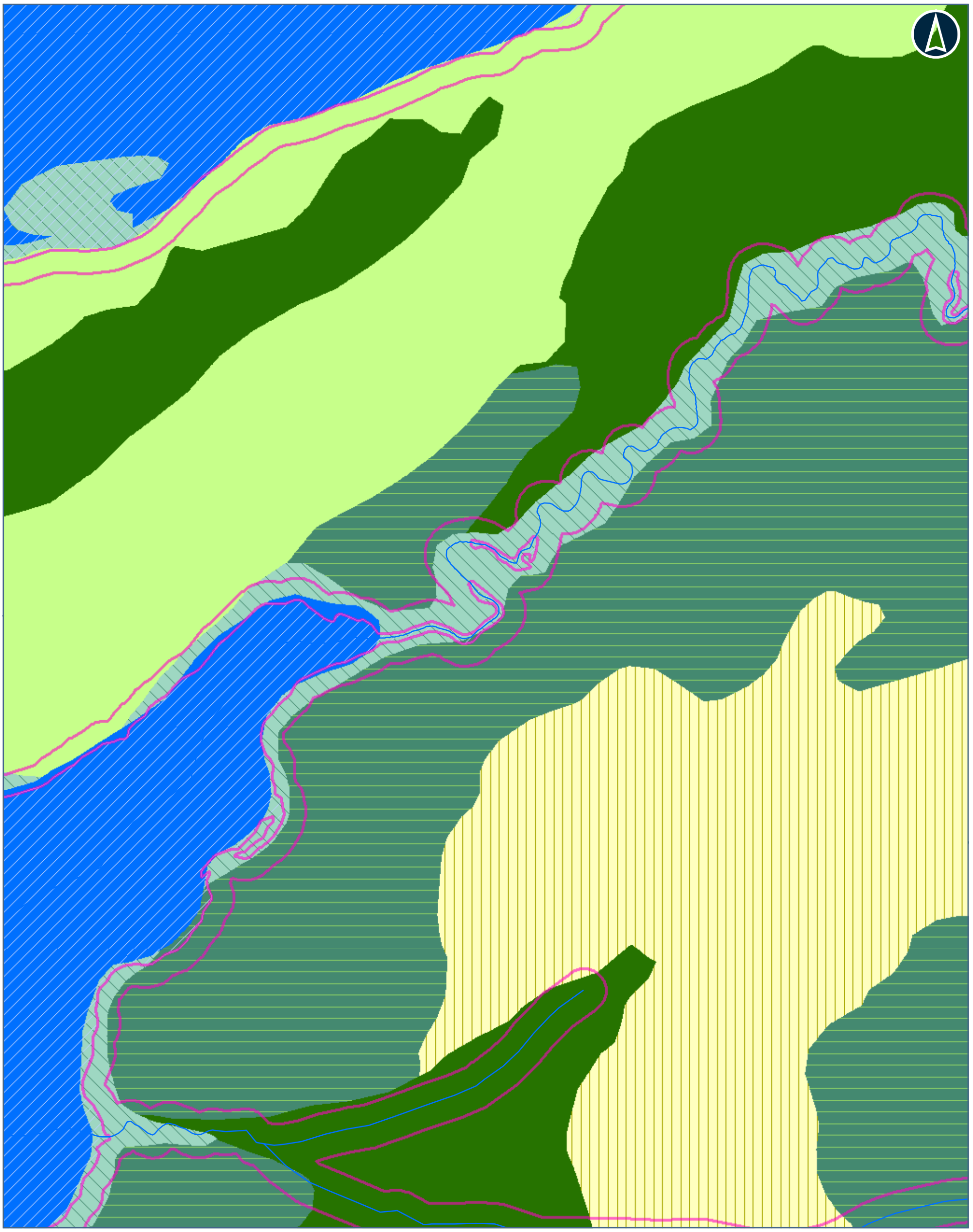
Due to the intersection between aquatic and terrestrial habitats, a healthy riparian ecosystem tends to have high diversity and high productivity rates (Wentzel & Hull, 2021). Increased exposure to sunlight in riparian vegetation communities can result in greater plant species diversity and contribute to higher growth rates and larger plant sizes (British Columbia Ministry of Environment, Lands and Parks and Ministry of Forests, 1999). Riparian ecosystems also support biodiversity by providing habitat for a variety of upland, wetland and aquatic associated plant and animal species and provide unique transitional habitat between aquatic and terrestrial ecosystems. Functions related to wildlife habitat are characterized and assessed in the *Birds Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026a), *Ungulates Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026f), and *Wildlife Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026g).

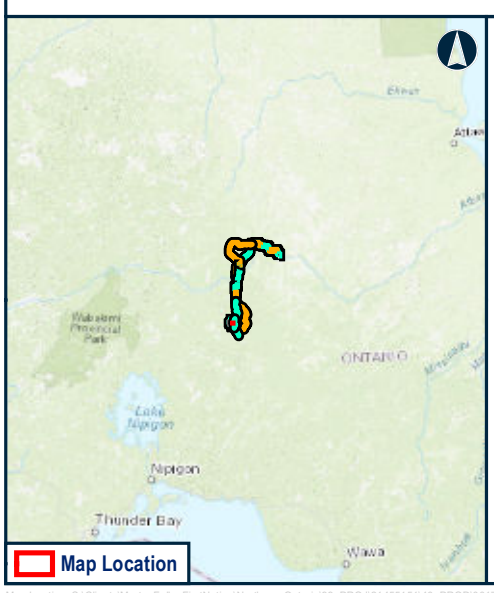
Riparian functioning can be assessed indirectly using vegetation cover, the frequency of invasive species, and the presence of steep banks and erosion as indicators (Wentzel & Hull, 2021). The majority of riparian area (over 90%) within the existing conditions Local Study Area is vegetated, with approximately half of the riparian area characterized by treed communities (i.e., forest, sparse treed or swamp). In the existing conditions Regional Study Area, approximately half (63%) of the riparian area is vegetated and 38% is characterized by treed communities. However, the actual proportion of the Regional Study

Area that is vegetated riparian habitat is likely to be higher than this value indicates as mapping anomalies have resulted in an overestimate of the extent of open water (**Section 5.1.1**).

Invasive species are generally absent from the existing conditions Study Areas (**Section 5.10**). Also, steep slopes are infrequent on the landscape. Small sections of steep slope areas were identified scattered throughout the existing conditions Local Study Area adjacent to meandering rivers where the outer bank of the meander bends has been eroded by the rivers or streams. As described in the *Physiography Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026d), many of the areas identified as steep slopes are also associated with veneers and thin veneers of till overlying bedrock and are at the southern end of the existing conditions Local Study Area.

Based on the data summarized above, riparian ecosystems in the existing conditions Study Areas are assessed to be healthy and functioning at a high-level. A more detailed assessment of riparian ecosystem function as it relates to fish habitat is provided in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026b).





Legend

- WATERBODY
- WATERCOURSE
- RIPARIAN ECOSYSTEMS

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Riparian Ecosystems Mapping Example

0 0.1 0.2
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:5,000 * when printed 11"x17"
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Figure 5-4

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5.6 Designated Areas

Designated areas include Provincial Parks, Areas of Natural and Scientific Interest, Significant Woodlands, Conservation Reserves, Environmentally Significant Areas, Enhanced Management Areas, and Critical Landform / Vegetation Associations. These features may be identified at a federal, provincial, or local level.

5.6.1 Availability

There are no Areas of Natural and Scientific Interest, Conservation Reserves, Environmentally Significant Areas, or Enhanced Management Areas currently mapped within the existing conditions Study Areas. Significant Woodlands are not designated on the Canadian Shield (Ministry of Natural Resources, 2000), and therefore none are present within the existing conditions Study Areas. Provincial Parks and Critical Landform / Vegetation Associations are discussed in the following sections.

5.6.1.1 Provincial Parks

There are two Provincial Parks located within the existing conditions Local Study Area: Ogoki River Provincial Park and Albany River Provincial Park. A third Provincial Park, Little Current River Provincial Park, is located at the southernmost limits of the existing conditions Regional Study Area.

Ogoki River Provincial Park is a 23,250 ha nonoperating Waterway Class Park that was established in 2004 (Ministry of the Environment, Conservation, and Parks, 2023c). The park includes approximately 140 km of the Ogoki River system, including three lakes, with water comprising approximately 40% of the park area (Ministry of the Environment, 2003). A total of 2,295.8 ha of the Ogoki River Provincial Park is located within the existing conditions Local Study Area. This represents approximately 1% of the existing conditions Local Study Area and approximately 10% of the total park area.

Albany River Provincial Park is a 95,100 ha nonoperating Waterway Class Park that was established in 1989 (Ministry of the Environment, Conservation, and Parks, 2023a). A total of 1,917.1 ha of the Albany River Provincial Park is located within the existing conditions Local Study Area. This represents approximately 1% of the existing conditions Local Study Area and approximately 2% of the total park area.

Little Current River Provincial Park is a 9,930 ha non-operating Waterway Class Park that was established in 1989 (Ministry of the Environment, Conservation, and Parks, 2023b). The park provides opportunities for backcountry canoeing and camping, fishing, and hunting (Ministry of the Environment, Conservation, and Parks, 2023b). Little Current River Provincial Park is entirely outside of the existing conditions Local Study Area, but partly within the existing conditions Regional Study Area.

5.6.1.2 Critical Landform / Vegetation Associations

Landform / Vegetation Associations are characterized by combining geological landform and vegetation communities. These Landform / Vegetation Associations are mapped by the Province of Ontario (i.e., Ministry of Natural Resources and / or Ministry of the Environment, Conservation and Parks) and analyzed on an Ecodistrict basis. Ontario's approach to ensuring ecosystem representation within its network of protected areas uses the Landform / Vegetation Association as a surrogate for biodiversity (Ontario Parks, 2021). The minimum conservation target for all Landform / Vegetation Associations is 1% or 50 ha (whichever is greater) of each Landform / Vegetation Association in an Ecodistrict (Davis et al., 2006, Ontario Parks, 2021). Landform / Vegetation Associations that do not have this minimum representation within protected areas are known as "gaps" (Davis et al., 2006, Ontario Parks, 2021). Landform / Vegetation Associations that are essential to the fulfillment of the representation threshold in their respective Ecodistrict *and* are within a protected area or proposed protected area are considered "Critical" Landform / Vegetation Associations (Onyshkewych pers. Comm. 2024).

According to the State of Ontario's Protected Areas Indicator Report (Ontario Parks, 2021), the percentage of Landform / Vegetation Associations that are protected in the four Ecodistricts that overlap the study area varies between "low" for Ecodistrict 2E-1 to "high" for Ecodistricts 2E-2 and 2W-3. Ecodistrict 2W-2 has a "moderate" percentage of the Landform / Vegetation Associations protected. The percentages are provided in **Table 5-11.**

Table 5-11: Percentage of Landform / Vegetation Associations Achieved by Ecodistrict

Ecodistrict	Percentage (%)	Category
2E-1	11%	Low
2E-4	87%	High
2W-2	55%	Medium
2W-3	86%	High

Source: Ontario Parks, 2021.
% = percent.

Landform / Vegetation Associations that have been mapped within existing protected areas and within areas identified as potential protected areas in community-based land use planning under the *Far North Act*, 2010 are provided in **Figure 5-5** Land use planning is ongoing, and boundaries have not yet been finalized; however, the most up to date mapping, provided by Ontario Parks in January 2024, was used to assess the presence of Critical Landform / Vegetation associations within the existing conditions Study Areas at the time of reporting.

A total of 35 Critical Landform / Vegetation Associations are mapped within protected areas or proposed protected areas within the existing conditions Local and / or Regional Study Area. All Critical Landform / Vegetation Associations in protected areas or proposed protected areas within the existing conditions Local Study Area and existing conditions Regional Study Area are presented in **Table 5-12.** Of the Critical Landform / Vegetation Associations mapped within the existing conditions Local Study Area, the most frequent include:

- Organic Deposits – Coniferous Swamp: 9,480.4 ha or 5%;
- Organic Deposits – Treed Fen: 5,113.9 ha or 3%;
- Organic Deposits – Treed Bog: 2,680.6 ha or 1%;
- Organic Deposits – Open Bog: 2,296.3 ha or 1%; and
- Fine Ground Moraine – Disturbance – Treed and / or Shrub: 1,886.4 ha or 1%.

The remaining Critical Landform / Vegetation Associations were small components of the Local Study Area, each comprising less than <1% of the existing conditions Local Study Area, with a combined total area of 2,184.1 ha (1% of the existing conditions Local Study Area).

Of the Critical Landform / Vegetation Associations mapped within the existing conditions Regional Study Area, the most frequent was Organic Deposits – Coniferous Swamp (10,047 ha or 2%). The remaining Critical Landform / Vegetation Associations were small components of the existing conditions Regional Study Area, each comprising less than <1% of the existing conditions Regional Study Area, with a combined total area of 26,070 ha (<1% of the existing conditions Regional Study Area).

Table 5-12: Critical Landform / Vegetation Associations within the Existing Conditions Local Study Area and Regional Study Area Protected Areas and Proposed Protected Areas

Landform	Vegetation	Local Study Area (ha)	Local Study Area (%)	Regional Study Area (ha)	Regional Study Area (%)
Fine Ground Moraine	Coniferous Swamp	56.8	<1%	1,120.5	<1%
Fine Ground Moraine	Deciduous Treed	57.8	<1%	313.6	<1%
Fine Ground Moraine	Disturbance – Non and Sparse Woody	25.4	<1%	93.4	<1%
Fine Ground Moraine	Disturbance – Treed and / or Shrub	1,886.4	1%	4,727.4	<1%
Fine Ground Moraine	Open Bog	27.2	<1%	522.3	<1%
Fine Ground Moraine	Open Fen	11.2	<1%	21.8	<1%
Fine Ground Moraine	Sparse Treed	1.4	<1%	10.8	<1%
Fine Ground Moraine	Thicket Swamp	6.4	<1%	6.4	<1%
Fine Ground Moraine	Treed Bog	143.5	<1%	1,287.6	<1%
Fine Ground Moraine	Treed Fen	311.8	<1%	1,403.9	<1%
Glaciofluvial Esker-Kettle Terrain	Coniferous Treed	26.4	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Open Bog	4.2	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Open Fen	32.8	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Sparse Treed	0.3	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Treed Bog	10.7	<1%	0.0	0%
Organic Deposits	Coniferous Swamp	9,480.4	5%	10,046.8	2%
Organic Deposits	Deciduous Treed	6.1	0%	156.5	<1%
Organic Deposits	Disturbance - Non and Sparse Woody	280.9	1%	1,308.9	<1%
Organic Deposits	Disturbance - Treed and / or Shrub	17.0	<1%	752.9	<1%
Organic Deposits	Open Bog	2,296.3	1%	4,060.6	<1%

Landform	Vegetation	Local Study Area (ha)	Local Study Area (%)	Regional Study Area (ha)	Regional Study Area (%)
Organic Deposits	Open Fen	303.3	<1%	1,184.1	<1%
Organic Deposits	Sparse Treed	1.1	<1%	15.8	<1%
Organic Deposits	Thicket Swamp	402.3	<1%	491.3	<1%
Organic Deposits	Treed Bog	2,680.6	1%	3,439.7	<1%
Organic Deposits	Treed Fen	5,113.9	3%	4,802.8	<1%
Precambrian Int. to Acidic Bedrock	Coniferous Treed	3.1	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Deciduous Treed	23.0	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Disturbance - Non and Sparse Woody	54.3	<1%	10.4	<1%
Precambrian Int. to Acidic Bedrock	Mixed Treed	9.6	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Open Bog	12.7	<1%	0.1	<1%
Precambrian Int. to Acidic Bedrock	Open Fen	0.9	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Sparse Treed	2.8	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Treed Bog	71.5	<1%	28.5	<1%
Precambrian Int. to Acidic Bedrock	Treed Fen	264.9	<1%	310.9	<1%
TOTAL		**23,627**	**12%**	**36,117**	**6%**

ha = hectare; % = percent; < = less than.

5.6.2 Distribution

5.6.2.1 Provincial Parks

Figure 5-1 displays the distribution of the three Provincial Parks within the existing conditions Local Study Area and existing conditions Regional Study Area. Little Current River Provincial Park crosses the very southern limits of the existing conditions Regional Study Area and crosses three Ecodistricts: 2W-3, 2W-2, and 2E-4. The Ogoki River Provincial Park is also located towards the south limits of the existing conditions Local and Regional Study Areas, primarily within Ecodistrict 2W-3. Albany River Provincial Park crosses near the middle of the existing conditions Local and existing conditions Regional Study Areas, primarily within Ecodistrict 2W-2.

5.6.2.2 Critical Landform / Vegetation Associations

Figure 5-5 displays the distribution of the Landform / Vegetation Associations and Critical Landform / Vegetation Associations mapped within the protected areas and proposed protected areas within the existing conditions Local Study Area and existing conditions Regional Study Area. Critical Landform / Vegetation Associations are concentrated within the southeast, central, and northeast portions of the existing conditions Local Study Area, with a small area in the northwest.

- In the south, between DeBaere Lake and Brundrit Lake (Ecodistricts 2W-2 and 2W-3), the Critical Landform / Vegetation Associations are largely associated with Fine Ground Moraine and Pre-cambrian Int. to Acidic Bedrock landforms;
- In the central part of the study area, north of Dusey Lake to Albany River (Ecodistrict 2W-2), the majority of the Critical Landform / Vegetation Associations are associated with Organic Deposits and Fine Ground Moraine landforms;
- In the northeast part of the study area along Albany River and north of the Albany River to Trebell Lake (Ecodistricts 2W-2, 2E-1, and 2E-4), the majority of the Critical Landform / Vegetation Associations are associated with Organic Deposits; and
- In the northwest part of the study area, southeast of Sherlock Lake (Ecodistrict 2W-2), the majority are associated with Organic Deposits and Glaciofluvial Esker Kettle Terrain landforms.

Figure 5-5 has been redacted from this public version of the Report.

5.6.3 Composition and Function

5.6.3.1 Provincial Parks

5.6.3.1.1 Ogoki River Provincial Park

As a Waterway Class Park, the Ogoki River Provincial Park protects both the waterways as well as a buffer on either side of the Ogoki River and its associated lakes (e.g., Patience Lake [Oji-Cree translation, *Bakihda'hawgan*] and Harrogate Lake). The park is therefore composed of riparian ecosystems, including upland and wetland ecosystems within and beyond the 30 m riparian zone. The *Ogoki River Provincial Park Management Statement* (Ministry of the Environment, 2003) notes that the park contributes to approximately 10% (i.e., 8 / 79) of the Landform / Vegetation Associations for Ecodistrict 2W-2, approximately 73% (i.e., 64 / 88) of the Landform / Vegetation Associations for Ecodistrict 2W-3, and approximately 28% (i.e., 23 / 83) of the Landform / Vegetation Associations for Ecodistrict 3W-1.

The Ogoki River Provincial Park is recreationally important and provides remote tourism opportunities including boating, canoeing, fishing, wildlife viewing, and hunting opportunities. The park is located within the bounds of the James Bay Treaty (Treaty 9) and cultural, traditional, and spiritual sites have been identified in the park by local First Nations (Ministry of the Environment, 2003). The park also provides habitat, feeding areas, and nesting / calving sites for a number of provincially significant and protected wildlife species. Additionally, the park supports regionally significant flora and a regionally significant vegetation community (Seepage Fen) (Ministry of the Environment, 2003).

5.6.3.1.2 Albany River Provincial Park

As a Waterway Class Park, the Albany River Provincial Park protects both the waterways as well as a 200 m buffer on either side of the Albany River and its associated lakes (e.g., Teabeau Lake). The park is therefore composed of riparian ecosystems, including upland and wetland ecosystems within and beyond the 30 m riparian zone. The *Albany River Provincial Park Management Statement* (Ministry of the Environment, 1985) does not outline the Landform / Vegetation Association contributions as the Management Statement was prepared prior to the introduction of this system of ecosystem representation.

A former route for fur traders, the park provides recreational activities such as backcountry camping, boating, canoeing, fishing, snowmobiling, and hunting (Ministry of the Environment, Conservation, and Parks, 2023a). Numerous campsites and portages along the waterway are known to be fairly well documented (Ministry of the Environment, 1985). Residents of Indigenous communities (including Marten Falls First Nation) also use the waterway for recreational uses including camping, boating, swimming, and snowmobiling,

and at the time that the Park Management Statement was prepared, there were portions of 14 traplines within the recommended park area (Ministry of the Environment, 1985).

5.6.3.1.3 Little Current River Provincial Park

As a Waterway Class Park, the Little Current River Provincial Park protects both the waterways as well as a 200 m buffer on either side of the Little Current River and its associated lakes (e.g., Percy Lake). The park is therefore composed of riparian ecosystems, including upland and wetland ecosystems within and beyond the 30 m riparian zone. The *Little Current River Provincial Park Management Statement* (Ministry of the Environment, 1991) does not outline the Landform / Vegetation Association contributions as the Management Statement was prepared prior to the introduction of this system of ecosystem representation.

The park provides recreational activities such as backcountry camping, canoeing, fishing, and hunting (Ministry of the Environment, Conservation, and Parks, 2023b). Locations of campsites and portages along the waterway were unknown when the Management Statement was prepared, however four outpost camps within the park boundary, with three of these being fly-in access locations (Ministry of the Environment, 1991). At the time that the Park Management Statement was prepared, there were portions of five traplines within the park boundary (Ministry of the Environment, 1991).

5.6.3.2 Critical Landform / Vegetation Associations

Landform / Vegetation Associations include both upland and wetland vegetation communities that provide habitat for flora and fauna and represent the diversity of habitat types in each respective Ecodistrict. Critical Landform / Vegetation Associations found within the protected areas and proposed protected areas within the existing conditions Local Study Area and existing conditions Regional Study Area include wetland vegetation communities (11% of the existing conditions Local Study Area) and upland vegetation communities (1% of the existing conditions Local Study Area) that together comprise 12% of the existing conditions Local Study Area.

By protecting a representative example of all Landform / Vegetation associations in each Ecodistrict, Ontario seeks to represent and protect the full range of Ontario's natural diversity (Ontario Parks, 2021). Therefore, the primary function of the Critical Landform / Vegetation Associations is to contribute to the protection of the full range of natural diversity within protected areas and proposed protected areas in each respective Ecodistrict. As noted above, there are a number of Critical Landform / Vegetation Associations within the existing conditions Local Study Area and existing conditions Regional Study Area, therefore these areas are contributing to the protection of Ontario's biodiversity.

Figure 5-5: Landform / Vegetation Associations

[Confidential Figure]

Figure 5-5.2: [Confidential Figure]

5.7 Traditional Use Plants

5.7.1 Availability and Distribution

Traditional use plants and plants of importance to Indigenous communities include plants that are historically used by Indigenous Peoples for food, materials, medicinal or spiritual purposes and are still of particular interest to Indigenous communities within the region. These species are generally well distributed across the region; however, most of the plant harvesting occurs close to access routes like large waterbodies, watercourses or existing roads. Members of Kashechewan First Nation have also noted that many species of berries which are typically harvested can be found along rivers or swampy areas, and that summer is the best time to gather berries (MNP LPP, 2024a).

A list of 43 traditional use plant species was initially generated based on a review of desktop resources and Indigenous Knowledge provided within the *Eabametoong First Nation Biodiversity Atlas* (n.d.). This list includes plants used for medicinal or spiritual purposes, food, and / or home uses. Each species, category of use (e.g., spiritual, medicinal), and information source is provided in **Table 5-13**. These 43 species were used to develop the Traditional Use Plant Habitat Suitability and Accessibility mapping presented in **Figure 5-6** (refer to **Section 4.3.3** for Methodology).These 43 species were used to develop the Traditional Use Plant Habitat Suitability and Accessibility mapping presented in **Figure 5-6** (refer to **Section 4.3.3** for Methodology).

After the completion of the Traditional Use Plant Habitat Suitability and Accessibility mapping exercise, additional traditional use plant species were identified by communities including Aroland First Nation, Fort Albany First Nation, Kashechewan First Nation, Marten Falls First Nation, and Weenusk First Nation (Dillon, 2024a; Firelight Research Inc., 2024; Marten Falls First Nation, 2023; MNP LPP, 2024a; Shared Value Solutions, 2024). **Although these additional species were not assessed in the mapping exercise, it is acknowledged that these species are of cultural importance**.

Additional species identified include: Arrowhead (*Sagittaria sp.*), Aspen (*Populus sp.*), Bear Root (*Ligusticum porteri*), Cottongrass (*Eriophorum sp.*), Gooseberry (*Ribes uva-crispa*), Lowbush Cranberry (*Vaccinium vitis-idaea*) (Mooseberry), Muskrat Root (Sweet Flag), Pine (various *Pinus sp.*), Red Currant Berry, Rock Tripe Lichen (*Umbilicaria sp.*), Rosehip (*Rosa sp.*), Sage (*Salvia sp.*), Spruce (*Picea sp.),* Tobacco (*Nicotiana sp.*), Wild Celery (*Vallisneria americana*), Wild Onion (*Allium canadense*), and Wild Rose.

Members of Kashechewan First Nation noted the importance of harvesting traditional use plants, including medicinal and edible plants and berries, throughout Kashechewan's traditional areas. Cedar, Labrador tea, Red Willow, and Tamarack were identified as valued medicinal plant species that are harvested and useful for medicinal purposes (e.g., treating coughs, colds, cuts, and headaches).

Several species of berries identified as being harvested by Kashechewan First Nation include lowbush cranberry (referred to as mooseberry), Blueberry, Gooseberry, Raspberry, Red Currant Berry, Bearberry, Saskatoonberry, and Strawberry. Some members of Kashechewan First Nation have also noted an observed change in the availability of some traditionally harvested berry species over time within their traditional territory, believed to be a result of the placement of hydro lines associated with the Victor Diamond Mine (MNP LPP, 2024a).

Members of Fort Albany First Nation provided input relating to vegetation species of importance including Sage (*Salvia sp.*), various berry species (e.g., Cranberry, Wild Strawberry, Wild Raspberry), Red Willow, Labrador Tea, Pine, Cedar, Spruce, Tamarack, Sage, and Paper Birch (Firelight Research Inc., 2024). Fort Albany First Nation also provided detail relating to areas within their traditional territory where members reported harvesting plants and medicines including (but not limited to) Fort Albany, coastal areas between the Albany and Moose River estuaries, and tributaries of the Albany River. One member also noted that some plant harvesting locations have been passed on across generations, noting that they had travelled to the same area to harvest Sage and Cranberry for 30 years (Firelight Research Inc., 2024).

Nibinamik First Nation noted the importance of edible berries (e.g. Bearberry and Bunchberry), as well as Wild Rose, acorns, and Labrador Tea, also describing several medicinal uses for acorns, boiled bark, roots, Labrador Tea. The community stated that they created snowshoes, toboggans, and birch bark canoes with various plant materials. Additionally, built wigwams covered in evergreen boughs and birch bark shelters - which were made from bark cut into different sizes and held together by woven Spruce roots (Dillon, 2024c).

Weenusk First Nation also provided input related to overall importance of berries to the community, including Cloudberry, Cranberry, and Blueberry. The community also noted that other important areas for plant gathering include areas for collecting firewood, and areas around family camps that support berry growth. One community member stating the following about gathering plants: "*Just like the meat we still get medicines from the ground and berries.*" (MNP LPP, 2024b).

Table 5-13: Traditional Use Plants Used to Assess Habitat Suitability and Accessibility in the Existing Conditions Local Study Area

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
Alpine Bilberry / Bog Bilberry	*Nikeminan*	*Vaccinium uliginosum*	Food	■ *Eabametoong First Nation Biodiversity Atlas*
American Sweetflag	Unknown	*Acorus americanus*	Medicinal	■ Verbal Indigenous Knowledge
Balsam Fir	*Zhingobaandag* (Eabametoong First Nation) *Ini'naandag* (Marten Falls First Nation)	*Abies balsamea*	Home uses	■ *Eabametoong First Nation Biodiversity Atlas* ■ Marten Falls First Nation communications ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study*; *Tailored Impact Statement Guidelines*
Balsam Poplar	*Maan azaadii*	*Populus balsamifera*	N/A	■ *Tailored Impact Statement Guidelines* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Black Crowberry	Unknown	*Empetrum nigrum*	N/A	■ *Tailored Impact Statement Guidelines* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Black Spruce	*Mina'ig* (Eabametoong First Nation *Shikobaatik* (Marten Falls First Nation)	*Picea mariana*	Home uses	■ Eabametoong First Nation Biodiversity Atlas ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Blue Flag	Unknown	*Iris versicolor*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*
Bog Goldenrod	Unknown	*Solidago uliginosa*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*
Broad-leaved Cattail	*Paskakannoog*	*Typha latifolia*	Home uses	■ *Eabametoong First Nation Biodiversity Atlas* ■ *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Bunchberry	*Shashagoominan* (Eabametoong First Nation) *Shashakominaan* (Marten Falls First Nation)	*Cornus canadensis*	Food	■ *Eabametoong First Nation Biodiversity Atlas* ■ Marten Falls First Nation communications; ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Nibinamik Aboriginal and/or Treaty Rights and Interests: Draft Assessment Report

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
Caribou / Reindeer Lichen	*Wabakamik*	*Cladonia rangiferina*	N/A	■ *Tailored Impact Statement Guidelines* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Cloudberry	*Machakotominun*	*Rubus chamaemorus*	Food; Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ *Weenusk First Nation Existing Conditions Report.*
Common Bearberry	*Makoominan*	*Arctostaphylos uva-ursi*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans* ■ Nibinamik Aboriginal and/or Treaty Rights and Interests: Draft Assessment Report
Common Yarrow	Unknown	*Achillea millefolium*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*
Creeping Snowberry	*Kinabik* (Eabametoong First Nation) *Wabiminaan* (Marten Falls First Nation)	*Gaultheria hispidula*	Food; Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Dwarf birch	Unknown	*Betula nana*	N/A	■ *Tailored Impact Statement Guidelines* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Eastern White Cedar	*Giishkaatig*	*Thuja occidentalis*	Medicinal; Spiritual	■ *Eabametoong First Nation Biodiversity Atlas* ■ Verbal Indigenous Knowledge ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ *Tailored Impact Statement Guidelines* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Fireweed	*Awihkabigwaan*	*Chamaenerion angustifolium*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
Highbush Cranberry	*Zhikwako Minik*	*Viburnum opulus*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Verbal Indigenous Knowledge ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Weenusk First Nation Existing Conditions Report.
Indian-pipe	Unknown	*Monotropa uniflora*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*
Jack Pine	*Okikaandaag*	*Pinus banksiana*	Food, Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Labrador Tea	*Kakekaybegoon*	*Rhododendron groenlandicum* or *Ledum groenlandicum*	Food; Medicinal; Spiritual	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Nibinamik Aboriginal and/or Treaty Rights and Interests: Draft Assessment Report
Narrow-leaved Cottongrass	Unknown	*Eriophorum angustifolium*	N/A	■ *Tailored Impact Statement Guidelines*
Northern Black Currant	*Maanatoominan*	*Ribes hudsonianum*	Food	■ *Eabametoong First Nation Biodiversity Atlas*
Northern Labrador Tea	Unknown	*Rhododendron tomentosum*	N/A	■ *Tailored Impact Statement Guidelines* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Northern Mountain-ash	*Makominagaawanzh*(iig) or *Makominatig*	*Sorbus decora*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*
Northern Wild Rice	*Manoomin*	*Zizania palustris*	Food	■ *Eabametoong First Nation Biodiversity Atlas* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Aroland First Nation – *Indigenous Knowledge Use Study For The Marten Falls Community Access Road* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
Paper Birch	*Wiigwaasatig* (Eabametoong First Nation) *Wigwaasatik* (Marten Falls First Nation)	*Betula papyrifera*	Home uses; Tools, Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Nibinamik Aboriginal and/or Treaty Rights and Interests: Draft Assessment Report
Prickly Rose	Unknown	*Rosa acicularis*	Food	■ *Eabametoong First Nation Biodiversity Atlas*
Red-osier Dogwood	*Miskwabiimagaatik* (Eabametoong First Nation) *Wabiminaatik* (Marten Falls First Nation)	*Cornus sericea*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans* ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Red Raspberry	*Miskominik*	*Rubus idaeus*	Food	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Red Willow – traditional name (also known as Green Alder)	*Wikobatik*	*Alnus alnobetula ssp. crispa*	Medicinal	■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Saskatoonberry	*Kosihgwakaminatik*	*Amelanchier alnifolia*	Medicinal	■ Verbal Indigenous Knowledge ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Small Cranberry	*Mashkikominan*	*Vaccinium oxycoccos*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas*

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
Sphagnum moss	*Maashkigo'aaki*	*Sphagnum sp.*	Home uses	■ *Eabametoong First Nation Biodiversity Atlas* ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Strawberry	*Ode'minan* (Wild Strawberry, Eabametoong First Nation) Miskomaang (Strawberry, Marten Falls First Nation)	*Fragaria virginiana*	Food; Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Marten Falls First Nation communications
Sweetgrass	Unknown	*Anthoxanthum spp.*	Medicinal; Spiritual	■ Verbal Indigenous Knowledge ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Tamarack	*Mashkiigwaatig* (Eabametoong First Nation) *Maaskigwatik* / *wakinagan* (Marten Falls First Nation)	*Larix larincina*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Trembling Aspen	*Apijih pakoosh*	*Populus tremuloides*	N/A	■ *Tailored Impact Statement Guidelines*
Velvet-leaved Blueberry	*Minan*	*Vaccinium myrtilloides*	Food	■ *Eabametoong First Nation Biodiversity Atlas* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Weenusk First Nation Existing Conditions Report.

Common Name	Oji-Cree name	Scientific Name	Traditional Use Category	Source
White Spruce	*Mihnaihk*	*Picea glauca*	N/A	■ *Tailored Impact Statement Guidelines* ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Aroland First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report* ■ Fort Albany First Nation. Indigenous Knowledge and Use Study Specific to the Proposed Marten Falls Community Access Road ■ Fort Albany First Nation - Letter from Fort Albany First Nation to the Impact Assessment Agency of Canada: *RE: Webequie First Nation Supply Road Project and Marten Falls First Nation Community Access Road – Comments on the Draft Tailored Impact Statement Guidelines and Draft Indigenous Engagement and Partnership Plans*
Yellow Pond-lily	*Ateebagoon* (Eabametoong First Nation *Okitebaag* (Marten Falls First Nation)	*Nuphar variegata*	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*
Willow	*Ashiisigobiminsh*(*iig*) (Eabametoong First Nation) *Wiisihkobihmagoon* (Marten Falls First Nation)	*Salix* spp.	Medicinal	■ *Eabametoong First Nation Biodiversity Atlas* ■ Verbal Indigenous Knowledge ■ Marten Falls First Nation communications ■ *Marten Falls First Nation Indigenous Knowledge Land Use and Occupancy Study* ■ Marten Falls First Nation - *Marten Falls First Nation Aboriginal and / or Treaty Rights and Interests: Preliminary Existing Conditions Report*

N/A = not applicable.

The 43 traditional use plant species were considered in identifying candidate traditional use plant habitat suitability. As outlined in **Section 4.3.3,** this was assessed qualitatively in terms of habitat suitability (reasonable likelihood of presence or absence within a given ecosite) and habitat accessibility (proximity to existing Indigenous Knowledge paths and locations) for each ecosite within the existing conditions Local Study Area. **Attachment C – Ecosites with Habitat Suitability for Traditional Use Plant Species in the Existing Conditions Local Study Area** is a table of all ecosites mapped within the existing conditions Local Study Area and the Traditional Use Plant Species that are considered to have reasonable potential to occur in each ecosite.

The results of the habitat suitability and habitat accessibility analysis are spatially displayed in **Figure 5-6**. **Table 5-14** displays the total area and percentage of each habitat suitability and habitat accessibility score within the existing conditions study area. Combined scores ranged from 0.0 to 1.8. As illustrated in **Figure 5-6**, suitable habitat for traditional use plants is available throughout the existing conditions Local Study Area. There is an apparent increase in the presence of ecosites with a higher score in the southwest, central, and north portion of the existing conditions Local Study Area, mostly associated with existing roads and waterways, where ecosites coloured darker shades of orange and red are more abundant. Ecosites with the highest habitat suitability for traditional use plants include:

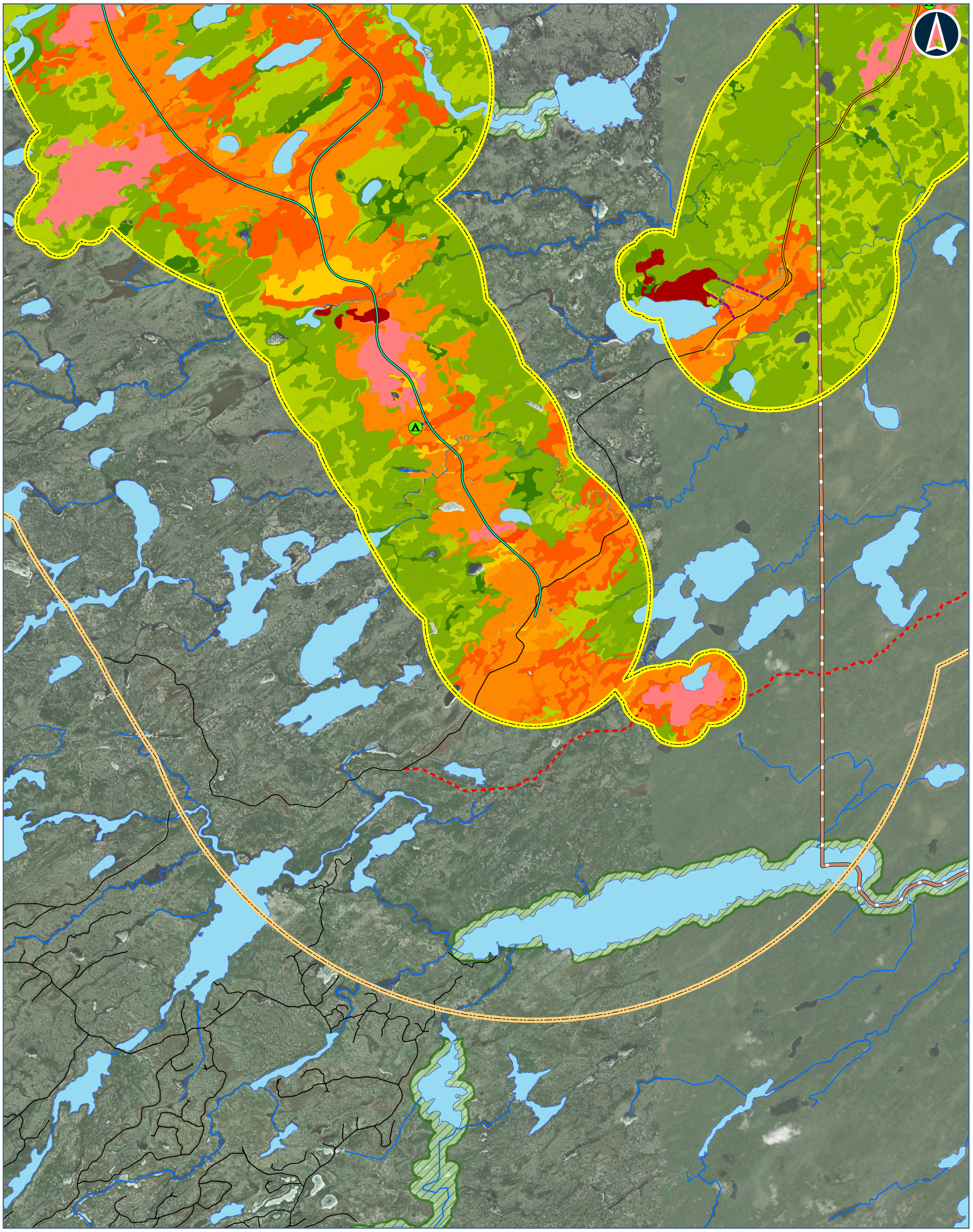
- Organic Conifer Swamp ecosites (e.g., B127, B128, and B129);
- Mineral Conifer Swamp ecosites (e.g., B222, B223); and
- certain Coniferous Forest ecosites (e.g., B012, B065, B067, B068).

Ecosites with the lowest scores (i.e., those coloured various shades of green in **Figure 5-6**), are more abundant towards the southeast and northwest limits of the existing conditions Local Study Area, generally away from existing roads and large watercourses, and where traditional access routes and points have not been documented.

Table 5-14: Summary of Traditional Use Plants Availability based on Habitat Suitability and Habitat Accessibility Index Score in the Existing Conditions Local Study Areas

Score	Existing Conditions Local Study Area	
	Area (ha)	Percentage (%)
0.0	7,506.6	4%
0.1	6.5	<1%
0.2	1,604.9	<1%
0.3	0.0	0%
0.4	806.7	<1%
0.5	42,241.9	21%
0.6	6,442.3	3%
0.7	4,408.0	2%
0.8	20,427.4	10%
0.9	0.0	0%
1.0	48.4	<1%
1.1	49.8	<1%
1.2	3,512.6	2%
1.3	0.0	0%
1.4	1,390.5	<1%
1.5	63,389.5	32.%
1.6	6,898.8	4%
1.7	5,294.5	3%
1.8	33,931.9	17%
1.9	0.0	0%
2.0	0.0	0%
TOTAL	**197,960.2**	**100%**

% = percent; ha = hectare; < = less than.



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-6.1

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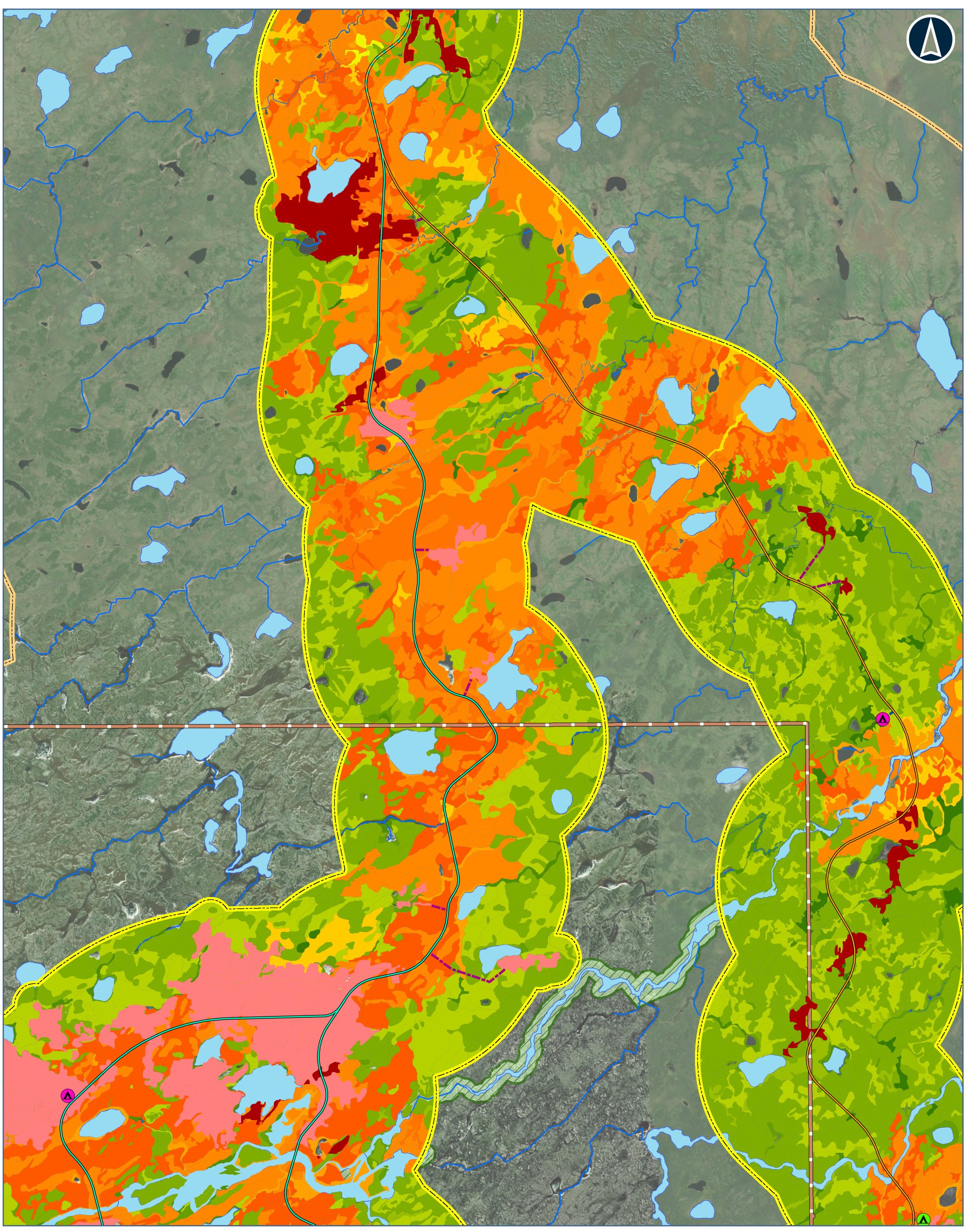

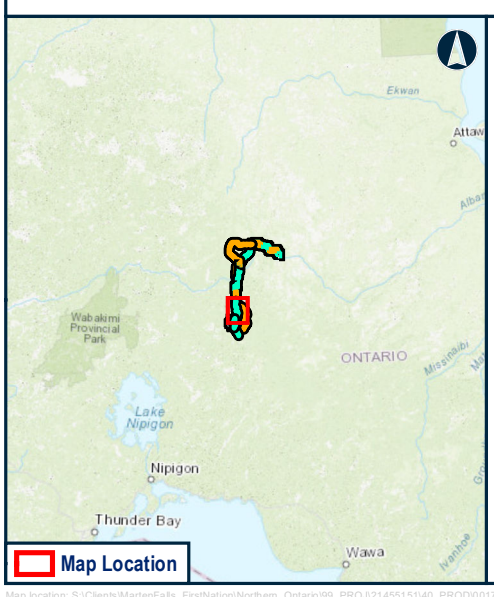

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 2.25 4.5
Kilometres

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Figure 5-6.2

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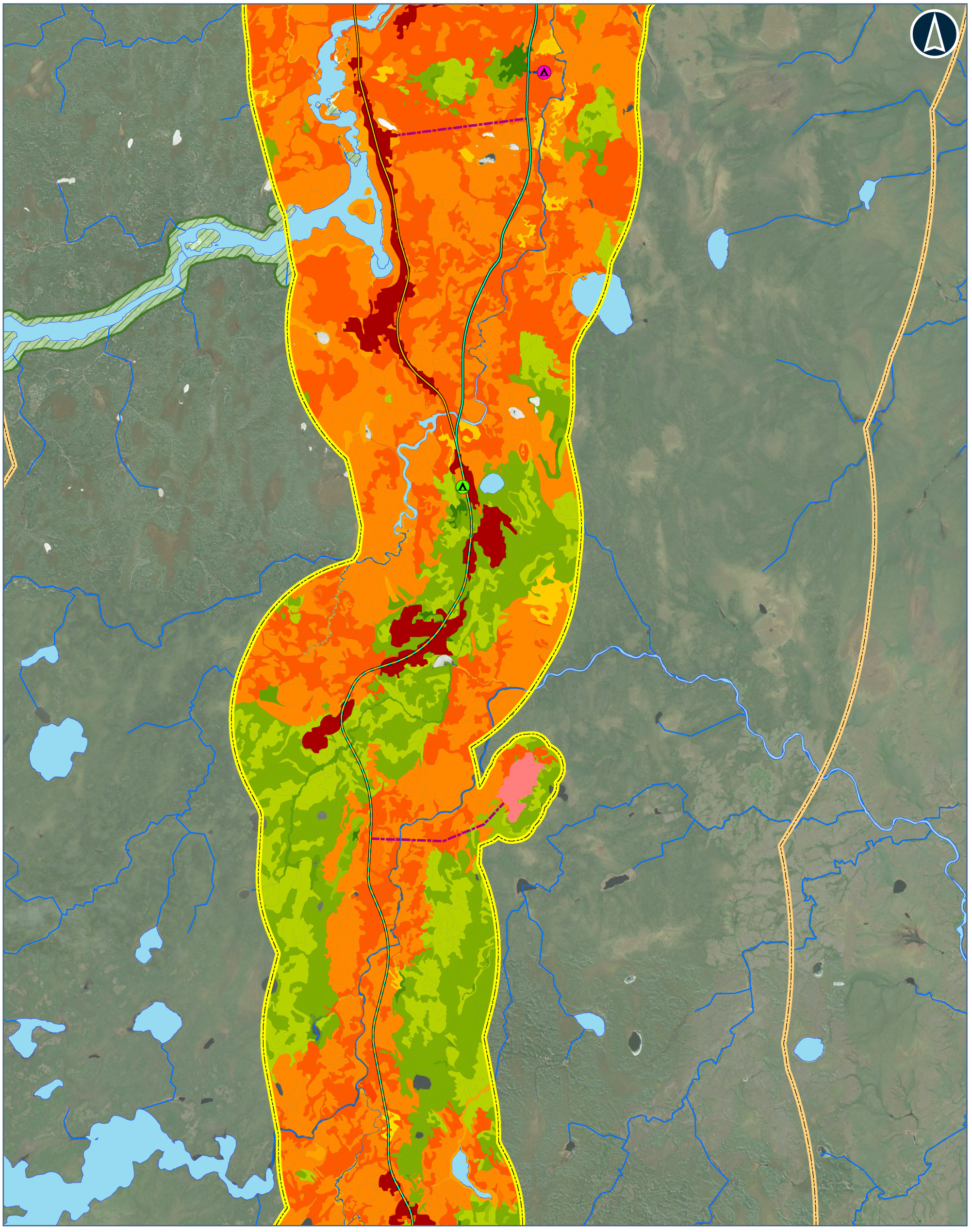

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 2.25 4.5
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-6.3

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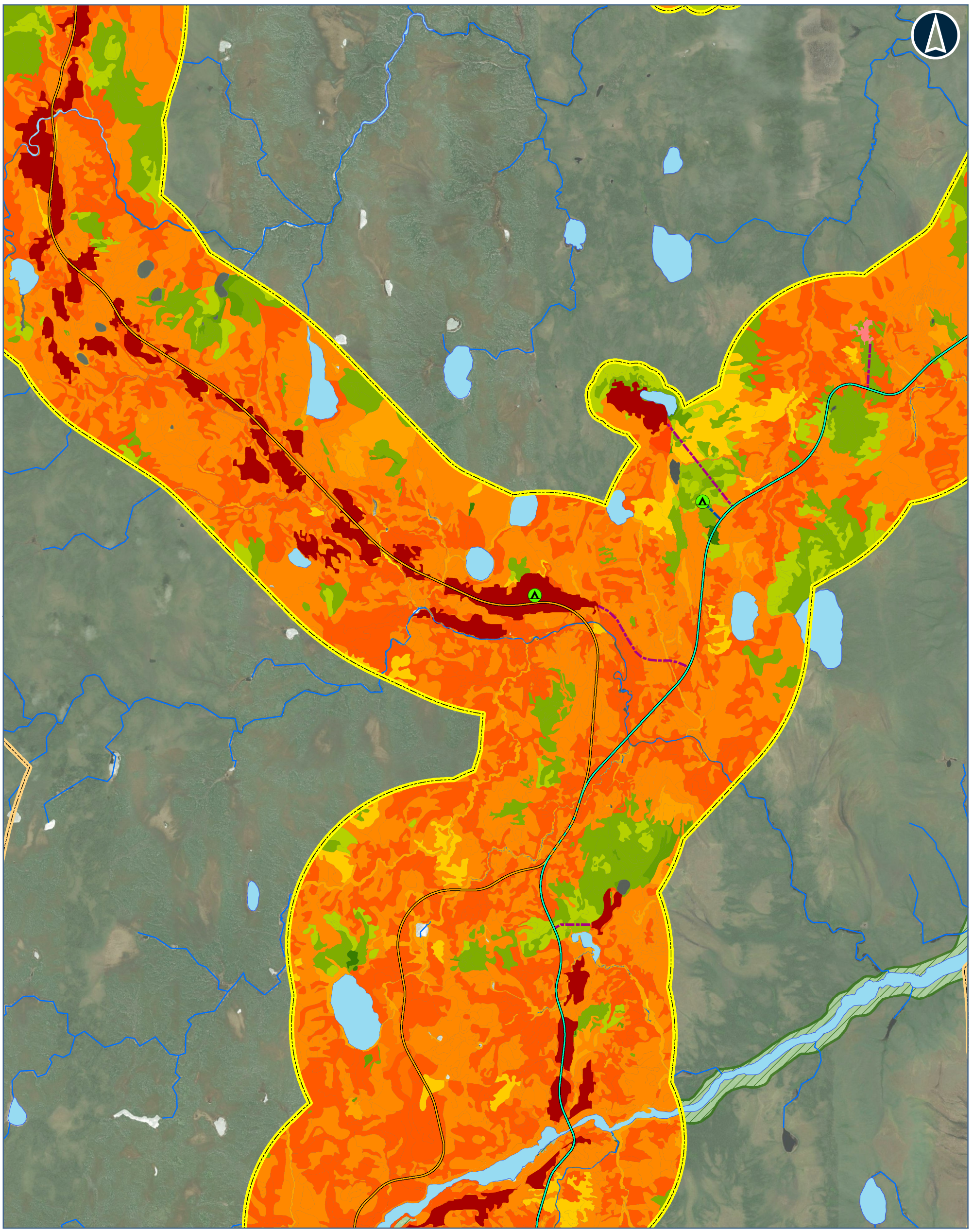

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 — 2.25 — 4.5
Kilometres

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Figure 5-6.4

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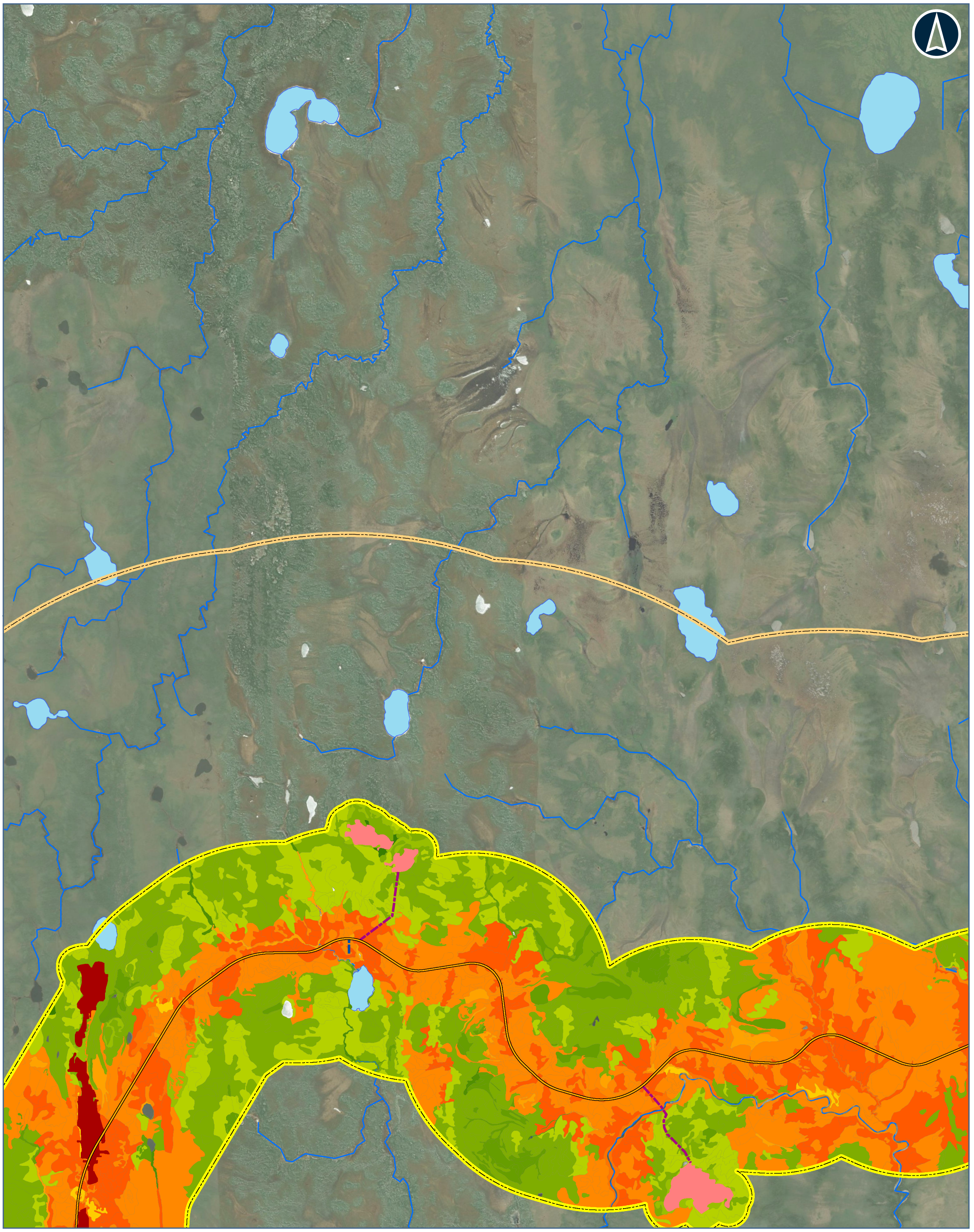

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-6.5

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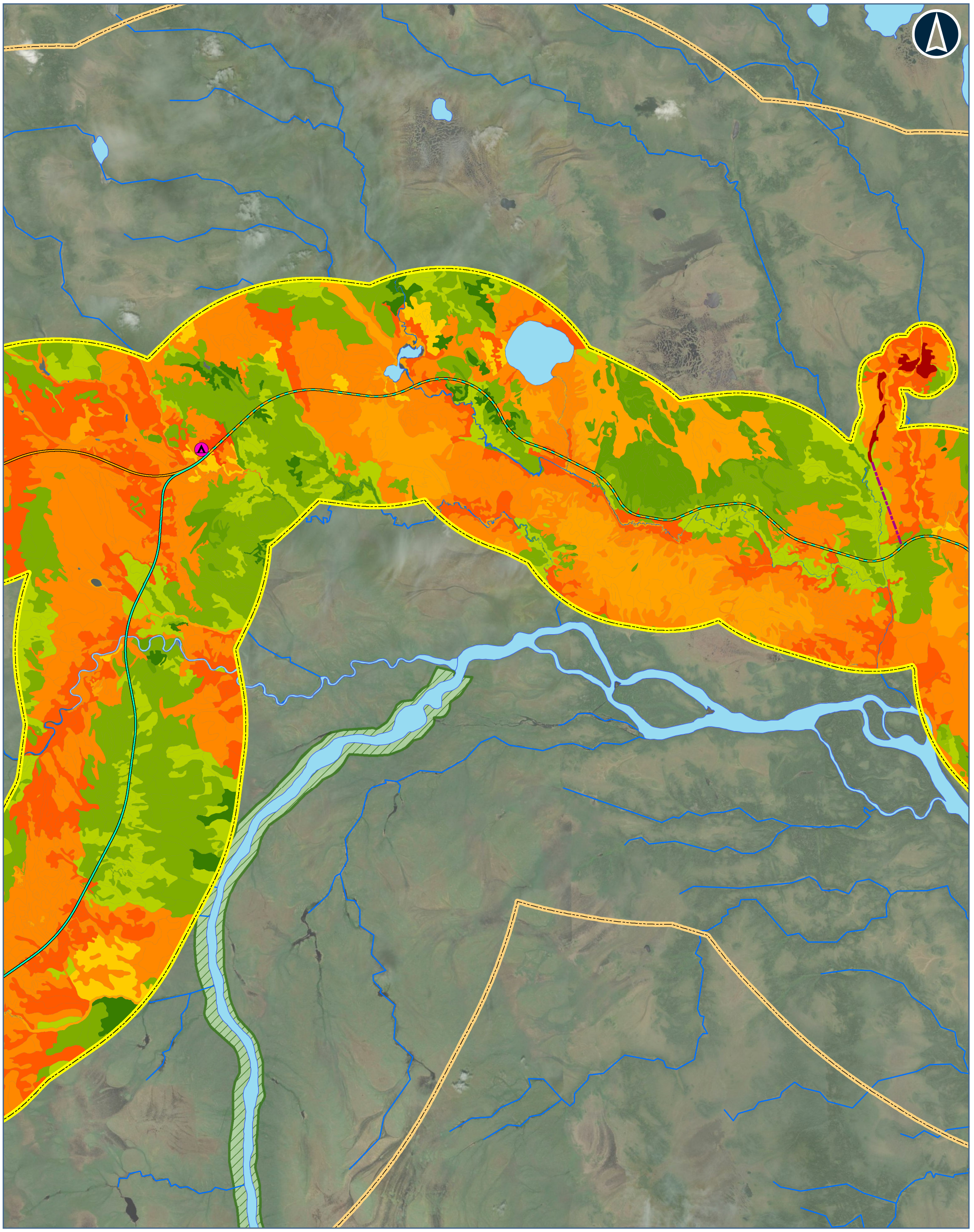

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-6.6

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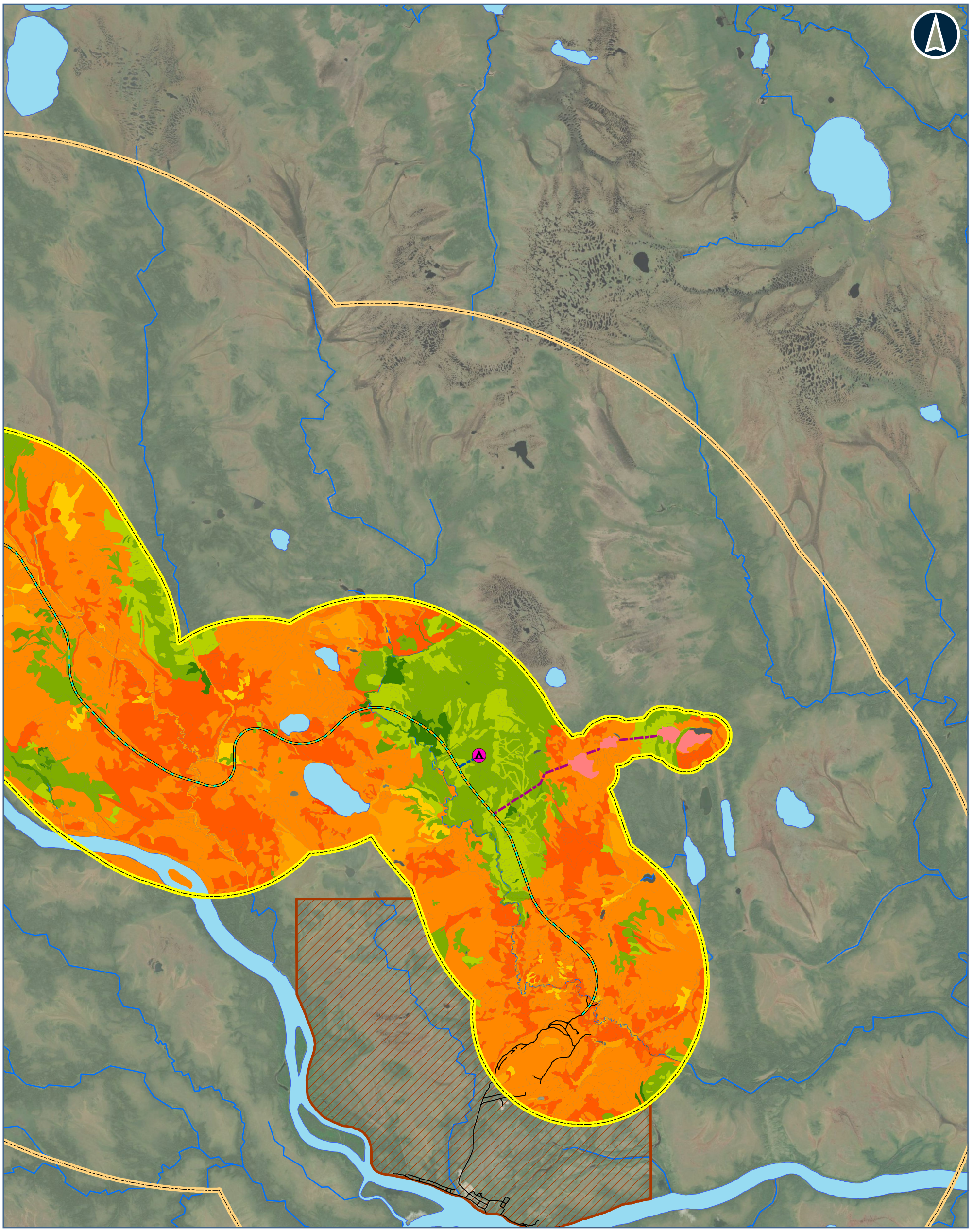

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-6.7

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5.8 Species at Risk and Species of Conservation Concern

5.8.1 Field Survey Results

As noted in **Section 4.3.4**, the background review determined that three Species at Risk and / or Species of Conservation Concern have potential to occur within the Project existing conditions Local Study Area: Black Ash, Pitcher's Thistle, and Northern Marsh Violet. One of these three species was confirmed in the Study Area during field surveys: Black Ash. A total of seven Black Ash tree locations were documented in two general areas, on three separate dates (September 21, 2021, June 29, and July 17, 2022). All observations are near the south limits of the existing conditions Local Study Area, as shown in **Figure 5-7**. One location represents a population of ~100 trees that all exhibited evidence of beaver browse.

There were no field observations of Pitcher's Thistle or Northern Marsh Violet made during the 2021-2023 field program.

5.8.2 Availability and Distribution

5.8.2.1 Black Ash

Black Ash was assessed as threatened in Canada by the Committee on the Status of Endangered Wildlife in Canada in 2018 (Committee on the Status of Endangered Wildlife in Canada, 2018) but is not currently listed under the federal *Species at Risk Act* (2002). Black Ash was assessed as endangered in Ontario by the Committee on the Status of Species at Risk in Ontario in 2020 and listed on the provincial *Endangered Species Act* (2007) in January 2022. Species and habitat protection for Black Ash under the *Endangered Species Act* were under a two-year temporary suspension from protection under the Act from the time it was listed as Endangered; however, temporary suspension ended on January 25, 2024. As stated in the *Ontario Regulation 6/24*, Black Ash that meet any of the criteria outlined in *Ontario Regulation 6/24* 2 (2) are not protected under 9 (1) (a) of the *Endangered Species Act*, including:

- Black Ash are not located within a municipality or territorial district described in Schedule 1 of *Ontario Regulation 6/24*;
- Black Ash has a stem height less than 1.37 m or a diameter of less than 8 cm at a stem height of 1.37 m; or
- Black Ash that have been determined to be unhealthy in a report prepared in accordance with subsection (3) and submitted to the Ministry prior to the commencement of an activity that may affect the Black Ash.

Based on the above criteria, all Black Ash located in the existing conditions Local Study Area and the existing conditions Regional Study Area are not protected under 9 (1) (a) of the *Endangered Species Act* (i.e., kill, harm, harass, capture or take a living member an endangered or threatened species), since they are not located within a municipality or territorial district described in Schedule 1.

The regulated habitat of Black Ash is defined in *Ontario Regulation 7/24* and includes a radial distance of 30 m from the stem of every Black Ash to which the prohibitions in clause 9 (1) (a) of the *Endangered Species Act* apply to, which are located in a municipality or territory identified in Schedule 1 of *Ontario Regulation 6/24*. Since all Black Ash in the existing conditions Local Study Area and the existing conditions Regional Study Area are not protected under 9 (1) (a) of the *Endangered Species Act*, no regulated habitat is present based on current regulations.

Black Ash is a midsized, deciduous hardwood tree. It is a facultative wetland species that occurs in moist to wet sites, such as swamps, fens, floodplain forests, and in riparian areas (i.e., along watercourses and waterbodies). It is adapted to long periods of inundation and grows best in well-aerated flooded areas. Black Ash can occur on a variety of soil types, but is most common on nutrient-rich, alkaline, and finer-textured soils (Catling et al., 2022) but can also be found on alluvial and peat and muck soils (Committee on the Status of Endangered Wildlife in Canada, 2018; Reznicek et al., 2011). In northern Ontario, Black Ash is commonly found in mixed and conifer dominated swamps, with species such as black spruce, tamarack, balsam fir (Oji-Cree translation, *ini'naandag*) (*Abies balsamea*), speckled alder (Oji-Cree translation, *wadopatik*), and balsam poplar (Committee on the Status of Endangered Wildlife in Canada, 2018).

Black Ash is found only in North America, with its northern range limit in northwestern Ontario at approximately 53°N. It has experienced notable decline in the southern portions of its range due to the effects of Emerald Ash Borer (*Agrilus planipennis*), an invasive insect pest. Threats to its recovery include the Emerald Ash Borer, other insect pests and pathogens, changing climate conditions, harvesting, invasive species, and habitat loss. Black Ash may be limited by a short growing season in the northern part of its range. Predicted climate warming, may result in a range expansion in the north (Catling et al., 2022; Oldham and Brinker, 2009; Committee on the Status of Endangered Wildlife in Canada, 2018; Rubenstein et al., 2023; Ministry of the Environment, Conservation and Parks, 2024).

Given the length of time the Project will take to reach completion, and that predicted climate warming may bring Emerald Ash Borer further north, Black Ash will be discussed in the context of Species at Risk as regulations related to habitat protection may be amended to include some or all of the existing conditions Local Study Area and / or existing conditions Regional Study Area during future Project phases.

To assess candidate habitat for Black Ash within the existing conditions Local Study Area, the habitat description provided in the *Black Ash Recovery Strategy* (Catling et al., 2022) was used as criteria to assess the suitability of all ecosites mapped within the existing conditions Local Study Area. Additionally, any ecosite listing Black Ash as a characteristic tree species in the vegetation description was included (Banton et al., 2009). In total, 18 out of the 57 ecosite types mapped within the existing conditions Local Study Area were identified as candidate habitat for Black Ash. Candidate habitat ecosites consist of moist forest, wetland, and riparian habitats, representing a total area of 65,022.3 ha (33% of the existing conditions Local Study Area). Ecosites with suitable habitat for Black Ash are displayed on **Figure 5-7**. Based on the current habitat suitability assessment, the distribution of these ecosites is relatively even across the existing conditions Local Study Area.

5.8.2.2 Pitcher's Thistle

Pitcher's Thistle is listed as endangered on Schedule 1 of the federal *Species at Risk Act* (2002). In Ontario, it is listed as endangered on the provincial *Endangered Species Act 2007*. The Global range of Pitcher's Thistle is restricted to the shores of Lake Huron, Lake Michigan, and Lake Superior (Parks Canada Agency, 2011). Most often it is found in Little Bluestem – Long-leaved Reed Grass – Great Lakes Wheat Grass Dune Grassland (Lee et al., 1998; Natural Heritage Information Centre, 2003), a habitat type that is not present within the existing conditions Local Study Area.

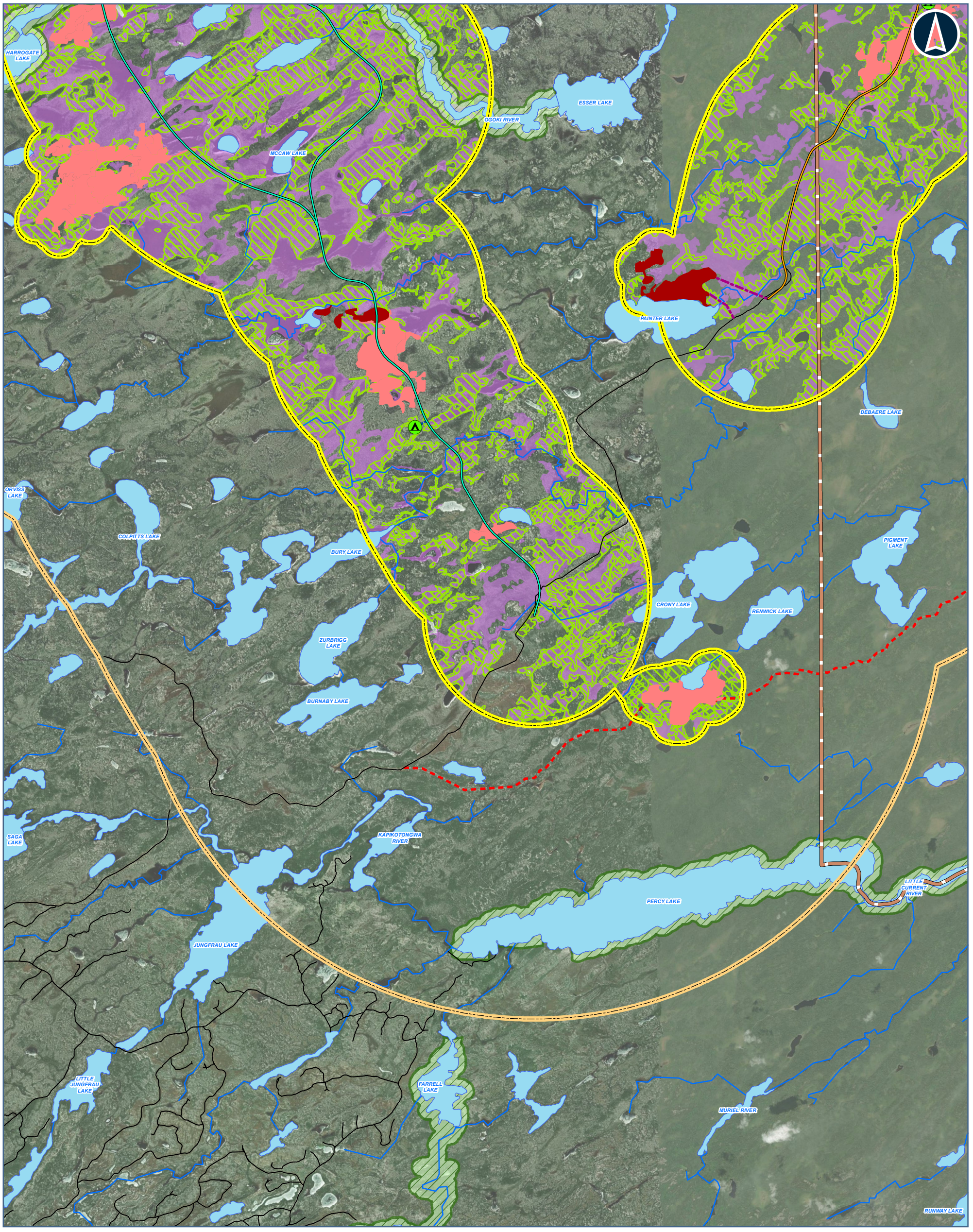
Due to the above factors (i.e., the species' range is restricted to the shores of the Great Lakes and a preferred habitat type that is not present within the existing conditions Local Study Area), this species has been removed from further consideration.

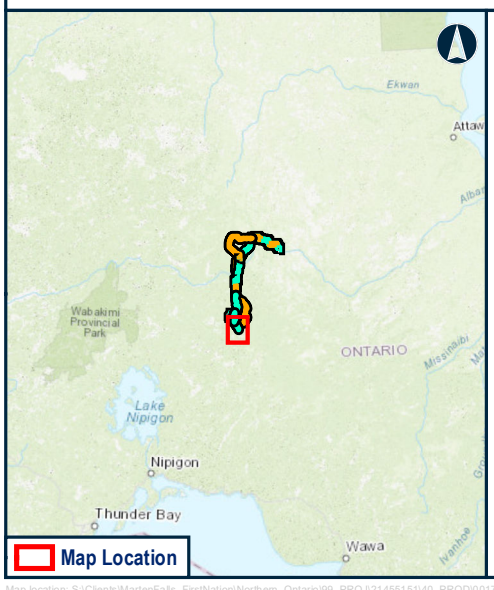
5.8.2.3 Northern Marsh Violet

Northern Marsh Violet is a provincially rare plant species ranked S2S3 in Ontario (i.e., a Species of Conservation Concern). It is a species that is tracked by the province but is not a Species at Risk afforded legal protection under the *Endangered Species Act 2007* or *Species at Risk Act* (2002).

Northern Marsh Violet it is distributed from Lake Superior north to Hudson Bay (McKinney and Little, 1993+; Ministry of Natural Resources and Forestry, 2022) and is found in a variety of habitats including alpine meadows, bogs, treed fens, swamps, marshes, mossy wet banks, rich moist woods, and other cool, wet places (McKinney et al., 1993+; Douglas et al., 2002; Ministry of Natural Resources and Forestry, 2022; Michigan State University, 2023). Although this species was not observed during field investigations, only a small proportion of the existing conditions Local Study Area and the ecosites with suitable habitat for this species were visited.

To assess candidate habitat for Northern Marsh Violet, the habitat descriptions provided from a variety of sources (McKinney and Little, 1993+; Douglas et al., 2002; Michigan State University, 2023) were reviewed and used as criteria to assess the suitability of all ecosites mapped within the existing conditions Local Study Area. In total, 22 of the 57 ecosites mapped within the existing conditions Local Study Area were identified as candidate habitat for Northern Marsh Violet. Candidate habitat ecosites consist of moist forests, treed and shrub dominated wetlands, and riparian habitats, representing a total area of 141,435.26 ha (71% of the existing conditions Local Study Area). Ecosites with suitable habitat for Northern Marsh Violet are displayed on **Figure 5-7**. Based on the habitat suitability assessment, the distribution of these ecosites increases towards the northern portion of the existing conditions Local Study Area, which is consistent with the increase in the availability and distribution of wetland ecosystems.





Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
Kilometres

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Figure 5-7.1

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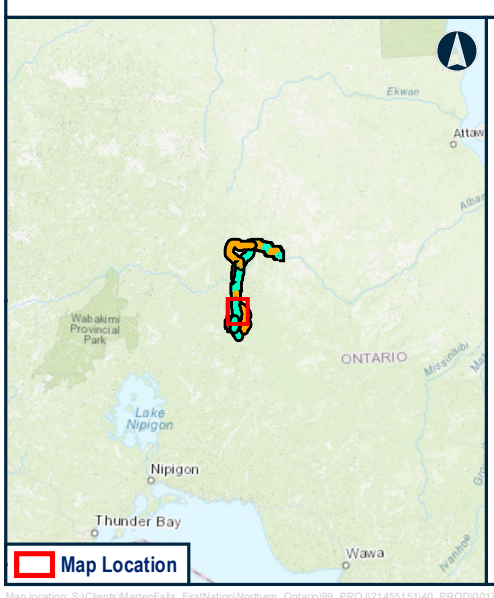
DUSEY LAKE
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
PATIENCE LAKE
OGOKI RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- BLACK ASH OBSERVATION
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
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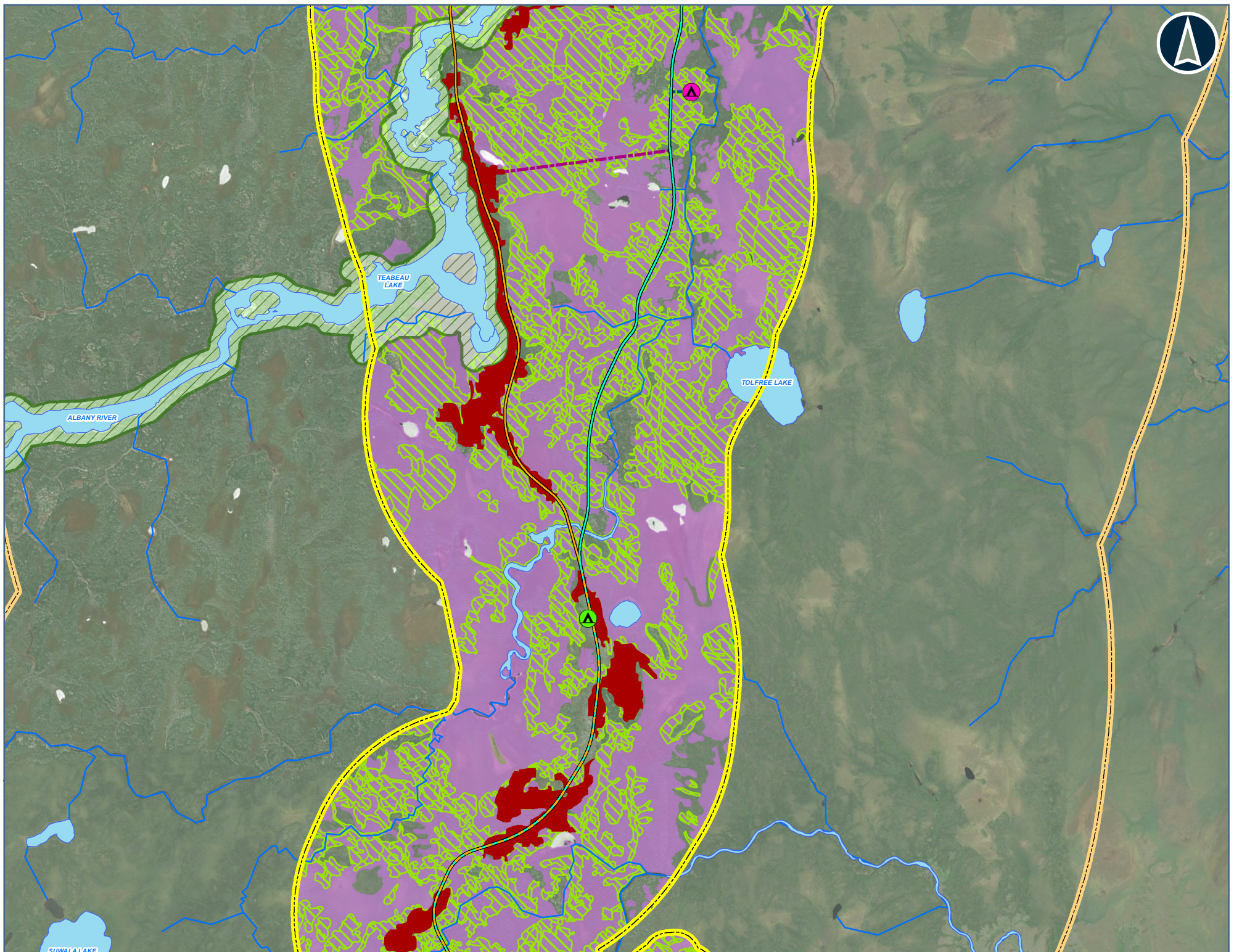

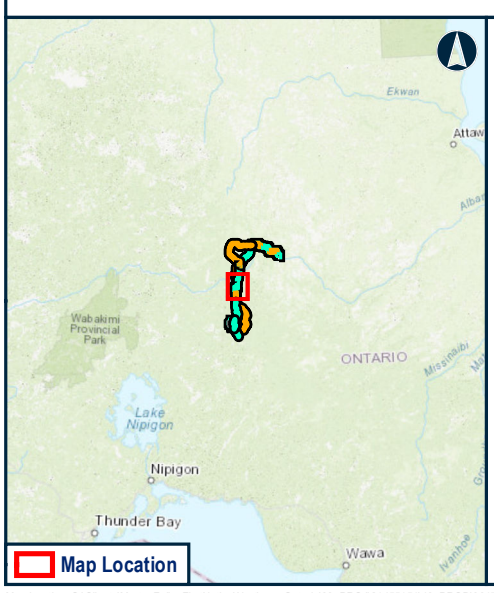

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
Kilometres

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Figure 5-7.3

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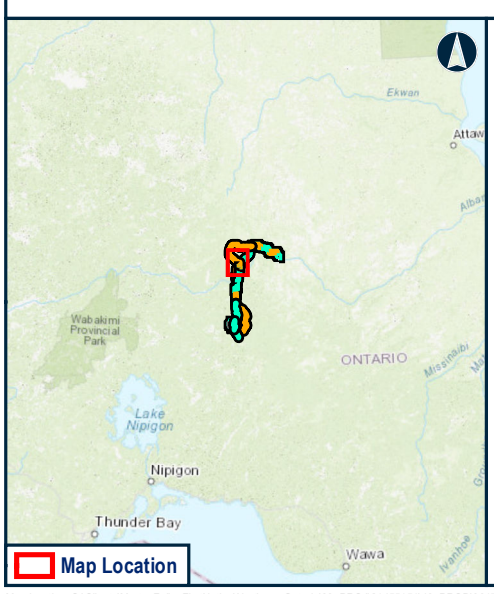
WABASSI RIVER
VENTON LAKE
MAXEY LAKE
TREBELL LAKE
SAARIMAKI LAKE
ALBANY RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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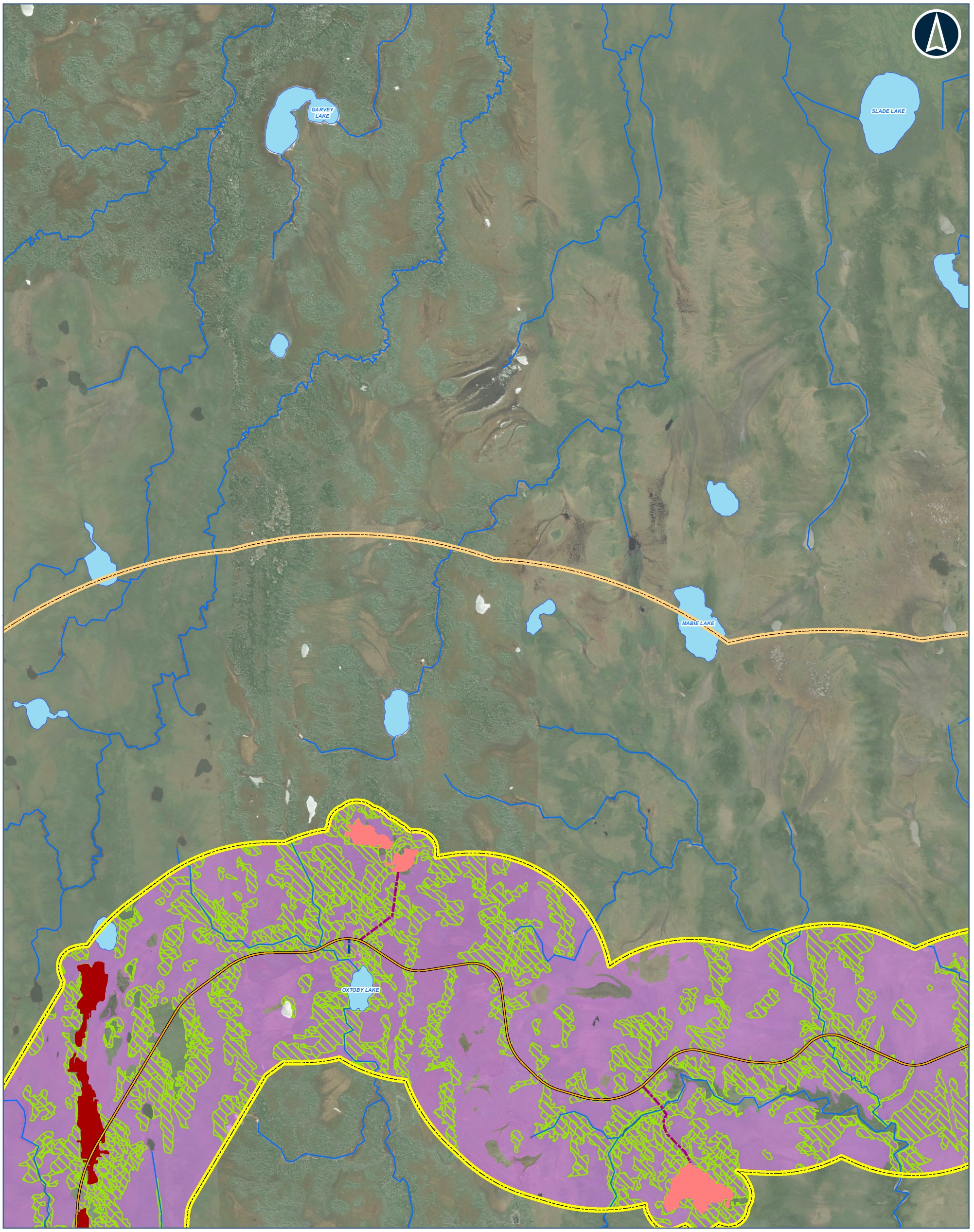

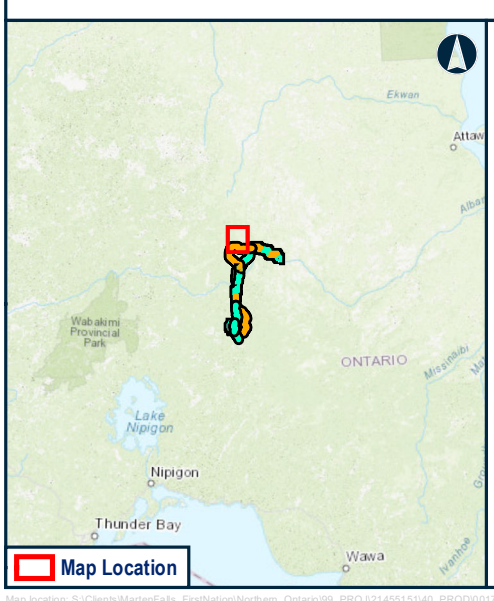

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
Kilometres

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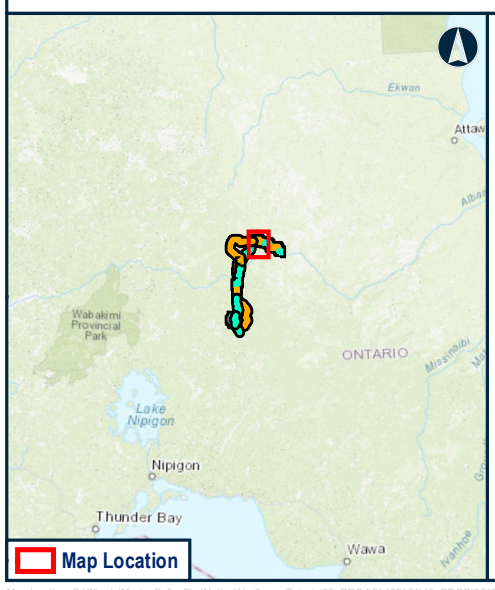
GUKDEN LAKE

GITTINS LAKE

WABASSI RIVER

ALBANY RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-7.6

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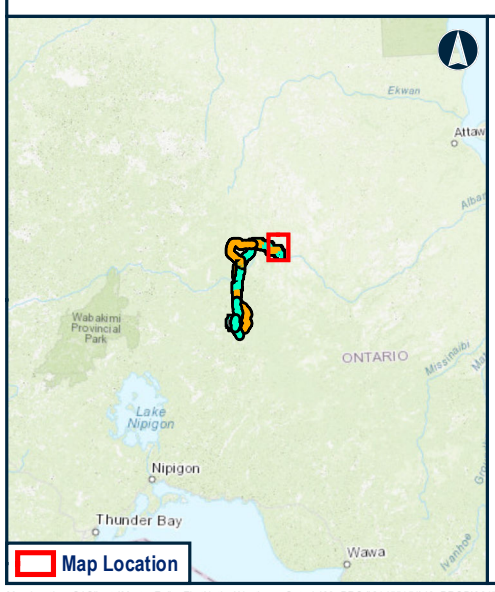
SEBERT LAKE
GURDEN LAKE
TIFFIN LAKE
ALBANY RIVER



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-7.7

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5.9 Invasive Plant Species

Non-native species occurring within the natural environment are commonly described as either introduced or invasive. Introduced species are those that may have been introduced to an area outside of their native range, while invasive species are introduced and negatively affect the environment or human health.

No invasive plant species were identified during field investigations. Based on the remote location of the existing conditions Local Study Area, the lack of invasive plant species observations is not surprising. It should be noted that absence of invasive plant species in ground inspection sites does not imply that invasive plant species are absent from the entire existing conditions Construction Disturbance Area, existing conditions Local Study Area, or existing conditions Regional Study Area; however, existing conditions indicate negligible to low invasive plant species presence.

5.10 Anthropogenic and Natural Disturbances

Disturbances within the existing conditions Local Study Area are displayed spatially in **Figure 5-8. Table 5-15** provides a summary of all anthropogenic and natural disturbance types mapped in the existing conditions Local Study Area and the amount of disturbance in wetland and upland communities. Based on the disturbance analysis approach described in **Section 4.3.6**, a total of 649.9 ha of anthropogenic disturbances and 38,279.9 ha of natural disturbances have occurred within the existing conditions Local Study Area. The natural disturbances included in the analysis include all fire and blowdown disturbances mapped by the province in the past 40 years.

Natural disturbances comprise of a significantly larger area than anthropogenic disturbances, which is expected given the remote location of the Project. The majority (nearly 100%) of the natural disturbances within the existing conditions Local Study Area were fires located in the Albany River Ecodistrict (Ecoregion 2E), and the Wunnummin Lake and Lower Sachigo River Ecodistricts (Ecoregion 2W). Fires occurred nearly equally in wetland communities (18,096.1 ha) and upland communities (18,357.7 ha) within the existing conditions Local Study Area. A very small portion of the Local Study Area (6.9 ha) located in upland habitats within the Wunnummin Lake Ecodistrict (Ecoregion 2W) was affected by blowdown. Both disturbance types are common in these Ecoregions (Crins et al., 2009) and are vital to maintaining natural processes in many boreal vegetation communities. Overall, these natural disturbances comprise approximately 19% of the existing conditions Local Study Area. The largest mapped disturbance is the result of a 1995 fire north of the Ogoki River Provincial Park mapped in **Figure 5-8**.

Anthropogenic disturbances within the existing conditions Local Study Area are located in the Albany River Ecodistrict (Ecoregion 2E), and the Wunnummin Lake and Lower Sachnigo River Ecodistricts (Ecoregion 2W) and are limited to the southern portion of the existing conditions Local Study Area (mostly all season and winter roads), and the northeast portion of the existing conditions Local Study Area associated with the Marten Falls First Nation community. These disturbances included various settlements (camps, commercial outpost camps, and communities; 53.1 ha), various linear infrastructure (all season roads, winter roads, and trails; 331.7 ha), and forestry activities (tree harvest; 26.9 ha). Overall, these anthropogenic disturbances are a very small component of the existing conditions Local Study Area (<1%).

Limited habitat fragmentation occurs in the south and northeast portions of the existing conditions Local Study Area. All season and winter roads bisect areas in the southern-most portion of the existing conditions Local Study Area. Small all-season roads and trails occur in the northeast portion of the study area surrounding the Marten Falls First Nation community. All linear infrastructure is minimal and is not likely a barrier to the reproduction and dispersal of flora in the existing conditions Local Study Area.

Table 5-15: Anthropogenic and Natural Disturbances in the Existing Conditions Local Study Area

Disturbance Type		Wetland		Upland		Water		Total	
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)
Natural	Blowdown	0.0	0%	6.9	<1%	0.0	0%	6.9	<1%
	Fire	18,357.7	9%	18,096.1	9%	1,819.2	<1%	38,273.0	19%
Natural Total		**18,357.7**	**9%**	**18,103.0**	**9%**	**1,819.2**	**<1%**	**38,279.9**	**19%**
Anthropogenic	Harvest	6.6	<1%	20.3	<1%	0.0	0%	26.9	<1%
	All Season Road	23.4	<1%	184.0	<1%	0.4	<1%	207.8	<1%
	Camp – Other	0.0	0%	<0.1	<1%	0.0	0%	<0.1	<1%
	Commercial Outpost Camp	0.0	0%	1.2	<1%	0.0	0%	1.2	<1%
	Community	31.5	<1%	20.4	<1%	0.0	0%	51.9	<1%
	Trail	60.3	<1%	47.0	<1%	238.2	<1%	345.6	<1%
	Winter Road	1.8	<1%	14.7	<1%	0.0	0%	16.6	<1%
Anthropogenic Total		**123.6**	**<1%**	**287.6**	**<1%**	**238.7**	**<1%**	**649.9**	**<1%**

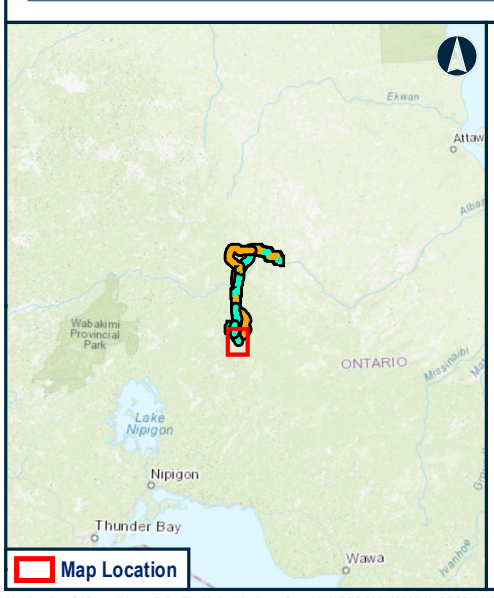
% = percent; ha = hectare; < = less than.

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- RECREATION
- TRAIL
- WINTER ROAD

NATURAL DISTURBANCE

- BLOWDOWN
- FIRE
- HARVEST

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 — 2.25 — 4.5
Kilometres

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Figure 5-8.1

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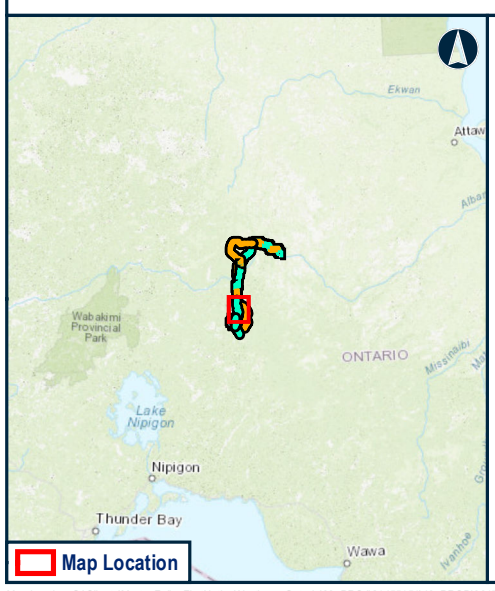
OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- RECREATION
- TRAIL
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- FIRE
- HARVEST

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 5-8.2

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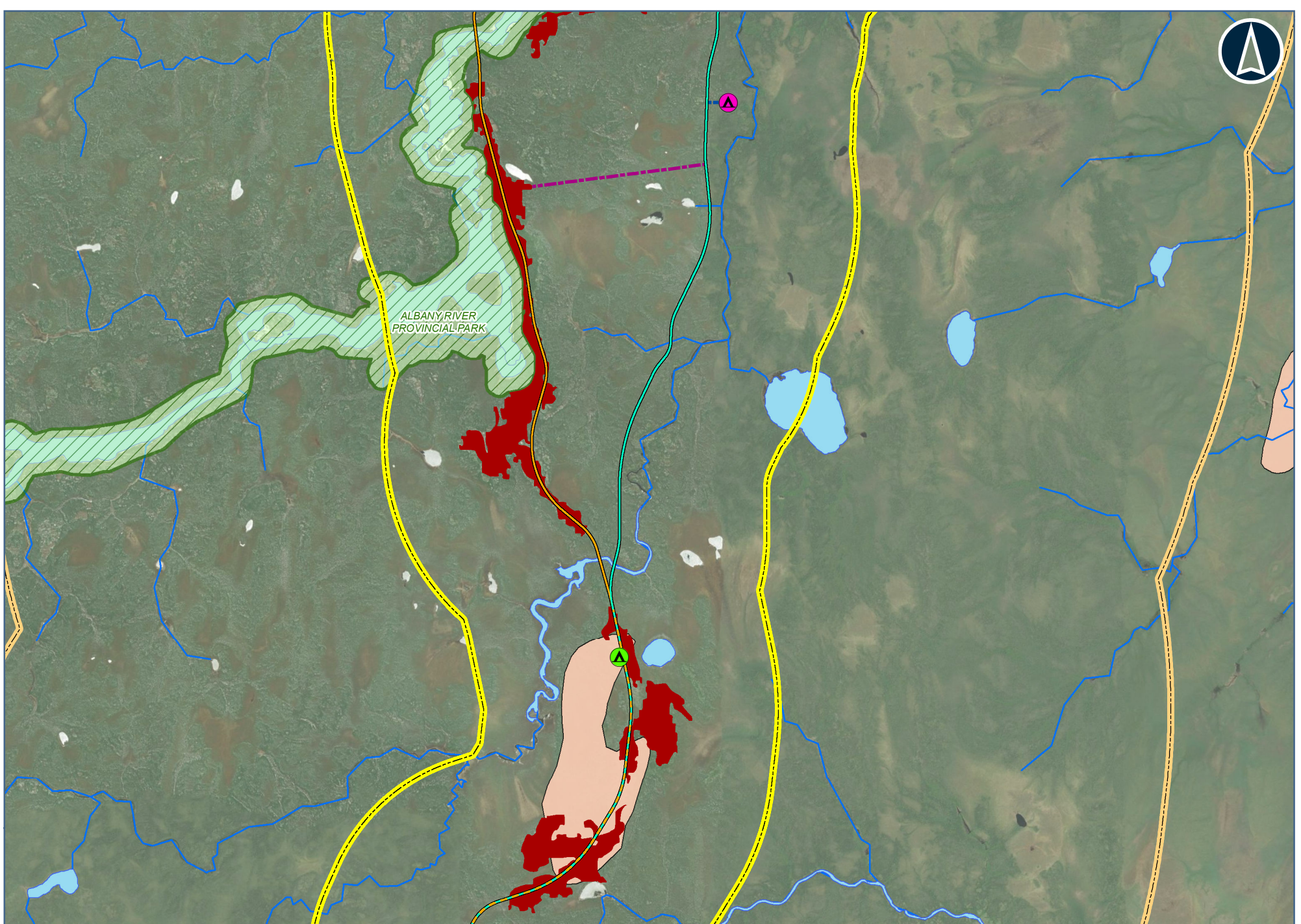

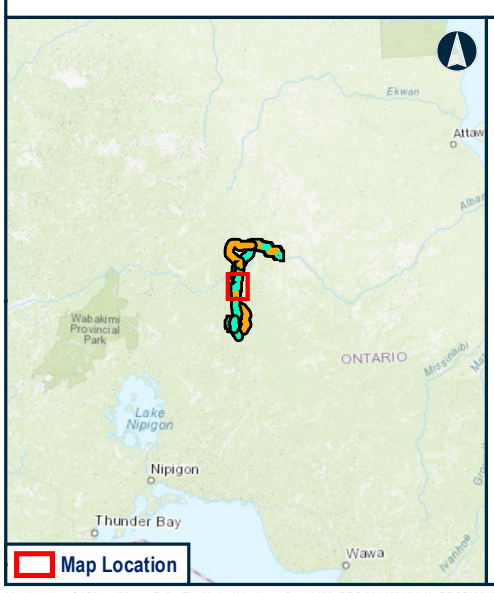

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- FIRE

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 2.25 4.5
Kilometres

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Figure 5-8.3

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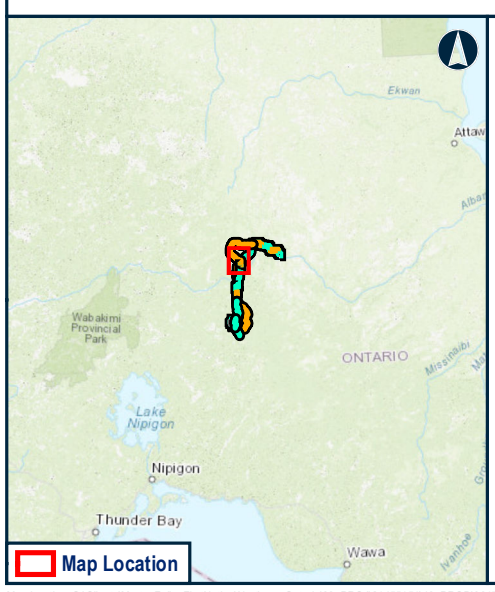
ALBANY RIVER
PROVINCIAL PARK



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- FIRE

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 — 2.25 — 4.5
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Figure 5-8.4

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Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

NATURAL DISTURBANCE

- FIRE

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

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Figure 5-8.5

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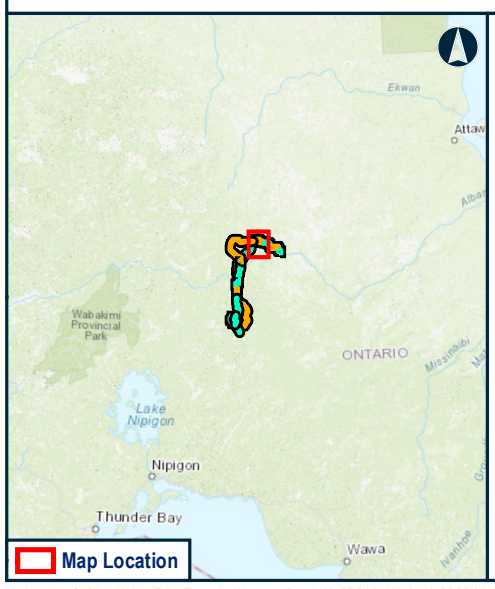
ALBANY RIVER
PROVINCIAL PARK



Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
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- BEDROCK
- SAND AND GRAVEL
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

NATURAL DISTURBANCE

- FIRE

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 2.25 4.5
Kilometres

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Figure 5-8.6

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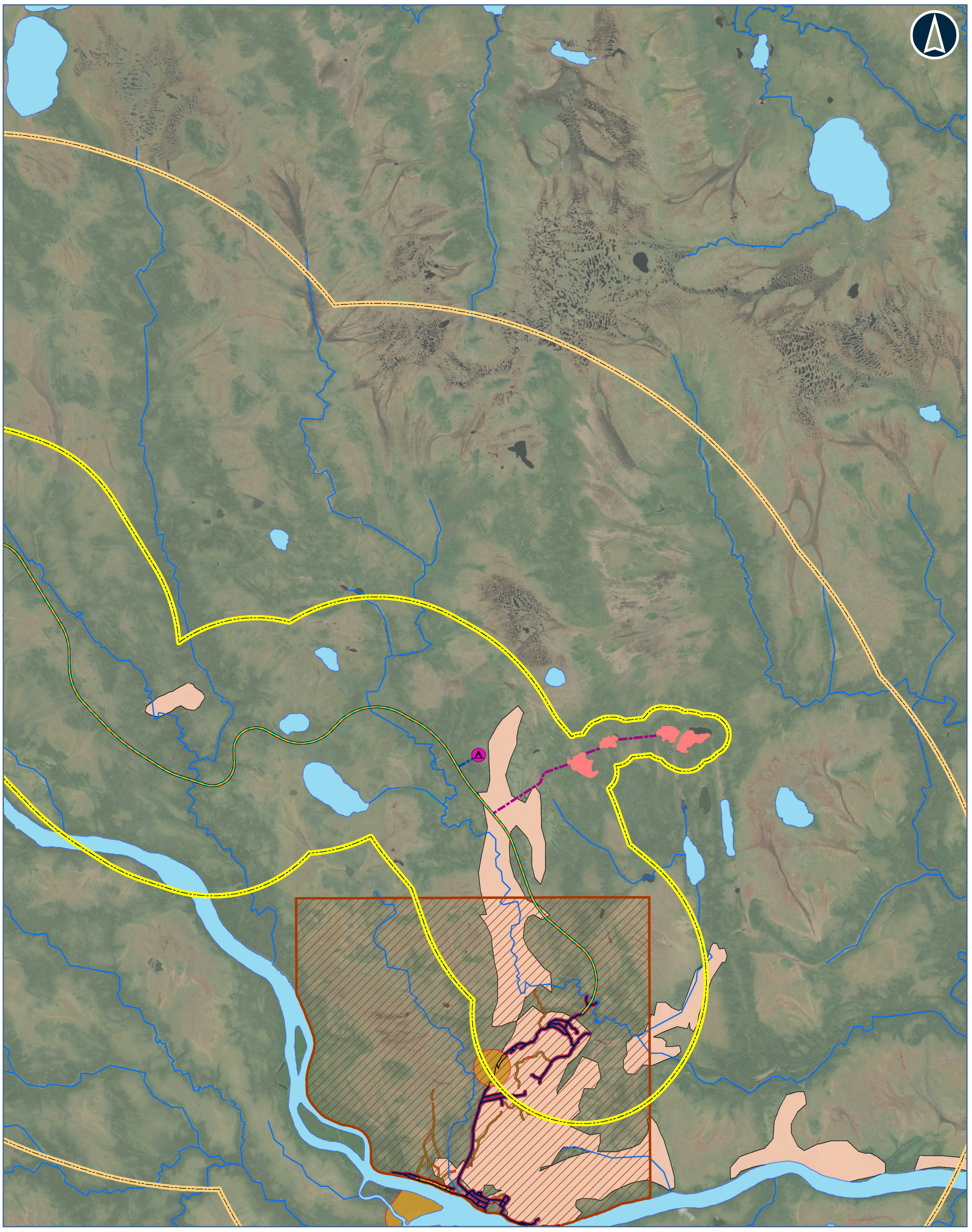

Legend

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 and ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- BEDROCK
- SAND AND GRAVEL
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- TRAIL

NATURAL DISTURBANCE

- FIRE

Data Source:
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Aerial photography provided by:
Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Rev:0	

Figure 5-8.7

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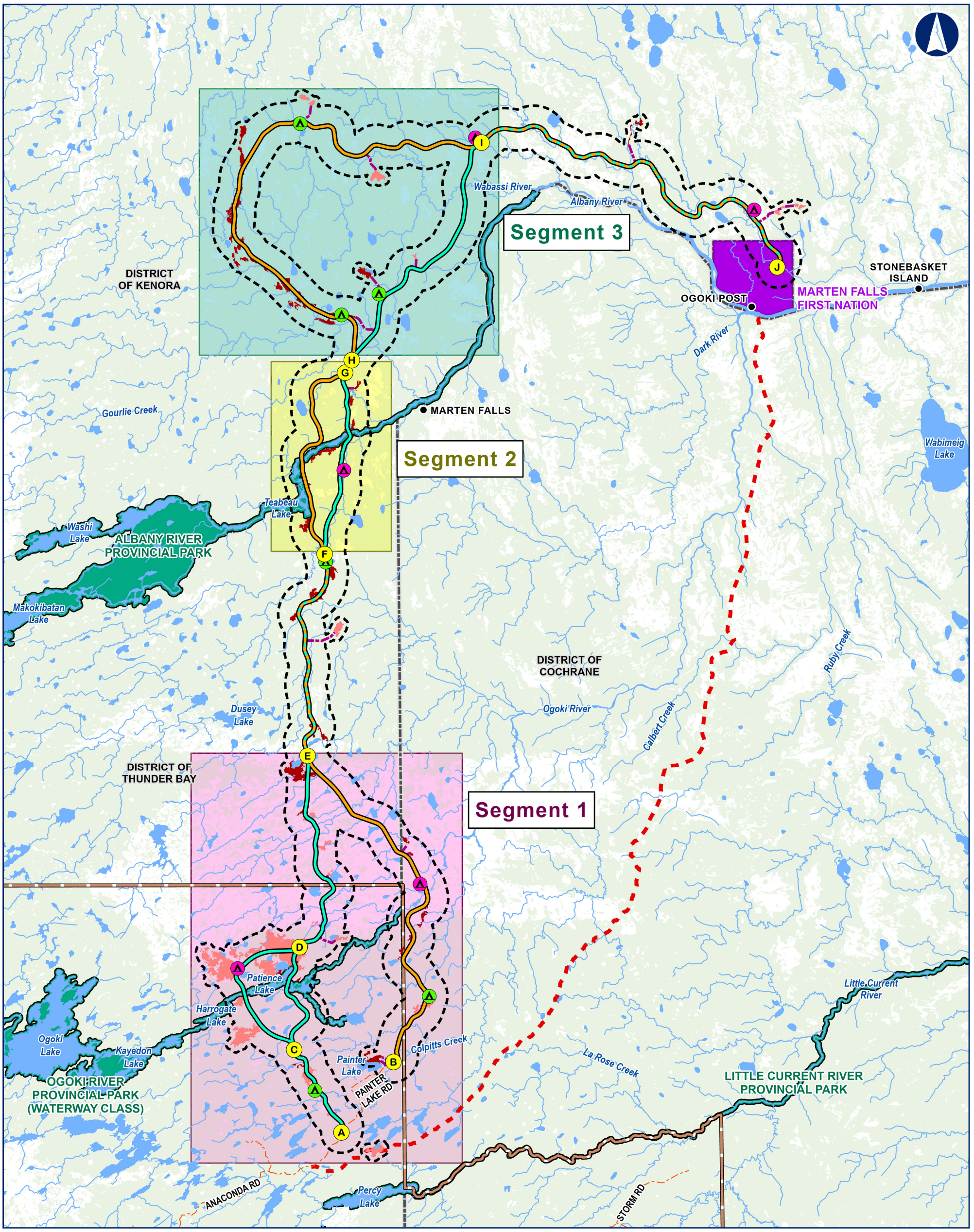
Date Saved: 2/10/2026 11:01:18 PM User Name: INGU06951

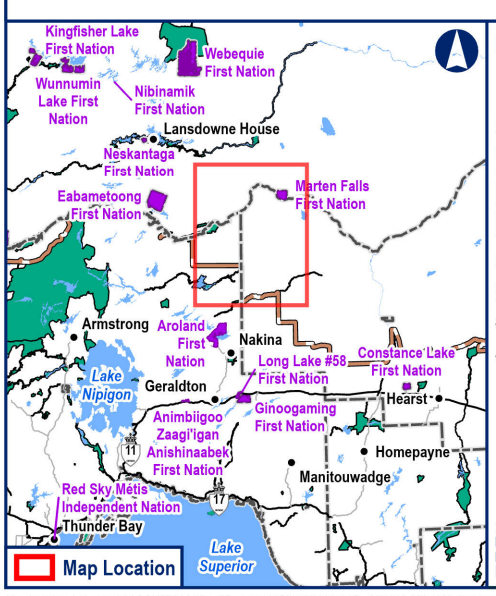
6. Selection of the Preferred Route

Following the collection of existing conditions information on the two alternative route alignments described in **Section 4**, the Project Team undertook an exercise to select a Preferred Route. The methodology and detailed results of this exercise are described in the *Environmental Assessment / Impact Statement Report* and are summarized at a high level below. The Preferred Route includes the footprint of any temporary features such as pits and quarries, temporary access roads, and worker camps associated with the construction of that route. The effects assessment will be completed using the identified Preferred Route.

6.1 Alternative Segments and Routes Within Each Segment

To simplify the evaluation of the alternatives, they were divided into three separate segments based on their geographical locations. The segments were determined so that any alternative route in one segment could connect with any alternative route in the next segment, allowing for decisions to be made based on the environment in each segment, and not based on the whole. This approach considers the variable environmental conditions within the Project area, allowing for flexibility to avoid sensitive natural features encountered within the Project disturbance area for each segment instead of requiring decision makers to balance trade-offs of one long route versus the other.





Legend

- Segment Node
- Project Study Area
- Segment 1
- Segment 2
- Segment 3

Construction Disturbance Area

Route Alternatives (100 m Right-of-Way)

- Alternative 1
- Alternative 4

Potential Camp Site

- 50 Persons (108 m x 150 m)
- 200 Persons (108 m x 150 m)
- Approximate Access Road to Potential Construction Camp (10 m Width)

Potential Aggregate Source

- Bedrock
- Sand and gravel
- Approximate Access Road to Potential Aggregate Site (10 m Width)

General Features

- Resource / Recreation Road
- MFFN Existing Winter Access Road
- Watercourse
- Waterbody
- First Nation Reserve
- District Municipal Boundary
- Far North Boundary
- Provincial Park

Data Source:
Base Data: Provided by MNRF 2023; Route Infrastructure - Provided by AECOM 2021. Contains Information licensed under the Government Licence Ontario.

Notes:
First Nation Reserves of MFFN CAR Neighboring Indigenous Communities are shown within the inset extent.

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Route Alternatives and Segments

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 6-1

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Date Saved: 2026-01-21 6:05 AM User Name: paige.crossman

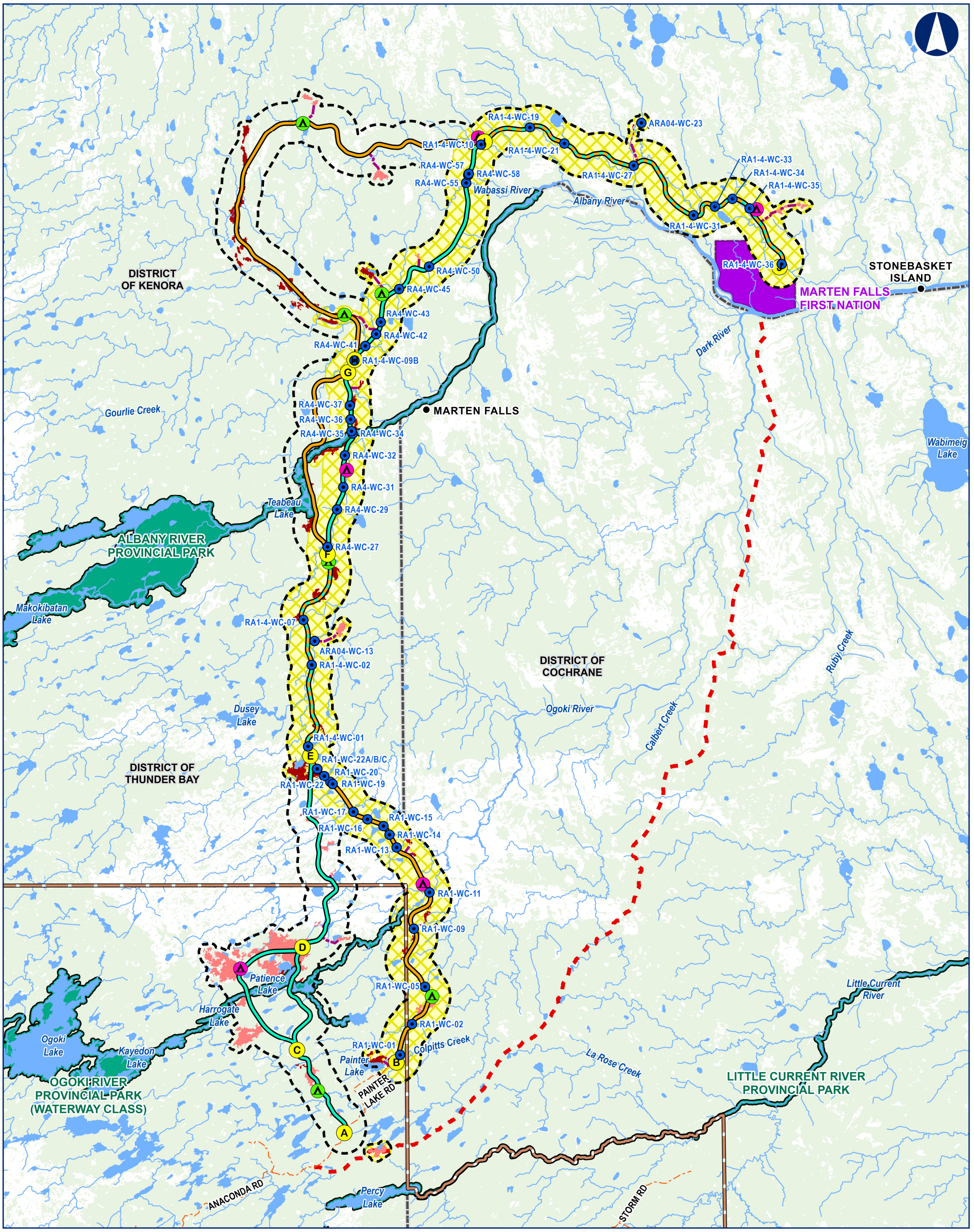
6.2 Preferred Route

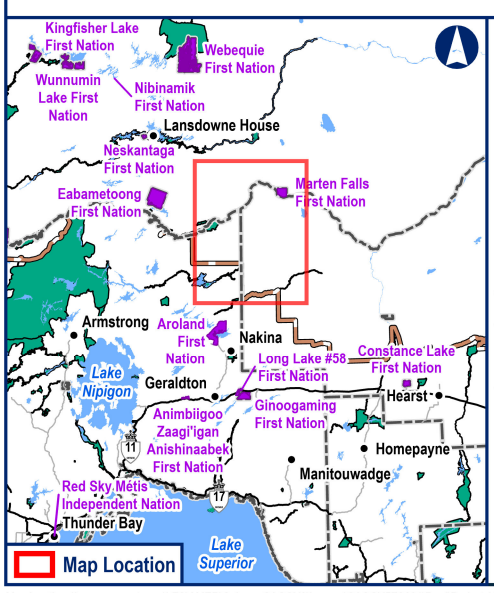
The selection of the Preferred Route within each segment involved a thorough analysis of technical, economic, natural, social, and cultural factors. The route alternative evaluation considered the potential effects and standard or known mitigation approaches to determine the net positive or negative effects of each alternative; it was completed using the reasoned argument (trade-off) method. The reasoned argument method qualitatively compares the advantages and disadvantages of each alternative including the relative significance of the potential residual effects.

After the completion of the steps outlined above, obtaining direction from the communities of Marten Falls First Nation, Aroland First Nation, and collecting input from the public and regulators, the Proponent identified a Preferred Route alignment for each segment.

- Segment 1 – Ogoki Crossing: Alternative 1;
- Segment 2 – Albany Crossing: Alternative 4; and
- Segment 3 – North of the Albany: Alternative 4.

The combination of segments 1, 2, and 3 create the final Preferred Route (**Figure 6-2**).





Legend

- Water Crossing
- Segment Node
- Project Study Area
- Final Route Recommendation

Construction Disturbance Area

Route Alternatives (100 m Right-of-Way)

- Alternative 1
- Alternative 4

N/A

- Alternative 1 and Alternative 4

Potential Camp Site

- 50 Persons (108 m x 150 m)
- 200 Persons (108 m x 150 m)

Potential Aggregate Source

- Bedrock
- Sand and gravel
- Approximate Access Road to Potential Aggregate Site (10 m Width)

General Features

- Resource / Recreation Road
- MFFN Existing Winter Access Road
- Watercourse
- Waterbody
- First Nation Reserve
- District Municipal Boundary
- Far North Boundary
- Provincial Park

Data Source:
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Notes:
First Nation Reserves of MFFN CAR Neighboring Indigenous Communities are shown within the inset extent.

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Final Route Recommendation

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Rev:00

Figure 6-2

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Date Saved: 2026-01-22 9:07 AM User Name: paige.crossman

7. Residual Effects Assessment

Effects assessment results are provided for the Preferred Route, with consideration of the temporal phase of the Project as described in **Section 4.2**. This includes the potential effects (positive and negative), mitigation measures, residual effects, and indirect effects.

7.1 Summary of the Existing Environment Within the Effects Assessment Study Areas

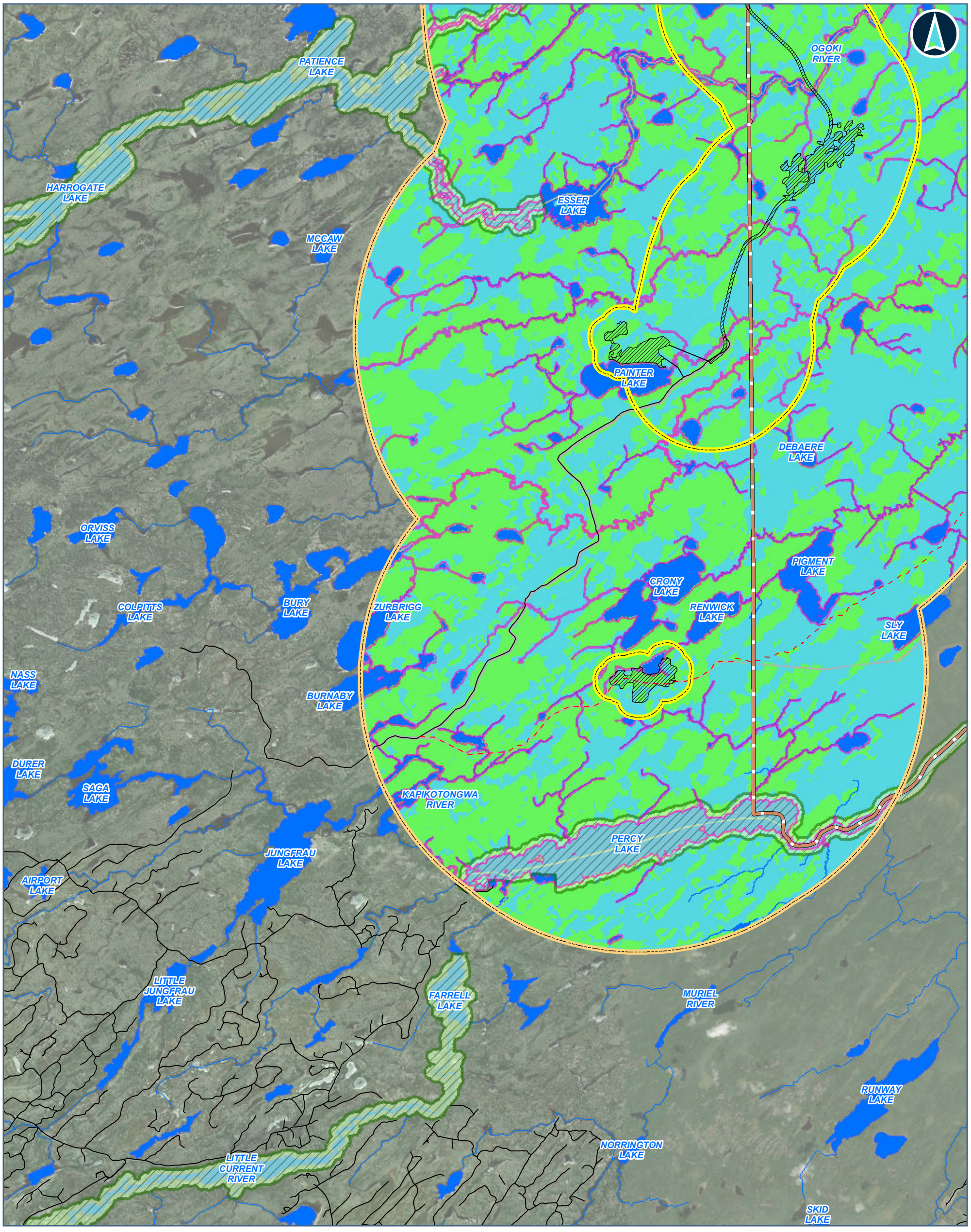
Existing conditions were established for the vegetation Valued Components within the existing conditions Local Study Area and Regional Study Area (where feasible for some Valued Components). These conditions provide a description of the existing environment for the effects assessment study areas (i.e., Local and Regional Study Areas established for the Preferred Route). The data are summarized in the following sections and shown in **Figure 7-1** through **Figure 7-4**. The effects assessment Local Study Area comprises a total area of 115,961.2 ha. The effects assessment Regional Study Area comprises a total area of 453,875.0 ha. The effects assessment Construction Disturbance Area comprises a total area of 4,700.2 ha.

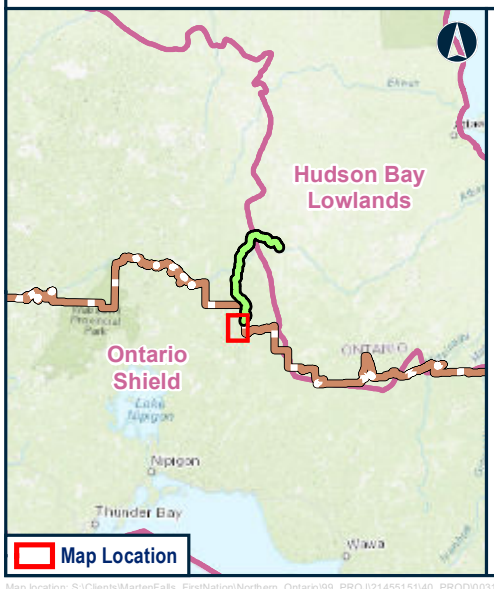
7.1.1 Upland Ecosystems

The availability, distribution, composition, and function of the upland ecosystems within the general Project area are described in **Section 5.3**. The following sections summarize the same data within the effects assessment study areas.

7.1.1.1 Availability

As summarized in **Table 7-1**, Upland Ecosystems represent 22% (25,510 ha) of the effects assessment Local Study Area and 28% (127,906.9 ha) of the effects assessment regional study area. Coniferous Forest communities are the dominant upland community type within the effects assessment Local Study Area (19%) as well as within the effects assessment Regional Study Area (14%). Deciduous Forests are the next most common upland community type within the effects assessment Local Study Area (3%), followed by Mixed Forest (<1%), Rock / Barren (<1%) and Early Successional / Sparse Treed (<1%). Similar upland vegetation community proportions are reflected in the effects assessment Regional Study Area, except that there is a greater abundance of Mixed Forest communities (3%) and Early Successional / Sparse Treed communities (9%) in the effects assessment Regional Study Area. **Table 7-1** summarizes the availability of upland ecosystems within the effects assessment study areas. Upland Ecosystems in the effects assessment study areas are also displayed in **Figure 7-1** and **Figure 7-2.**





Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-1.1

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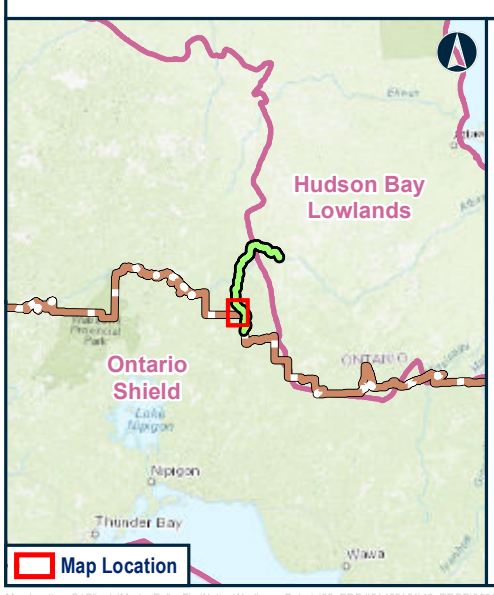
Date Saved: 2/11/2026 7:52:22 PM User Name: gld_rduval

BALSON LAKE
DUSEY LAKE
DUSEY RIVER
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
OGOKI RIVER
PATIENCE LAKE
HARROGATE LAKE
MCCAW LAKE
ESSER LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-1.2

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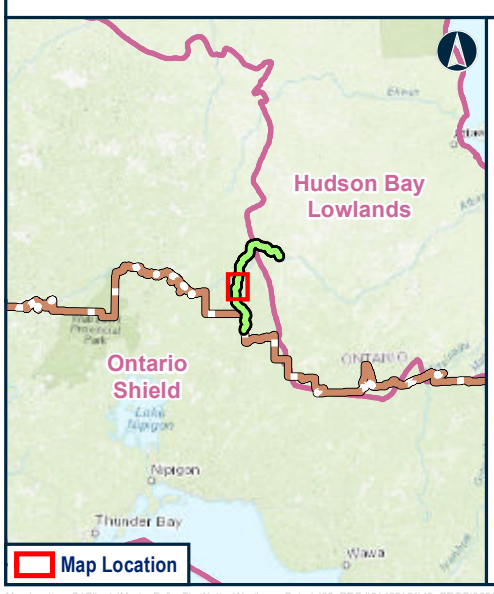
ALBANY RIVER
TRELOAR LAKE
TEABEAU LAKE
TOLFREE LAKE
SUWALA LAKE
DUSEY RIVER
TANASE LAKE
BALSON LAKE
DUSEY LAKE
WINSLOW LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres

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Figure 7-1.3

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Date Saved: 2/11/2026 7:52:22 PM User Name: gld_rduval

WABASSI RIVER

VENTON LAKE

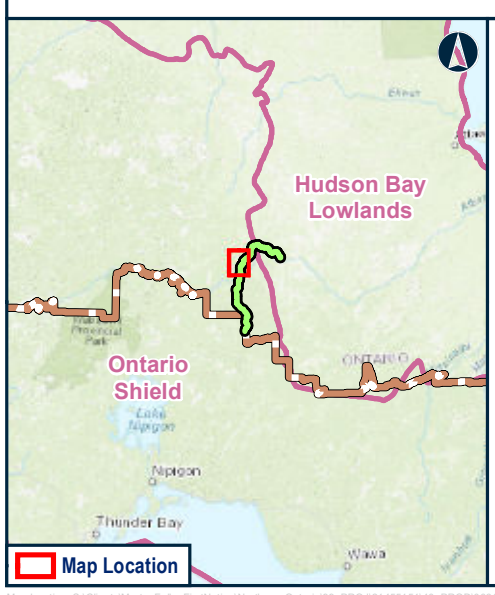
MAXEY LAKE

TREBELL LAKE

SAARIMAKI LAKE

ALBANY RIVER

TRELOAR LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-1.4

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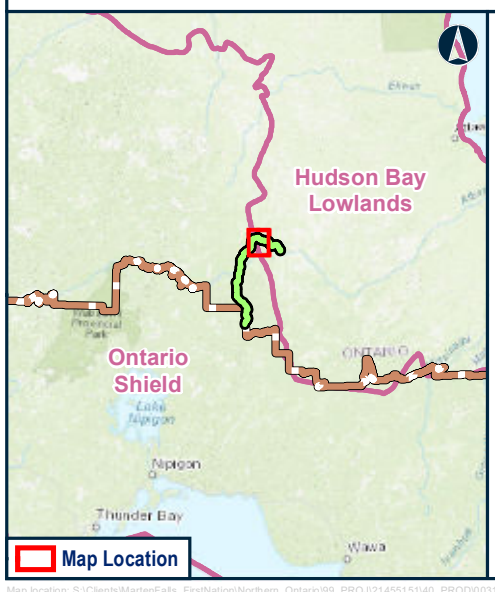
ACTON LAKE
SEBERT LAKE
GURDEN LAKE
GITTINS LAKE
WABASSI RIVER
ALBANY RIVER
TREBELL LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-1.5

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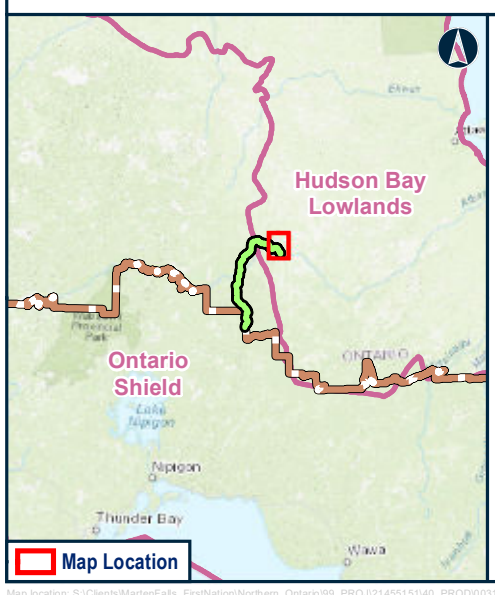
ACTON LAKE
SEBERT LAKE
GURDEN LAKE
TIFFIN LAKE
ALBANY RIVER
DARK RIVER
OGOKI RIVER



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- CONSTRUCTION DISTURBANCE AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems in the Effects Assessment Study Areas

0 3 6
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-1.6

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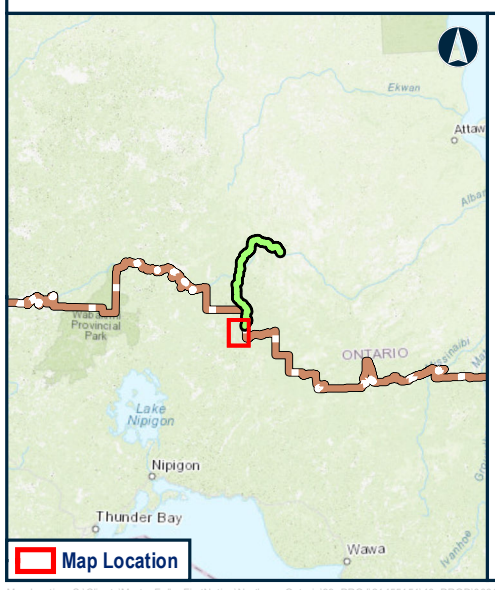
Date Saved: 2/11/2026 7:52:22 PM User Name: gld_rduval

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-6.1

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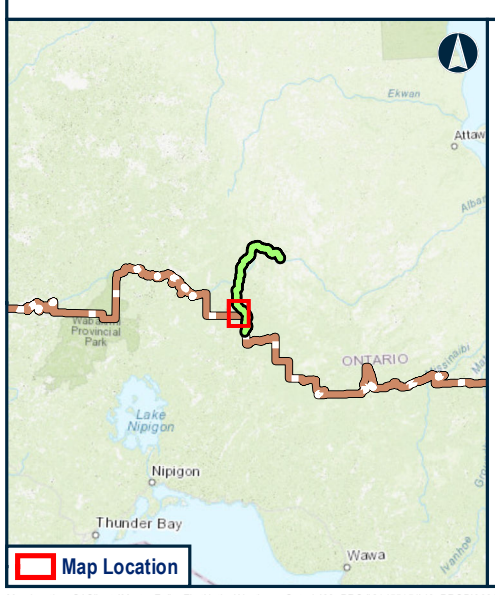
OGOKI RIVER
PROVINCIAL PARK
(WATERWAY CLASS)



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

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Figure 7-6.2

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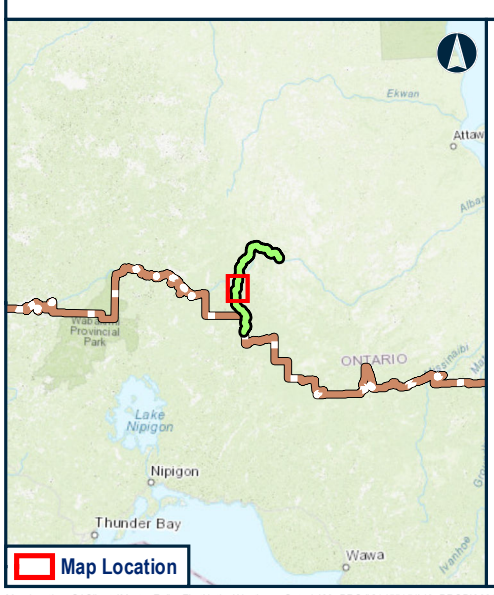
ALBANY RIVER
PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

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Figure 7-6.3

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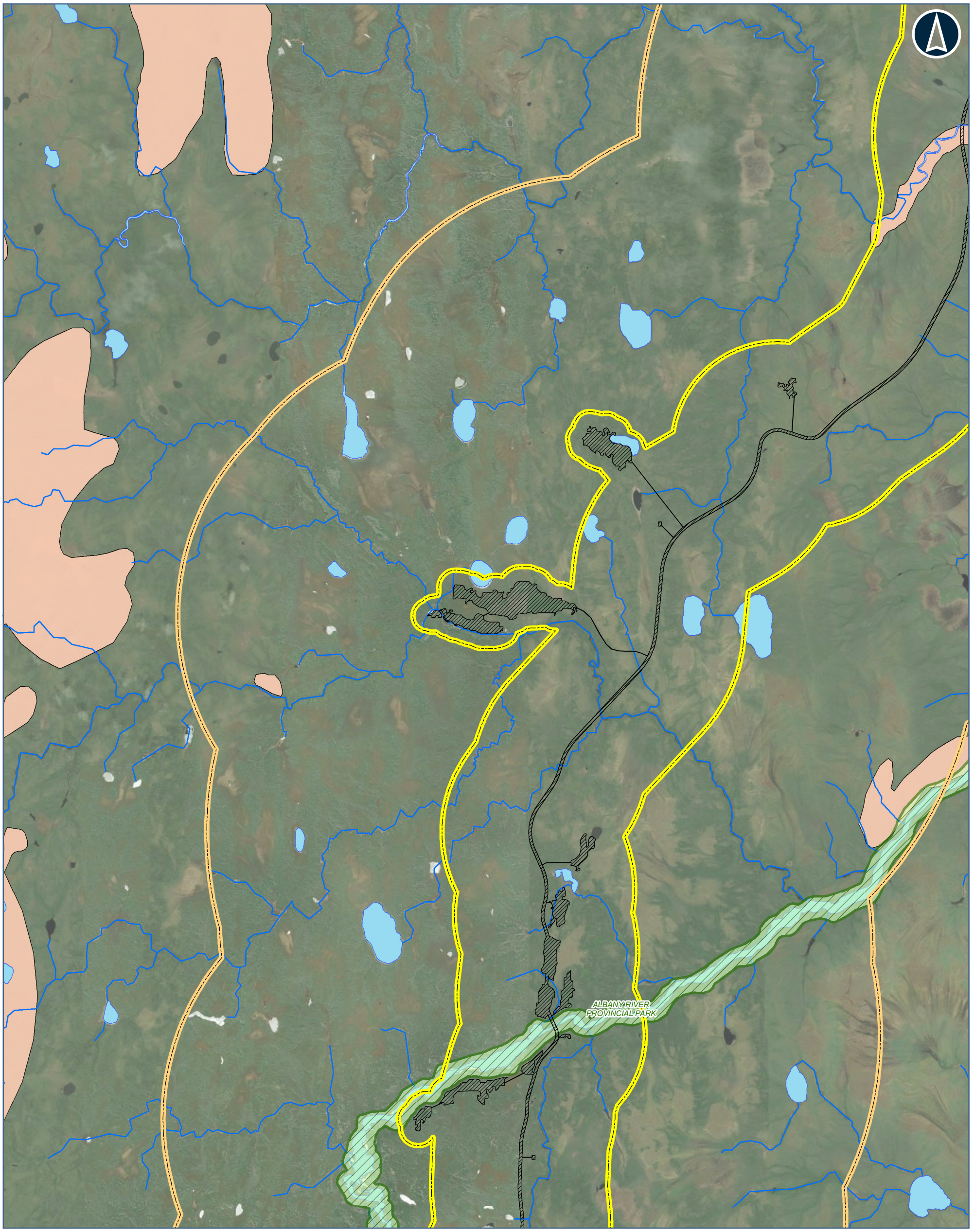

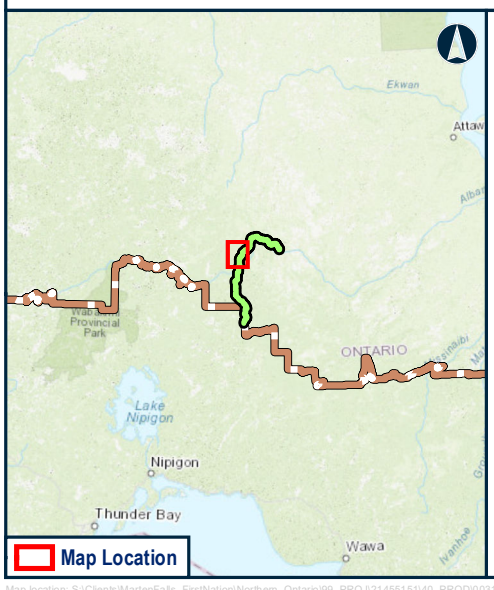

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

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Figure 7-6.4

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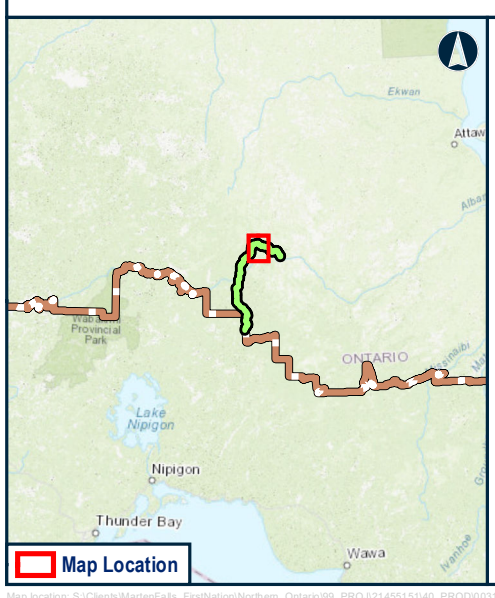
ALBANY RIVER
PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 2.75 5.5
Kilometres

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Figure 7-6.5

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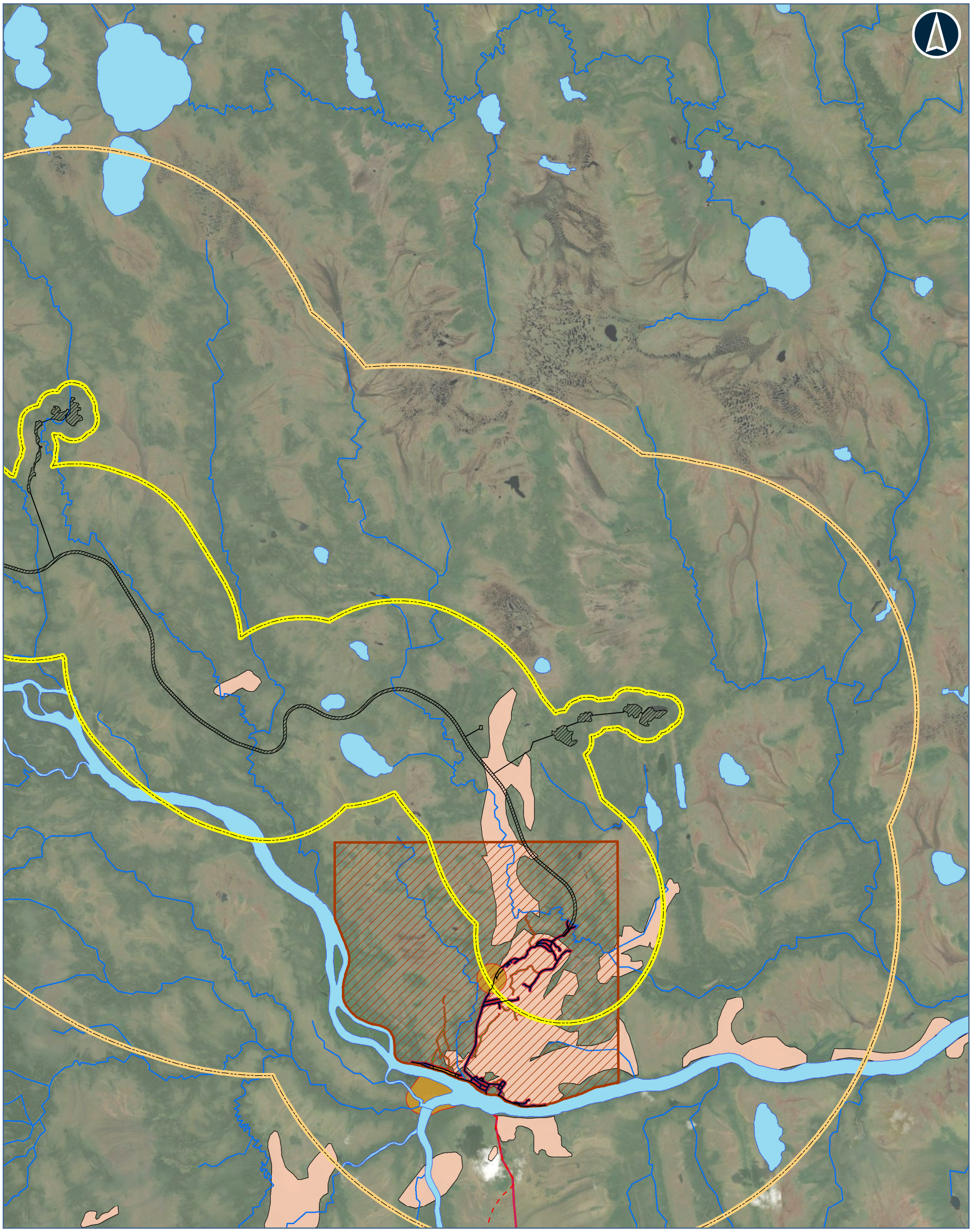

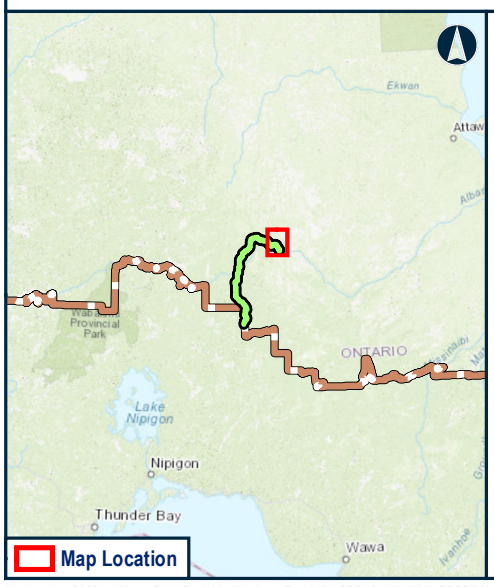

Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

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Figure 7-6.6

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Table 7-1: Summary of Upland Ecosystem Availability in the Effects Assessment Study Areas

Upland Community	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		% of Community Type within the Effects Regional Study Area Affected
	Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Regional Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
Coniferous Forest	21,683.8	19%	62,843.7	14%	1,620.6	1%	8%
Deciduous Forest	3,311.3	3%	9,593.0	2%	601.1	<1%	6%
Mixed Forest	348.1	<1%	15,024.3	3%	73.9	<1%	<1%
Rock / Barren	113.1	<1%	137.4	<1%	8.3	<1%	6%
Early Successional / Sparse Treed	53.7	<1%	40,308.4	9%	5.5	<1%	<1%
Total [(a)]	**25,510.0**	**22%**	**127,906.9**	**28%**	**2,309.3**	**2%**	**2%**

Notes:
(a) Percentages do not add to 100% since remaining area is composed of wetland ecosystems, riparian ecosystems, water, and anthropogenic areas.
% = percent; ha = hectare.

7.1.1.2 Distribution

The Distribution of upland ecosystems within the effects assessment Study Areas is illustrated on **Figure 5-2** and **Figure 5-3**. Generally, upland ecosites are found throughout the effects assessment Study Areas, but are more frequent south of Dusey Lake, as can be seen at a glance by the dominance of green shading on **Figure 5-2, plates 1** and **2**. Likewise, Coniferous Forest communities are most common in the southern portion of the effects assessment Local Study Area, with Deciduous Forest communities also present (See **Figure 5-3, plates 1** and **2**).

7.1.1.3 Composition and Function

The composition of the upland vegetation communities within the Project landscape is described in **Attachment B**.

Information about the function of uplands within the existing conditions Study Areas are summarized in **Section 5.3.3**. That information has not been repeated here as the information relates to upland systems as a whole and does not change within the effects assessment Study Areas.

7.1.2 Wetland Ecosystems

The availability, distribution, composition, and function of the wetland ecosystems within the general Project landscape are described in **Section 5.4**. The following sections summarize the same data within the effects assessment study areas.

7.1.2.1 Availability

As summarized in **Table 7-2**, Wetland Ecosystems represent 75% of the effects assessment Local Study Area (86,514.5 ha) and 66% of the effects assessment Regional Study Area (301,022.6 ha). Fen and Swamp communities are the dominant wetland communities within the effects assessment Local Study Area, comprising 40% and 32%, respectively. Fen and Swamp communities also dominate the effects assessment Regional Study Area, but to a lesser degree, at 24% and 27%, respectively. Marsh and Bog communities are much less common within the effects assessment Local Study Area, at 2% and 1%, respectively. Bogs are notably more common in the effects assessment Regional Study Area at 15%; however, this may represent mapping bias in either the Landcover dataset or in the vegetation mapping produced for the Project.

Table 7-2 summarizes the availability of wetland ecosystems within the effects assessment study areas. Wetland Ecosystems in the effects assessment study areas are also displayed in **Figure 7-1** and **Figure 7-2.**

Table 7-2: Summary of Wetland Ecosystems Availability in the Effects Assessment Study Areas

Wetland Community	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		% of Community Type within the Effects Regional Study Area Affected
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) of the Effects Local Study Area	
Swamp	36,719.1	32%	123,938.6	27%	1,510.5	1%	4%
Marsh	2,273.0	2%	2,274.4	<1%	37.4	<1%	2%
Fen	46,083.6	40%	109,053.9	24%	786.2	<1%	2%
Bog	1,438.8	1%	65,755.6	15%	29.2	<1%	2%
Total [(a)]	**86,514.5**	**75%**	**301,022.6**	**66%**	**2,363.2**	**2%**	**3%**

Notes:
(a) Percentages do not add to 100% since remaining area is composed of upland ecosystems, riparian ecosystems, water, and anthropogenic areas.
% = percent; ha = hectare.

7.1.2.2 Distribution

The Distribution of wetland ecosystems within the effects assessment study areas is illustrated in **Figure 5-2** and **Figure 5-3**. Generally, wetland ecosites are found throughout the effects assessment study areas but are more frequent north of Dusey Lake, as can be seen at a glance by the dominance of blue shading in **Figure 5-2, plates 3** through **6**. Likewise, fen and swamp communities are most common in the northern portion of the effects assessment Local Study Area (See **Figure 5-3, plates 3** through **6**).

7.1.2.3 Composition and Function

The composition of the wetland vegetation communities within the Project landscape is described in **Attachment B**.

Information about the function of wetlands within the existing conditions Study Areas are summarized in **Section 5.4.3**. That information has not been repeated here as the information relates to wetland systems as a whole and does not change within the effects assessment study areas.

7.1.3 Riparian Ecosystems

The availability, distribution, composition, and function of the riparian ecosystems within the general Project landscape are described in **Section 5.5.**

7.1.3.1 Availability

As summarized in **Table 7-3**, Riparian Ecosystems represent 4% (4,937 ha) of the effects assessment Local Study Area and 4% (15,769 ha) of the effects assessment Regional Study Area.

Riparian Ecosystems include both upland and wetland vegetation communities. Within the effects assessment Local Study Area, 16% of the riparian zone is composed of upland vegetation and 74% is composed of wetland vegetation communities. Upland and wetland vegetation communities represent <1% and 3% of the effects assessment Local Study Area, respectively.

In the effects assessment Regional Study Area, 21% of the riparian zone is composed of upland vegetation, and 38% is composed of wetland. Upland and wetland vegetation communities represent <1% and 1% of the effects assessment Regional Study Area, respectively.

A small area of the effects assessment Local and Regional Study Areas are mapped as anthropogenic (i.e., a total of 0.4 ha and 8.6 ha, respectively) also falls within the riparian zone. In a more developed landscape, it would be expected that a much larger proportion

of the riparian zone would be anthropogenic, given the tendency for settlements to occur along watercourses and waterbodies.

The 501.4 ha (or <1%) of the effects assessment Local Study Area and 6,436 ha (1%) of the effects assessment Regional Study Area that is mapped as Water is more a reflection of mapping and analyses process than a reflection of the landscape. This anomaly results because the provincial waterbody layer (i.e., Ontario Hydro Network Waterbody) does not correspond directly to the polygons mapped as “Water” within the desktop vegetation community mapping, as illustrated in **Figure 5-4**.

Table 7-3 summarizes the availability of riparian ecosystems within the Effects Assessment Study Areas. Riparian Ecosystems in the effects assessment study areas are also displayed in **Figure 7-1.**

Table 7-3: Summary of Riparian Ecosystems Availability in the Effects Assessment Study Areas

Vegetation Community Grouping	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		% of Community Type within Riparian Ecosystems of the Effects Regional Study Area Affected
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) of the Effects Local Study Area	
Coniferous Forest	670.9	<1%	1,719.5	<1%	24.3	<1%	1%
Deciduous Forest	100.1	<1%	372.5	<1%	5.2	<1%	1%
Mixed Forest	7.8	<1%	698.6	<1%	1.0	<1%	0%
Rock / Barren	18.1	<1%	18.1	0%	0.3	<1%	2%
Early Successional / Sparse Treed	4.1	<1%	482.2	<1%	0.2	<1%	0%
Fen	651.1	<1%	1,360.2	<1%	16.4	<1%	1%
Bog	5.1	<1%	97.3	0%	0.0	0%	0%
Marsh	1,383.2	1%	1,383.5	<1%	24.1	<1%	2%
Swamp	1,595.3	1%	3,192.5	<1%	32.0	<1%	1%
Anthropogenic	0.4	<1%	8.6	0%	1.3	<1%	3%
Water	501.4	<1%	6,436.1	1%	13.0	<1%	0%
Total	**4,937.4**	**4%**	**15,769.0**	**4%**	**116.7**	**<1%**	**1%**

% = percent; ha = hectare; < = less than.

7.1.3.2 Distribution

There are waterbodies and watercourses throughout the effects assessment Local Study Area, however, the frequency of these features decreases towards the north part of the effects assessment Local Study Area where large wetland complexes dominate the landscape. This decrease in riparian area frequency can be seen in **Figure 5-2**, where **plates 1** through **2** show a noticeably higher density of riparian areas, relative to **plates 3** through **6**. This is consistent with the fact that lakes and rivers with complex drainage patterns are frequent in the Ontario Shield Ecozone, while the Hudson Bay Lowlands Ecozone is extremely flat, with vast wetlands and a few large rivers (e.g., Albany River and Winisk River) that cut channels across the landscape (Crins et al., 2009).

7.1.3.3 Composition and Function

Information about the function of Riparian Ecosystems within the existing conditions Study Areas are summarized in **Section 5.5.2**. That information has not been repeated here as the information relates to Riparian Ecosystems as a whole and does not change within the effects assessment Study Areas.

7.1.4 Designated Areas

The availability, distribution, composition, and function of designated areas within the general Project landscape are described in **Section 5.6**. The following sections summarize the same data within the effects assessment study areas.

7.1.4.1 Availability

7.1.4.1.1 Provincial Parks

Both the Ogoki River Provincial Park and Albany River Provincial Park are partly located within the effects assessment Local Study Area, whereas Little Current River only crosses the effects assessment Regional Study Area. A total of 222.3 ha of the Ogoki River Provincial Park is within the effects assessment Local Study Area, which is only 1% of the total park area. Similarly, 758.6 ha of the Albany River Provincial Park falls within the effects assessment Local Study Area, which is less than 1% of the total park area. **Table 7-4** summarizes the availability of Provincial Parks within the effects assessment study areas.

7.1.4.1.2 Critical Landform / Vegetation Associations

Landform / Vegetation Associations that have been mapped within existing protected areas and within areas identified as potential protected areas in community-based land use planning under the *Far North Act*, 2010 are provided on **Figure 7-3.**

Land use planning is ongoing, and boundaries have not yet been finalized; however, the most up to date mapping, provided by Ontario Parks in January 2024, was used to assess the presence of Critical Landform / Vegetation associations within the Vegetation study areas at the time of reporting.

A total of 35 Critical Landform / Vegetation Associations are mapped within protected areas or proposed protected areas within the effects assessment Local and / or Regional Study Areas. All Critical Landform / Vegetation Associations in protected areas or proposed protected areas within the existing conditions Local Study Area and existing conditions Regional Study Area are presented in **Table 7-5**. Of the Critical Landform / Vegetation Associations mapped within the effects assessment Local Study Area, the most frequent include:

- Organic Deposits – Coniferous Swamp: 8,478.7 ha or 7%;
- Organic Deposits – Treed Fen: 4,639.1 ha or 4%;
- Organic Deposits – Treed Bog: 2,459.6 ha or 2%;
- Organic Deposits – Open Bog: 2,206.0 ha or 2%; and
- Fine Ground Moraine – Disturbance – Treed and / or Shrub: 1,873.7 ha or 2%.

The remaining Critical Landform / Vegetation Associations were small components of the effects assessment Local Study Area, each comprising less than 1% of the effects assessment Local Study Area, with a combined total area of 1980.9 ha (2%).

Figure 7-3: Landform / Vegetation Associations in the Effects Assessment Study Areas

[Confidential Figure]

Table 7-4: Summary of Provincial Park Availability in the Effects Assessment Study Areas

Designated Area	Total Park Area (ha)	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		Percentage (%) of Designated Area within the Effects Regional Study Area Affected
		Area (ha)	Percentage (%) [(a)]	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) within Effects Local Study Area	
Little Current River Provincial Park	9,930	N/A	N/A	2,016.4	<1%	N/A	N/A	N/A
Ogoki River Provincial Park	23,250	222.3	1%	1,336.1	<1%	0.0	0%	0%
Albany River Provincial Park	95,100	758.6	<1%	5,202.1	1%	5.7	<1%	<1%

Notes:
(a) This percentage represents the proportion of the given Provincial Park that is located within the effects assessment Local Study Area.
% = percent; ha = hectare; < = less than; N/A = not applicable.

Table 7-5: Summary of Critical Landform / Vegetation Associations Availability in the Effects Assessment Study Areas

Landform	Vegetation	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		Percentage (%) of Designated Area within the Effects Regional Study Area Affected
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) of the Effects Local Study Area	
Fine Ground Moraine	Coniferous Swamp	56.8	<1%	1,082.5	<1%	2.0	0%	4%
Fine Ground Moraine	Deciduous Treed	57.8	<1%	357.6	<1%	0.0	0%	0%
Fine Ground Moraine	Disturbance - Non and Sparse Woody	25.4	0%	99.0	0%	2.4	0%	9%
Fine Ground Moraine	Disturbance - Treed and / or Shrub	1,873.7	1%	6,608.3	2%	86.2	<1%	5%
Fine Ground Moraine	Fresh Water Marsh	14.6	0%	14.7	0%	0.0	0%	0%
Fine Ground Moraine	Open Bog	24.3	0%	370.4	<1%	0.0	0%	0%
Fine Ground Moraine	Open Fen	11.2	0%	31.5	0%	0.0	0%	0%
Fine Ground Moraine	Sparse Treed	1.4	0%	3.6	0%	0.0	0%	0%
Fine Ground Moraine	Thicket Swamp	6.4	0%	11.7	0%	0.0	0%	0%
Fine Ground Moraine	Treed Bog	70.9	<1%	994.7	<1%	2.1	0%	3%
Fine Ground Moraine	Treed Fen	311.8	<1%	1,637.3	0%	9.2	0%	3%
Glaciofluvial Esker-Kettle Terrain	Coniferous Treed	5.5	0%	26.4	0%	0.2	0%	3%
Glaciofluvial Esker-Kettle Terrain	Open Bog	4.2	0%	4.2	0%	0.0	0%	0%
Glaciofluvial Esker-Kettle Terrain	Open Fen	5.4	0%	32.8	0%	0.0	0%	0%
Glaciofluvial Esker-Kettle Terrain	Sparse Treed	0.3	0%	0.3	0%	0.0	0%	0%
Glaciofluvial Esker-Kettle Terrain	Treed Bog	10.7	0%	10.8	0%	0.0	0%	0%
Organic Deposits	Coniferous Swamp	8,478.7	7%	18,648.4	4%	186.5	<1%	2%
Organic Deposits	Deciduous Treed	6.1	0%	162.6	0%	0.0	0%	0%
Organic Deposits	Disturbance - Non and Sparse Woody	271.6	<1%	1,876.0	<1%	71.5	<1%	26%
Organic Deposits	Disturbance - Treed and / or Shrub	17.0	0%	773.5	<1%	5.4	0%	32%
Organic Deposits	Open Bog	2,206.0	2%	6,707.7	2%	1.6	0%	<1%
Organic Deposits	Open Fen	278.0	<1%	1,988.6	<1%	1.1	0%	<1%
Organic Deposits	Sparse Treed	1.1	0%	17.0	0%	0.0	0%	0%
Organic Deposits	Thicket Swamp	357.5	0%	854.6	0%	10.2	0%	1%
Organic Deposits	Treed Bog	2,459.6	2%	6,134.0	1%	7.7	0%	0%
Organic Deposits	Treed Fen	4,639.1	4%	9,570.6	2%	81.5	0%	1%

Landform	Vegetation	Effects Local Study Area		Effects Regional Study Area		Construction Disturbance Area		Percentage (%) of Designated Area within the Effects Regional Study Area Affected
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) of the Effects Local Study Area	
Precambrian Int. to Acidic Bedrock	Coniferous Treed	3.1	0%	3.1	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Deciduous Treed	23.0	0%	23.0	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Disturbance - Non and Sparse Woody	54.3	0%	64.7	0%	0.7	0%	1%
Precambrian Int. to Acidic Bedrock	Mixed Treed	9.6	0%	9.6	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Open Bog	12.7	0%	12.8	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Open Fen	0.9	0%	0.9	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Sparse Treed	2.8	0%	2.8	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Treed Bog	71.5	0%	100.0	0%	0.0	0%	0%
Precambrian Int. to Acidic Bedrock	Treed Fen	264.9	0%	575.8	0%	22.9	0%	4%
TOTAL		**21,638.0**	**19%**	**58,811.1**	**13%**	**491.2**	**0%**	**1%**

% = percent; ha = hectare; < = less than.

7.1.4.2 Distribution

7.1.4.2.1 Provincial Parks

Little Current River Provincial Park crosses the very southern limits of the effects assessment Regional Study Area. The Ogoki River Provincial Park is also located towards the south limits of the effects assessment Local and Regional Study Areas. Albany River Provincial Park crosses near the middle of the effects assessment Local and Regional Study Areas.

7.1.4.2.2 Critical Landform / Vegetation Associations

Figure 5-1 displays the distribution of Critical Landform / Vegetation Associations within protected areas and proposed protected areas within the effects assessment Local Study Area and Regional Study Areas.

Critical Landform / Vegetation Associations are concentrated within the southeast, central, and northeast portions of the effects assessment Local and Regional Study Areas.

- In the south, between Debaere Lake and Brundrit Lake (Ecodistricts 2W-2 and 2W-3), the Critical Landform / Vegetation Associations are largely associated with Fine Ground Moraine and Pre-cambrian Int. to Acidic Bedrock landforms;
- In the central part of the study area, north of Dusey Lake to Albany River (Ecodistrict 2W-2), the majority of the Critical Landform / Vegetation Associations are associated with Organic Deposits and Fine Ground Moraine landforms; and
- In the northeast part of the study area along Albany River and north of the Albany River to Trebell Lake (Ecodistricts 2W-2, 2E-1, and 2E-4), the majority of the Critical Landform / Vegetation Associations are associated with Organic Deposits.

7.1.4.3 Composition and Function

7.1.4.3.1 Provincial Parks

Information about the composition and function of the three provincial parks located within the Effects Assessment Local and Regional Existing Conditions Study Areas are summarized in **Section 5.6.3**. That information has not been repeated here as the information relates to the parks as a whole and does not change within the effects assessment study areas.

7.1.4.3.2 Critical Landform / Vegetation Associations

Landform / Vegetation Associations include both upland and wetland vegetation communities, which provide habitat for flora and fauna and represent the diversity of habitat types in each respective Ecodistrict. Critical Landform / Vegetation Associations found within the protected areas and proposed protected areas within the effects

assessment Local Study Area and effects assessment Regional Study Area include wetland vegetation communities (17% of the effects assessment Local Study Area) and upland vegetation communities (2% of the effects assessment Local Study Area) that together comprise 19% of the effects assessment Local Study Area.

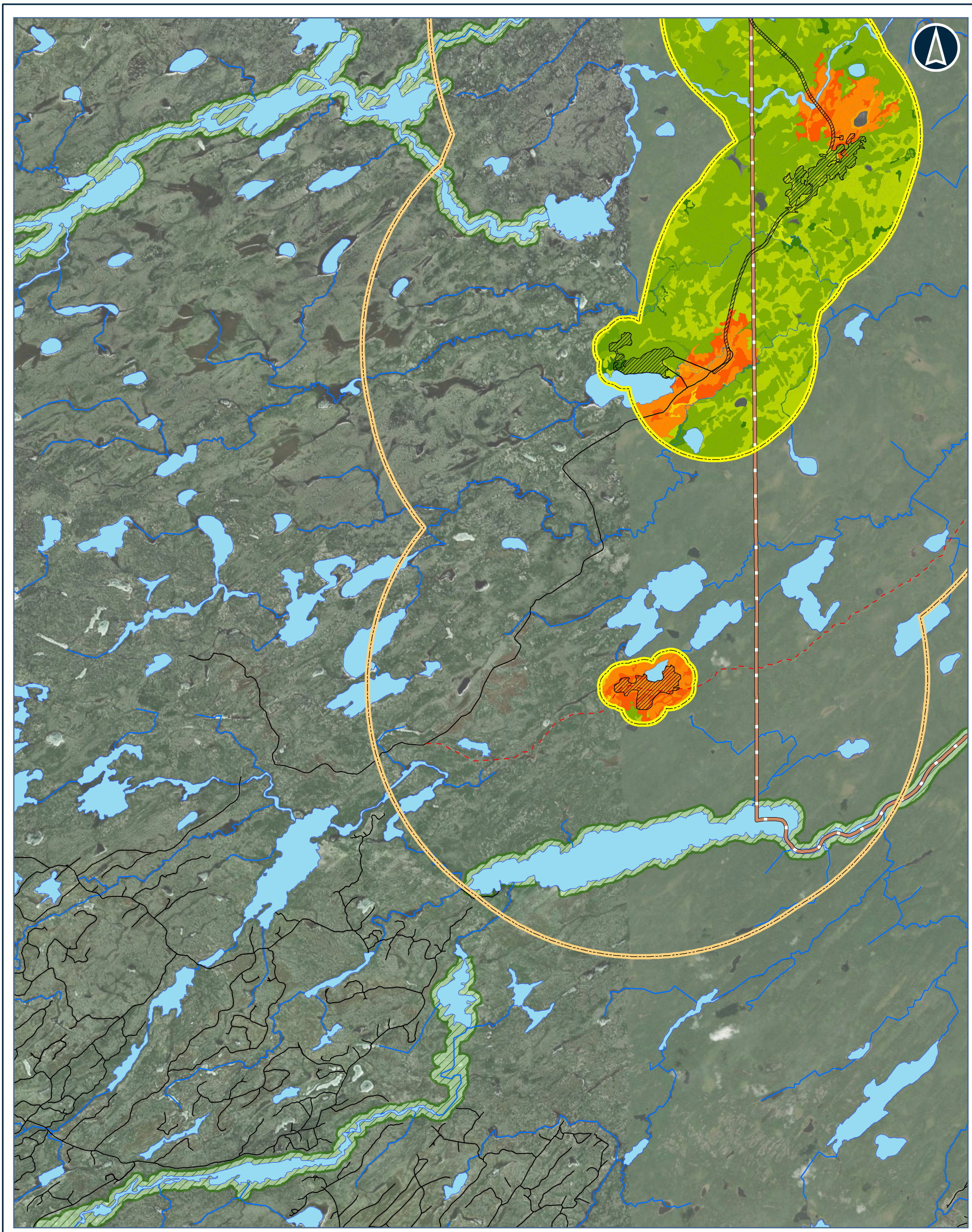
By protecting a representative example of all Landform / Vegetation associations in each Ecodistrict, Ontario seeks to represent and protect the full range of Ontario's natural diversity (Ontario Parks, 2021). Therefore, the primary function of the Critical Landform / Vegetation Associations is to contribute to the protection of the full range of natural diversity within protected areas and proposed protected areas in each respective Ecodistrict. As noted above, there are a number of Critical Landform / Vegetation Associations within the effects assessment Local Study Area and effects assessment Regional Study Area, therefore these areas are contributing to the protection of Ontario's biodiversity.

7.1.5 Traditional Use Plants

7.1.5.1 Availability and Distribution

The availability of suitable and accessible Traditional Use Plant habitat within the effects assessment Local Study Area is summarized in **Table 7-6**. Combined scores within the effects assessment Local Study Area ranged from 0.0 to 1.8. The results are also spatially illustrated in **Figure 7-4**

As illustrated in **Figure 7-4**, suitable and accessible habitat for Traditional Use Plant species is available throughout the effects assessment Local Study Area. There is an apparent increase in the presence of ecosites with a higher score in the central, and north portion of the effects assessment Local Study Area, mostly associated with existing roads and waterways, where ecosites are coloured darker shades of orange and red are more abundant. Ecosites with the lowest scores (i.e., those coloured various shades of green on **Figure 7-4**), are more abundant towards the south limits of the effects assessment Local Study Area, generally away from roads and large watercourses, and where traditional access routes have not been documented.



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-4.1

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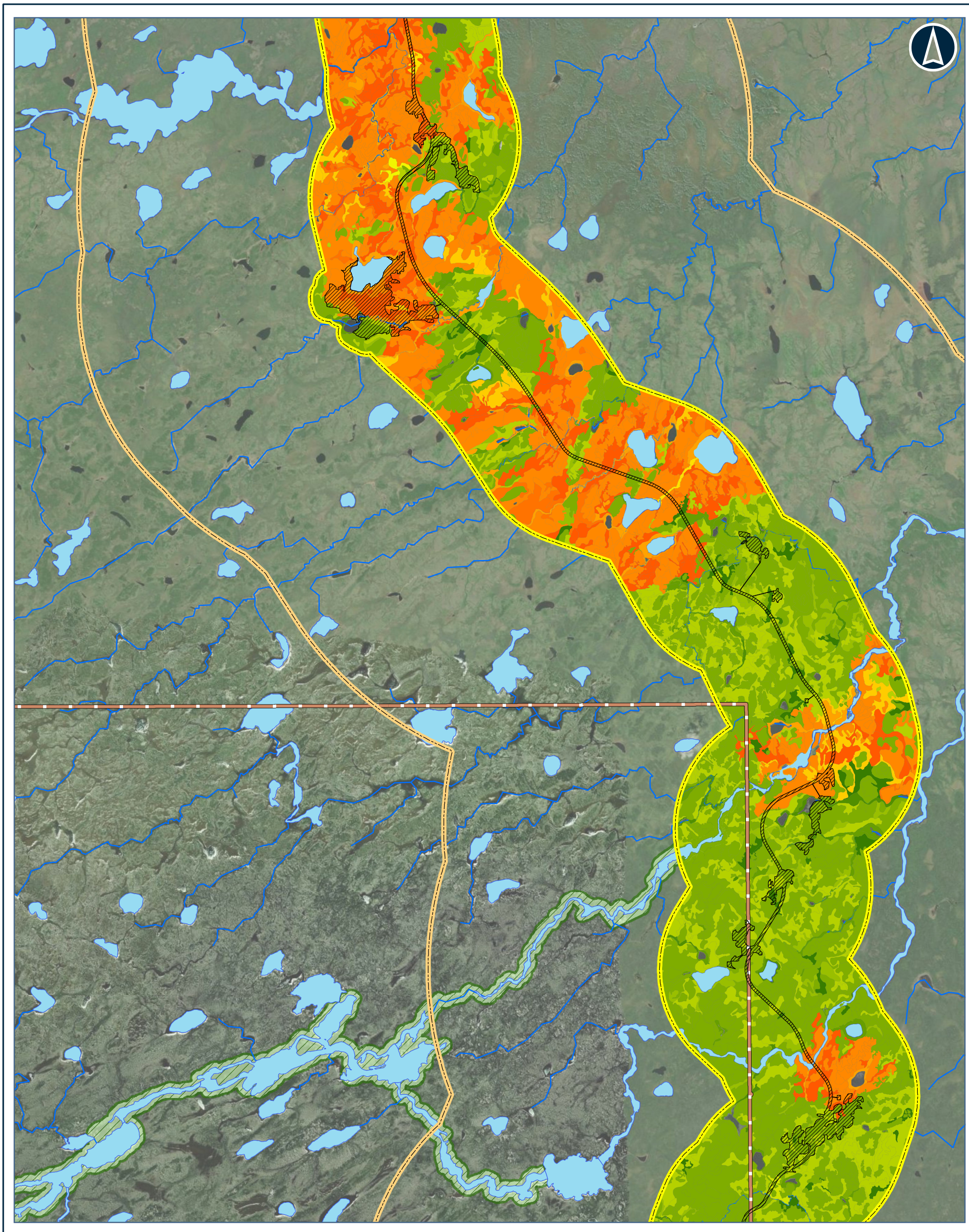

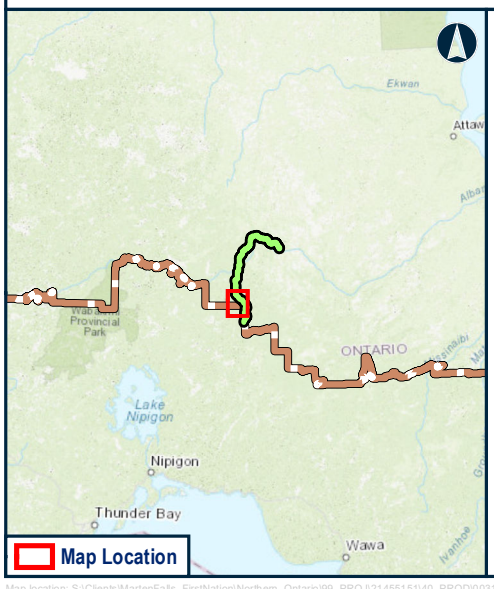

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-4.2

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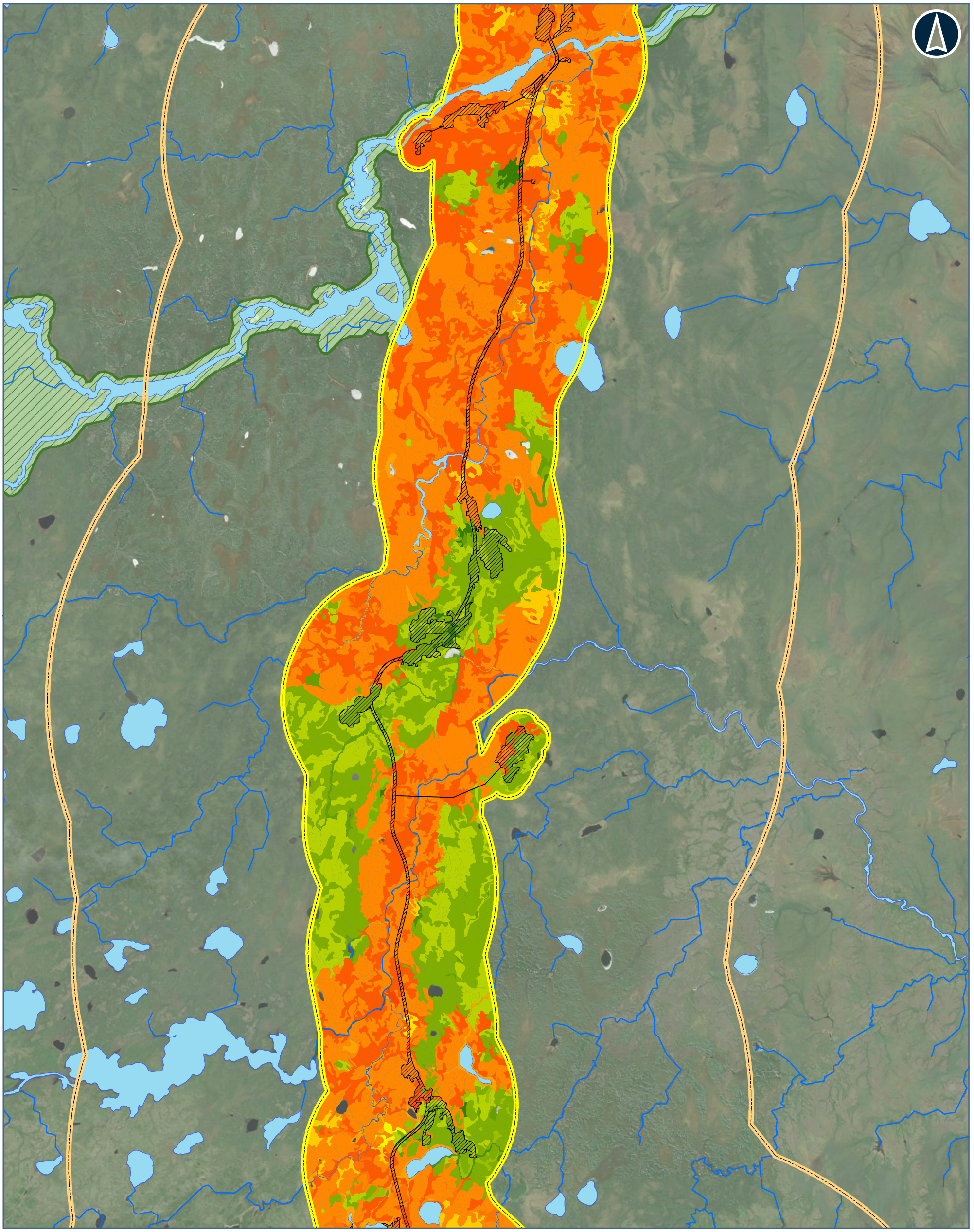

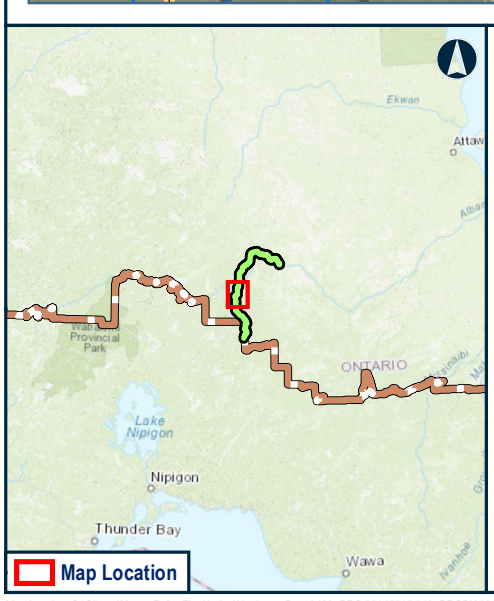

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-4.3

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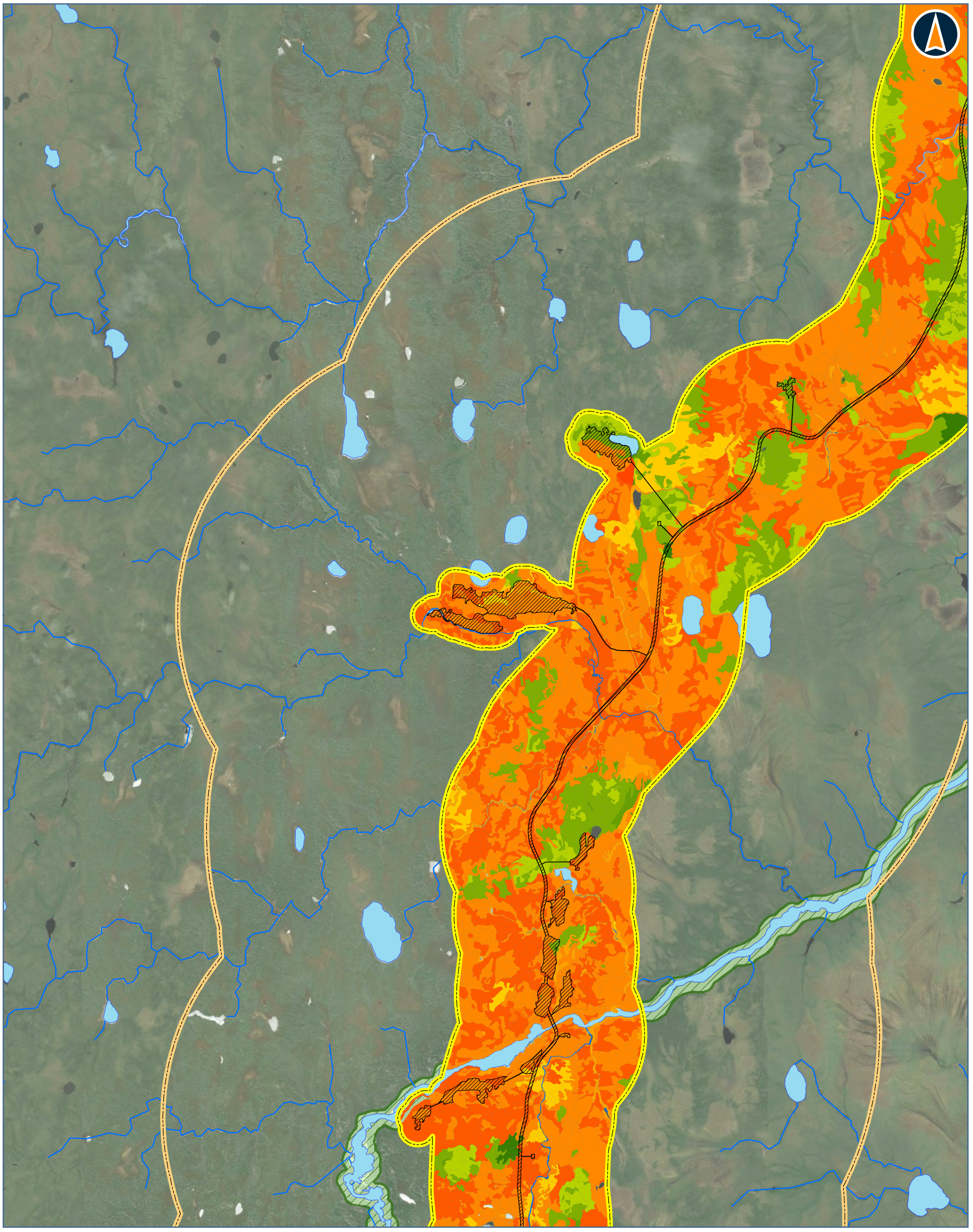

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

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Figure 7-4.4

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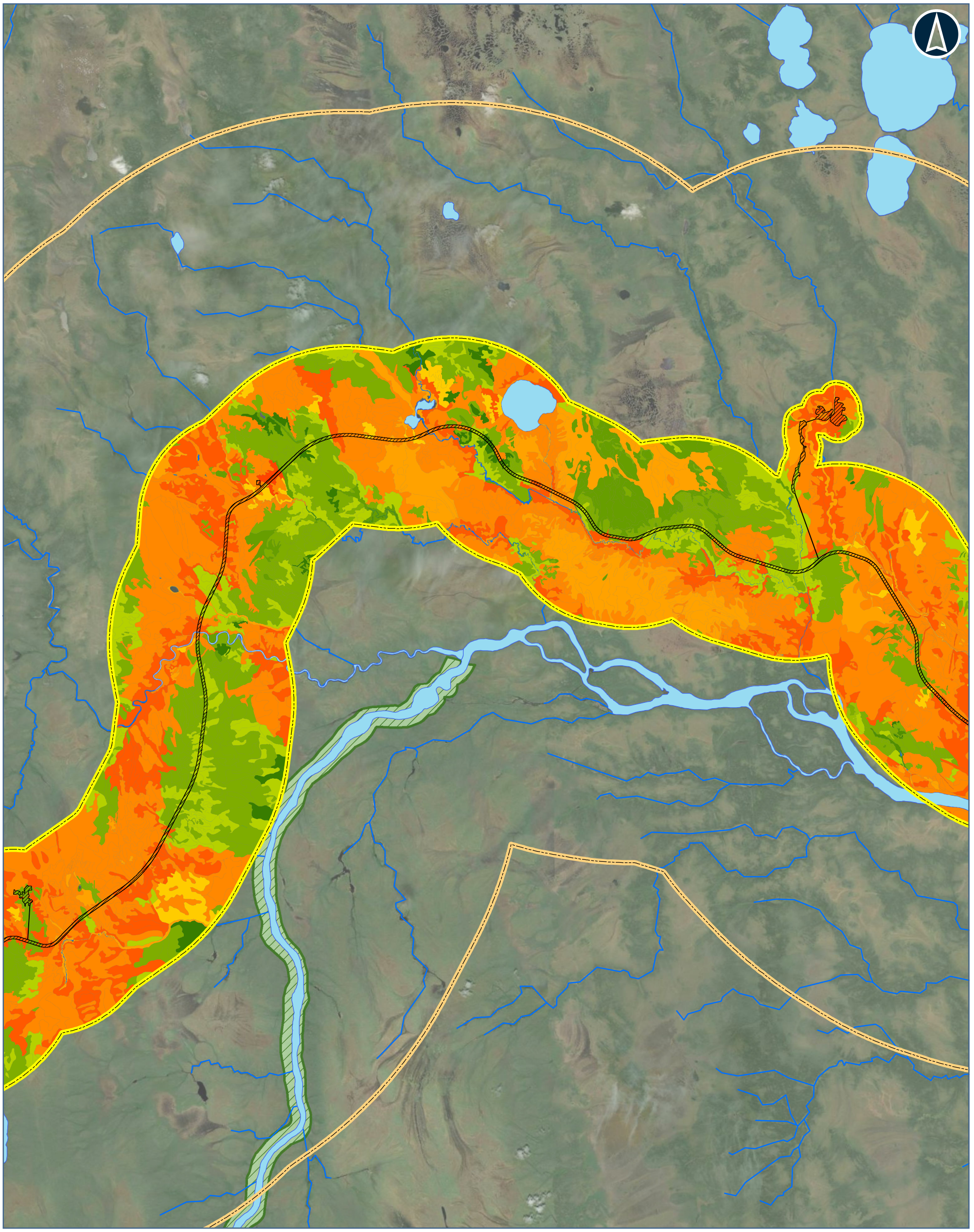

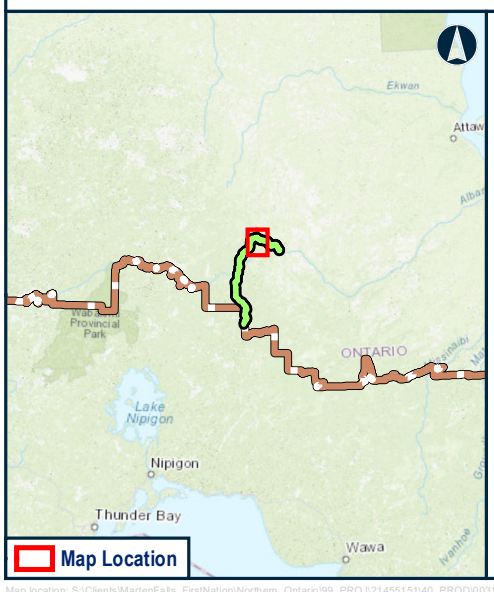

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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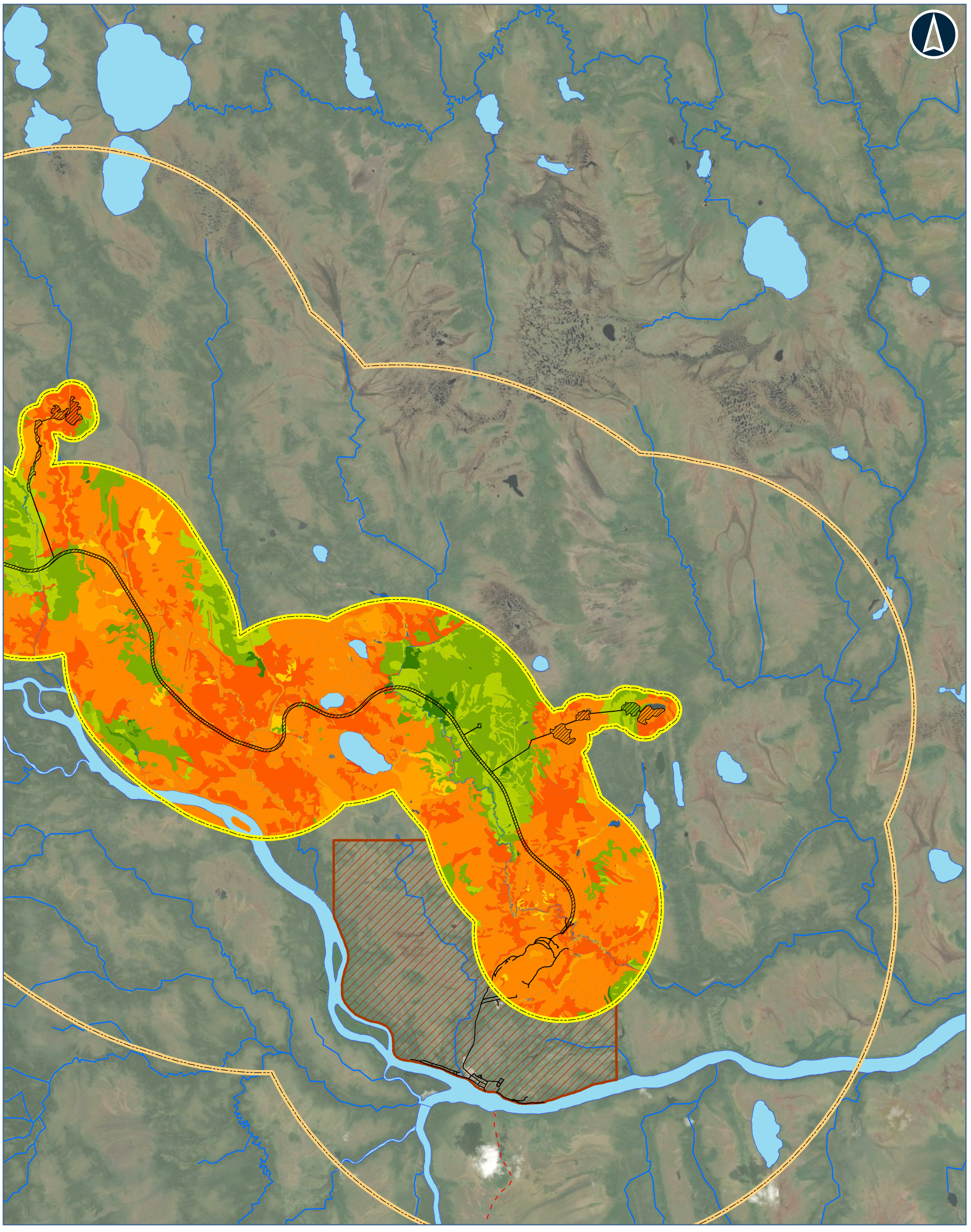

Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility in the Effects Assessment Local Study Area

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-4.6

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Table 7-6: Summary of Traditional Use Plants Availability based on Habitat Suitability and Habitat Accessibility Index Score in the Effects Assessment Study Areas

Score	Effects Assessment Local Study Area		Effects Assessment Construction Disturbance Area		% of Ecosites with Given Score Within the Effects Local Study Area Affected
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%) of the Effects Local Study Area	
0.0	3,904.8	3%	19.7	<1%	<1%
0.1	1.7	<1%	0.0	0%	0%
0.2	1,252.8	1%	85.1	<1%	7%
0.3	0.0	0%	0.0	0%	0%
0.4	342.4	<1%	6.5	<1%	2%
0.5	24,225.5	21%	932.8	<1%	4%
0.6	4,736.5	4%	446.2	<1%	9%
0.7	2,107.6	2%	133.8	<1%	6%
0.8	12,055.1	10%	425.1	<1%	4%
0.9	0.0	0%	0.0	0%	0%
1.0	41.3	<1%	1.8	<1%	4%
1.1	37.0	<1%	4.7	<1%	13%
1.2	2,399.4	2%	78.6	<1%	3%
1.3	0.0	0%	0.0	0%	0%
1.4	858.0	<1%	38.8	<1%	6%
1.5	38,949.5	34%	1,093.4	<1%	3%
1.6	4,512.3	4%	448.6	<1%	10%
1.7	2,097.3	2%	186.3	<1%	9%
1.8	18,430.3	16%	798.8	<1%	4%
1.9	0.0	0%	0.0	0%	0%
2.0	0.0	0%	0.0	0%	0%
TOTAL	**115,951.5**	**100%**	**4,700.2**	**4%**	**4%**

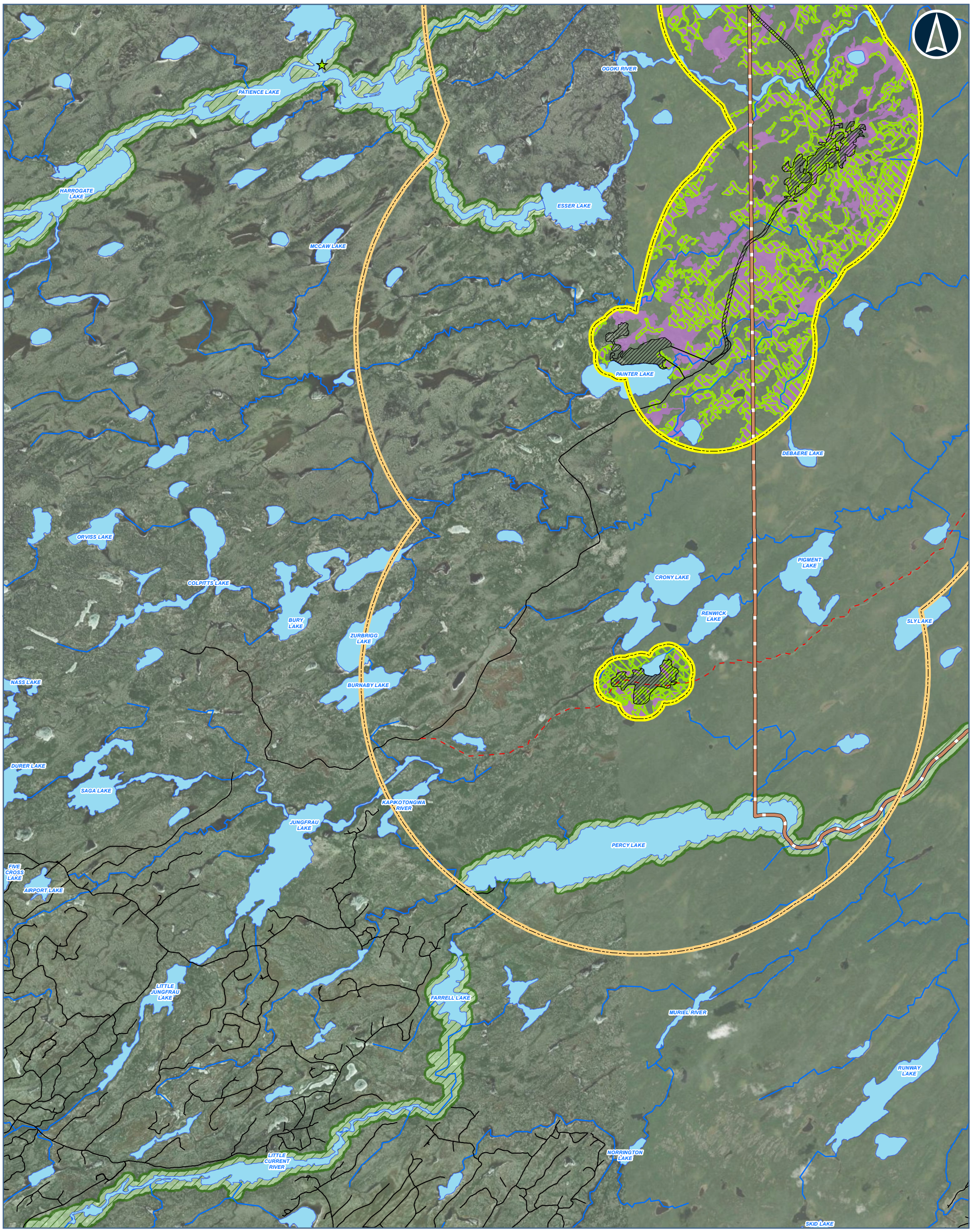
% = percent; ha = hectare; < = less than.

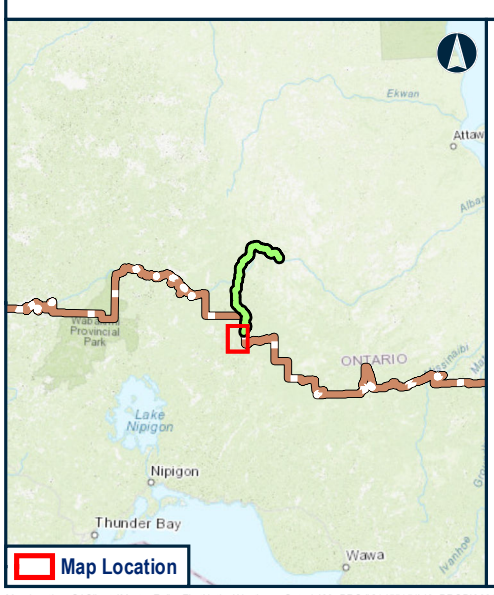
7.1.6 Species at Risk and Species of Conservation Concern

7.1.6.1 Availability and Distribution

7.1.6.1.1 Black Ash

Ecosites within the effects assessment Local Study Area with suitable habitat for Black Ash are displayed in **Figure 7-5** and summarized in **Table 7-7**. Approximately 35,390.2 ha, representing 31% of the effects assessment Local Study Area has been assessed as suitable for Black Ash. This is a slightly reduced proportion relative to the existing conditions Local Study Area which has 33% of the area assessed as suitable. Based on the habitat suitability assessment, the distribution of these ecosites is relatively even across the effects assessment Local Study Area.





Legend

- CONSTRUCTION DISTURBANCE AREA
- BLACK ASH OBSERVATION
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-5.1

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BALSON LAKE
DUSEY LAKE
DUSEY RIVER
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
OGOKI RIVER
PATIENCE LAKE
HARROGATE LAKE
ESSER LAKE
MCCAW LAKE

Map Location

Legend

- CONSTRUCTION DISTURBANCE AREA
- BLACK ASH OBSERVATION
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-5.2

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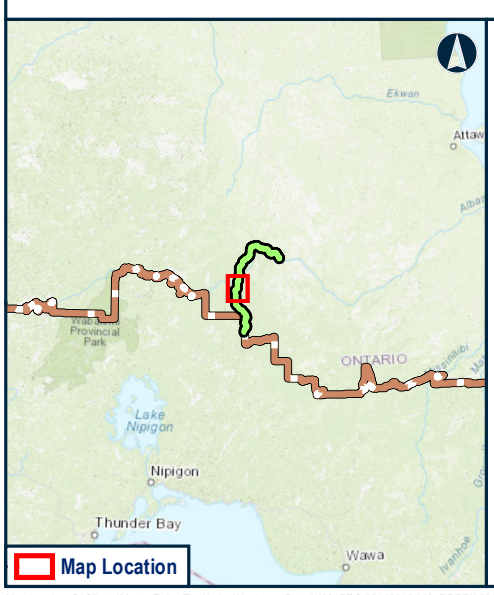
ALBANY RIVER
TEABEAU LAKE
TOLFREE LAKE
TRELOAR LAKE
SUWALA LAKE
DUSEY RIVER
TANASE LAKE
BALSON LAKE
DUSEY LAKE
WINSLOW LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

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Figure 7-5.3

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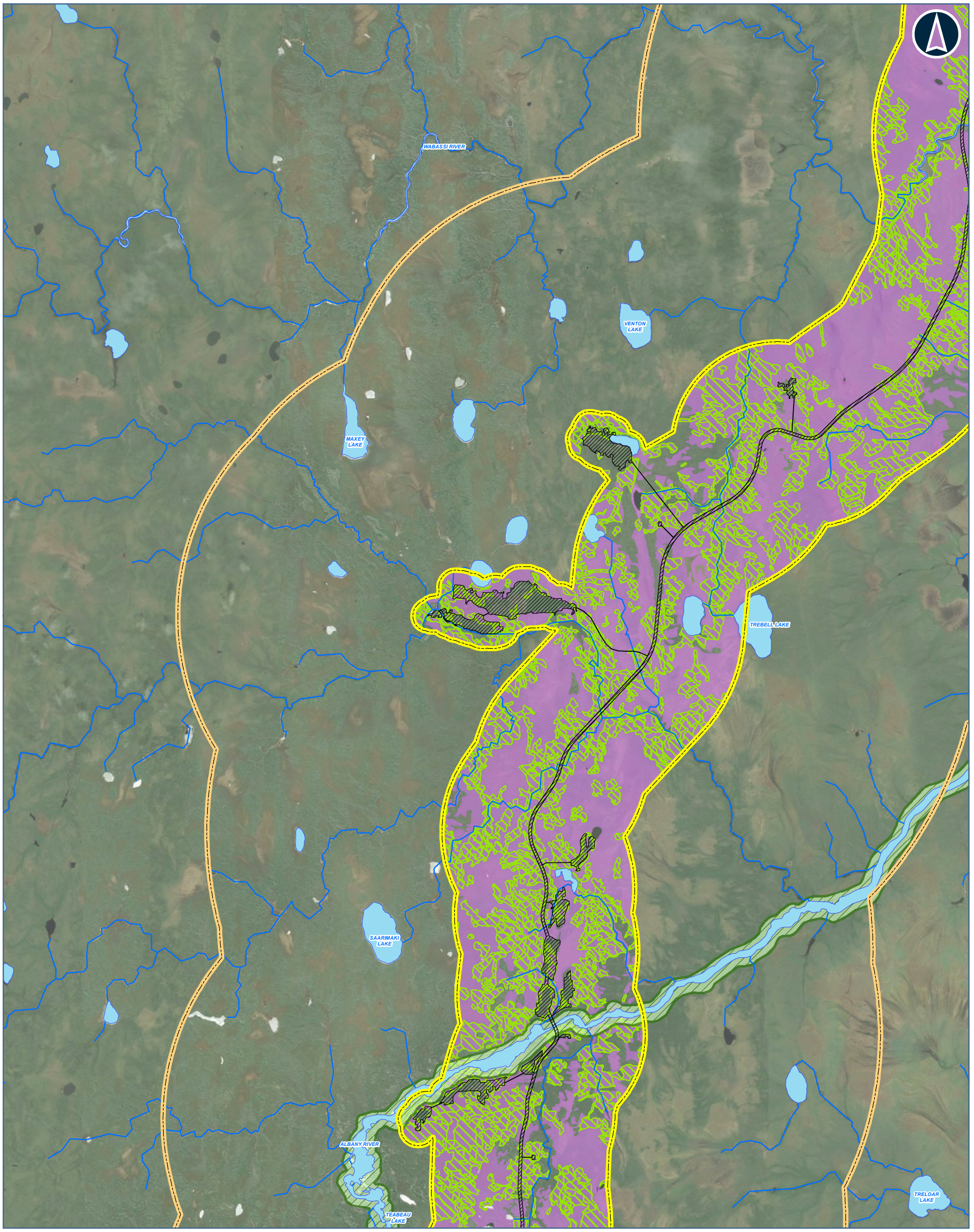

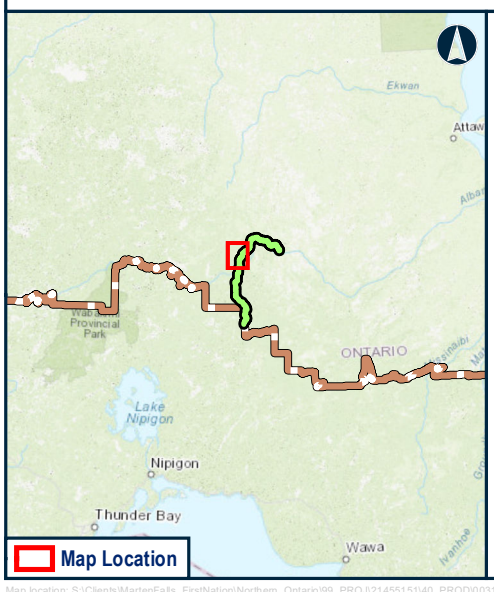

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

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Figure 7-5.4

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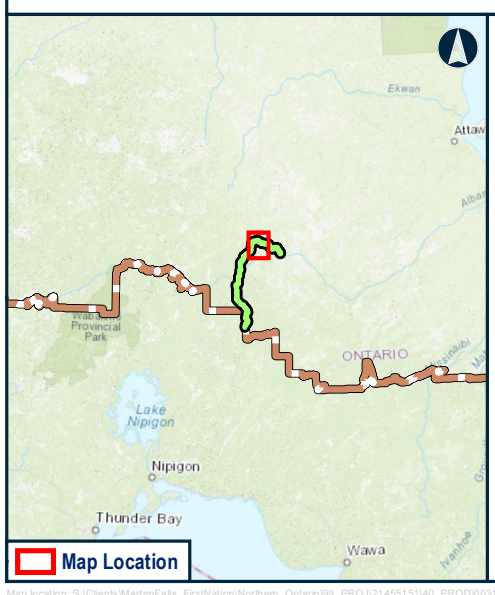
ACTON LAKE
SEBERT LAKE
GURDEN LAKE
GITTINS LAKE
WABASSI RIVER
ALBANY RIVER
TREBELL LAKE



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

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Figure 7-5.5

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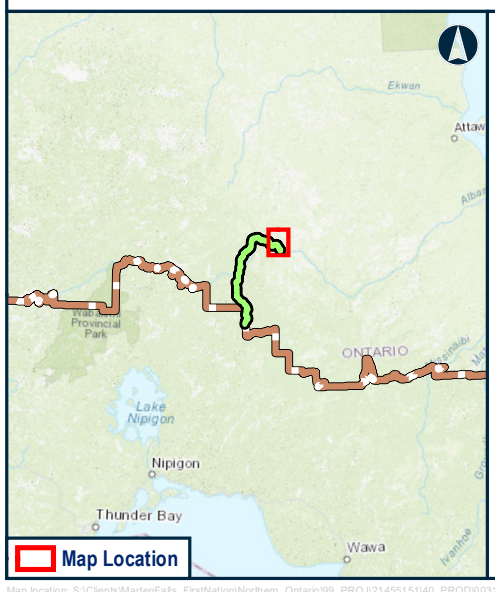
ACTON LAKE
SEBERT LAKE
GURDEN LAKE
TIFFIN LAKE
ALBANY RIVER
OGOKI RIVER
DARK RIVER



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Plant Species Locations and Habitat Suitability in the Effects Assessment Local Study Area

0 2.75 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-5.6

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Table 7-7: Availability of Suitable Habitat for Black Ash in the Effects Assessment Study Areas

Ecosite	Ecosite Description	Effects Local Study Area		Construction Disturbance Area		% of Ecosite Within the Effects Local Study Area Affected
		Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
B005X	Active Mineral Shoreline	30.0	<1%	0.5	<1%	2%
B059Tl	Dry to Fresh, Coarse: Mixedwood	0.0	0%	0.0	0%	0%
B059Tt	Dry to Fresh, Coarse: Mixedwood	82.3	<1%	4.1	<1%	5%
B063S	Moist, Coarse, Shrub	0.0	0%	0.0	0%	0%
B065	Moist, Coarse: Black Spruce – Pine Conifer	41.3	<1%	33.4	1%	81%
B065Tl	Moist, Coarse: Black Spruce – Pine Conifer	633.7	<1%	19.1	<01%	3%
B065Tt	Moist, Coarse: Black Spruce – Pine Conifer	1,018.3	<1%	122.6	<1%	12%
B066Tt	Moist, Coarse: Cedar (Hemlock) Conifer	11.9	<1%	0.0	0%	0%
B067Tt	Moist, Coarse: Spruce – Fir Conifer	36.7	<1%	12.6	<1%	34%
B068Tl	Moist, Coarse: Conifer	38.3	<1%	15.6	<1%	41%
B068Tt	Moist, Coarse: Conifer	64.7	<1%	1.4	<1%	2%
B070	Moist, Coarse: Aspen – Birch Hardwood	12.8	<1%	12.8	<1%	100%
B070Tl	Moist, Coarse: Aspen – Birch Hardwood	6.4	<1%	0.0	0%	0%
B070Tt	Moist, Coarse: Aspen – Birch Hardwood	56.0	<1%	0.0	0%	0%
B076Tt	Moist, Coarse: Mixedwood	227.7	<1%	69.8	<1%	31%
B119	Moist, Fine: Aspen – Birch Hardwood	2.4	<1%	0.0	<1%	0%
B127	Organic Poor Conifer Swamp	305.5	<1%	6.2	<1%	2%
B127Tl	Organic Poor Conifer Swamp	52.4	<1%	0.6	<1%	1%
B127Tt	Organic Poor Conifer Swamp	1,170.0	1%	82.6	<1%	7%
B128	Organic Intermediate Conifer Swamp	5,603.6	5%	34.3	<1%	<1%
B128Tl	Organic Intermediate Conifer Swamp	2,507.0	2%	141.6	<1%	6%
B128Tt	Organic Intermediate Conifer Swamp	13,979.0	12%	826.1	<1%	6%

Ecosite	Ecosite Description	Effects Local Study Area		Construction Disturbance Area		% of Ecosite Within the Effects Local Study Area Affected
		Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
B129	Organic Rich Conifer Swamp	0.0	<1%	0.0	0%	0%
B129TI	Organic Rich Conifer Swamp	86.1	<1%	24.5	<1%	29%
B129Tt	Organic Rich Conifer Swamp	211.7	<1%	22.3	<1%	11%
B134	Mineral Thicket Swamp	21.5	<1%	0.0	0%	0%
B134S	Mineral Thicket Swamp	25.3	<1%	1.2	<1%	5%
B135	Organic Thicket Swamp	1.7	<1%	0.0	0%	0%
B135S	Organic Thicket Swamp	234.9	<1%	11.9	<1%	5%
B222	Mineral Poor Conifer Swamp	7,768.8	7%	75.9	<1%	1%
B222TI	Mineral Poor Conifer Swamp	185.7	<1%	16.9	<1%	9%
B222Tt	Mineral Poor Conifer Swamp	889.4	<1%	95.6	<1%	11%
B223	Mineral Intermediate Conifer Swamp	19.9	<1%	0.2	<1%	<1%
B223Tt	Mineral Intermediate Conifer Swamp	47.3	<1%	11.5	<1%	24%
B224	Mineral Rich Conifer Swamp	13.4	<1%	0.0	0%	0%
B224Tt	Mineral Rich Conifer Swamp	4.7	<1%	0.2	<1%	5%
TOTAL		**35,390.2**	**31%**	**1,643.5**	**1%**	**5%**

% = percent; ha = hectare; < = less than.

7.1.6.1.2 Northern Marsh Violet

Ecosites within the effects assessment Local Study Area with suitable habitat for Northern Marsh Violet are displayed in **Figure 7-5** and summarized in **Table 7-8**. Approximately 71% of the effects assessment Local Study Area has been assessed as suitable for Northern Marsh Violet. This is very similar to the existing conditions Local Study Area which also has 71% of the area assessed as suitable. Based on the habitat suitability assessment, the distribution of these ecosites increases towards the north of the effects assessment Local Study Area which is consistent with the increase in the availability and distribution of wetland ecosystems.

Table 7-8: Availability of Suitable Habitat for Northern Marsh Violet in the Effects Assessment Study Areas

Ecosite	Ecosite Description	Effects Local Study Area		Construction Disturbance Area		Percent (%) of Ecosite Within the Effects Local Study Area Affected
		Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
B005X	Active Mineral Shoreline	30.0	<1%	0.5	<1%	2%
B065	Moist, Coarse: Black Spruce – Pine Conifer	41.3	<1%	33.4	<1%	81%
B065Tl	Moist, Coarse: Black Spruce – Pine Conifer	633.7	<1%	19.1	<1%	3%
B065Tt	Moist, Coarse: Black Spruce – Pine Conifer	1,018.3	<1%	122.6	<1%	12%
B066Tt	Moist, Coarse: Cedar (Hemlock) Conifer	12.0	<1%	0.0	0%	0%
B067Tt	Moist, Coarse: Spruce – Fir Conifer	51.6	<1%	27.6	<1%	53%
B068Tl	Moist, Coarse: Conifer	23.4	<1%	0.7	<1%	3%
B068Tt	Moist, Coarse: Conifer	77.5	<1%	14.2	<1%	18%
B126	Low Treed Bog	21.8	<1%	0.0	0%	0%
B126Tl	Low Treed Bog	218.9	<1%	1.9	<1%	<1%
B126Tt	Low Treed Bog	86.3	<1%	13.9	<1%	16%
B127	Organic Poor Conifer Swamp	305.5	<1%	6.2	<1%	2%
B127Tl	Organic Poor Conifer Swamp	52.4	<1%	0.6	<1%	1%
B127Tt	Organic Poor Conifer Swamp	1,170.0	1%	82.6	<1%	7%
B128	Organic Intermediate Conifer Swamp	5,603.6	5%	34.3	<1%	<1%
B128Tl	Organic Intermediate Conifer Swamp	2,507.0	2%	141.6	<1%	6%
B128Tt	Organic Intermediate Conifer Swamp	13,979.0	12%	826.1	<1%	6%

Ecosite	Ecosite Description	Effects Local Study Area		Construction Disturbance Area		Percent (%) of Ecosite Within the Effects Local Study Area Affected
		Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
B129	Organic Rich Conifer Swamp	0.0	0%	0.0	0%	0%
B129TI	Organic Rich Conifer Swamp	86.1	<1%	24.5	<1%	29%
B129Tt	Organic Rich Conifer Swamp	211.8	<1%	22.3	<1%	11%
B136	Sparse Treed Fen	19.6	<1%	0.7	<1%	3%
B136TI	Sparse Treed Fen	39,102.6	34%	628.7	<1%	2%
B136Tt	Sparse Treed Fen	2,013.7	2%	108.4	<1%	5%
B137TI	Sparse Treed Bog	943.9	<1%	9.6	<1%	1%
B137Tt	Sparse Treed Bog	42.4	<1%	4.3	1%	10%
B138	Open Bog	81.0	<1%	0.0	0%	0%
B138N	Open Bog	150.0	<1%	0.0	0%	0%
B139	Poor Fen	10.2	1%	0.0	0%	0%
B139N	Poor Fen	119.6	<1%	0.0	0%	0%
B139S	Poor Fen	76.7	<1%	0.5	<1%	<1%
B140	Open Moderately Rich Fen	34.9	<1%	0.0	0%	0%
B140N	Open Moderately Rich Fen	1,771.6	2%	3.3	<1%	<1%
B140S	Open Moderately Rich Fen	132.8	<1%	3.5	<1%	3%
B142	Mineral Meadow Marsh	17.8	<1%	0.5	<1%	3%
B142N	Mineral Meadow Marsh	733.9	<1%	10.5	<1%	1%
B144	Organic Meadow Marsh	249.8	<1%	3.9	<1%	2%

Ecosite	Ecosite Description	Effects Local Study Area		Construction Disturbance Area		Percent (%) of Ecosite Within the Effects Local Study Area Affected
		Area (ha)	Percentage (%) of the Effects Local Study Area	Area (ha)	Percentage (%) of the Effects Local Study Area	
B144N	Organic Meadow Marsh	1,246.8	1%	22.5	<1%	2%
B146N	Open Shore Fen	207.4	<1%	35.6	<1%	17%
B146S	Open Shore Fen	14.6	<1%	0.0	0%	0%
B148N	Mineral Shallow Marsh	9.5	<1%	0.0	0%	0%
B149N	Organic Shallow Marsh	14.2	<1%	0.0	0%	0%
B222	Mineral Poor Conifer Swamp	7,768.8	7%	75.9	<1%	1%
B222TI	Mineral Poor Conifer Swamp	185.7	<1%	16.9	<1%	9%
B222Tt	Mineral Poor Conifer Swamp	889.4	<1%	95.6	<1%	11%
B223	Mineral Intermediate Conifer Swamp	19.9	<1%	0.2	<1%	<1%
B223Tt	Mineral Intermediate Conifer Swamp	47.3	<1%	11.5	<1%	24%
B224	Mineral Rich Conifer Swamp	13.4	<1%	0.0	0%	0%
B224Tt	Mineral Rich Conifer Swamp	4.7	<1%	0.2	<1%	5%
TOTAL		**82,052.1**	**71%**	**2,404.1**	**2%**	**3%**

% = percent; ha = hectare; < = less than.

7.1.7 Anthropogenic Disturbances and Natural Disturbances

Disturbances within the effects assessment study areas are displayed spatially in **Figure** 7-6**. Table 7-10** provides a summary of all anthropogenic and natural disturbance types mapped in the effects assessment study areas and the amount of disturbance in wetland and upland communities. Based on the disturbance analysis approach described in **Section 4.3.6**, a total of 364.2 ha of anthropogenic disturbances and 20,741.7 ha of natural disturbances have occurred within the effects assessment Local Study Area. In the effects assessment Regional Study Area, a total of 540.4 ha of anthropogenic disturbances and 30,365.1 ha of natural disturbances were identified. The natural disturbances included in the analysis include all fire and blowdown disturbances mapped by the province in the past 40 years.

Natural disturbances comprise of a significantly larger area than anthropogenic disturbances, which is expected given the remote location of the Project. The majority (nearly 100%) of the natural disturbances within the effects assessment study areas were fires located in the Albany River Ecodistrict (Ecoregion 2E), and the Wunnummin Lake and Lower Sachigo River Ecodistricts (Ecoregion 2W). Fires occurred nearly equally in wetland communities and upland communities: 8,910.9 ha and 10,727 ha within the effects assessment Local Study Area, respectively, and 12,947.8 ha and 15,758.3 ha in the effects assessment Regional Study Area, respectively. A very small portion of the effects assessment Regional Study Area (6.9 ha) located in upland habitats within the Wunnummin Lake Ecodistrict (Ecoregion 2W) was affected by blowdown. Both disturbance types are common in these Ecoregions (Crins et al., 2009) and are vital to maintaining natural processes in many boreal vegetation communities. Overall, these natural disturbances comprise approximately 18% of the effects assessment Local Study Area, and 7% of the effects assessment Regional Study Area. The largest mapped disturbance is the result of a 1995 fire north of the Ogoki River Provincial Park mapped in **Figure 5-8**.

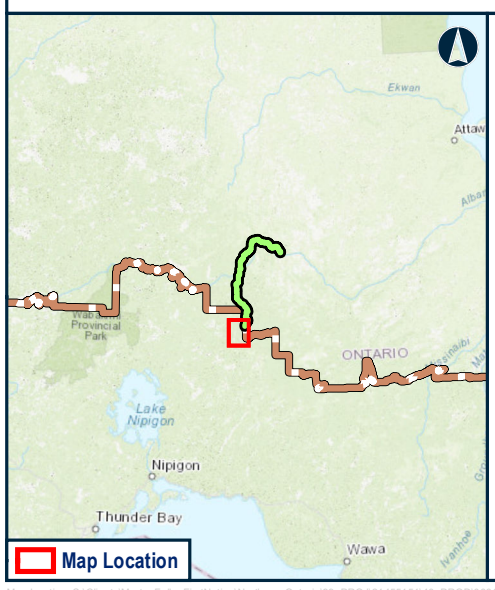
Anthropogenic disturbances within the existing effects assessment study areas are located in the Albany River Ecodistrict (Ecoregion 2E), and the Wunnummin Lake and Lower Sachnigo River Ecodistricts (Ecoregion 2W) and are limited to the southern portion of the effects assessment study areas (mostly all season and winter roads), and the northeast portion of the effects assessment study areas associated with the Marten Falls First Nation community. These disturbances in the effects assessment Local and Regional Study Areas included various settlements (camps, commercial outpost camps, and communities; 52.2 ha and 52.8 ha), various linear infrastructure (all season roads, winter roads, and trails; 307.7 ha and 483.2 ha), and forestry activities (tree harvest; 4.3 ha and 4.3 ha). Overall, these anthropogenic disturbances are a very small component of the effects assessment Local Study Area (<1%) and effects assessment Regional Study Area (<1%).

Limited habitat fragmentation occurs in the south and northeast portions of the effects assessment study areas. All season and winter roads bisect areas in the southern-most portion of the effects assessment study areas. Small all-season roads and trails occur in the northeast portion of the area surrounding the Marten Falls First Nation community. All linear infrastructure is minimal and is not likely a barrier to the reproduction and dispersal of flora in the effects assessment study areas.

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 7-6.1

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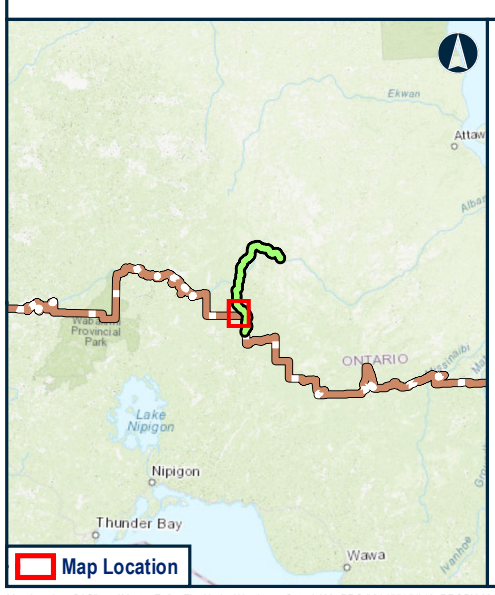
OGOKI RIVER
PROVINCIAL PARK
(WATERWAY CLASS)



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

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Kilometres

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Figure 7-6.2

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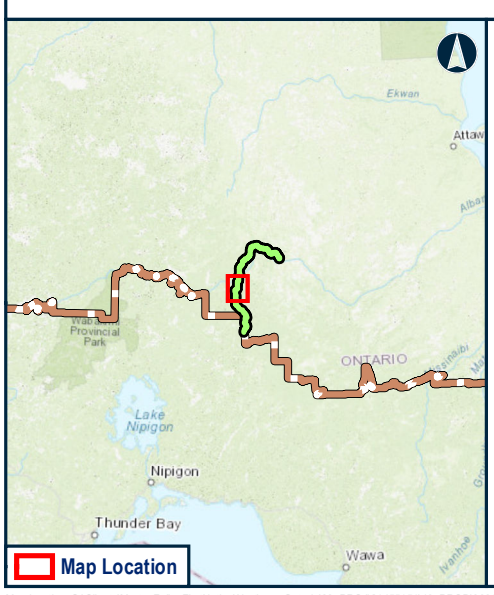
ALBANY RIVER
PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

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Figure 7-6.3

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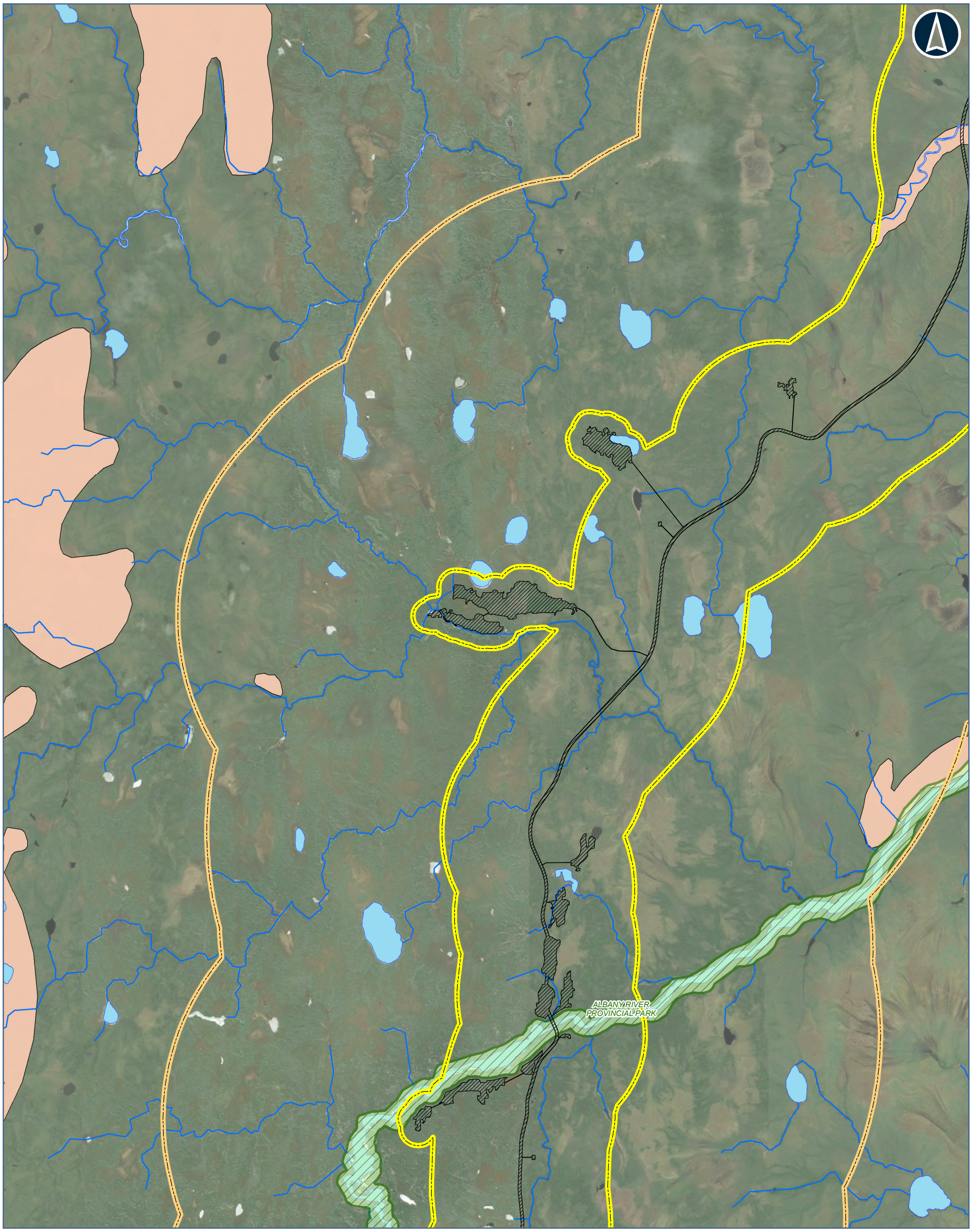

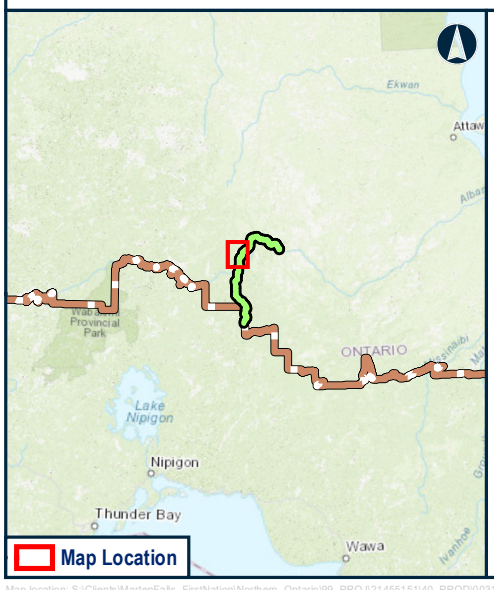

Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

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Kilometres

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Figure 7-6.4

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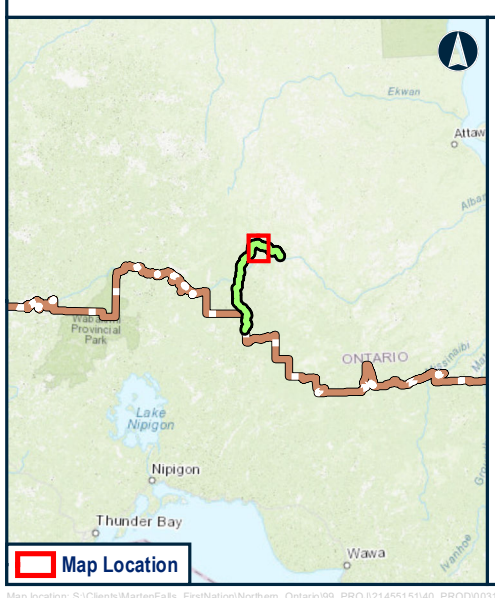
ALBANY RIVER
PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- WATERBODY
- WATERCOURSE
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 2.75 5.5
Kilometres

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Figure 7-6.5

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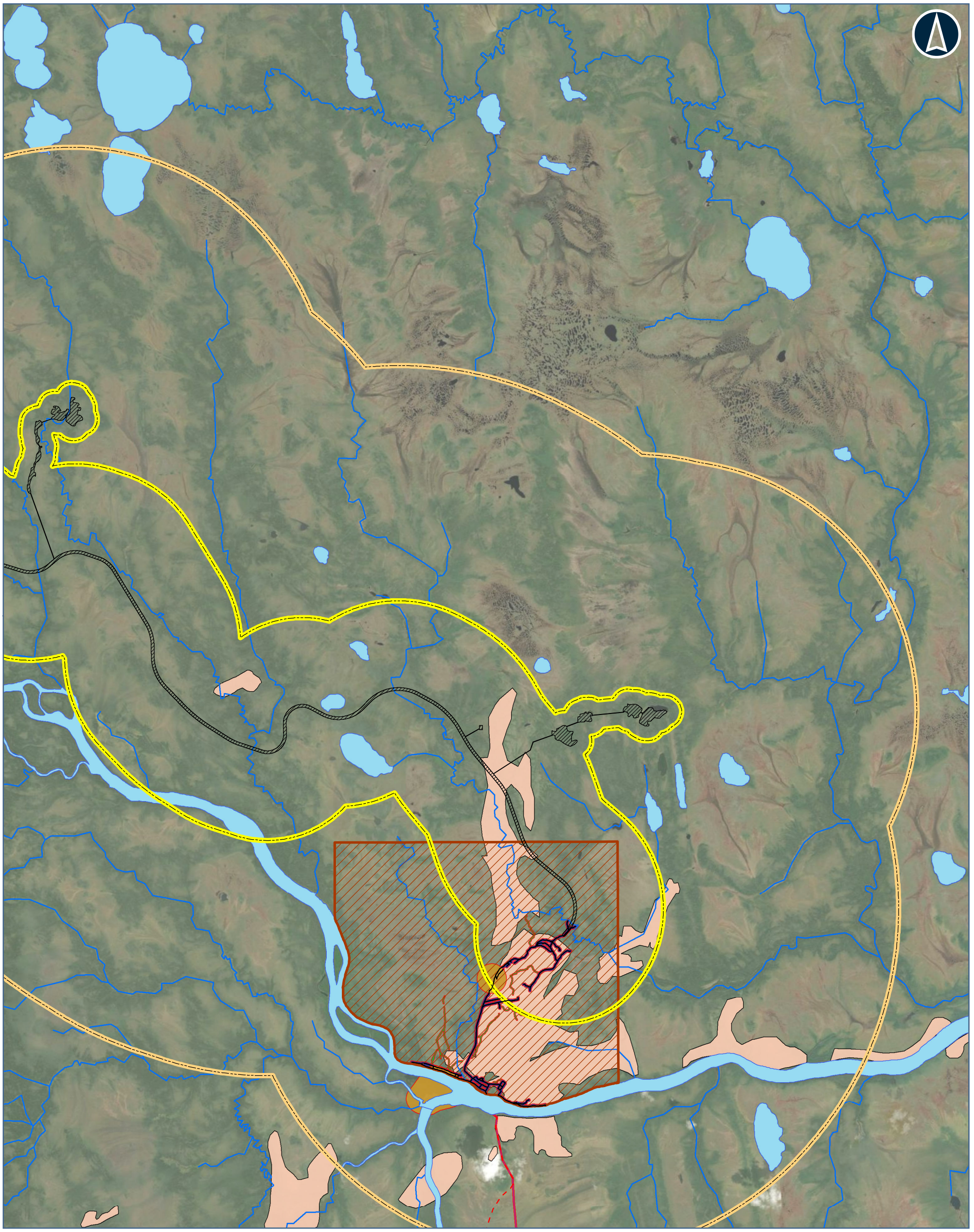

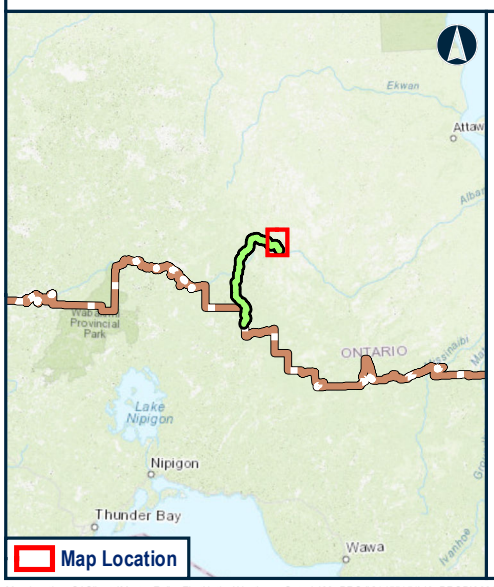

Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

ANTHROPOGENIC DISTURBANCE

- ALL SEASON ROAD
- COMMUNITY
- RAILWAY
- RECREATION
- TRAIL
- UTILITY LINE
- WINTER ROAD
- CAMP - OTHER
- COMMERCIAL OUTPOST CAMP

NATURAL DISTURBANCE

- BLOWDOWN
- DISEASE
- DROUGHT
- FIRE
- FLOOD
- HARVEST
- INSECTS

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Anthropogenic and Natural Disturbances in the Effects Assessment Study Areas

0 — 2.75 — 5.5
Kilometres

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Figure 7-6.6

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Table 7-9: Anthropogenic and Natural Disturbances in the Effects Assessment Local and Regional Study Areas

Disturbance Type		Local Study Area								Regional Study Area							
		Wetland		Upland		Water		Total		Wetland		Upland		Water		Total	
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)
Natural	Blowdown	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	6.9	<1%	0.0	0%	6.9	<1%
	Fire	8,910.9	8%	10,727.5	9%	1,103.3	1%	20,741.7	18%	12,947.8	3%	15,758.3	4%	1,652.1	<1%	30,358.2	7%
Natural Total		**8,910.9**	**8%**	**10,727.5**	**9%**	**1,103.3**	**<1%**	**20,741.7**	**18%**	**12,947.8**	**3%**	**15,765.2**	**4%**	**1,652.1**	**<1%**	**30,365.1**	**7%**
Anthropogenic	Harvest	0.1	<1%	4.2	<1%	0.0	0%	4.3	<1%	0.1	<1%	4.2	<1%	0.0	0%	4.3	<1%
	All Season Road	6.7	<1%	124.5	<1%	0.3	<1%	131.5	<1%	23.3	<1%	184.0	<1%	0.4	<1%	207.7	<1%
	Camp – Other	0.0	0%	<0.1	<1%	0.0	0%	<0.1	<1%	0.0	<1%	<0.1	<1%	0.0	0%	<0.1	<1%
	Commercial Outpost Camp	0.0	0%	0.5	<1%	0.0	0%	0.5	<1%	0.0	<1%	0.9	<1%	0.1	<1%	1.0	<1%
	Community	31.4	<1%	20.3	<1%	0.0	0%	51.7	<1%	31.5	<1%	20.3	<1%	0.0	0%	51.8	<1%
	Trail	24.5	<1%	27.8	<1%	107.3	<1%	159.6	<1%	59.7	<1%	44.8	<1%	154.3	<1%	258.9	<1%
	Winter Road	1.9	<1%	14.7	<1%	0.0	0%	16.6	<1%	1.9	<1%	14.7	<1%	0.0	0%	16.6	<1%
Anthropogenic Total		**64.6**	**<1%**	**192.0**	**<1%**	**107.6**	**<1%**	**364.2**	**<1%**	**116.6**	**<1%**	**269.0**	<1%	**154.8**	**<1%**	**540.4**	<1%

% = percent; ha = hectare; < = less than.

7.2 Project–Environment Interactions

The analysis of Project–environment interactions for Vegetation that are likely to have a potential effect is provided in **Table 7-10.**

Table 7-10: Project–Environment Interactions

Project Phase	Project Activities	Valued Component	Indicator	Description of Potential Effects
Construction	■ Mobilization of equipment and supplies ■ Temporary construction staging areas(a) ■ Temporary access roads and trails(a) ■ Temporary construction camps(a) ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries(a) ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act ■ Decommissioning of temporary camps, roads / trails and staging areas	■ All Valued Components	■ Availability ■ Distribution	■ Changes to the availability and distribution of vegetation Valued Components as a result of direct vegetation loss
			■ Composition and Function	■ Changes to the composition and function of vegetation Valued Components as a result of direct vegetation loss
				■ Changes to vegetation Valued Components as a result of changes to hydrology (e.g., alteration of drainage patterns and increased / decreased drainage flows and surface levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities)
				■ Changes to vegetation Valued Components as a result of changes to groundwater (e.g., alteration of drainage patterns and increased / decreased drainage flows and groundwater levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities)
				■ Changes to vegetation Valued Components resulting from the introduction and spread of invasive plant species (e.g., Phragmites)
				■ Changes to vegetation Valued Components as a result of fragmentation and edge effects (e.g., clearing within an otherwise intact landscape introduces a range of edge effects on retained vegetation communities including sunscald and windthrow)
				■ Changes to vegetation Valued Components from the release of sediment during construction
				■ Changes to vegetation Valued Components from spills of fuel or other contaminants
				■ Changes to vegetation Valued Components as a result of the deposition of air contaminants during construction
				■ Changes to vegetation Valued Components as a result of the deposition of air contaminants during construction
				■ Changes to vegetation Valued Components as a result of fugitive dust emissions during construction
				■ Changes to vegetation community composition and function resulting from increased public access
Operation and Maintenance	■ Road usage ■ Maintenance[(b)]	■ All Valued Components	■ Availability ■ Distribution	■ Changes to the availability and distribution of vegetation Valued Components as a result of additional vegetation clearing required for maintenance activities
			■ Composition and Function	■ Changes to vegetation Valued Components as a result of changes to hydrology (e.g., alteration of drainage patterns and increased / decreased drainage flows and surface levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities)
				■ Changes to vegetation Valued Components as a result of changes to groundwater (e.g., alteration of drainage patterns and increased / decreased drainage flows and groundwater levels that can cause changes to soils and vegetation health / composition thereby changing the availability, distribution, composition, and function of retained vegetation communities)
				■ Changes to vegetation Valued Components from spills of fuel or other contaminants
				■ Changes to vegetation Valued Components from the release of sediment
				■ Changes to vegetation Valued Components as a result of the deposition of air contaminants from road usage
				■ Changes to vegetation Valued Components as a result of fugitive dust emissions from road usage
				■ Changes to vegetation Valued Components resulting from the introduction and spread of invasive plant species (e.g., Phragmites) from road usage
				■ Changes to vegetation community composition and function resulting from increased public access

Notes:
(a) Includes General Maintenance (e.g., grading, erosion control, quarrying, pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance, and Special Maintenance (e.g., slope failures, road settlement / break-up).

7.3 Assessing Residual Effects

This section presents the potential effects, and appropriate mitigation measures to prevent or reduce effects on vegetation. Net residual effects are brought forward for characterization into **Section 7.3.2** and into the cumulative effects assessment in **Section 8** (where residual effects are greater than "negligible"). A summary of the potential effects, mitigation measures and residual effects are presented in **Section 7.3.1.12** (**Table 7-15**).

7.3.1 Potential Effects, Mitigation Measures, and Predicted Residual Effects

The potential effects of the Project on vegetation Valued Components are presented below. The effects of direct vegetation loss on each Valued Component are assessed in **Section 7.3.1.1**, along with appropriate mitigation measures, and predicted residual effects. **Section 7.3.1.2** through **Section 7.3.1.11** present effects that are common to all vegetation Valued Components. Mitigation measures are presented for each potential effect, along with predicted residual effects. A summary of the potential effects, mitigation measures, and residual effects is provided in **Section 7.3.1.12** (**Table 7-15**).

7.3.1.1 Changes to the Availability and Distribution of Vegetation Valued Components as a result of Direct Vegetation Loss

7.3.1.1.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

Construction

Clearing of vegetation for all construction-related activities will result in the direct loss of vegetation communities (including upland, wetland, and riparian ecosystems), thereby reducing the availability of these communities within the effects assessment Local and Regional Study Areas as well as changing their distribution within the Project landscape. As a conservative estimate, it is assumed that that the entire effects assessment Construction Disturbance Area will be cleared, resulting in the following direct loss of vegetation (**Table 7-11** through

Table 7-13):

- **2,309.3 ha Upland Ecosystems**, which equates to **2%** of the Upland Ecosystems within the effects assessment Regional Study Area;
- **2,363.2 ha Wetland Ecosystems**, which equates to **1%** of the Wetland Ecosystems within the effects assessment Regional Study Area; and

- **116.7 ha Riparian Ecosystems**, which equates to **1%** of the Riparian Ecosystems within the Effects Assessment Regional Study Area.

Table 7-11: Summary of Upland Ecosystem Loss in the Effects Regional Study Area

Upland Community	Construction Disturbance Area (ha)	% of Community Type within the Effects Regional Study Area Affected
Coniferous Forest	1,620.6	3%
Deciduous Forest	601.1	6%
Mixed Forest	73.9	0%
Rock / Barren	8.3	6%
Early Successional / Sparse Treed	5.5	0%
Total	**2,309.3**	**2%**

% = percent; ha = hectare.

Table 7-12: Summary of Wetland Ecosystem Loss in the Effects Regional Study Area

Wetland Community	Construction Disturbance Area (ha)	% of Community Type within the Effects Regional Study Area Affected
Swamp	1,510.5	1%
Marsh	37.4	2%
Fen	786.2	1%
Bog	29.2	0%
Total	**2,363.2**	**1%**

% = percent; ha = hectare.

Table 7-13: Summary of Riparian Ecosystem Loss in the Effects Regional Study Area

Vegetation Community Grouping	Construction Disturbance Area (ha)	% of Community Type within Riparian Ecosystems of the Effects Regional Study Area Affected
Coniferous Forest	24.3	1%
Deciduous Forest	5.2	1%
Mixed Forest	1.0	0%
Rock / Barren	0.3	2%

Vegetation Community Grouping	Construction Disturbance Area (ha)	% of Community Type within Riparian Ecosystems of the Effects Regional Study Area Affected
Early Successional / Sparse Treed	0.2	0%
Fen	16.4	1%
Bog	0.0	0%
Marsh	24.1	2%
Swamp	32.0	1%
Anthropogenic	1.3	3%
Water	13.0	0%
Total	**116.7**	**1%**

% = percent; ha = hectare.

Most of these direct losses are expected to be permanent (and are assumed to be permanent in the direct loss calculation) because the Operation and Maintenance Phase is predicted to be indefinite. However, the effects assessment Construction Disturbance Area footprint includes temporary features (e.g., temporary access roads, storage and temporary laydown areas, temporary construction camps, and temporary pits and quarries) some of which may be decommissioned and restored or vegetation will be established, as outlined on the required Rehabilitation Plan to align with the 'Aggregate Resources of Ontario: Site Plan (2020) Standards' (

Table 7-14).

Restoration activities would support the establishment and succession of vegetation communities with similar function to existing ecosystems. These areas are anticipated to eventually provide some of the functions that the cleared vegetation communities currently provide; however, the re-establishment of certain vegetation community types (e.g., peatlands) is challenging. Further discussion on the re-establishment of peatland communities is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

Table 7-14: Summary of Permanent and Temporary Features within the Construction Disturbance Area

	Permanent Footprint	Temporary Footprint
Description of Footprint Area	■ 60 m of the 100 m wide right-of-way ■ Assume 30 m on either side of the centreline	■ The outer 20 m on either side of the 60 m permanent right-of-way (i.e., outside of the 60 m permanent right-of-way)
Features	■ Nine of 18 aggregate and quarry sites, as well as the associated 10 m wide access roads, will remain open for maintenance.	■ Nine of 18 aggregate and quarry sites, as well as the associated 10 m wide access roads, will be closed after construction and are opportunities for future restoration. ■ Camps, laydown areas, fly yards (all construction based areas).

m = metre.

Operation and Maintenance

Operation and Maintenance activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss in the Construction Phase and would not represent additional direct loss of vegetation.

Designated Areas

Construction

Provincial Parks

Clearing of vegetation for all construction-related activities will result in the direct loss of Designated Areas (i.e., Provincial Parks and Critical Landform / Vegetation Associations), thereby reducing the availability of Designated Areas within the effects assessment Local and Regional Study Areas as well as marginally affecting their distribution within the Project landscape. As a conservative estimate, it is assumed that the entire Construction Disturbance Area will be cleared. Two of the Provincial Parks (i.e., Little Current River and Ogoki River) will not be directly affected by the Project. Only the Albany River Provincial Park will experience direct effects through vegetation removal, as outlined below and in **Table 7-4**.

- 5.7 ha of the Albany River Provincial Park will be affected by the clearing of the Construction Disturbance Area. This represents <1% of the total Provincial Park area and <1% of the Provincial Park that occurs within the effects assessment Regional Study Area.

Critical Landform / Vegetation Associations

Clearing of vegetation for all construction-related activities will also result in the direct loss of some Critical Landform / Vegetation associations within protected areas and proposed protected areas, thereby reducing the availability of these communities within the effects assessment Local and Regional Study Areas as well as changing their distribution within the Project landscape. As a conservative estimate, it is assumed that that the entire Construction Disturbance Area will be cleared, resulting in the following direct loss of Critical Landform / Vegetation associations (**Table 7-5**).

- 491.2 ha of Critical Landform / Vegetation associations will be affected by the Construction Disturbance Area, which represents 1% of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area. The six Landform / Vegetation associations with the greatest impacts (i.e., 458.8 ha or 93% of the 491.2 ha affected) are:
  - Fine Ground Moraine – Disturbance – Treed and / or Shrub: 86.2 ha.
  - Organic Deposits – Coniferous Swamp: 186.5 ha.
  - Organic Deposits – Disturbance – Non and Sparse Woody: 71.5 ha.
  - Organic Deposits - Treed Fen: 81.5 ha.
  - Precambrian Int. to Acidic Bedrock – Treed Fen: 22.9 ha.
  - Organic Deposits – Thicket Swamp: 10.2 ha.

The remaining 32.4 ha of Critical Landform / Vegetation associations that are affected include ten Critical Landform / Vegetation associations. Loss of Critical Landform / Vegetation associations reduces their contribution to the protection of Ontario's biodiversity.

Operation and Maintenance

Operation and Maintenance activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss in the Construction Phase and would not represent additional direct loss of vegetation.

Traditional Use Plant Habitat Availability

Construction

As summarized in **Section 7.1.5.1**, suitable and accessible habitat for Traditional Use Plant species is available throughout the effects assessment Local Study Area. There is an apparent increase in the presence of ecosites with a higher score in the central, and

north portion of the effects assessment Local Study Area (i.e., those coloured darker shades of orange and red on **Figure 7-4**), however it does not appear that clearing of vegetation within the Construction Disturbance Area will disproportionally affect the ecosites with a high score (**Table 7-6**).

Operation and Maintenance

Operation and Maintenance activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss in the Construction Phase and would not represent additional direct loss of vegetation.

Species at Risk and Species of Conservation Concern

Construction

Black Ash

As summarized in **Section 7.1.6.1.1**, approximately 35,390.2 ha, representing 31% of the effects assessment local study area has been assessed as suitable habitat for Black Ash. Clearing of vegetation within the Construction Disturbance Area will remove approximately 1,643.5 ha of this area, representing 5% of the suitable habitat within the effects assessment Local Study Area. While this is moderately large area of potential loss of suitable Black Ash habitat, it must be recognized that the Project is at the northern limit of the known range for Black Ash (Catling et al., 2022); therefore, the affected suitable habitat represents both current and future suitable habitat (i.e., range expansion resulting from climate change). Observations of Black Ash during the 2021-2023 vegetation field program were limited to seven locations near the south end of the effects assessment Local Study Area (i.e., along the Ogoki River). Locations of Black Ash observations are shown in **Figure 7-5.2**. One known location of Black Ash is within the Construction Disturbance Area. There is good potential that Black Ash is found in other locations within the Construction Disturbance Area.

As noted in **Section 5.9.2.1**, Black Ash trees located in the Project landscape are not currently protected under 9 (1) (a) of the *Endangered Species Act* (i.e., kill, harm, harass, capture or take a living member an endangered or threatened species), since they are not located within a municipality or territorial district described in Schedule 1 of *Ontario Regulation 6/24*. However, given the length of time the Project will take to reach completion, and that predicted climate warming may bring Emerald Ash Borer further north, Black Ash are discussed in the context of Species at Risk as regulations related to habitat protection may be amended to include some or all of the effects assessment Local Study Area and / or effects assessment Regional Study Area during future Project phases.

Northern Marsh Violet

As summarized in **Section 7.1.6.1.2**, approximately 82,052.1 ha, representing 71% of the effects assessment Local Study Area has been assessed as suitable habitat for Northern Marsh Violet. Clearing of vegetation within the Construction Disturbance Area will remove approximately 2,404.1 ha of this area, representing 3% of the suitable habitat within the Effects Assessment Location Study Area. Northern Marsh Violet was not observed during the 2021-2023 field program therefore direct impacts to individuals are unknown.

Northern Marsh Violet is a provincially rare plant species ranked S2S3 in Ontario (i.e., a Species of Conservation Concern). It is a species that is tracked by the province but is not a Species at Risk afforded legal protection under the *Endangered Species Act* or *Species at Risk Act*.

Operation and Maintenance

Operation and Maintenance activities, such as culvert or bridge replacements, may result in disturbance of vegetation. However, given the conservative assumptions used regarding the footprint area for Construction, it is assumed that these disturbances are already captured in the calculation of permanent loss in the Construction Phase and would not represent additional direct loss of vegetation.

7.3.1.1.2 Mitigation Measures

Construction

Mitigation measures that will be implemented during the Construction Phase to minimize direct vegetation loss wherever and whenever possible are outlined below. These measures are generally applicable to all vegetation Valued Components.

- Limit vegetation clearing to within the 100 m right-of-way and to less than this width to the extent possible:
  - Minimize clearing widths in more sensitive ecosystems (e.g., riparian ecosystems) and more difficult to restore vegetation community groups (e.g., fen and bog) to the extent possible.
  - Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on more sensitive or difficult to restore vegetation communities. These details will be refined during detailed design, prior to construction.
  - Limit clearing of riparian vegetation (i.e., within 30 m of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only.

  - Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (e.g., upland ecosystems), where possible. Avoid peatland communities for temporary features wherever feasible.

- Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act*, which will include backfilling, levelling, recompacting, and redistributing organic materials to encourage natural revegetation. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance;
- Perform clearing and construction activities in winter months where feasible;
- Develop and implement a Project-specific Environmental Protection Plan;
- Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan;
- Reassess the status of Black Ash protection during future study phases. If Schedule 1 of *Ontario Regulation 6/24* has been updated to include the area of the Project, a search for Black Ash trees shall be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the effects assessment Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment Canada and Climate Change) shall be consulted on next steps;
- Prepare and implement a Vegetation Management Plan at detailed design that contains measures to protect rare plants, including protocols specific to Black Ash (e.g., commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented;
- Consult with Ontario Parks at detailed design to determine permitting, mitigation and/or compensation / offsetting expectations for direct impacts to the Albany River Provincial Park;

- Consult with Ontario Parks at detailed design to determine permitting, mitigation and /or compensation / offsetting expectations for impacts to Critical Landform / Vegetation Associations;
- Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles away from known Traditional Use Plant harvesting areas, where possible;
- Prepare and Implement a Vegetation Restoration Plan. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.; and
- Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.

Operation and Maintenance

The following mitigation measures are recommended during Operation and Maintenance:

- Prepare and implement a Vegetation Management Plan to keep vegetation from interfering with the safe and reliable operation and maintenance of the road; and
- Avoid re-entry and disturbance of restored temporary access areas post-construction.

7.3.1.1.3 Predicted Residual Effects

Construction

Measures to minimize direct impacts to vegetation Valued Components will be implemented, but direct losses cannot be avoided, therefore changes to the availability and distribution of vegetation Valued Components as a result of direct vegetation loss during Construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

Operation and Maintenance

With the implementation of mitigation measures, and the conservative assumptions applied for the Construction Phase, no additional clearing or disturbance of vegetation is expected during Operation and Maintenance. Therefore, the interaction was not carried forward to the residual effects characterization.

7.3.1.2 Changes to the Composition and Function of Vegetation Valued Components as a Result of Direct Vegetation Loss

7.3.1.2.1 Potential Effects

Upland, Wetland and Riparian Ecosystems

Construction

The removal of vegetation reduces habitat availability (i.e., through direct loss of habitat) and can alter habitat suitability (e.g., by disrupting habitat connectivity) for wildlife and vegetation species. This can result in a decline in biodiversity. A more detailed discussion of potential effects on wildlife habitat are discussed in the *Wildlife Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026g), *Birds Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026a) and *Ungulates Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026f).

In addition to the above, vegetation clearing in Riparian Ecosystems can reduce the stabilizing forces provided by plant roots, reduce physical obstructions provided by plant material that moderate surface water run-off velocity, and also expose vulnerable banks or slopes resulting in increased erosion and sedimentation. Disturbance of soils can contribute to sedimentation by increasing the quantity of loose material present. Soil disturbance during vegetation removal can also facilitate the spread of invasive species (discussed in **Section 7.3.1.4)** Loss of vegetation cover might also increase the water temperature due to a reduction in shading, which can reduce aquatic species richness and alter habitat suitability for fish. A more detailed discussion of potential effects on fish and fish habitat are discussed in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026b).

Clearing of vegetation for all construction-related activities will also result in the direct loss of functional area from vegetation communities (including Upland, Wetland, and Riparian Ecosystems), and might reduce the ability of remaining areas to carry out important ecosystem functions. For example, construction on areas that were previously swamp or fen might reduce surface water flows into unaffected areas, causing the water table to drop and conditions to become unsuitable for species adapted to saturated soils. This, in turn, could result in increased abundance of upland species, a reduction in biodiversity, a decline in peat production and an accompanying reduction in carbon sequestration capacity (Borkenhagen et al., 2023). Changes to the composition of vegetation communities has been noted as a concern by Indigenous communities who have provided feedback on the Project including Weenusk First Nation (MNP LPP, 2024b). Vegetation loss also reduces the capacity of ecosystems to conduct biogeochemical functions such as photosynthesis and the uptake and processing of nutrients.

Potential effects on the composition and function of Upland, Wetland, and Riparian Ecosystems due to Project activities are also discussed in other sections, including changes to hydrology and groundwater (**Section 7.3.1.3**), fragmentation and edge effects (**Section 7.3.1.5**), release of sediment (**Section 7.3.1.6**), spills (**Section 7.3.1.7**), deposition of air contaminants and fugitive dust (**Section 7.3.1.8** and **Section 7.3.1.9**), and increased public access (**Section 7.3.1.10**).

Operation and Maintenance

With the implementation of mitigation measures, and the conservative assumptions applied for the Construction Phase, no additional clearing or disturbance of vegetation is expected during Operation and Maintenance. Therefore, the interaction was not carried forward to the residual effects characterization.

7.3.1.2.2 Mitigation Measures

Mitigation measures that will be implemented during the Construction and Operation and Maintenance Phases to minimize direct vegetation loss wherever and whenever possible are outlined in **Section 7.3.1.1.2.**

7.3.1.2.3 Predicted Residual Effects

Measures to minimize direct impacts to Upland, Wetland, and Riparian Ecosystems will be implemented but direct losses cannot be avoided during Construction. Therefore, changes to the composition and function of Upland, Wetland, and Riparian Ecosystems as a result of direct vegetation loss during Construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

With the implementation of mitigation measures, and the conservative assumptions applied for the Construction Phase, no additional clearing or disturbance of vegetation is expected during Operation and Maintenance. Therefore, the interaction was not carried forward to the residual effects characterization.

7.3.1.3 Changes to Vegetation as a Result of Changes to Hydrology

7.3.1.3.1 Potential Effects

All Vegetation Valued Components

Construction

Project activities such as road construction through wetlands, watercourse crossings, vegetation clearing, short-term water-taking and discharge of water during the Construction Phase can cause alterations of drainage patterns, impacts on surface water quality, and increased / decreased drainage flows and surface water levels. This can, in turn, cause changes to soils and vegetation health / composition thereby altering the

availability, distribution, composition and function of retained upland, wetland and riparian ecosystems. Although wetland and riparian ecosystems experience water level fluctuations as part of natural variability, changes in the amplitude, frequency, and timing of flood or drought compared to historical levels can cause adverse effects. This effect may be felt more acutely in wetland ecosystems where water levels greatly influence vegetation community composition. If changes to hydrological regimes are notable enough to change the composition of a vegetation community, then the availability, distribution, composition, and function of that altered vegetation community type will also eventually be affected within the effects assessment Local Study Area.

Changes to surface water drainage can lead to increased levels of surface water runoff into adjacent communities, which can have an impact on the species composition of a community and the overall community classification. For example, flooding can cause a turnover of vegetation, leading to the die-off of woody vegetation, creating more open wetland habitats such as open bogs, open fens and marsh habitat that replace treed wetland habitats (Asada et al., 2005). Additionally, linear disturbances obstructing surface flow between an upgradient and downgradient side of the Community Access Road can lead to increased water levels and pooling on the upgradient side, causing aerobic conditions and the accelerated decomposition of peat on the downgradient end, further influencing the composition and function of these communities (Vu, 2019). Similarly, studies have found that in some instances, a drawdown of water tables (**Section 7.3.1.4**) can create a disconnect between previously connected wetland systems and can, in-turn, impact water availability for downstream systems (Balliston et al., 2023).

The surface water quality within wetlands may also be affected by the construction of the Community Access Road. During construction, surface water may become contaminated if chemicals or substances (e.g., petroleum products, sediments, and garbage) from Project equipment, vehicles, road surfaces, or blasting sites are transported into surface water during precipitation events (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]). This includes contamination of surface water from accidental spills and leaks of chemicals and hazardous materials (**Section 7.3.1.8**).

Additionally, there may be changes to surface water quality from increases in concentrations of suspended solids in waterbodies as a result of increased rates of erosion–sedimentation processes during water-taking and discharge activities. This might also occur following the removal of the diversion works and / or installation or removal of temporary waterbody crossing structures due to the disturbance of the bed and banks of a waterbody (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]).

Furthermore, air emissions from Project activities during Construction could result in changes to surface water quality (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]).

Areas in the Construction Disturbance Area are at highest risk of surface water contamination from the Project (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]).

Short-term residual changes to surface water quantity are predicted during the Construction Phase because of short-term water discharges and water-taking and water diversions at waterbody crossings (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]). These residual effects have been assessed as likely to cause minimal changes to stream flows and / or water levels at receiving waterbodies and be limited to, at most, the spatial extent of the Local Study Area during Construction (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]). This finding has been extrapolated to indicate that the resulting residual effects on wetland ecosystems is likewise expected to be minimal and limited to the Local Study Area during Construction.

These indirect effects on retained vegetation communities are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

Operation and Maintenance

Long-term residual changes to surface water quantity were predicted during the Operation and Maintenance phase as a result of changes in channel hydraulics at waterbody crossings and changes in land cover *(Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]). These residual effects were assessed as having minimal changes to stream flows and / or water levels at receiving waterbodies and limited to, at most, the spatial extent of the Local Study Area (*Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* [WSP, 2026e]). This finding has been extrapolated to indicate that the resulting residual effects on vegetation Valued Components is likewise expected to be minimal and limited to the Local Study Area during Operation and Maintenance.

7.3.1.3.2 Mitigation Measures

Construction

A list of mitigation measures to limit changes to surface water quantity and quality during Construction is provided in the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e).

Additional mitigation measures that will be implemented during the Construction Phase include:

- Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan;
- Design and implement a pre-, during- and post-construction monitoring program that assesses surface water movement and helps to ensure that pre-construction conditions are maintained to the extent feasible (**Section 9)**; and
- Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.

Once further hydrological monitoring and water budget studies are undertaken during detailed design, specific mitigation measures to maintain wetland hydrology may be required and will be included with detailed design documentation as the Project schedule allows. See **Sections 9** and **10** for further details regarding monitoring commitments and recommendations.

Operation and Maintenance

A list of mitigation measures to limit changes to hydrology during Operation and Maintenance is provided in the *Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP, 2026e). The effectiveness of mitigation measures will be evaluated during Operation and Maintenance Phase, and mitigation measures will be modified or enhanced as necessary through adaptive management.

7.3.1.3.3 Predicted Residual Effects

Construction

With the implementation of the recommended mitigation measures, changes to hydrology will be minimized and impacts to retained vegetation communities should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction drainage patterns. It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. Changes to vegetation as a result of changes to hydrology is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

Operation and Maintenance

Changes to the retained vegetation Valued Components resulting from changes to hydrology during Operation and Maintenance is not predicted to result in a residual effect and this interaction is not carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.4 Changes to Vegetation as a Result of Changes to Groundwater

7.3.1.4.1 Potential Effects

All Vegetation Valued Components

Construction

Project activities such as road construction through wetlands, changes to topography, short-term water-taking, pit / quarry dewatering and discharge of water can cause alterations of drainage patterns, recharge rates and increased / decreased groundwater levels. This can in turn cause changes to soils and vegetation health / composition thereby changing the composition and function of retained upland, wetland and riparian ecosystems. In particular, quarry and pit dewatering has potential to change groundwater levels near the excavation by more than 50% of the natural seasonal variability. Although wetland and riparian ecosystems experience water level fluctuations as part of natural variability, changes in the amplitude, frequency, and timing of drought compared to historical levels can cause adverse effects. This effect may be felt more acutely in wetland ecosystems where water levels greatly influence vegetation community composition.

The construction of the road across peatland wetland areas has the potential to interrupt groundwater flows through the peatland which could cause changes to the availability of groundwater to peatlands upgradient and downgradient of the Community Access Road. A more detailed discussion of potential effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP& AECOM, 2026).

Groundwater quality may be affected through changing groundwater levels which could have an impact on various wetland processes, a change in the groundwater chemistry in areas adjacent to the road, or through spills during Construction. For example, the drying of peat, where the groundwater regime has been altered by construction and operation of the road, or impacted via climate change, could lead to an increase in production of methylmercury and inorganic mercury concentrations in those wetland communities. Additional discussion of groundwater quality effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

If changes to groundwater regimes are notable enough to change the composition of a vegetation community, then the availability, distribution, composition, and function of that altered vegetation community type will also eventually be affected within the effects assessment Local Study Area.

These indirect effects on retained vegetation communities are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

Operation and Maintenance

During the Operation and Maintenance Phase, short-term water takings from groundwater sources may be required for the repair of below ground structures such as footings or culverts. Additionally, as in the Project's Construction Phase, aggregate extraction below the water table at pits or quarries may lower local groundwater levels. Periodic extraction from pits and quarries is expected to continue at some sources to provide material for road maintenance during the Operation and Maintenance Phase of the Project.

Clearing of the Effects Assessment Construction Disturbance Area and resulting changes to vegetation cover may change groundwater infiltration rates for precipitation relative to the existing conditions. Areas that were cleared during the Construction Phase but not maintained for use are expected to gradually return to similar existing conditions through active or passive restoration processes. In remaining areas, these changes to groundcover will persist for the road right-of-way and any access roads, laydown areas, or pits and quarries that are maintained or re-activated for use during the Operation and Maintenance Phase.

Equipment and vehicles used during the Operation and Maintenance phase of the Project will have the potential for malfunctions or accidents to cause leaks of fuels, oils, lubricants, coolants, and other potential contaminants. Storage and transfer of fuels and other chemicals in the Effects Assessment Construction Disturbance Area during the Operation and Maintenance phase and maintenance also pose a risk of accidental spills. These accidental spills and leaks may contact the ground and migrate to the water table causing contamination of the groundwater.

7.3.1.4.2 Mitigation Measures

Construction

A list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the *Groundwater and Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026c). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management.

Additional mitigation measures that will be implemented during the Construction Phase include:

- Construct the Community Access Road through peatland communities using a "floating road" construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve:
  - Completion of a detailed ground survey, characterizing the peat and local hydrology at a later stage of the Project / detailed design.
  - Site-specific identification of appropriate values for peat strength.
  - Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat.
  - Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw.
  - Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading.
  - Provide transitions between floating road sections, excavated and fill sections.
  - Schedule construction to allow for primary settlement of the peat without risk of shear failure.
  - Monitor the work through construction, measuring and recording lateral movement and settlements. Be prepared to adjust the design based on observation and monitoring.
  - Mitigation measures as outlined in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).
- The mitigation measures established and refined using adaptive management during Project Construction should be maintained during the Operation and Maintenance;
- Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan;
- Design and implement a pre-, during- and post-construction monitoring program that assesses surface and groundwater movement that allows for the maintenance of pre-construction conditions to the extent feasible (**Section 9**); and

- Implement adaptive management measures if drainage and groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.

Operation and Maintenance

A list of mitigation measures to limit changes to groundwater quantity and quality during Operation and Maintenance is provided in the *Groundwater and Geochemistry Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP, 2026c). Additionally, adaptive management measures will be implemented if groundwater flow patterns are determined to be significantly altered.

7.3.1.4.3 Predicted Residual Effects

Construction, Operation and Maintenance

With the implementation of the recommended mitigation measures, changes to groundwater regimes will be minimized and impacts to retained vegetation communities should be minimal. However, this assumes that the mitigation measures will be sufficient to maintain pre-construction groundwater regimes.

It is expected that a robust monitoring program will be undertaken, and adaptive management measures implemented, as required. This monitoring program is described in more detail in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

Changes to vegetation Valued Components as a result of changes to groundwater quantity and quality is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.5 Changes to Vegetation as a Result of the Introduction and Spread of Invasive Plant Species

7.3.1.5.1 Potential Effects

All Vegetation Valued Components

Construction

The introduction and spread of invasive plant species can affect plant community composition and function over the long term. This is a particular concern for the Project given its remote nature and current absence of invasive plant species from the Project area. Indigenous communities, including Aroland First Nation and Métis Nation of Ontario noted concerns related to the potential spread of invasive species (Dillon 2024a; Métis Nation of Ontario, 2023).

The resulting changes to vegetation communities can in turn have an effect on the function of those communities and their ability to support certain wildlife species. Specifically, the introduction of invasive plant species into new areas can reduce the quality of bird habitats by altering species diversity and the community plant structure through competition with native species, and by changing soil conditions (e.g., nutrients, moisture) (Mack et al., 2000; Carlson and Shepherd, 2007; Truscott et al., 2008). Invasive plant species thrive in areas with recently disturbed soils and a high ratio of edge habitat as this improves their ability to establish and spread (Honnay et al., 2002). Invasive plant species often establish in fragmented landscapes along edge habitats, such as cleared areas adjacent to roads (Lafortezza et al., 2010).

Most non-native invasive plant species are introduced through various forms of human transport (Mack et al., 2000; Reichard and White, 2001). The regular movement of vehicles, equipment and personnel associated with the Project in-and-out of the Construction Disturbance Area could transport invasive plant seeds or plant parts into new areas inside and adjacent to the Construction Disturbance Area.

Vehicles and equipment can serve as dispersal mechanisms for plant seeds and vegetative parts that can get lodged in tires, the undercarriage, or mud on the surface of the vehicle (Parendes and Jones, 2000; Trombulak and Frissell, 2000). Many non-native invasive plant species are able to spread more easily in landscapes that have been fragmented, and often become established along edge habitats, such as disturbed road edges associated with transportation corridors (Lafortezza et al., 2010).

Operation and Maintenance

During the Operation and Maintenance Phase, regular vehicle traffic on the Community Access Road could transport invasive plant seeds or plant parts into the effects assessment Local Study Area. The indirect effects on vegetation resulting from the introduction of spread of invasive species described above, are also relevant to the Operation and Maintenance Phase.

7.3.1.5.2 Mitigation Measures

Construction

It is generally more efficient and cost effective to prevent the introduction and spread of invasive plant species in a new area compared to efforts aimed at removing those plants once established (Clark, 2003; Polster, 2003; Carlson and Shepard, 2007). To this end, the following mitigation measures are recommended:

- An Environmental Protection Plan will be developed during detailed design, and will be implemented during construction to prevent, detect, control (i.e., remove), and monitor areas with invasive species. The plan will also include the following measures:

- Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning shall be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the cleaning of equipment (e.g., the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan.
- Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate to promote natural revegetation.
- Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation.
- Limit off-road vehicle use by contractors during Construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detailed design and / or through the development of the Environmental Protection Plan.
- Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible.
- Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.

Operation and Maintenance

The following mitigation measures are recommended during Operations and Maintenance:

- Include the following measures as part of the Environmental Protection Plan to prevent, detect, control (i.e., remove), and monitor areas with invasive species:
  - Limit off-road vehicle use by contractors during Operation and Maintenance. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detailed design and / or through the development of the Environmental Protection Plan.
  - Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.

- Remove and manage invasive species using manual and mechanical means. Herbicides will not be used. Design and implement post-construction invasive species monitoring program to detect invasive species presence and control (i.e., remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.

7.3.1.5.3 Predicted Residual Effects

Construction

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts to the retained vegetation communities should be minimal. However, this assumes that mitigation measures are effectively implemented, and all observations of invasive species are reported and addressed immediately. Changes to vegetation Valued Components as a result of the introduction and spread of invasive plant species during Construction is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

Operation and Maintenance

With the implementation of the recommended mitigation measures and continued monitoring and control of invasive species, impacts to the retained vegetation communities should be minimal. However, this assumes that mitigation measures are effectively implemented. Additionally, introduction of invasive plant species may be higher during Operation and Maintenance due to public use of the Community Access Road. As such, changes to vegetation Valued Components as a result of the introduction and spread of invasive plant species during Operation and Maintenance is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.6 Changes to Vegetation as a Result of Fragmentation and Edge Effects

7.3.1.6.1 Potential Effects

<u>All Vegetation Valued Components</u>

Construction

Clearing within an otherwise intact landscape introduces new fragmentation and a range of edge effects on retained vegetation communities, particularly evident in forested communities. Edge effects include the introduction and spread of invasive species (discussed in **Section 7.3.1.4**), as well as sunscald, desiccation and windthrow which alter the microclimate of the retained communities. These effects influence the composition and

function of the retained vegetation communities resulting in secondary effects (e.g., altering habitat use by certain wildlife species). These secondary or indirect edge effects generally extend further into a forest than forest structure changes (Franklin et al., 2021). In Ontario, sunscald, desiccation, and windthrow effects are typically experienced to a greater degree (or penetrate further into the retained forest) on south and west-facing forest edges due to more solar exposure and prevailing westerly winds (Hylander, 2005; Honnay et al., 2002; Murcia, 1995). However, boreal forests have been shown to be less influenced by edge effects than tropical and temperate forests (Franklin et al., 2021), because they are adapted to large-scale natural disturbances (e.g., fire, windthrow, insect outbreaks), typically have a short canopy height and more widely spaced trees (relative to temperate and tropical forests) and have a natural vegetation community heterogeneity (Harper et al., 2015). Nevertheless, some edge effects are anticipated to occur in the Project area and are expected to be more pronounced on south and west-facing forest edges.

As discussed in **Section 5.10, Section 7.1.7** and displayed on, **Figure 5-8**, while the landscape in the Project area is largely intact, there are anthropogenic and natural disturbances that have influenced the landscape. Notably, natural disturbances (primarily fire) have occurred over 20,741.7 ha (18%) of the effects assessment Local Study Area, while anthropogenic disturbances were determined to cover 364.2 (<1%) of the effects assessment Local Study Area. In the effects assessment Regional Study Area, natural disturbances (primarily fire) have occurred over 30,365.1 ha (7%) and anthropogenic disturbances cover a total of 540.4 ha (<1%). These disturbances have caused minor fragmentation and edge effects on the existing landscape. The Project will create new anthropogenic disturbances layered over the existing disturbance regime. The total Construction Disturbance Area footprint is 4700.2 ha.

Operation and Maintenance

It is not expected that the Operation and Maintenance Phase will introduce new fragmentation or edge effects on the retained vegetation communities.

7.3.1.6.2 Mitigation Measures

Construction

Mitigation measures that will be implemented during the Construction Phase are as follows:

- Adjust the alignment or clear off centre within the right-of-way to minimize forest fragmentation and the creation of new forest edges, where feasible. These details will be refined during detailed design;
- Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the

construction of temporary laydown areas and temporary construction camps will be determined at detailed design;

- Avoid grubbing along newly created forest edges to promote natural regeneration which will quickly "seal" the new forest edge;
- Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate to promote natural revegetation (e.g., use low impact method to leave surface vegetation root mat intact until a site is proven for further development); and
- Use progressive restoration on-site once temporary work areas (e.g., staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.

Operation and Maintenance

No additional mitigation measures are recommended during the Operation and Maintenance Phase.

7.3.1.6.3 Predicted Residual Effects

Construction, Operation and Maintenance

Changes to the retained vegetation Valued Components resulting from edge effects is predicted to result in a residual effect and this interaction is carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.7 Changes to Vegetation from the Release of Sediment

7.3.1.7.1 Potential Effects

All Vegetation Valued Components

Construction

The Project has the potential to result in the release of sediment from vegetation clearing, earth moving, pit and quarry development and other construction activities. Sediment release into adjacent retained natural areas can have an effect on the composition and function of retained vegetation communities / vegetation Valued Components. The effects on vegetation would be expected to be very localized but could include vegetation smothering and changes to drainage patterns and infiltration in the area of sediment deposits.

Operation and Maintenance

There is potential that activities during the Operation and Maintenance Phase may cause the release of sediment to adjacent retained vegetation ecosystems. Large precipitation events may lead to run-off from the road and sedimentation in low lying areas such as wetland and riparian habitats. Similar to Construction, the effects would be localized, intermittent and variable throughout the year.

7.3.1.7.2 Mitigation Measures

Construction

Mitigation measures that will be implemented during the Construction Phase include:

- Develop and implement a Project-specific Environmental Protection Plan;
- Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ontario Provincial Standard Specifications OPSS.PROV.804 and OPSS.MUNI.805). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Construction;
- Regularly inspect and maintain Erosion and Sediment Control structures (e.g., sediment fences, rip rap or other sediment control structures) in accordance with Ontario Provincial Standard Specifications OPSS.PROV 804 during all phases of the project and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved;
- Stabilize disturbed areas through revegetation with native plant species or other appropriate means (e.g., erosion control blankets) following completion of the works;
- Reschedule work or reduce traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic are required will be determined during the detailed design phase;
- Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands; and
- Adhere to all mitigation measures outlined in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026b) and the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e).

Operation and Maintenance

The mitigation measures established and refined using adaptive management during Project Construction should be maintained during the Operation and Maintenance Phase.

7.3.1.7.3 Predicted Residual Effects

Construction, Operation and Maintenance

With the implementation of the mitigation measures, specifically implementation of a project-specific Erosion and Sediment Control Plan, changes to the retained vegetation Valued Components resulting from the release of sediment is not predicted to result in a residual effect. Should sediment be released into an adjacent vegetation community, the effect would be very localized such that a measurable effect on the availability, distribution, composition, and function of vegetation Valued Components would not be realized. Therefore, this interaction is not carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.8 Changes to Vegetation from Spills of Fuel or Other Contaminants

7.3.1.8.1 Potential Effects

All Vegetation Valued Components

Construction

During Project construction, chemical or hazardous material spills (e.g., petroleum products) can have detrimental effects on ecosystems in the affected area. Spills that occur in high enough concentrations can contaminate soils and affect soil organisms, vegetation health and survival, thereby affecting the composition and function of the affected vegetation communities and dependant wildlife. As a result, there is potential that the Project could cause spills of fuel or other contaminants that could negatively affect the composition and function of vegetation Valued Components. Indigenous communities including Weenusk First Nation noted concerns related to contamination of medicinal plants. In particular, the importance of these resources remaining uncontaminated as the community also relies on access to harvested medicines for treatments since the cost of travel south outside of Peawanuck is expensive. One community member noting, "*My father used to gather some medicine when my mother would cough or get the flu (…) they used to boil (…) pinecones. My mother used to drink that. Tastes awful but it works.*"; and another community member referencing the use of Labrador Tea to combat aching bones and colds. The community also highlighted the importance of transmitting knowledge about medicines to the younger generation so that it is not lost (MNP LPP, 2024b).

Operation and Maintenance

There is the potential for accidental spills of fuels and other materials resulting from vehicle collisions during Operation and from malfunctions of equipment or spills during equipment or vehicle refuelling during Maintenance activities. The indirect effects on vegetation resulting from spills of fuel or other contaminants during Operation and Maintenance are the same as discussed in the Construction section, above.

7.3.1.8.2 Mitigation Measures

Construction

The following mitigation measures will be implemented during the Construction Phase:

- Mitigation measures as outlined in the Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026b), Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026c) and the Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026e);
- Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal Transportation of Dangerous Goods Act, Ontario Dangerous Goods Transportation Act and the Ontario Environment Protection Act; and
- Mitigation measures will be modified or enhanced as necessary through adaptive management.

Operation and Maintenance

During Operation and Maintenance, mitigation measures will include a posting and enforcement of a speed limit on the highway, which should reduce potential for chemical or hazardous material spills by reducing vehicle collision risk.

Detailed lists of mitigation measures to limit the risk and effects from spills of fuel and other contaminants during Operation and Maintenance is provided in the *Surface Water Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP, 2026e), *Groundwater Technical Support Document: Existing Conditions and Effects Assessment Report* (WSP, 2026c), *Physiography, Terrain, and Soils Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026d).

7.3.1.8.3 Predicted Residual Effects

Construction, Operation and Maintenance

As discussed in the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e), *Groundwater and Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026c), and *Physiography, Terrain, and Soils Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026d), there are predicted to be no residual effects from chemical or hazardous material spills on surface water quality, groundwater, or soil quality during Construction or Operation and Maintenance. The implementation of mitigation measures outlined above are expected to effectively avoid and minimize the frequency, spatial extent, and severity of spills of chemicals and / or hazardous materials on site. Spills are expected to infrequently occur and are not expected to result in a measurable change to the availability, distribution, composition, and function of vegetation Valued Components relative to existing conditions. As a result, changes to the retained vegetation Valued Components resulting from spills of fuel or other contaminants was determined to have no residual effect and this interaction was not carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.9 Changes to Vegetation from the Deposition of Air Contaminants

7.3.1.9.1 Potential Effects

All Vegetation Valued Components

Construction

Construction of the Project is expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), and nitrogen oxides. Construction activities are expected to produce air emissions from the use of construction vehicles, motorized equipment and machinery, power generators (to be used at temporary construction camps and temporary pits and quarries), the use of explosives (blasting), and the burning of non-hazardous waste materials (e.g., food garbage at temporary construction camps).

The deposition of criteria air contaminant emissions can result in changes to soil and surface water quality, which has the potential to alter plant community structure, composition, and diversity by modifying the pH, nutrient content, and abundance and diversity of living organisms in the soil. Soil acidification can result from the deposition of sulphur and nitrogen oxides and uptake of these contaminants by plants can cause varying levels of effects on vegetation depending on the concentrations and durations of deposition.

Specifically, there is potential for effects on Traditional Use Plants resulting from the deposition of contaminants, including herbicides. This was a concern expressed by Aroland First Nation, with one community member specifically highlighting concerns relating to impacts on blueberries. In particular, the community expressed concerns related to impacts to berries (Dillon, 2024b; Shared Value Solutions, 2024). Weenusk First Nation and Fort Albany First Nation also noted similar concerns, in relation to how the Project may result in pollution effects (e.g., vehicle emissions, dust) on plants and plant habitat (Firelight Research Inc., 2024; MNP LPP, 2024b). One community member from Fort Albany First Nation shared past observations relating to road pollution effects associated with the Victor Diamond Mine, noting browning of roadside adjacent vegetation (Firelight Research Inc., 2024).

> "*There's a winter road that goes right through my territory, and it's been 10 years maybe it's been used. Like they had those — first they start car-vehicles, nothing heavy. ... So, maybe about since the [Victor Diamond] mine started, and when they were hauling those heavy equipment and big, big materials, like those big trucks, mining trucks, those dump trucks, those big tractors. Those trucks are hauling the semis. They're going back and forth. I noticed that fumes were killing the plants, eh. ... You know, those plants were turning brown along the road, the side of the road. Maybe about 50 feet off, you'll see the plants go brown ... I noticed that fumes [from the vehicles] were killing the plants, eh*." (Firelight Research Inc., 2024).

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during the Construction and Operation and Maintenance Phases. as the methods and results for air quality modelling are presented in detail in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a). During the Construction Phase, most air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds. However, threshold exceedances for the Project were noted for nitrogen dioxide (NO_2) and sulphur dioxide (SO_2), carbon monoxide (CO), acrolein, and benzo(a)pyrene emissions. Most threshold exceedances were limited to less than 760 m from the emission source. The exceptions to this distance threshold are NO_2, SO_2, and CO emissions during quarry blasting. During quarry blasting, NO_2 and SO_2 emissions thresholds may be exceeded by up to 12.3 km, while CO emissions may exceed the Ontario Ambient Air Quality Criteria threshold out to 1.5 km.

It should be noted that the air quality modelling incorporated conservative assumptions (i.e., using worst-case scenarios) so effects would not be underestimated.

Operation and Maintenance

During the Operation and Maintenance Phase of the Project, emissions will be generated mainly from the use of fossil fuels associated with vehicle use of the Project and road maintenance (general, seasonal, and special maintenance).

As discussed in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a), air criteria contaminants were predicted to be below Canadian Ambient Air Quality Standards and / or Ontario Ambient Air Quality Criteria thresholds during the Operation and Maintenance Phase.

It should be noted that the air quality modelling incorporated conservative assumptions (i.e., using worst-case scenarios) to so effects would not be underestimated.

7.3.1.9.2 Mitigation Measures

Construction

A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during the Construction Phase.

Operation and Maintenance

A list of mitigation measures that will be implemented to limit air particulate emissions during Operation and Maintenance is provided in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a). The effectiveness of mitigation measures will be evaluated during Operation and Maintenance, and mitigation measures will be modified or enhanced as necessary through adaptive management.

7.3.1.9.3 Predicted Residual Effects

Construction, **Operation and Maintenance**

During the Construction and Operation and Maintenance Phases, emissions of criteria air contaminants may have negative effects on water, soils and vegetation composition and function. Effects are expected to be larger during the Construction Phase than during the Operation and Maintenance Phase.

An Environmental Protection Plan and Environmental Monitoring Plan developed for the Project, which will include adaptive management, are expected to limit the emissions of criteria air contaminants.

Even with mitigation, residual effects from the deposition of air contaminants on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are anticipated. As such, residual effects from the deposition of air contaminants were carried forward into the residual effects characterization (**Section 7.3.2**).

7.3.1.10 Changes to Vegetation from Fugitive Dust Emissions

7.3.1.10.1 Potential Effects

All Vegetation Valued Components

Construction

Fugitive dust emissions are expected to be produced by the Project during construction activities such as land clearing, blasting, and infrastructure implementation (Dillon, 2025). Accumulation of airborne dust produced from the Project may result in local and direct changes to vegetation; for example, deposition of airborne dust onto vegetation can smother plant tissues, hinder gas exchange, and reduce photosynthesis by physically blocking sunlight. Dust particles often contain metals or pollutants, which can leach into the soil and lead to toxicity or nutrient imbalances in plants (Hirano et al., 1995; Prajapati, 2012). Consequently, the deposition of dust can affect plant health, and alter plant species composition, structure, and biomass in affected areas. The potential for impacts on vegetation related to the generation of dust has also been noted as a concern by the Métis Nation of Ontario, Fort Albany First Nation, and Aroland First Nation (Métis Nation of Ontario, 2023; Shared Value Solutions, 2024). One community member from Aroland First Nation specifically noted concerns that dust, sand, and debris would impact plants along the road, or make its way into the river system and watercourse crossings, noting the following:

> "*And all that dust that, especially the summertime with all that dust that's flying around, it's gonna have an impact on those plants along the road. And that's where the, they'll probably slowly die out because there's so much sand on them […] plus the water system, the bridges, on the bridges there, they'll be sand come, going into the river system, same thing. It's gonna have an affect on the wildlife, and the plants even, the plants. Even the, I think it would really have an impact on insects too….and that's another thing, the environment. All that dust kills the plants and everything, pollutes the water along the way."* (Shared Value Solutions, 2024)

Air quality modelling was used to predict maximum ground-level concentrations of criteria air contaminant emissions during Construction and Operation and Maintenance as described in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a). During construction, threshold exceedances for the Project are predicted for total suspended particulate, particulate matter less than 2.5 micrometres (µm) ($PM_{2.5}$) and particulate matter less than 10 µm

(PM_{10}) emissions. Threshold exceedances for dust emissions are predicted to be reached at less than 300 m from the emission source.

It should be noted that the air quality modelling incorporated conservative assumptions (i.e., using worst-case scenarios) so effects were not underestimated.

Operation and Maintenance

Fugitive dust emissions are expected to be produced by the Project by traffic on the Community Access Road during operations and maintenance. Accumulation of airborne dust produced from the Project may result in local and direct changes to vegetation as described in the Construction section above.

During Operation and Maintenance, threshold exceedances for the Project are predicted for $PM_{2.5}$, PM_{10} and total suspended particulate. The $PM_{2.5}$ levels are predicted to reach the 24-hour and annual criteria thresholds at 115 m and 134 m from the road, respectively. Levels of PM_{10} are predicted to reach the 24-hour threshold at 1,986 m from the road. Emissions of total suspended particulate are predicted to reach the 24-hour and annual thresholds at 3,004 m and 899 m from the road, respectively (*Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* [Dillon, 2026a]).

It should be noted that the air quality modelling incorporated conservative assumptions (i.e., using worst-case scenarios) so effects were not underestimated.

7.3.1.10.2 Mitigation Measures

Construction

A list of mitigation measures that will be implemented to limit dust deposition during Construction is provided in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026). These measures will be implemented to minimize effects from dust emissions and deposition on vegetation. The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management.

Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during the Construction Phase.

Operation and Maintenance

A list of mitigation measures that will be implemented to limit dust deposition during Operation and Maintenance is provided in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a). The effectiveness of mitigation measures will be evaluated during Operation and Maintenance, and mitigation measures will be modified or enhanced as necessary through adaptive management.

7.3.1.10.3 Predicted Residual Effects

Construction, **Operation and Maintenance**

Although mitigations will be implemented to reduce dust emissions, dust deposition during Construction, Operation and Maintenance are predicted to degrade vegetation immediately adjacent to the Project (within 100 m). There are currently no plans to decommission the Project and dust deposition is expected over the life of the Project.

Even with mitigation, residual effects from dust emissions on the condition of upland, wetland, and riparian ecosystems relative to existing conditions are expected to occur. As such, residual effects from dust emissions were carried forward into the residual effects characterization (**Section 7.3.2**).

7.3.1.11 Changes to Vegetation as a Result of Increased Public Access

7.3.1.11.1 Potential Effects

<u>All Vegetation Valued Components</u>

Construction, Operation and Maintenance

The construction of the Community Access Road and associated infrastructure (e.g., pits and quarries, temporary access roads, and worker camps) could negatively affect the availability and distribution of certain vegetation species, particularly Traditional Use Plant Species that are harvested for various small-scale uses (e.g., medicinal, spiritual, food, home uses). Harvest pressure may increase from small communities close to the Project. This has been noted as a concern by Indigenous nations and communities including Métis Nation of Ontario and Weenusk First Nation (Métis Nation of Ontario, 2023; MNP LLP, 2024b). Additionally, increased road access also opens the Project area to potential future industry pressure (e.g., timber harvesting and mining). These are discussed in **Section 8** (Cumulative Effects).

The construction of the Community Access Road will expand access to a broader range of individuals and groups. However, the region will remain relatively remote with the nearest urban centre (Thunder Bay with a population of approximately 111,000) being over 430 km

from Marten Falls First Nation. Therefore, a large influx of individuals or groups harvesting plants for traditional use is not expected. Furthermore, the plant species typically harvested for traditional uses (by both Indigenous and non-Indigenous individuals) are common and abundant in the Project area. Given that impacts to the availability and distribution of Traditional Use Plant Species is unlikely affected to a measurable degree, this change may be viewed as a positive by increased access to these resources for local Indigenous communities.

Another potential effect from increased public access includes the introduction and spread of invasive plant species. Non-native and invasive plant species may compete with local native flora. This potential effect is discussed in **Section 7.3.1.3**.

Finally, increased public access may also introduce an additional risk of human-ignited wildfire (Morrison, 2007). According to one study based in the United States, it was determined that 88% of all wildfires in the United States are caused by humans and of those wildfires, 90% occurred within one mile of a road (Morrison, 2007). While the boreal landscape is adapted to a natural wildfire disturbance regime, these natural regimes are changing as a result of climate change. The total area and the number of large fires has increased across Canada since 1959, when wildfire monitoring began (Natural Resources Canada, 2024). The *Climate Adaptation and Resiliency Technical Support Document: Existing Conditions and Effects Assessment Report* (AECOM, 2026) also predicts that the warmer weather and less snow in winter that is expected to result from climate change will increase the likelihood of wildfires in the Project area and that the wildfires will burn hotter and faster and consume a greater area than they did historically. This increased wildfire frequency and extent may ultimately influence the availability and distribution, composition, and function of all vegetation Valued Components. This effect cannot be quantified at this time but should be considered in future planning phases and in the development of the monitoring programs (**Section 9**).

7.3.1.11.2 Mitigation Measures

Construction

The following mitigation measures will be implemented during the Construction Phase:

- Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (e.g., share / coordinate access, concentrate temporary activities spatially, leave habitat outside of scoped Construction Disturbance Area, selective clearing, use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands;

- Use progressive restoration on-site once temporary work areas (e.g., staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access); and
- Develop a policy for Project personnel while on shift or at temporary construction camps in regards to any plant or timber harvesting activities.
- Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.

Operation and Maintenance

The following mitigation measures will be implemented during the Operation and Maintenance Phase:

- Install access controls (e.g., gates and boulders) to control public vehicle travel on some temporary access routes and trails; and,
- Install signage at regular intervals stating that any dumping is prohibited.

Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security/ID system will require further dialogue between the communities and the Province.

7.3.1.11.3 Predicted Residual Effects

Construction, Operation and Maintenance

Increased public access is not predicted to result in a measurable negative effect on vegetation Valued Components. Rather, increased access may result in a positive effect on local Indigenous communities with respect to increased access to harvest Traditional Use Plants; therefore, this interaction is not carried forward to the residual effects characterization (**Section 7.3.2**).

7.3.1.12 Summary of Potential Effects, Mitigation Measures, and Identification of Residual Effects

Table 7-15 provides a summary of the potential effects due to Project–environment interactions during Construction, Operation and Maintenance of the Project, mitigation measures, and the residual effects identified in previous sections.

Table 7-15: Summary of Potential Effects, Mitigation Measures and Predicted Residual Effects on Vegetation Valued Components

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[(a)] ■ Temporary access roads and trails[(a)] ■ Temporary construction camps[(a)] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[(a)] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to all vegetation Valued Components as a result of direct vegetation loss	■ Limit vegetation clearing to within the 100 m right-of-way and to less than this width to the extent possible. Specifically, ○ Minimize clearing widths in more sensitive ecosystems (e.g., riparian ecosystems) and more difficult to restore vegetation community groups (e.g., fen and bog) to the extent possible. ○ Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on more sensitive or difficult to restore vegetation communities. These details will be refined during detailed design, prior to construction. ○ Limit clearing of riparian vegetation (i.e., within 30 m of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only. ○ Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (e.g., upland ecosystems), where possible. Avoid peatland communities for temporary features wherever feasible. ■ Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the Aggregate Resource Act, which will include backfilling, levelling, recompacting, and redistributing organic materials to encourage natural revegetation. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance. ■ Perform clearing and construction activities in winter months where feasible. ■ Develop and implement a Project-specific Environmental Protection Plan. ■ Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan. ■ Reassess the status of Black Ash protection during future study phases. If Schedule 1 of Ontario Regulation 6/24 has been updated to include the area of the Project, a search for Black Ash trees shall be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the effects assessment Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment Canada and Climate Change) shall be consulted on next steps. ■ Prepare and implement a Vegetation Management Plan at detailed design that contains measures to protect rare plants, including protocols specific to Black Ash (e.g., commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented. ■ Consult with Ontario Parks at detailed design to determine permitting, mitigation and /or compensation / offsetting expectations for direct impacts to the Albany River Provincial Park. ■ Consult with Ontario Parks at detailed design to determine permitting, mitigation and / or compensation / offsetting expectations for impacts to Critical Landform / Vegetation Associations. ■ Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles away from known Traditional Use Plant harvesting areas, where possible.	Residual effects on the availability and distribution of vegetation Valued Components.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
				■ Prepare and Implement a Vegetation Restoration Plan. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols.. ■ Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.	
	■ Road usage ■ Maintenance[b]	Operation and Maintenance		■ Prepare and implement a Vegetation Management Plan to keep vegetation from interfering with the safe and reliable operation and maintenance of the road. ■ Avoid re-entry and disturbance of restored temporary access areas post-construction.	No predicted residual effect
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[a] ■ Temporary access roads and trails[a] ■ Temporary construction camps[a] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[a] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes all vegetation Valued Components as a result of changes to hydrology	A list of mitigation measures to limit changes to surface water quality and quantity during Construction is provided in the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e). Additional mitigation measures that will be implemented during the Construction Phase include ■ Have environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are implemented appropriately. Details regarding Environmental Monitors and their role during the Project will be determined through the development of the Environmental Protection Plan. ■ Design and implement a pre-, during- and post-construction monitoring program that assesses surface movement and helps to ensure that pre-construction conditions are maintained to the extent feasible (**Section 9**). ■ Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan. Once further hydrological monitoring and water budget studies are undertaken at detailed design, specific mitigation measures to maintain wetland hydrology may be required and will be included with detailed design documentation as the Project schedule allows. See **Section 9** and **Section 10** for further details regarding monitoring commitments and recommendations.	Residual effects on the composition and function of retained vegetation Valued Components.
	■ Road usage ■ Maintenance[b]	Operation and Maintenance		■ A list of mitigation measures are outlined in the Surface Water Technical Support Document: Existing Conditions & Effects Assessment (WSP, 2026e). ■ The effectiveness of mitigation measures will be evaluated during the Operation and Maintenance Phase, and mitigation measures will be modified or enhanced as necessary through adaptive management.	No predicted residual effect
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[a] ■ Temporary access roads and trails[a] ■ Temporary construction camps[a] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[a] ■ Drilling / blasting / aggregate production	Construction	Changes all vegetation Valued Components as a result of changes to groundwater	A list of mitigation measures to limit changes to groundwater quantity and quality during construction is provided in the Groundwater and Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026c). The effectiveness of mitigation measures will be evaluated during construction and mitigation measures will be modified or enhanced as necessary through adaptive management. Additional mitigation measures that will be implemented during the Construction Phase include: ■ Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve: ○ Completion of a detailed ground survey, characterizing the peat and local hydrology at a later stage of the Project / detailed design.	Residual effects on the composition and function of retained vegetation Valued Components.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
	■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas			○ Site-specific identification of appropriate values for peat strength. ○ Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat. ○ Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw. ○ Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading. ○ Provide transitions between floating road sections, excavated and fill sections. ○ Schedule construction to allow for primary settlement of the peat without risk of shear failure. ○ Monitor the work through construction, measuring and recording lateral movement and settlements. Be prepared to adjust the design based on observation and monitoring. ■ Mitigation measures as outlined in the Peatlands Existing Conditions and Effects Assessment Report (WSP & AECOM, 20264). ■ The mitigation measures established and refined using adaptive management during Project Construction should be maintained during the Operation and Maintenance. ■ Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan; ■ Design and implement a pre-, during and post-construction monitoring program that assesses surface and groundwater movement that allows for the maintenance of pre-construction conditions to the extent feasible. ■ Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.	
	■ Road usage ■ Maintenance[b]	Operation and Maintenance		■ A list of mitigation measures are outlined in the Groundwater and Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026c). ■ Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered.	
	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[a] ■ Temporary access roads and trails[a] ■ Temporary construction camps[a] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[a] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	Construction	Changes all vegetation Valued Components as a result of the introduction and spread of invasive plant species	■ An Environmental Protection Plan will be developed during detailed design, and will be implemented during construction to prevent, detect, control (i.e., remove), and monitor areas with invasive species. The plan will also include the following measures: ○ Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning shall be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the cleaning of equipment (e.g., the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan. ○ Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate to promote natural revegetation. ○ Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation. ○ Limit off-road vehicle use by contractors during Construction. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use	Residual effects on the composition and function of retained vegetation Valued Components.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
	■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas			to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detailed design and / or through the development of the Environmental Protection Plan. ○ Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible. ○ Follow Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species.	
	■ Road usage ■ Maintenance[(b)]	Operation and Maintenance		■ Limit off-road vehicle use by contractors during Operation and Maintenance. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detailed design and / or through the development of the Environmental Protection Plan. ■ Require that the road operator follows Ministry of Transportation Ontario Provincial Standard Specification 803 to avoid spreading invasive plant species. ○ Remove and manage invasive species using manual and mechanical means. Herbicides will not be used ■ Design and implement post-construction invasive species monitoring program to detect invasive species presence and control (i.e., remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.	
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[(a)] ■ Temporary access roads and trails[(a)] ■ Temporary construction camps[(a)] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[(a)] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to all vegetation Valued Components as a result of fragmentation and edge effects	■ Adjust the alignment or clear off centre within the right-of-way to minimize forest fragmentation and the creation of new forest edges, where feasible. These details will be refined during detailed design. ■ Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detailed design. ■ Avoid grubbing along newly created forest edges to promote natural regeneration which will quickly “seal” the new forest edge. ■ Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate to promote natural revegetation (e.g., use low impact method to leave surface vegetation root mat intact until a site is proven for further development). ■ Use progressive restoration on-site once temporary work areas (e.g., staging areas) are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.	Residual effects on the composition and function of retained vegetation Valued Components.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[(a)] ■ Temporary access roads and trails[(a)] ■ Temporary construction camps[(a)] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[(a)] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to all vegetation Valued Components from the release of sediment during construction	■ Develop and implement a Project-specific Environmental Protection Plan. ■ Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ontario Provincial Standard Specifications OPSS.PROV.804 and OPSS.MUNI.805). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Construction. ■ Regularly inspect and maintain Erosion and Sediment Control structures (e.g., sediment fences, rip rap or other sediment control structures) in accordance with Ontario Provincial Standard Specification OPSS.PROV 804 during all phases of the Project and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved. ■ Stabilize disturbed areas through revegetation with native plant species or other appropriate means (e.g., erosion control blankets) following completion of the works. ■ Reschedule work or reduce traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic are required will be defined during the detailed design phase. ■ Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands. ■ Adhere to all mitigation measures outlined in the Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026b) and the Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report (WSP, 2026e).	No predicted residual effect.
	■ Road usage ■ Maintenance[(b)]	Operation and Maintenance		■ Mitigation measures established and refined using adaptive management during Project Construction should be maintained during the Operation and Maintenance Phase.	

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[a] ■ Temporary access roads and trails[a] ■ Temporary construction camps[a] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[a] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to Vegetation from spills of fuel or other contaminants	■ Mitigation measures as outlined in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026b), *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026c) and the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026e). ■ Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act,* Ontario *Dangerous Goods Transportation Act* and the Ontario *Environment Protection Act*. ■ Mitigation measures will be modified or enhanced as necessary through adaptive management.	No predicted residual effect.
	■ Road usage ■ Maintenance[b]	Operation and Maintenance			
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[a] ■ Temporary access roads and trails[a] ■ Temporary construction camps[a] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[a] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to vegetation from the deposition of air contaminants Changes to vegetation from fugitive dust emissions	■ A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. ■ Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during the Construction Phase.	Residual effects on the composition and function of retained vegetation Valued Components.

Valued Component(s)	Project Activities	Project Phase	Description of Potential Effect	Mitigation Measures	Predicted Residual Effect
	■ Road usage ■ Maintenance[(b)]	Operation and Maintenance			
All Valued Components	■ Mobilization of equipment and supplies ■ Temporary construction staging areas[(a)] ■ Temporary access roads and trails[(a)] ■ Temporary construction camps[(a)] ■ Right-of-way clearing and grubbing ■ Brush and timber disposal ■ Pits and quarries[(a)] ■ Drilling / blasting / aggregate production ■ Road construction (stripping, subgrade excavation, embankment fill placement, grading, ditching) ■ Bridge and culvert installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls) ■ Construction site restoration ■ Pits and quarries will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act* ■ Decommissioning of temporary camps, roads / trails and staging areas	Construction	Changes to all vegetation Valued Components as a result of increased public access	■ Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (e.g., share / coordinate access, concentrate temporary activities spatially, leave habitat outside of scoped Construction Disturbance Area, selective clearing, use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands. ■ Use progressive restoration on-site once temporary work areas (e.g., staging areas) are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). ■ Develop a policy for Project personnel while on shift or at temporary construction camps in regards to any plant or timber harvesting activities. ■ Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.	No predicted residual effect.
	■ Road usage ■ Maintenance[(b)]	Operation and Maintenance		■ Install access controls (e.g., gates and boulders) to control public vehicle travel on some temporary access routes and trails. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security/ID system will require further dialogue between the communities and the Province. ■ Install signage at regular intervals stating that any dumping is prohibited.	

Notes:
(a) Includes General Maintenance (e.g., grading, erosion control, quarrying, pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance, and Special Maintenance (e.g., slope failures, road settlement / break-up).
m = metre. b) Some mitigation measures outlined in this table are required to maintain compliance with standard regulations and guidelines. While required, these measures are still important to project design and inform the effects assessment.

7.3.2 Characterization of Predicted Residual Effects

Assuming effective implementation of all mitigation measures presented in **Table 7-15**, residual effects as a result of the Project are predicted for all vegetation Valued Components and are included in the characterization of predicted residual effects and cumulative effects assessment. Predicted residual effects are characterized according to the effect characteristics of context, direction, magnitude, geographic extent, duration; frequency, reversibility, and likelihood (**Section 4.4.3**). A description of the predicted residual effects of the Project on vegetation Valued Components, and a determination of significance and prediction confidence is presented below and summarized in **Table 7-11.**

Residual effects for the effects assessment Regional Study Area were not assessed for Traditional Use Plants and Species at Risk and Species of Conservation Concern because the habitat suitability assessment for these Valued Components was based on ecosite mapping, which is only available for the effects assessment Local Study Area.

7.3.2.1 Residual Effects on Vegetation as a Result of Direct Vegetation Loss

7.3.2.1.1 Upland, Wetland and Riparian Ecosystems

The construction of the Community Access Road will result in the direct loss of Upland, Wetland and Riparian Vegetation communities, representing 2%, 1% and 1% of these ecosystems within the effects assessment Regional Study Area, respectively. This is a conservative estimate in that this calculation assumes the full 100 m width of the right-of-way and the full footprint area of all other components of the Construction Disturbance Area (e.g., staging areas, temporary access roads, camps) will be permanently affected (i.e., cleared, grubbed, and not restored). However, with the implementation of the recommended mitigation measures outlined in **Section 7.3.1**, the actual area of direct and permanent vegetation loss is expected to be less than the areas calculated. Anticipated restoration and offsetting measures (**Section 9**) will also serve to reduce the long-term residual effects on Upland, Wetland and Riparian Ecosystems as a result of direct vegetation loss.

Changes to Upland, Wetland and Riparian Ecosystems are predicted to be small, but discernible and therefore **low** in magnitude (**Table 4-11** for magnitude definitions). Further, Wetland and Riparian Ecosystems are not rare in this landscape and no net loss of function of these ecosystems are anticipated. However, it is noteworthy that the percentage of each ecosystem affected is based on a total of all vegetation community types in each ecosystem type. If the vegetation community effects are examined in more detail, there are some upland community types that are affected to a greater degree. For example, 6% of the Deciduous Forest communities within the effects assessment Regional Study Area will be lost. These upland vegetation communities are uncommon in the effects assessment Regional Study Area and will experience a disproportionate loss. After implementation of the mitigation measures, the effects from direct vegetation loss will

mostly be **permanent** (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. The effects are **certain** to occur, and the changes are **negative**; however as noted above, the magnitude is considered **low**. As a result, the residual effects as a result of direct vegetation loss on Upland, Wetland and Riparian Ecosystems are determined to be **not significant**.

7.3.2.1.2 Designated Areas

The construction of the Community Access Road will result in the direct loss of 5.7 ha of the Albany River Provincial Park which represents <1% of the total park area and <1% of the park area that occurs within the effects assessment Regional Study Area. The construction of the Project will also result in the direct loss of 491.2 ha of Critical Landform / Vegetation associations which represents 1% of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area. These calculated direct vegetation losses are a conservative estimate in that they assume the full 100 m width of the right-of-way and the full footprint area of all other components of the Construction Disturbance Area (e.g., staging areas, temporary access roads, camps) will be permanently affected (i.e., cleared, grubbed, and not restored). However, with the implementation of the recommended mitigation measures outlined in **Section 7.3.1**, the actual area of direct vegetation loss is expected to be less than the areas calculated. Anticipated restoration and offsetting measures (**Section 9**) will also serve to reduce the long-term residual effects on Designated Areas as a result of direct vegetation loss.

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be **permanent** (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. The effects are **certain** to occur, and the changes are **negative**; however, the magnitude is considered **low** as the percentage of the Provincial Park and Critical Landform / Vegetation Associations affected within the effects assessment Regional Study Area (i.e., <1% and 1% respectively) is small, but discernible. As a result, the residual effects as a result of direct vegetation loss on Designated Areas are determined to be **not significant**.

7.3.2.1.3 Traditional Use Plants

Habitat for Traditional Use Plants is available throughout the effects assessment Local Study Area. It does not appear that clearing of vegetation during construction within the Construction Disturbance Area will disproportionally affect the ecosites with a high score to suitability and accessibility for Traditional Use Plants.

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be **permanent** (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally and will likely support populations of Traditional Use Plants. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. The effects are **certain** to occur, and the changes are **negative**; however, the magnitude is considered **low** as changes to habitat availability within the effects assessment Local Study Area are small (i.e., 4%), and is likely to have small but discernible effects on the regional populations of Traditional Use Plants given the small anticipated loss of habitat relative to what is available in the remainder of the effects assessment Local Study Area. Further, vegetation clearing is not expected to disproportionally affect high scoring ecosites. Although not mapped for the Project, it is anticipated that additional suitable habitat for Traditional Use Plants is also available throughout the effects assessment Regional Study Area. As a result, the residual effects as a result of direct vegetation loss on habitat for Traditional Use Plants are determined to be **not significant**.

7.3.2.1.4 Species at Risk and Species of Conservation Concern

The construction of the Community Access Road will result in the direct loss of 1,643.5 ha of suitable habitat for Black Ash within the effects assessment Local Study Area which represents 5% of the suitable habitat for Black Ash within the effects assessment Local Study Area. As discussed in **Section 0**, since the Project is at the northern limit of the known range for Black Ash and the only Black Ash observations were in the south portion of the Local Study Area, the affected area represents both current and future suitable Black Ash habitat. There may also be some direct loss of Black Ash trees where they occur within the Construction Disturbance Area (e.g., at the Ogoki River).

The construction of the Project will also result in the direct loss of 2,404.1 ha of suitable Northern Marsh Violet habitat, representing 3% of the suitable habitat within the effects assessment Local Study Area.

Implementation of the mitigation measures outlined in **Section 7.3.1**, will minimize the effects on suitable habitat for Black Ash, suitable habitat for Northern Marsh Violet and Black Ash trees, to the extent feasible.

After implementation of the mitigation measures, the effects from direct vegetation loss will mostly be **permanent** (irreversible), as most of the Construction Disturbance Area will remain disturbed in perpetuity; however, some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. The effects are **certain** to occur, and the changes are **negative**; however, the magnitude is considered **low** as changes to habitat availability for Blask Ash and Northern Marsh Violet are likely to have small but discernible effects on the regional populations of these species given the small anticipated loss of habitat within the effects assessment Local Study Area (i.e., 5% and 3% respectively) relative to what is available in the remainder of the effects assessment Local Study Area. Although not mapped for the Project, it is anticipated that additional suitable habitat for these two species is also available throughout the effects assessment Regional Study Area. As a result, the residual effects as a result of direct vegetation loss on Species at Risk and Species of Conservation Concern are determined to be **not significant**.

7.3.2.2 Residual Effects on Vegetation as a Result of Changes to Hydrology

The construction of the Community Access Road may cause alterations to drainage patterns and increased / decreased drainage flows and surface water levels, thereby affecting associated vegetation communities. However, with the effective implementation of the mitigation measures (detailed in **Section 7.3.1**and **Table 7-15**) and the use of best management practices, it is anticipated that residual changes to vegetation Valued Components from changes to hydrology will be reduced or moderated, as well as regulated through permitting.

Changes to vegetation Valued Components resulting from changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels are expected to be **negative** in direction, **negligible** in magnitude, **local** in geographic extent, **long-term**, **infrequent**, **irreversible**, and **possible** to occur. As a result, the residual effects as a result of changes to hydrology on vegetation Valued Components are determined to be **not significant**.

7.3.2.3 Residual Effects on Vegetation as a Result of Changes to Groundwater

The construction of the Community Access Road may cause alterations to drainage patterns and increased / decreased groundwater levels, thereby affecting associated vegetation communities. However, with the effective implementation of the mitigation measures (detailed in **Section 7.3.1** and **Table 7-15**) and the use of best management practices, it is anticipated that residual changes to vegetation Valued Components from changes to groundwater will be reduced or moderated, as well as regulated through permitting. Although pit and quarry dewatering have potential to significantly alter groundwater levels near excavations, the total number and area of pit and quarry sites is

small compared to the size of the effects assessment Regional Study Area. Potential effects on vegetation communities would therefore not be expected to result in a net change on ecosystem or population availability, distribution, composition or function.

Construction of the Community Access Road through peatlands also has potential to alter groundwater quality, quantity and flow, altering the availability of those Wetland Ecosystems. Mitigation measures, namely construction of the road using the “floating road” construction methodology and implementation of a monitoring program, are expected to limit residual changes. However, there is uncertainty about the effectiveness of this mitigation and measurable changes to groundwater levels and groundwater quality near the road are possible. A more detailed discussion of potential effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

Changes to vegetation Valued Components resulting from changes in groundwater that may alter drainage patterns, decrease groundwater quality, and increase or decrease groundwater levels are expected to be **negative** in direction, **medium** in magnitude, **local** in geographic extent, **long-term**, **continuous**, **irreversible**, and **probable**. As a result of the uncertainty related to the magnitude of effect that changes to groundwater will have on peatland wetlands, the residual effects as a result of changes to groundwater on these Wetland Ecosystems are determined to be **significant**. For all other vegetation Valued Components, the residual effects are determined to be **not significant**.

7.3.2.4 Residual Effects on Vegetation as a Result of the Introduction and Spread of Invasive Plant Species

During Construction, Operation and Maintenance, invasive plant species may occasionally be introduced within the Effects Assessment Construction Disturbance Area. Best management practices and mitigation measures for controlling the spread of invasive species are well understood and the methods have been demonstrated to be effective, particularly if newly detected species are removed quickly. After implementation of mitigation, effects from the introduction of invasive plants are predicted to be **possible**, **reversible** in the short-term, **infrequent**, and confined to the Construction Disturbance Area. Effects from the introduction of invasive plants on the vegetation Valued Components in the effects assessment Local Study Area are anticipated to be **negative** but **negligible** in magnitude. As a result, the residual effects as a result of changes the introduction and spread of invasive plant species on vegetation Valued Components are determined to be **not significant**.

7.3.2.5 Residual Effects on Vegetation as a Result of Edge Effects

Secondary effects on retained vegetation communities, particularly forested communities, may be felt following the clearing of the right-of way during Construction of the Project. These include changes to community composition and function as a result of sunscald, desiccation, and windthrow. After implementation of mitigation, edge effects are predicted to be **probable**, **reversible** in the medium-term, **frequent**, and limited to the effects assessment Local Study Area. These edge effects are anticipated to be **negative**, but **negligible** in magnitude, particularly given that boreal forests are generally adapted to large-scale natural disturbances and are less influenced by fragmentation and edge effects than temperate and tropical forests. As a result, residual effects as a result of edge effects on vegetation Valued Components are determined to be **not significant**.

7.3.2.6 Residual Effects on Vegetation from the Deposition of Air Contaminants

Soil contamination from emissions of criteria air contaminants during Construction, Operation and Maintenance of the Project may have negative effects on soils and vegetation communities. After implementation of mitigation, soil contamination from the emissions of criteria air contaminants is predicted to be **possible, permanent (irreversible), continuous**, and confined to the effects assessment Local Study Area. Effects from the soil contamination on the vegetation Valued Components in the effects assessment Local Study Area are anticipated to be **negative** but **negligible** in magnitude. As a result, the residual effects as a result of soil contamination from deposition of air contaminants on vegetation Valued Components are determined to be **not significant**.

7.3.2.7 Residual Effects on Vegetation from Fugitive Dust Emissions

Project Construction, Operation and Maintenance is expected to increase dust emissions. Although mitigations will be implemented to reduce dust emissions, dust deposition during Project construction and operations is predicted to degrade vegetation immediately adjacent to the Project. Effects from dust emissions are predicted to be **certain**, **permanent** (irreversible), **continuous**, and confined to the effects assessment Local Study Area. Effects from dust emissions on the vegetation Valued Components in the effects assessment Local Study Area are anticipated to be **negative** but **negligible** in magnitude. As a result, the residual effects as a result of dust emissions on vegetation Valued Components are determined to be **not significant**.

7.3.3 Assessment of Significance

The assessment of the overall significance of residual effects of the Project is informed by the interaction between the above assessment ratings for each residual effect, with magnitude and geographic extent being the most important criteria. Consideration is also given to context, which includes ecological context (i.e., the sensitivity and resilience of the Valued Components), and social context (i.e., concerns of Indigenous communities,

interested agencies, groups and individuals that were raised during consultation and engagement and in review comments on the Environmental Assessment reports). Implementation of industry standard mitigation measures is expected to aid in the avoidance or reduction of the magnitude, geographic extent, and / or duration of residual effects on vegetation Valued Components. **Section 4.4.2.6** provides additional explanation related to the approach to assessing significance.

The magnitude of the predicted residual effects described above are either negligible, low or medium, and the extent ranges from confined to the Construction Disturbance Area to local (i.e., the effects assessment Local Study Area) in geographic extent. Based on these and other ratings, in most cases the residual effects are considered **not significant** because they are not expected to compromise the long-term viability of vegetation Valued Components. There is the potential for management concerns through increased public access leading to the spread of invasive species, increased risk of human-ignited wildfire and increased pressure on timber and Traditional Use Plant harvest, however these risks are minor and manageable.

A high uncertainty rating has been assigned to two of the residual effects (i.e., residual changes to Wetland Ecosystems Valued Components due to changes in groundwater that may alter drainage patterns or groundwater regimes, or groundwater quality, and residual changes to Wetland Ecosystems Valued Components due to changes in hydrology that may alter drainage patterns and increase or decrease drainage flows and surface water levels). The uncertainty related to these effects is in regards to the lack of a full understanding of Wetland Ecosystems (specifically peatland) hydrology and hydrogeology in the effects assessment Local and Regional Study Areas, as well as uncertainty regarding the preliminary design details and effectiveness of the key design-related mitigation measure (i.e., the “floating road”). Given the high uncertainty in the magnitude of this effect on peatland hydrogeology (**Section 7.3.3.1**) and probable likelihood of occurrence (versus the possible likelihood of occurrence for the residual effects to hydrology) the residual effects to Wetland Ecosystems associated with groundwater (quantity and quality) are determined to be significant at this time. There are commitments to address these gaps in knowledge during pre-construction and future stages of the project (See **Section 9** and **Section 10**), thereby reducing the high uncertainty that has been conservatively assigned in this assessment. With an improved understanding of wetland (specifically peatland) hydrology and hydrogeology in the study areas and associated refined road design within peatlands that will be developed during future stages of the Project, the uncertainty associated with the two residual effects is expected to be reduced, supporting the continued self-sustaining and ecologically effectiveness of Wetland Ecosystems.

The analysis indicates that uncertainty in effects predictions, specifically those associated with the “floating road” approach to construction and operation, and application of the precautionary approach, Project-related changes in the availability, distribution,

composition, and function of Wetland Ecosystems could occur. Specifically, those changes to Wetland Ecosystems associated with groundwater quantity and quality were assessed as significant. As a result, the combined residual effects from the Project on Wetland Ecosystems are predicted to be **significant**.

Overall, the remaining vegetation Valued Components are expected to remain to be self-sustaining and ecologically effective, and therefore, the predicted residual effects on all other Valued Components (i.e. Upland Ecosystems, Riparian Ecosystems, Designated Areas, Traditional Use Plants, Species at Risk and Species of Conservation Concern) are assessed as **not significant.**

A summary of the predicted residual effects of the Project on vegetation Valued Components is provided in **Section 7.3.4**, including the assessment of significance for each predicted residual effect.

7.3.3.1 Prediction Confidence and Uncertainty

Scientific inference is associated with uncertainty, and prediction confidence (i.e., the level of confidence in assessment results) depends on the level of uncertainty and the way this uncertainty is addressed. Primary factors affecting confidence in the predictions made in the Vegetation assessment include:

- Availability and accuracy of existing conditions data (e.g., accuracy of vegetation mapping);
- Level of understanding of existing vegetation conditions, range of natural variation, and the resilience of vegetation Valued Components to disturbance;
- Understanding of Project-related effects on complex ecosystems that contain interactions across different scales of time and space (e.g., exactly how the Project would influence vegetation Valued Components); and
- Level of certainty associated with the effectiveness of proposed mitigations, where applicable.

Uncertainty was managed by:

- Rolling-up the vegetation mapping from ecosites to vegetation community groupings and completing the effects assessment on these groupings;
- Where appropriate, uncertainty may be addressed by additional mitigations as required, or through monitoring programs designed to verify the effects predictions and / or the effectiveness of mitigation;
- Completing quality assurance and quality control of existing conditions data;

- Applying conservative assumptions regarding the footprint area and related Project activities that may cause disturbance or direct vegetation loss to increase confidence that the effects were not underestimated;
- Applying conservative assumptions to increase confidence that the effects were not underestimated; and
- Comparing assessment results to relevant published scientific literature.

Overall, there is a **low** to **high** degree of confidence in the predictions related to the effects on vegetation Valued Components and the mitigation measures and best management practices that will be implemented during the Project lifespan. For example, residual effects from the introduction and spread of invasive plants, depositions of criteria air contaminants, surface water quality and quantity, and dust and air emissions have high prediction confidence because Project-related effects are well understood and the level of certainty associated with the effectiveness of proposed mitigation measures and best management practices is high as these are routinely and effectively implemented across Canada. One notable exception to this is the “floating road” design mitigation proposed for the development of this Project within Wetland Ecosystems. This type of road design is relatively novel with only one known recent example in northern Manitoba. While the project in northern Manitoba indicates promising results approximately ten years post-construction, long term effectiveness of this design is unknown. This has resulted in low confidence in the predictions made about its ability to maintain groundwater flow and in turn groundwater quality on either side of the road within peatland ecosystems. This is coupled with the lack of available data specific to peatland hydrogeology and water balance also have resulted in low confidence in the predictions within this residual effect pathway at this time. For all other vegetation Valued Components, there is moderate confidence in the predicted residual effects resulting from changes to groundwater.

Overall, most confidence levels were considered to be **moderate** because there were existing conditions data for the effects assessment Local Study Area, the Project-related effects are mostly understood, and the level of certainty associated with the effectiveness of proposed mitigations is low to high.

7.3.4 Summary

Table 7-16 provides a summary of the characterization of predicted residual effects and determination of significance for vegetation Valued Components.

Table 7-16: Characterization of Predicted Residual Effects and Determination of Significance for Vegetation Valued Components

Valued Component	Predicted Residual Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty	Direct / Indirect
Upland Ecosystems	Residual changes to Upland Ecosystems as a result of **direct vegetation loss**	Construction	Upland ecosystems represent approximately 28% of the effects assessment Regional Study Area	Negative	**Low** 2,309.3 ha or **2%** of the upland ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can and will be restored)	Continuous	Certain	Not significant	Moderate	Direct
Wetland Ecosystems	Residual changes to Wetland Ecosystems as a result of **direct vegetation loss**	Construction	Wetland ecosystems represent approximately 66% of the effects assessment regional study area	Negative	**Low** 2,363.2 ha or **1%** of the wetland ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can and will be restored)	Continuous	Certain	Not significant	Moderate	Direct
Riparian Ecosystems	Residual changes to Riparian Ecosystems as a result of **direct vegetation loss**	Construction	Riparian ecosystems represent approximately 4% of the effects assessment Regional Study Area	Negative	**Low** 116.7 ha or **1%** of the riparian ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can and will be restored)	Continuous	Certain	Not significant	Moderate	Direct
Designated Areas	Residual changes to Designated Areas as a result of **direct vegetation loss**	Construction	Three Provincial Parks are located within the effects assessment Regional Study Area, but only one Provincial Parks will be directly affected by the Project. Critical Landform / Vegetation Associations aim to protect a representative example of Ontario's biodiversity. Loss of these protected areas reduces their contribution to biodiversity protection.	Negative	**Low** 5.7 ha or **<1%** of Albany River Provincial Park within the effects assessment Regional Study Area will be directly affected. 491.2 ha or **1%** of the Critical Landform / Vegetation associations that occur within the effects assessment Regional Study Area will be directly affected.	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can and will be restored)	Continuous	Certain	Not significant	Low	Direct
Traditional Use Plant Species	Residual changes to habitat for Traditional Use Plant Species as a result of **direct vegetation loss**	Construction	Traditional Use Plants are of importance to Indigenous communities and are generally well distributed across the landscape.	Negative	**Low** 4,700 ha or 4% of suitable and accessible habitat for Traditional Use Plant species within the effects assessment	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can	Continuous	Certain	Not significant	Moderate	Direct

Valued Component	Predicted Residual Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty	Direct / Indirect
					Local Study Area will be directly affected. Habitat areas with a higher score will not be disproportionately affected. Small changes to regional populations.		and will be restored)					
Species at Risk and Species of Conservation Concern	Residual changes to habitat for Species at Risk and Species of Conservation Concern as a result of **direct vegetation loss**	Construction	Only Species at Risk plant (Black Ash) is known to be present in the effects assessment Local Study Area. One Species of Conservation Concern plant (Northern Marsh Violet) has good potential to occur within the effects assessment Local Study Area	Negative	**Low** 1,643.5 ha or **5%** of the suitable habitat for Black Ash effects assessment Local Study Area will be directly affected. Small changes to regional populations. 2,404.1 ha or **3%** of the suitable habitat for northern Marsh Violet within the effects assessment Local Study Area will be directly affected. Small changes to regional populations.	Construction Disturbance Area	**Long-term** (for permanent impacts) **Medium-term** (for temporary impacts where vegetation communities can and will be restored)	Continuous	Certain	Not significant	Moderate	Direct
Wetland Ecosystems	Residual changes to Wetland Ecosystems due to **changes in groundwater** that may alter drainage patterns, groundwater regimes, or groundwater quality.	Construction	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways. However, there is uncertainty about the effectiveness of the “floating road” construction methodology.	Negative	**Medium** Measurable changes to groundwater quantity and quality possible that result in changes to Wetland Ecosystem availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas	Local	Long term	Infrequent	Probable	Significant	High	Indirect
	Residual changes to Wetland Ecosystems due to **changes in groundwater** that may alter drainage patterns, groundwater regimes, or groundwater quality.	Operation and Maintenance	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways. However, there is uncertainty about the effectiveness of the “floating road” construction methodology.	Negative	**Medium** Measurable changes to groundwater quantity and quality possible that result in changes to Wetland Ecosystem availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas	Local	Long term	Continuous	Probable	Significant	High	Indirect
All Vegetation Valued Components	Residual changes to vegetation due to **changes in hydrology** that may alter drainage patterns and increase or decrease drainage flows and surface water levels	Construction	Mitigations to limit changes to hydrology are well understood and the methods have been demonstrated to be effective.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas	Local	Long-term	Infrequent	Possible	Not Significant	High	Indirect

Valued Component	Predicted Residual Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty	Direct / Indirect
	Residual changes to vegetation due to **changes in groundwater** that may alter drainage patterns or groundwater regimes (except Wetland Ecosystems)	Construction	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways.	Negative	**Medium** Measurable changes to groundwater levels possible that result in changes to ecosystem and population availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas	Local	Long-term and Irreversible	Continuous	Probable	Not Significant	Moderate	Indirect
	Residual changes to vegetation due to **changes in groundwater** that may alter drainage patterns or groundwater regimes (except Wetland Ecosystems)	Operation and Maintenance	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways.	Negative	**Medium** Measurable changes to groundwater levels possible that result in changes to ecosystem and population availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas	Local	Long-term and Irreversible	Continuous	Probable	Not Significant	Moderate	Indirect
	Residual changes to vegetation as a result of the **introduction and spread of invasive plant species**	Construction	Limited existing human disturbance has resulted in limited potential for invasive species to be present in the Construction Disturbance Area. No invasive plant species were documented during field surveys. Mitigations to limit the introduction and spread of invasive plants are well understood and the methods have been demonstrated to be effective.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas, relative to existing conditions.	Construction Disturbance Area	Long-term	Infrequent	Possible	Not Significant	Low	Indirect
	Residual changes to vegetation as a result of the **introduction and spread of invasive plant species**	Operations and Maintenance	Limited existing human disturbance has resulted in limited potential for invasive species to be present in the Construction Disturbance Area. No invasive plant species were documented during field surveys. Mitigations to limit the introduction and spread of invasive plants are well understood and the methods have been demonstrated to be effective.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas, relative to existing conditions.	Construction Disturbance Area	Long-term	Infrequent	Possible	Not Significant	Low	Indirect
	Residual changes to vegetation as a result	Construction	The Project is located in a landscape that is largely intact, however there are natural disturbances (e.g., fire) that	Negative	**Negligible** in magnitude, given that boreal forests are generally adapted to large-scale natural disturbances and	Local	Medium-term	Frequent	Probable	Not Significant	Moderate	Indirect

Valued Component	Predicted Residual Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty	Direct / Indirect
	of **fragmentation and edge effects**		have influenced the landscape as well as some small areas of anthropogenic disturbances. The Project will introduce new anthropogenic disturbances that will cause fragmentation and edge effects.		are less influenced by fragmentation and edge effects than temperate and tropical forests.							
	Residual changes to vegetation as a result of the **deposition of air contaminants**	Construction	Construction of the Project are expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), nitrogen oxides, and particulate matter.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas.	Local	Long-term	Continuous	Possible	Not Significant	Low	Indirect
	Residual changes to vegetation as a result of the **deposition of air contaminants**	Operations and Maintenance	Operation and maintenance of the Project are expected to generate air particulate emissions, including carbon monoxide, sulphur oxides (including sulphur dioxide), nitrogen oxides, and particulate matter.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas.	Local	Long-term	Continuous	Possible	Not Significant	Low	Indirect
	Residual changes to vegetation as a result of the **fugitive dust emissions**	Construction	Construction of the Project are expected to produce fugitive dust emissions.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas.	Local	Long-term	Continuous	Certain	Not Significant	Low	Indirect
	Residual changes to vegetation as a result of the **fugitive dust emissions**	Operations and Maintenance	Operation and maintenance of the Project are expected to produce fugitive dust emissions.	Negative	**Negligible** changes to vegetation Valued Components availability, distribution, composition, and function in the effects assessment Local and Regional Study Areas.	Local	Long-term	Continuous	Certain	Not Significant	Low	Indirect

% = percent; ha = hectare; < = less than.

8. Cumulative Effects Assessment

The *Canadian Environmental Assessment Act, 2012* (Government of Canada, 2019) requires that each Environmental Assessment of a project consider cumulative environmental effects that are likely to result from the project in combination with the environmental effects of other physical activities that have been or will be carried out.

This section presents the assessment of potential cumulative effects completed as part of the Project. The effects of past and present activities on the effects assessment Regional Study Area and Valued Components identified for the Project were assessed and results are described in the following sections.

8.1 Cumulative Effects Scoping

8.1.1 Valued Components with Residual Effects

The cumulative effects assessment builds on the results of the residual effects assessment described in **Section 7** and provides the incremental changes that are predicted to have a likely residual adverse effect on a Valued Component. A cumulative effects assessment was not completed in the following cases:

- Where no residual effects were identified in Section 7;
- The magnitude of the residual effect was rated as negligible and the probability of occurrence was unlikely or possible;
- The residual effect was positive in direction

Residual effects that have been carried forward in the cumulative effects assessment are described in **Table 8-1**.

Table 8-1: Valued Components and Residual Effects

Valued Component	Residual Effect
Upland Ecosystems	**Direct Vegetation Loss**: Direct removal of 2,309.3 ha (2%) of the Upland Ecosystems within the effects assessment Regional Study Area. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions. **Changes to Groundwater:** Project activities may cause alterations of groundwater quality, drainage patterns, levels and discharge rates, which can change the composition and function of retained vegetation communities. **Fragmentation and Edge Effects:** The Project will introduce new anthropogenic disturbances that will cause fragmentation and edge effects (i.e., introduction and spread of invasive species, sunscald, desiccation and windthrow). These effects influence the composition and function of the retained vegetation communities resulting in secondary effects (e.g., altering habitat use by certain wildlife species). **Fugitive Dust Emissions:** Accumulation of airborne dust produced from the Project can affect plant health, and alter plant species composition, structure, and biomass in affected areas.
Wetland Ecosystems	**Direct Vegetation Loss:** Direct removal of 2,363.2 ha (1%) of the Wetland Ecosystems within the effects assessment Regional Study Area. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions. **Changes to Groundwater:** Project activities may cause alterations to groundwater quality, drainage patterns, levels and discharge rates, which could change the composition and function of retained vegetation communities. **Fragmentation and Edge Effects:** New anthropogenic disturbances will cause fragmentation and edge effects and influence the composition and function of the retained vegetation communities resulting in secondary effects. **Fugitive Dust Emissions:** Accumulation of airborne dust produced from the Project can affect plant health, and alter plant species composition, structure, and biomass in affected areas.
Riparian Ecosystems	**Direct Vegetation Loss:** Direct removal of 116.7 ha (1%) of the Riparian Ecosystems within the effects assessment Regional Study Area. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions. **Changes to Groundwater:** Project activities may cause alterations of groundwater quality, drainage patterns, levels and discharge rates, which can change the composition and function of retained vegetation communities. **Fragmentation and Edge Effects:** New anthropogenic disturbances will cause fragmentation and edge effects and influence the composition and function of the retained vegetation communities resulting in secondary effects. **Fugitive Dust Emissions:** Accumulation of airborne dust produced from the Project can affect plant health, and alter plant species composition, structure, and biomass in affected areas.
Designated Areas	**Direct Vegetation Loss**: Direct removal of 5.7 ha (<1%) of Albany River Provincial Park within the effects assessment Regional Study Area. Direct removal of 491.2 ha (1%) of the Critical Landform / Vegetation associations that occur within the effects assessment Regional Study Area. **Changes to Groundwater:** Project activities may cause alterations of groundwater quality, drainage patterns, levels and discharge rates, which can change the composition and function of retained vegetation communities. **Fragmentation and Edge Effects:** New anthropogenic disturbances will cause fragmentation and edge effects and influence the composition and function of the retained vegetation communities resulting in secondary effects. **Fugitive Dust Emissions:** Accumulation of airborne dust produced from the Project can affect plant health, and alter plant species composition, structure, and biomass in affected areas.
Traditional Use Plants and Species at Risk and Species of Conservation Concern	**Direct Vegetation Loss**: Direct removal of 4,700.2 ha (4%) of suitable and accessible habitat for Traditional Use Plant species within the effects assessment Local Study Area. Habitat areas with a higher score will not be disproportionately affected. Small changes to regional populations. Direct removal of 1,643.5 ha (5%) of the suitable habitat for Black Ash within the effects assessment Local Study Area. Small changes to regional populations. Direct removal of 2,404.1 ha (3%) of the suitable habitat for northern Marsh Violet within the effects assessment Local Study Area. Small changes to regional populations. **Changes to Groundwater:** Project activities may cause alterations to groundwater quality, drainage patterns, levels and discharge rates, which could change the composition and function of retained vegetation communities. **Fragmentation and Edge Effects:** New anthropogenic disturbances will cause fragmentation and edge effects and influence the composition and function of the retained vegetation communities resulting in secondary effects. **Fugitive Dust Emissions:** Accumulation of airborne dust produced from the Project can affect plant health, and alter plant species composition, structure, and biomass in affected areas.

ha = hectare; % = percent.

8.1.2 Spatial and Temporal Boundaries

Temporal boundaries for the cumulative effects assessment correspond to the predicted duration of the likely residual adverse effects of the Project. There are currently no plans to decommission the Community Access Road as there is no expected / known end date for its need. Therefore, future suspension, decommissioning, and eventual abandonment was not considered in this report. It will be considered if and when a decommissioning or abandonment application is made for the Community Access Road.

The Project is planned to occur in two phases:

- **Construction Phase**—The time from start of Construction, including site preparation activities, to the start of Operation and Maintenance of the Community Access Road. Decommissioning of construction works is included in the Construction Phase. The Construction Phase is anticipated to take approximately three to ten years to complete; and
- **Operation and Maintenance Phase**—The Operation and Maintenance Phase starts once construction activities are complete and lasts for the life of the Project. The Operation and Maintenance Phase of the Project is considered to be permanent based on the expected timeline for when major refurbishment of road components (e.g., bridges) is anticipated.

In determining the temporal boundaries for the cumulative effects assessment, in particular the long duration of the Operation and Maintenance Phase, consideration was given to the long-term effects on the well-being of present and future generations.

The spatial boundary for the cumulative effects assessment corresponds to the geographic extent of the likely residual adverse effects of the Project are predicted to occur. The study area used in the cumulative effects assessment is the same as the vegetation effects assessment Regional Study Area used for the residual effects assessment (**Section 4.2.3.2.2**) (**Table 8-2**).

Table 8-2: Spatial and Temporal Boundaries

Valued Component	Spatial Boundary	Temporal Boundary
Upland Ecosystems, Wetland Ecosystems, Riparian Ecosystems, Designated Areas, Traditional Use Plants and Species at Risk and Species of Conservation Concern	11 km buffer on either side of the centreline of the Community Access Road Preferred Route	■ Construction ■ Operation and Maintenance

km = kilometre.

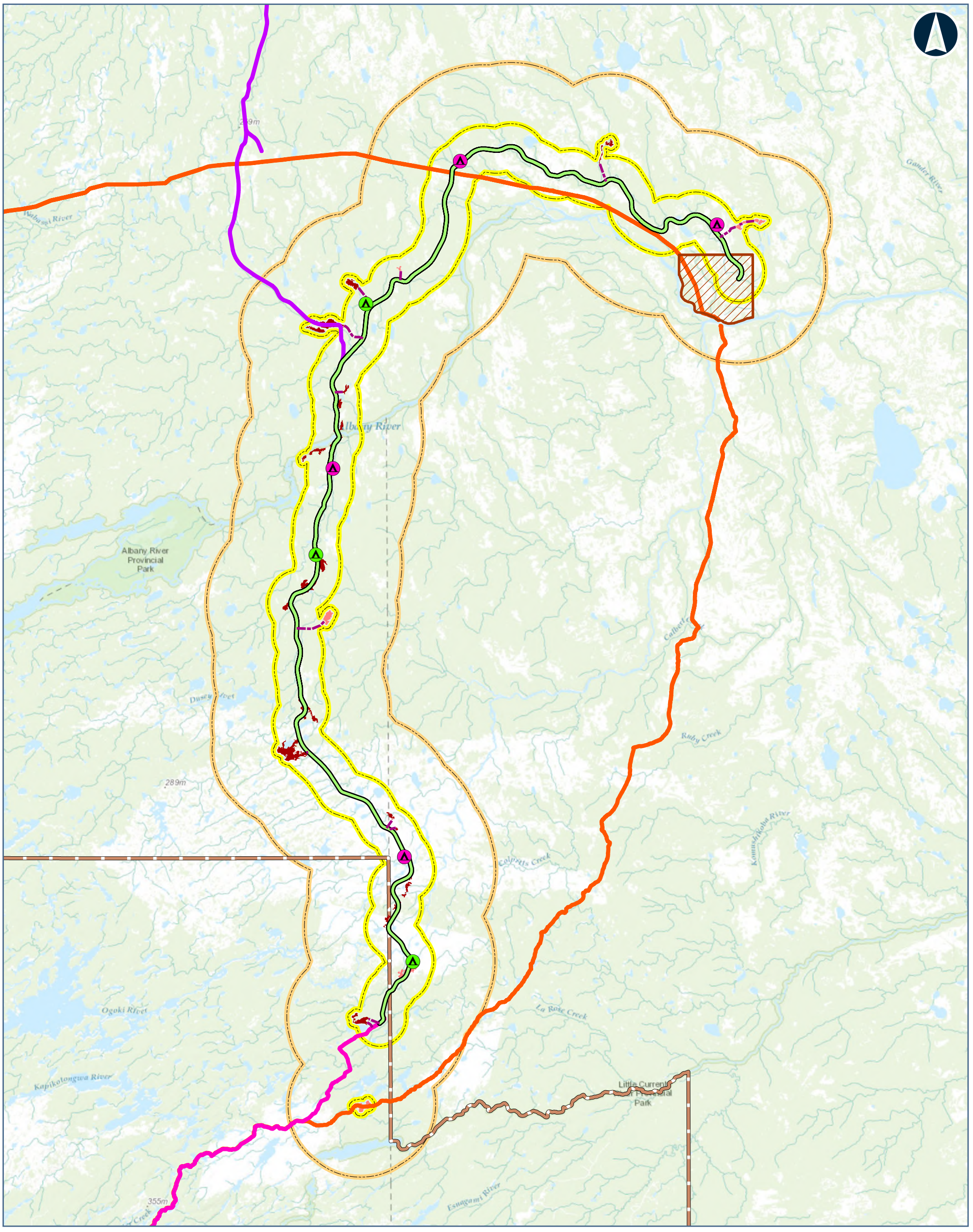
8.1.3 Physical Activities Inclusion List

To determine the spatial boundaries of potential cumulative effects, four related projects within the vegetation effects assessment Regional Study Area were considered for the cumulative effects assessment (**Table 8-3; Figure 8-1**). One project, the Ogoki Forest Management Plans was not displayed on the cumulative effects assessment mapping as the Forest Management Unit is not an accurate representation of the forestry impacts at any one point in time. As such, a qualitative assessment of forestry impacts in conjunction with the project impacts within the portion of the study area was completed instead.

Table 8-3: Project and Physical Activity Inclusion List for Vegetation

Project	Identified in *Tailored Impact Statement Guidelines* (Y / N)	Location	Status	Distance (km) and Direction from the Project	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Y / N)	Project Description	Vegetation Valued Components Temporal Overlap with Project (Y / N)	Vegetation Valued Components Spatial Overlap with Project (Y / N)	Included in Cumulative Effects Assessment (Y / N)
Northern Road Link	Yes	Between Marten Falls First Nation Community Access Road and Webequie Supply Road, northwestern Ontario	Impact Assessment ongoing	0 (adjacent or overlapping)	Webequie First Nation Marten Falls First Nation	Impact Assessment initiated in August 2023 Construction start date unknown	Unknown	Unknown	Yes – construction and operation will overlap with Community Access Road construction (expected for Northern Road Link to begin construction during construction of northern portion of Community Access Road.)	■ Marten Falls First Nation and Webequie First Nation are proposing to build, operate and maintain an all-season multi-use road and associated infrastructure between the Community Access Road that has been proposed by Marten Falls First Nation (the Project) and the supply road that has been proposed by Webequie First Nation. ■ *Terms of Reference* for the preparation of an Environmental Assessment were approved March 3, 2023.	Yes	Local Study Area – Yes Regional Study Area – Yes	Yes
Anaconda and Painter Lake Road Upgrades	Yes	James Bay Lowlands	Unknown	0 (adjacent or overlapping)	In discussions: Ministry of Transportation, Ontario and Aroland First Nation	Not Started	2-5 years	Unknown	Yes – operation expected to overlap with Community Access Road construction and operation	■ Upgrades to existing road will be required for heavy vehicles accessing the Community Access Road route during construction and operations. ■ Currently discussions on proponency and scope of work are underway. ■ Potential scope of work is expected to include roadway widening, culvert and bridge replacements / rehabilitations to accommodate higher weight vehicles, and road base improvements. ■ This project will be completed prior to the start of the construction of the Community Access Road and therefore the upgrades to these roads is not expected to overlap with the construction of the Community Access Road.	Yes	Local Study Area – Yes Regional Study Area – Yes	Yes
Rapid Lynx Broadband	Yes	Matawa First Nation communities	Phase 1: 70% complete, with remaining sections targeted for September 2024 completion; section near the Project is complete Phase 2: targeted completion September	Phase 1 – 0 (adjacent or overlapping) Phase 2 – 57.69	Rapid Lynx	February 2020	Unknown	Unknown	Yes –construction of Phase 2 and operations of Phase 1 and 2 expected to overlap with Community Access Road construction and operations	■ Approximately 810 km of fibre optic cables, providing reliable high-speed internet service to five Matawa First Nation communities: Eabametoong, Marten Falls, Neskantage, Nibinamik and Webequie with an interconnection at Aroland.	Yes	Local Study Area – Yes (Phase 1) Regional Study Area – Yes (Phase 1)	Yes

Project	Identified in *Tailored Impact Statement Guidelines* (Y / N)	Location	Status	Distance (km) and Direction from the Project	Developer / Company	Project Start Date	Project Duration	Project Completion Date	Assumed Temporal Overlap with Community Access Road Activities (Y / N)	Project Description	Vegetation Valued Components Temporal Overlap with Project (Y / N)	Vegetation Valued Components Spatial Overlap with Project (Y / N)	Included in Cumulative Effects Assessment (Y / N)
Ogoki Forest Management Plans	Yes	Ogoki Forest, Ontario	Operating	Forest Management Plans: Varies Ogoki Primary Roads: 6.24 km	GreenForest Management Inc. and Geraldton Area Natural Resources Advisory Committee	2020	10 years	2030	Yes – Operations overlap with Community Access Road Construction and Operation	■ Forest Management Plans for the Ogoki Forest. ■ Includes Ogoki-Armstrong Primary Roads as these roads are being used for forest management. ■ Includes plans for future harvest. ■ Ogoki Forest is approximately 10,900 km^2 in size, and includes approximately 9,798 km^2 of forested area. ■ Majority of the forest is traditional territory and is subject to forest management planning and forest management operations.	Yes	Local Study Area – Yes Regional Study Area - Yes	Yes.



LEGEND

CONSTRUCTION DISTURBANCE AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- PREFERRED ROUTE
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTION CAMP
- BEDROCK
- SAND AND GRAVEL
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY

PHYSICAL ACTIVITIY PROJECT INCLUSION

- ANACONDA AND PAINTER LAKE FORESTRY ACCESS ROAD UPGRADES
- NORTHERN ROAD LINK
- RAPID LYNX BROADBAND PROJECT

Notes:

None

Data Source:

Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, AAFC, NRCan
World Topographic Map: Esri Canada, Esri, © OpenStreetMap contributors, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, AAFC, NRCan

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Physical Activities Inclusions in the Vegetation Local and Regional Study Areas

0 2.75 5.5 11 16.5 22
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:480,000 * when printed 11"x17"
Rev:0	

Figure 8-1

Contains information provided by Ontario Ministry of the Environment, Conservation and Parks or by Ontario Ministry of Natural Resources and Forestry (Copyright: King's Printer of Ontario 2023), through a Sensitive Data License Agreement. This drawing has been prepared for use of AECOM client and may not be reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM express written consent. The use of Sensitive Data in this drawing does not constitute an endorsement by the Ministry for this drawing or by AECOM of the Sensitive Data.

8.1.4 Summary of Outcome

The predicted residual effects identified in **Table 8-1**are applicable to all five vegetation Valued Components (upland ecosystems, wetland ecosystems, riparian ecosystems, designated areas, traditional use plants and species at risk and species of conservation concern). The four projects identified within **Table 8-3** have the potential for residual effects to overlap with the spatial and temporal boundaries of the vegetation Valued Components (**Table 8-2**); therefore, four projects and five Valued Components have been considered for the cumulative effects assessment (**Section 8.2**). **Table 8-4** summarizes the outcome of the cumulative effects scoping.

Table 8-4: Summary of Outcome

Past, Existing and Future Physical Activities / Projects	Valued Component Carried Forward	Results of Scoping
Northern Road Link	■ Upland Ecosystems ■ Wetland Ecosystems ■ Riparian Ecosystems ■ Designated Areas ■ Traditional Use Plants and Species at Risk and Species of Conservation Concern	Both the Marten Falls First Nation Community Access Road Project and Northern Road Link project have the potential for residual effects on the availability, distribution, composition and function of vegetation Valued Components through direct removal of vegetation, changes to groundwater because of road construction and fugitive dust emissions during construction and operations. The residual effects from both projects may overlap temporally during the Construction and Operation and Maintenance Phases. Spatially, residual effects from the Northern Road link project may overlap with the residual effects from the Marten Falls First Nation Community Access Road project within the effects assessment Local and Regional Study Areas.
Anaconda and Painter Lake Road upgrades	■ Upland Ecosystems ■ Wetland Ecosystems ■ Riparian Ecosystems ■ Designated Areas ■ Traditional Use Plants and Species at Risk and Species of Conservation Concern	Both the Marten Falls First Nation Community Access Road Project and Anaconda and Painter Lake Road upgrades project have the potential for residual effects on the availability, distribution, composition and function of vegetation Valued Components through direct removal of vegetation, changes to groundwater because of road construction or upgrades and fugitive dust emissions during construction and operations. The residual effects from both projects may overlap temporally during the Construction and Operation and Maintenance Phases. Spatially, residual effects from the Anaconda and Painter Lake Road upgrades project may overlap with the residual effects from the Marten Falls First Nation Community Access Road project within the effects assessment Local and Regional Study Areas.
Rapid Lynx Broadband	■ Upland Ecosystems ■ Wetland Ecosystems ■ Riparian Ecosystems ■ Designated Areas ■ Traditional Use Plants and Species at Risk and Species of Conservation Concern	Both the Marten Falls First Nation Community Access Road Project and Rapid Lynx Broadband project have the potential for residual effects on the availability, distribution, composition and function of vegetation Valued Components through direct removal of vegetation, changes to groundwater because of road construction or infrastructure implementation and fugitive dust emissions during construction. The residual effects from both projects may overlap temporally during the Operation and Maintenance Phases. Spatially, residual effects from the Anaconda and Painter Lake Road updates and Rapid Lynx Broadband project may overlap with the residual effects from the Marten Falls First Nation Community Access Road project within the effects assessment Local and Regional Study Areas.
Ogoki Forest Management Plans	■ Upland Ecosystems ■ Wetland Ecosystems ■ Riparian Ecosystems ■ Designated Areas ■ Traditional Use Plants and Species at Risk and Species of Conservation Concern	Both the Marten Falls First Nation Community Access Road Project and Ogoki Forest Management Plans project have the potential for residual effects on the availability, distribution, composition and function of vegetation Valued Components through direct removal of vegetation. The residual effects from both projects may overlap temporally during the Construction and Operation and Maintenance Phases. Spatially, residual effects from the Ogoki Forest Management Plans may overlap with the residual effects from the Marten Falls First Nation Community Access Road project within the effects assessment Local and Regional Study Areas. Vegetation loss or changes to distribution and composition of ecosystems associated with forestry activities is considered in a qualitative discussion within the effects assessment Regional Study Area.

8.2 Cumulative Effects Assessment

8.2.1 Overview of Climate Change Effects on Boreal Ecosystems

Environmental stress and disturbances from climate change are likely to cause major pressures on forest availability, distribution, and composition across most of Canada's boreal ecozones within the next few decades. The assessment of climate-related effects is complex because of the continuous interaction of parameters but can be best divided between direct effects such as environmental stress and indirect effects such as environmental disturbances. Climate change will have many environmental stress-related effects (direct effects) on boreal ecosystem functions due to increased temperature, changes in water availability and increases in atmospheric carbon dioxide (CO_2) concentration (Price et al., 2013). Changing temperature driving regional evapotranspiration coupled with changing the distribution and timing of annual precipitation will alter the seasonality and amount of water available to vegetation (Price et al. 2013). An increase in temperature, and changes in water availability, are imminent threats to the functions of boreal ecosystems, which are particularly sensitive to climate-related changes and threatened by warming and drying.

In addition to climate-related environmental stress, the boreal forest will also be impacted by environmental disturbances (indirect effects) from changes in climatic extremes and seasonality, such as extended, but drier, growing seasons; occurrence of more intense convective storms (from latent heat) leading to more lightning-caused wildfires; wind damage and / or flooding; as well as less frequent weather events such as ice storms in early spring, and late spring frosts (Price et al., 2013).

The combination of environmental stress (e.g., higher temperatures, changes in water availability, increases in atmospheric CO_2 concentration) and environmental disturbances (e.g., extended drier growing season, more intense convective storms, an increase in the occurrence of wildfire, wind damage and / or flooding, ice storms, spring frosts) is expected to reduce the amount of area covered by boreal forests (Price et al., 2013, Thompson et al., 1998, Varrin et al., 2007).

Climate change effects for the Project are discussed in more detail in the *Climate Adaptation and Resiliency Technical Support Document: Existing Conditions & Effects Assessment Report* (AECOM, 2026) and in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions and Effects Assessment Report: Volume 2 – Greenhouse Gasses* (Dillon, 2026).

8.2.2 Direct Vegetation Loss

8.2.2.1 Potential Cumulative Effects

8.2.2.1.1 Upland Ecosystems

The Project, the Northern Road Link, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband projects are predicted to remove a combined **3,140 ha** of Upland Ecosystems, which equates to **3%** of the Upland Ecosystems within the effects assessment Regional Study Area (**Table 8-5**). Effects from direct vegetation loss from the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband projects will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain and footprints are unknown.

Table 8-5: Changes to Upland Ecosystem Availability in the Effects Assessment Regional Study Area due to Direct Vegetation Loss

Upland Community	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects Area (ha)[(b)]	Percentage (%) of Community Type within the Effects Regional Study Area Affected
Coniferous Forest	62,843.7	14%	1,992.4	3%
Deciduous Forest	9,593.0	2%	743.9	8%
Mixed Forest	15,024.3	3%	176.4	1%
Rock / Barren	137.4	<1%	15.8	12%
Early Successional / Sparse Treed	40,308.4	9%	211.5	<1%
Total [(a)]	**127,906.9**	**28%**	**3,140.0**	**3%**

Notes:
(a) Percentages do not add to 100% since remaining area is composed of wetland ecosystems, riparian ecosystems, water, and anthropogenic areas
(b) Cumulative residual effects represent the amount of each upland community that remains after construction of the Project and reasonably foreseeable developments.
% = percent; ha = hectare.

The predicted loss of Upland Ecosystems in the effects assessment Regional Study Area from the Project and other reasonably foreseeable developments would result in localized changes in the extent of some vegetation communities. The distribution of Upland Ecosystems may be further affected by potential changes brought on by climate change, which is discussed further below.

As discussed in **Section 0**, removal of vegetation results in the direct loss of functional area which may reduce the ability of retained vegetation communities to carry out ecosystem functions. Vegetation removal also reduces habitat availability and alters habitat suitability for wildlife and vegetation species, which can result in a decline in biodiversity.

The proportion of direct vegetation loss attributed to the Northern Road Link project is expected to be greater because it will be a new disturbance on the landscape and involve extensive clearing. However, it is possible that the Anaconda and Painter Lake Road upgrades may also require realignment of a portion of the road which would also represent a new disturbance and involve more extensive clearing of vegetation than if works were limited to upgrades along the existing footprint.

The direct loss of vegetation from the Northern Road Link project and the Anaconda and Painter Lake Road upgrades is considered permanent because the Operation and Maintenance Phase of each of those projects is predicted to be indefinite. However, temporary features associated with those projects that are decommissioned and restored or vegetated in accordance with the Rehabilitation Plan after the Construction Phase is complete are anticipated to eventually provide some of the functions that the cleared vegetation communities currently provide. This would likely reduce, but not eliminate, the cumulative residual effects on Upland Ecosystems caused by reasonably foreseeable activities during the Operation and Maintenance Phase.

Direct vegetation loss from the Rapid Lynx Broadband project may be reversible over the long term as the cable will be primarily buried with some aerial sections; however, given the uncertainty about the project (e.g., start and end dates, details of a maintenance plan or decommissioning activities) and to be conservative in the assessment, all vegetation loss is considered permanent in the Construction Phase and through the Operation and Maintenance Phase of the Project for the purposes of the Cumulative Effects Assessment.

Overall, Upland Ecosystems are predicted to remain at a similar distribution and abundance (a 3% change) to existing conditions in the effects assessment Regional Study Area after addition of the Project and other reasonably foreseeable developments. Therefore, predicted changes in availability, distribution and composition from the Project and other projects are expected to have little cumulative effect on the net ecological function of Upland Ecosystems in the effects assessment Regional Study Area.

Forest Management Plan

It is the responsibility of the Ministry of Natural Resources to manage forests in a sustainable manner and provide healthy forests for future generations. Forest health and values are managed through the use of forest guides. Pest control and forest fire management are other tools used to maintain healthy forests (Ministry of Natural Resources, 2012c). The annual average harvest from 2004 to 2008 in Ontario boreal forests was 180,447 ha (Ministry of Natural Resources, 2012c). These years provide an example of a reduced harvest relative to previous years as the forest sector experienced a major economic downturn during this period (Ministry of Natural Resources, 2012c). Across Ontario, the average annual harvest between 2009 and 2019 was 121,000 ha (Ministry of Northern Development, Mines, Natural Resources and Forestry, 2021). Reductions in forest harvesting and the suppression of fire and insects could lead to a shift to older forests over time. While this shift provides habitat for species that rely on older forests, it may reduce the amount of available habitat for species that rely on younger forests. The average annual area regenerated in Ontario boreal forests from 2004 to 2008 was 202,947 ha (approximately 13% higher than the average annual harvest) showing that renewal efforts were greater than harvesting (Ministry of Natural Resources, 2012c).

The Ogoki Forest Management Plan (Ministry of Natural Resources and Forestry, 2021) describes future plans and expected forest structure and age, which is summarized as follows:

- Projected available harvest over the next 80 years is characterized by coniferous forest types, with Black Spruce Dominant (SbDom) and Black Spruce Lowland (SbLow) dominating the available harvest area at a combined 66%. All forest harvest is planned to be completed using clearcut methods. Planned harvest in the portion of the Forest Management Plan that overlaps the effects assessment Regional Study Area is planned for the period of 2020-2040. An additional 213.3 km of new or reconstructed primary roads and 167.4 km of branch roads are planned to be constructed during the period of the Forest Management Plan; and
- Forest Management Plan objectives include increasing the landscape cover of upland conifer and reducing cover of hardwood, particularly of the mature and old age classes. As a result, projected forest conditions show an increase in conifer dominated forest types, particularly Black Spruce (SbMx1, SbDom, SbLow), Jack Pine conifer mix (PjMx1), conifer-hardwood mix (ConMx) and other conifer lowland (OCLow). Hardwood dominated forest types (BwDom, HrdMw, HrDom) are projected to decrease over time, also in line with landscape objectives of the Forest Management Plan. One hardwood forest type, Poplar Dominant (PoDom), is projected to fluctuate with an eventual increase in cover which may be attributed to a succession to this forest type following the harvest of other hardwood dominated forests areas.

Climate Change

Climate change has the potential to alter Upland Ecosystem availability and distribution in the effects assessment Regional Study Area in various ways, including reducing the extent of Upland Ecosystems, biological diversity and habitat available to upland-specific rare species, changing forest composition to favour deciduous species, and increasing the abundance of invasive species.

The boreal forest requires large-scale disturbances to clear extensive areas and drive natural forest succession (Price et al. 2013, Price and Apps 1995, Oliver and Larson 1996). Fire-adapted conifers (Jack Pine and Black Spruce) produce serotinous cones (i.e., that release seeds following an environmental trigger), which allow a simultaneous regeneration by rapid and dense colonization over vast areas following large fires (Thompson et al. 1998, Brown and Johnstone 2012). An increase in occurrence of large fires because of climate change is therefore likely to result in changes in boreal forest species composition (Loehle 2003). When hot, dry conditions prevent successful establishment of conifer seedlings, pioneer deciduous species, such as Aspen and Birch, may outcompete conifers by their ability to regrow following drought and fire (Goldblum and Rigg 2005, Price et al. 2001, Price et al. 2013). This is exacerbated when the interval between fires becomes too short to allow sexual maturation of conifer trees (Price et al. 2013). Comparatively, where disturbances remain less frequent, temperate hardwood species such as Sugar Maple may gradually expand into areas that are presently conifer-dominated boreal forest (Goldblum and Rigg 2005, Price et al. 2013).

Effects of climate change on invasive species abundance and pest or pathogen outbreaks may also contribute to changes in Upland Ecosystem composition and function (Ministry of Natural Resources, 2012c; Climate Risk Institute et al., 2023). For example, outbreaks of mountain pine beetle (*Dendroctonus ponderosae*) have been recorded in British Columbia and Alberta linked to a range expansion made possible by warmer temperatures and drought (D'Orangeville et al., 2023). Mountain pine beetle primarily uses Lodgepole Pine (*Pinus contorta var. latifolia*) as a host species but will feed on most native pine species (Ministry of Natural Resources, 2024). Although not currently present in Ontario, the species has been recorded moving into northern parts of Alberta's boreal forest (D'Orangeville et al., 2023) and climate change could allow the species to expand in Ontario's boreal forest as well (Ministry of Natural Resources, 2024).Depending on the rate of climate change, there may be increased forest mortality for species that are unable to adapt to changes fast enough (Thompson et al., 1998). Species that are adapted to regenerate following fire such as Pine and Aspen are predicted to increase in the landscape leading to a homogenization of species on the landscape (Thompson et al., 1998, Iverson and Prasad, 2001, Varrin et al., 2007).

The magnitude of climate change effects on Upland Ecosystems is difficult to predict. However, climate change is expected to negatively influence the availability, distribution, composition and function of Wetland Ecosystems within and beyond the effects assessment Regional Study Area.

8.2.2.1.2 Wetland Ecosystems

The combination of the Project, the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project is predicted to remove **3,921.6 ha** of Wetland Ecosystems, which equates to **1%** of the Wetland Ecosystems within the effects assessment Regional Study Area (**Table 8-6**) (**Figure 8-2**).

Effects from direct vegetation loss from the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start date for Construction of other reasonably foreseeable activities is uncertain and footprints are unknown.

Table 8-6: Changes to Wetland Ecosystem Availability in the Effects Assessment Regional Study Area due to Direct Vegetation Loss

Wetland Community	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(b)]	Percentage (%) of Community Type within the Effects Regional Study Area Affected
Swamp	123,938.6	27%	2,078.0	2%
Marsh	2,274.4	<1%	43.5	2%
Fen	109,053.9	24%	1,504.4	1%
Bog	65,755.6	15%	295.8	<1%
Total [(a)]	**301,022.6**	**66%**	**3,921.6**	**1%**

Notes:
(a) Percentages do not add to 100% since remaining area is composed of upland ecosystems, riparian ecosystems, water, and anthropogenic areas
(b) Cumulative residual effects represent the amount of each wetland community that remains after construction of the Project and reasonably foreseeable developments.
% = percent; ha = hectare.

The predicted loss of Wetland Ecosystems in the effects assessment Regional Study Area from the Project and other reasonably foreseeable developments would result in localized changes in the extent of wetland vegetation communities. The distribution of Wetland Ecosystems may be further affected by potential hydrologic changes brought on by climate change, which is discussed below.

As discussed in **Section 0**, removal of vegetation results in the direct loss of functional area, which may reduce the ability of retained vegetation communities to carry out ecosystem functions. Vegetation removal also reduces habitat availability and alters habitat suitability for wildlife and vegetation species, which can result in a decline in biodiversity.

The proportion of direct vegetation loss attributed to the Northern Road Link project is expected to be greater because it will be a new disturbance on the landscape and involve extensive clearing. However, it is possible that the Anaconda and Painter Lake Road upgrades may also require realignment of a portion of the road which would also represent a new disturbance and involve more extensive clearing of vegetation than if works were limited to upgrades along the existing footprint.

The direct loss of vegetation from the Northern Road Link project and the Anaconda and Painter Lake Road upgrades is considered permanent because the Operation and Maintenance Phase of each of those projects is predicted to be indefinite. However, temporary features associated with those projects that are decommissioned and restored or naturally revegetated after Construction is complete are anticipated to eventually provide some of the functions that the cleared vegetation communities currently provide. This would likely reduce, but not eliminate, the cumulative residual effects on Wetland Ecosystems caused by the reasonably foreseeable activities during the Operation and Maintenance Phase. However, the re-establishment of certain vegetation community types (e.g., peatlands) is challenging. Direct vegetation loss from the Rapid Lynx Broadband project may be reversible over the long term as the cable will be primarily buried with some aerial sections; however, given the uncertainty about the project (e.g., start and end dates, details of a maintenance plan or decommissioning activities) and to be conservative in the assessment, all vegetation loss is considered permanent in the Construction Phase and through the Operation and Maintenance Phase of the Project for the purposes of the Cumulative Effects Assessment.

Overall, Wetland Ecosystems are predicted to remain abundant (a 1% change from existing conditions) and well connected in the effects assessment Regional Study Area after addition of the Project and other reasonably foreseeable developments. Therefore, changes to availability, distribution and composition are predicted to have little effect on the net ecological function of Wetland Ecosystems in the effects assessment Regional Study Area.

Forest Management Plans

Future forestry activities would change the availability, distribution and composition of wetland ecosystems in the effects assessment Regional Study Area. The goal for Forest Management Plans is to reach target levels for forest diversity and composition, wildlife habitat for provincially significant species, and locally featured species and species at risk. Overall, the Forest Management Plans seek to achieve a level of forestry operation and

harvest that meets market demand while incorporating sustainable forest practices and environmental values to meet a desired forest composition. While bog, fen and marsh wetland types are not a target for forest harvesting, swamp wetland types are. The Ogoki Forest Management Plans outlines that potential impacts on wetlands not protected through Conservation Reserve or Park status will be managed through practices such as winter harvesting, and proper road and water crossing construction techniques to minimize site damage and the disruption of water flows in these areas (Ministry of Natural Resources and Forestry, 2021).

Climate Change

Climate change has the potential to alter wetland ecosystem availability and distribution in the effects assessment Regional Study Area in various ways, including reducing the extent of wetland ecosystems, biological diversity and habitat available to wetland-specific rare species, and increase the abundance of invasive species.

Wetlands are one of the ecosystems most sensitive to predicted climate changes because they are at the interface between terrestrial and aquatic ecosystems (Environment and Climate Change Canada, 2017). Increases in evapotranspiration and decreases in surface water flow could cause wetlands to reduce in size and in extreme cases to convert to drier upland ecosystems (Dove-Thompson et al., 2011; Mortsch, 1998; Lemmon and Warre, 2004). The diversity of plants and animals in wetlands is linked to water level fluctuations. Predicted decreases in water levels could lead to negative impacts on species diversity (Dove-Thompson et al., 2011; Mortsch et al., 2003). The reliance on precipitation to maintain hydrological function in bogs makes them especially vulnerable to climate change, and a decline in precipitation could lead to drying of peatlands and altered distribution and abundance of bog vegetation (Dove-Thompson et al., 2011). A more detailed assessment of cumulative effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

Warmer temperatures could create conditions that may be inhospitable to some plant species while favoring others, thereby affecting community composition (Varrin et al., 2007). In particular, climate change is expected to result in an increase in temperature and evapotranspiration, and a reduction in moisture and water availability. If there is a transition to drier habitat conditions, plant species reliant on higher soil moisture content are expected to be impacted first. Species with a coefficient of wetness level between -2 and -5, or species with lower tolerance to dry conditions, have been documented throughout the effects assessment Regional Study Area (**Attachment B**).

Similar to Upland Ecosystems, effects of climate change on invasive species abundance may also contribute to changes in wetland composition and function (Ministry of Natural Resources, 2012c; Environment and Climate Change Canada, 2017). For example, temperature increase may allow invasive species such as purple loosestrife *(Lythrum salicaria*) to expand their northern range in the province (Environment and Climate Change

Canada, 2017). Invasive plants can affect wetland species diversity through direct competition with native plants.

The magnitude of climate change effects on wetlands is difficult to predict. However, climate change is expected to negatively influence the availability, distribution, composition and function of Wetland Ecosystems within and beyond the effects assessment Regional Study Area.

8.2.2.1.3 Riparian Ecosystems

The Project and the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove **163.6 ha** of Riparian Ecosystems, which equates to **1%** of the Riparian Ecosystems within the effects assessment Regional Study Area (**Table 8-7**) (**Figure 8-2**).

Effects from direct vegetation loss due to the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain and footprints are unknown.

Table 8-7: Changes to Riparian Ecosystem Availability in the Effects Assessment Regional Study Area due to Direct Vegetation Loss

Vegetation Community Grouping	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(b)]	Percentage (%) of Community Type within the Effects Regional Study Area Affected
Coniferous Forest	1,719.5	<1%	27.5	2%
Deciduous Forest	372.5	<1%	6.9	2%
Mixed Forest	698.6	<1%	1.5	<1%
Rock / Barren	18.1	0%	0.3	2%
Early Successional / Sparse Treed	482.2	<1%	1.4	<1%
Fen	1,360.2	<1%	21.1	2%
Bog	97.3	0%	1.1	1%
Marsh	1,383.5	<1%	29.1	2%
Swamp	3,192.5	<1%	46.5	2%

Vegetation Community Grouping	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(b)]	Percentage (%) of Community Type within the Effects Regional Study Area Affected
Anthropogenic	8.6	0%	7.1	83%
Water	6,436.1	1%	21.1	<1%
Total [(a)]	**15,769.0**	**4%**	**163.6**	**1%**

Notes:
(a) Percentages do not add to 100% since remaining area is composed of wetland ecosystems, upland ecosystems, water, and anthropogenic areas located greater than 30 m from waterbodies
(b) Cumulative residual effects represent the amount of each vegetation community grouping that remains after construction of the Project and reasonably foreseeable developments.
% = percent; ha = hectare, < = less than.

The predicted loss of Riparian Ecosystems in the effects assessment Regional Study Area from the Project and other reasonably foreseeable developments would result in localized changes in distribution. The distribution of Riparian Ecosystems may be further affected by potential hydrologic changes brought on by climate change, which is discussed further below.

As discussed in **Section 7.3.1.2**, removal of vegetation results in the direct loss of functional area which may reduce the ability of retained vegetation communities to carry out ecosystem functions. Vegetation removal also reduces habitat availability and alters habitat suitability for wildlife and vegetation species, which can result in a decline in biodiversity. Furthermore, vegetation loss in Riparian Ecosystems can contribute to erosion and sedimentation, facilitate the spread of invasive species, and increase water temperature due to a reduction in shading.

The proportion of direct vegetation loss attributed to the Northern Road Link project is expected to be greater because it will be a new disturbance on the landscape and involve extensive clearing. However, it is possible that the Anaconda and Painter Lake Road upgrades may also require realignment of a portion of the road which would also represent a new disturbance and involve more extensive clearing of vegetation than if works were limited to upgrades along the existing footprint.

The direct loss of vegetation from the Northern Road Link project and the Anaconda and Painter Lake Road upgrades is considered permanent because the Operation and Maintenance Phase of each of those projects is predicted to be indefinite. However, temporary features associated with those projects that are decommissioned and restored or naturally revegetated after Construction is complete are anticipated to eventually provide some of the functions that the cleared vegetation communities currently provide. This would likely reduce, but not eliminate, the cumulative residual effects on Riparian Ecosystems caused by the reasonably foreseeable activities during the Operation and

Maintenance Phase. However, the re-establishment of certain features of riparian community types is challenging. Direct vegetation loss from the Rapid Lynx Broadband project may be reversible over the long term as the cable will be primarily buried with some aerial sections; however, given the uncertainty about the project (e.g., start and end dates, details of a maintenance plan or decommissioning activities) and to be conservative in the assessment, all vegetation loss due to it is considered permanent in the Construction Phase and through the Operation and Maintenance Phase of the Project for this cumulative effects assessment.

Overall, Riparian Ecosystems are predicted to remain abundant (a 1% change from existing conditions) and to have not net loss of connectivity in the effects assessment Regional Study Area after addition of the Project and other reasonably foreseeable developments. Therefore, changes to availability, distribution and composition are predicted to have no to little effect on the net ecological function of Riparian Ecosystems in the effects assessment Regional Study Area.

Forest Management Plans

The Ogoki Forest Management Plan implements area of concern prescriptions for operations around waterbodies and riparian areas, resulting in selection of harvest areas that maintain protection of water quality and fish habitat. Harvest operations are not permitted within 30-90 m of waterbodies, depending on slope (Ministry of Natural Resources and Forestry, 2021). Therefore, forest management operations are not predicted to affect Riparian Ecosystems within the effects assessment Regional Study Area.

Climate Change

Riparian Ecosystems include both upland and wetland vegetation communities. Discussion of climate change related effects are in **Section 8.2.2.1.**

As with Upland and Wetland Ecosystems, Riparian Ecosystems may be negatively influenced by alterations in water flows and levels through the effects of climate change. The distribution of Riparian Ecosystems may be further affected by potential hydrologic changes brought on by climate change. Effects of climate change on the abundance of invasive species may also contribute to changes in Riparian Ecosystems, as invasive plants can affect riparian species diversity through direct competition with native plants.

ALBANY RIVER PROVINCIAL PARK

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT-RIVER PROVINCIAL PARK

Albany River

Ogoki River

Kenogamy River

Gunder River

Ruby Creek

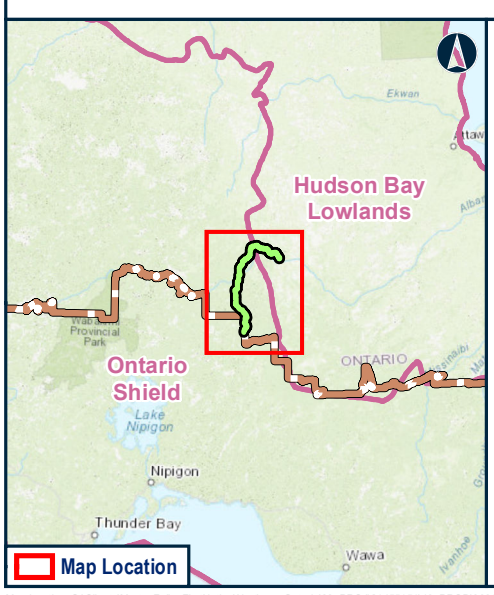
Kawagama River

La Rose Creek

Caliper's Creek

Catherine Creek

289m



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- ANTHROPOGENIC
- RIPARIAN ECOSYSTEMS
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

PHYSICAL ACTIVITIY PROJECT INCLUSION

- ANACONDA AND PAINTER LAKE FORESTRY ACCESS ROAD UPGRADES
- NORTHERN ROAD LINK
- RAPID LYNX BROADBAND PROJECT

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland, Upland and Riparian Ecosystems Cumulative Effects

0 5 10 20
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:480,000 * when printed 11"x17"
Rev:0	

Figure 8-2

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8.2.2.1.4 Designated Areas

Provincial Parks

Two of the Provincial Parks (i.e., Little Current River and Ogoki River) within the effects assessment Regional Study Area will not be directly affected by the Project or other reasonably foreseeable developments. The Project and the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove **5.7 ha** of the Albany River Provincial Park, which equates to **<1%** of the total Provincial Park area, and **<1%** of the Provincial Park that occurs within the effects assessment Regional Study Area (**Table 8-8**) (**Figure 8-1**)**.** It should be noted that the entire portion of Albany River Provincial Park that will be affected is attributed to the Project. None of the reasonably foreseeable developments are predicted to directly affect Albany River Provincial Parks so there would be no cumulative effects from other developments.

Table 8-8: Changes to Provincial Park Availability in the Effects Assessment Regional Study Area due to Direct Vegetation Loss

Designated Area	Total Park Area (ha)	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area[a]	Cumulative Effects (ha)[b]	Percentage (%) of Designated Area within the Effects Regional Study Area Affected
Little Current River Provincial Park	9,930	2,016.4	<1%	0.0	0%
Ogoki River Provincial Park	23,250	1,336.1	<1%	0.0	0%
Albany River Provincial Park	95,100	5,202.1	1%	5.7[c]	<1%

Notes:
(a) This percentage represents the proportion of the given Provincial Park that is located within the effects assessment Regional Study Area.
(b) Cumulative residual effects represent the amount of each Provincial Park that remains after construction of the Project and reasonably foreseeable developments.
(c) Loss is due entirely to the Project and therefore no cumulative effects from other projects are predicted.
% = percent; ha = hectare, < = less than.

Forest Management Plans

Ogoki River Provincial Park overlaps the Ogoki Forest Management Plan area within the effects assessment Regional Study Area. However, Provincial Parks are not available for forest management purposes (Ministry of Natural Resources and Forestry, 2021).

Critical Landform / Vegetation Associations

The Project and the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove **750.9 ha** of Critical Landform / Vegetation associations, which equates to **1%** of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area **(Table 8-9)** **(Figure 8-3)**.

A total of 17 Critical Landform / Vegetation associations are predicted to be impacted by cumulative effects. Of these, the Northern Road Link, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband projects affect nine:

- Organic Deposits – Coniferous Swamp;
- Organic Deposits – Deciduous Treed;
- Organic Deposits – Disturbance – Non and Sparse Woody;
- Organic Deposits – Disturbance – Treed and / or Shrub;
- Organic Deposits – Open Bog;
- Organic Deposits - Open Fen;
- Organic Deposits – Thicket Swamp;
- Organic Deposits - Treed Bog; and
- Organic Deposits - Treed Fen.

Effects from direct vegetation loss from the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain.

Figure 8-3: Landform / Vegetation Associations Cumulative Effects

[Confidential Figure]

Table 8-9: Changes to Critical Landform / Vegetation Associations Availability in the Effects Assessment Regional Study Area due to Direct Vegetation Loss

Landform	Vegetation	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Designated Area within the Effects Regional Study Area Affected
Fine Ground Moraine	Coniferous Swamp	1,082.5	<1%	2.0	<1%
Fine Ground Moraine	Deciduous Treed	357.6	<1%	0.0	0%
Fine Ground Moraine	Disturbance - Non and Sparse Woody	99.0	<1%	2.4	2%
Fine Ground Moraine	Disturbance - Treed and / or Shrub	6,608.3	2%	86.2	1%
Fine Ground Moraine	Fresh Water Marsh	14.6	<1%	0.0	0%
Fine Ground Moraine	Open Bog	370.4	<1%	0.0	0%
Fine Ground Moraine	Open Fen	31.5	<1%	0.0	0%
Fine Ground Moraine	Sparse Treed	3.6	<1%	0.0	0%
Fine Ground Moraine	Thicket Swamp	11.7	<1%	0.0	0%
Fine Ground Moraine	Treed Bog	994.7	<1%	2.1	<1%
Fine Ground Moraine	Treed Fen	1,637.3	<1%	9.2	<1%
Glaciofluvial Esker-Kettle Terrain	Coniferous Treed	26.4	<1%	0.2	<1%
Glaciofluvial Esker-Kettle Terrain	Open Bog	4.2	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Open Fen	32.8	<1%	0.0	0%
Glaciofluvial Esker-Kettle Terrain	Sparse Treed	0.3	<1%	0.0	0%

Landform	Vegetation	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Designated Area within the Effects Regional Study Area Affected
Glaciofluvial Esker-Kettle Terrain	Treed Bog	10.8	<1%	0.0	0%
Organic Deposits	Coniferous Swamp	18,648.4	4%	283.1	2%
Organic Deposits	Deciduous Treed	162.6	<1%	2.3	1%
Organic Deposits	Disturbance - Non and Sparse Woody	1,876.0	<1%	78.2	4%
Organic Deposits	Disturbance - Treed and / or Shrub	773.5	<1%	6.0	<1%
Organic Deposits	Open Bog	6,707.7	2%	26.7	<1%
Organic Deposits	Open Fen	1,988.6	<1%	20.2	1%
Organic Deposits	Sparse Treed	17.0	<1%	0.0	0%
Organic Deposits	Thicket Swamp	854.6	<1%	11.7	1%
Organic Deposits	Treed Bog	6,134.0	1%	63.4	1%
Organic Deposits	Treed Fen	9,570.6	2%	133.5	1%
Precambrian Int. to Acidic Bedrock	Coniferous Treed	3.1	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Deciduous Treed	23.0	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Disturbance - Non and Sparse Woody	64.7	<1%	0.7	1%
Precambrian Int. to Acidic Bedrock	Mixed Treed	9.6	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Open Bog	12.8	<1%	0.0	0%

Landform	Vegetation	Existing Conditions Area (ha)	Percentage (%) of the Effects Regional Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Designated Area within the Effects Regional Study Area Affected
Precambrian Int. to Acidic Bedrock	Open Fen	0.9	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Sparse Treed	2.8	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Treed Bog	100.0	<1%	0.0	0%
Precambrian Int. to Acidic Bedrock	Treed Fen	575.8	<1%	22.9	4%
Total		**58,811.1**	**13%**	**750.9**	1%

Notes:

(a) Cumulative residual effects represent the amount of each Critical Landform / Vegetation Association that remains after construction of the Project and reasonably foreseeable developments.

% = percent; ha = hectare, < = less than.

Forest Management Plans

Critical Landform / Vegetation Associations are mapped only within protected areas or proposed protected areas within the effects assessment Regional Study Area. Because the Ogoki Forest Management Plan is identified for harvest operations, no Critical Landform / Vegetation Associations overlap the plan area.

8.2.2.1.5 Traditional Use Plants

As summarized in **Section 7.1.5.1**, suitable and accessible habitat for Traditional Use Plant species is available throughout the effects assessment Local Study Area. The Project and the Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove vegetation from across the entire range of scores (**Table 8-810)** (**Figure 8-4**). This includes habitats with a score of 0 that are unsuitable for Traditional Use Plant species and / or are inaccessible.

Over 90% of the habitat areas affected by the reasonably foreseeable developments are characterized by ecosites scoring 1 to 1.8. This may be a reflection of the Anaconda and Painter Lake Road upgrades and Rapid Lynx Broadband project being associated with existing roads where accessibility is easier.

Coniferous swamp and coniferous forest vegetation communities were assessed to have the highest suitability for Traditional Use Plants (**Section 5.7**). A total of 3% of coniferous forest and 2% of swamp vegetation communities are predicted to be removed within the effects assessment Regional Study Area by the Project and other reasonably foreseeable developments (**Section 8.2.2.1** and **Section 8.2.2.4**). However, it is expected that additional suitable and accessible habitat is available throughout the effects assessment Regional Study Area.

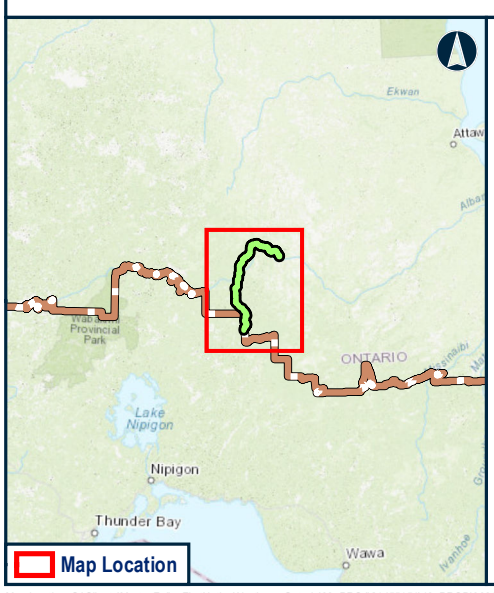
Effects from direct vegetation loss from the Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain and footprints are unknown.

ALBANY RIVER PROVINCIAL PARK

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)

PHYSICAL ACTIVITIY PROJECT INCLUSION

- ANACONDA AND PAINTER LAKE FORESTRY ACCESS ROAD UPGRADES
- NORTHERN ROAD LINK
- RAPID LYNX BROADBAND PROJECT

Traditional Use Plant Habitat Suitability and Accessibility Scores

- 0.0 - 0.1 (LOW)
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0 (MODERATE)
- 1.0 - 1.
- 1.1 - 1.2
- 1.2 - 1.3
- 1.3 - 1.4
- 1.4 - 1.5
- 1.5 - 1.6
- 1.6 - 1.7
- 1.7 - 1.8
- 1.8 - 1.9
- 1.9 - 2.0 (HIGH)

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Traditional Use Plant Habitat Suitability and Accessibility Cumulative Effects

0 5 10 20
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 8-4

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Table 8-10: Changes to Traditional Use Plant Habitat Availability in the Effects Assessment Local Study Area due to Direct Vegetation Loss

Score	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Ecosites with Given Score Within the Effects Local Study Area
0.0	3,904.8	3%	21.2	<1%
0.1	1.7	<1%	0.0	0%
0.2	1,252.8	1%	85.1	7%
0.3	0.0	0%	0.0	0%
0.4	342.4	<1%	6.5	2%
0.5	24,225.5	21%	987.8	4%
0.6	4,736.5	4%	450.1	10%
0.7	2,107.6	2%	133.8	6%
0.8	12,055.1	10%	431.3	4%
0.9	0.0	0%	0.0	0%
1.0	41.3	<1%	17.7	43%
1.1	37.0	<1%	4.7	13%
1.2	2,399.4	2%	90.7	4%
1.3	0.0	0%	0.0	0%
1.4	858.0	<1%	40.0	5%
1.5	38,949.5	34%	1,616.2	4%
1.6	4,512.3	4%	515.0	11%
1.7	2,097.3	2%	194.5	9%
1.8	18,430.3	16%	1,005.2	6%
1.9	0.0	0%	0.0	0%
2.0	0.0	0%	0.0	0%
Total	**115,951.5**	**100%**	**5,599.8**	**5%**

Notes:

(a) Cumulative residual effects represent the amount of each Traditional Use Plant Index Score category (based on Habitat Suitability and Habitat Accessibility) that is removed after construction of the Project and reasonably foreseeable developments.

% = percent; ha = hectare; < = less than.

Overall, habitat for Traditional Use Plant species is predicted to remain abundant (a 5% change from existing conditions) in the effects assessment Local Study Area after addition of the Project and other reasonably foreseeable developments. Therefore, changes to availability, distribution and composition of suitable habitat and on the regional populations of Traditional Use Plant species are predicted in the effects assessment Regional Study Area.

Forest Management Plans

Future forestry activities would change the availability, distribution and composition of Traditional Use Plant habitat in the effects assessment Regional Study Area. The goal for Forest Management Plans is to reach target levels for forest diversity and composition, wildlife habitat for provincially significant species, and locally featured species and species at risk. Overall, the Forest Management Plans seek to achieve a level of forestry operation and harvest that meets market demand while incorporating sustainable forest practices and environmental values to meet a desired forest composition. Meeting these targets is expected to support the maintenance of self-sustaining and ecologically effective Upland and Wetland Ecosystems that provide habitat for Traditional Use Plant species within the effects assessment Regional Study Area. The Ogoki Forest Management Plan is further discussed in **Section 8.2.2.1** for Upland and Wetland Ecosystems.

Climate Change

Traditional Use Plant habitat availability may be negatively affected by climate change. Many Traditional Use Plant species prefer wetland habitats, which are considered to be one of the ecosystems most sensitive to predicted climate changes (Environment and Climate Change Canada, 2017). Increases in temperature, increases in evapotranspiration and decreases in surface water flow could cause wetland habitats to change in the landscape by reducing their coverage and in extreme cases causing them to become completely dry (Dove-Thompson et al. 2011, Mortsch 1998, Lemmon and Warre 2004). The reliance on precipitation to maintain function makes bogs especially vulnerable to climate change, and a decline in precipitation could lead to drying of peatlands and altered distribution and abundance of bog vegetation (Dove-Thompson et al. 2011). A more detailed discussion of potential effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026). The diversity of plants in wetlands is linked to water level fluctuations and therefore predicted decreases in water levels may lead to concerns for species diversity, including plants of traditional use (Dove-Thompson et al. 2011, Mortsch et al. 2003). The combination of environmental stress (i.e., higher temperature) paired with environmental disturbances (i.e., increase in the occurrence of fire) caused by climate change is expected to reduce the area covered by the boreal forests in its southern boundary from their present-day distributions (Price et al. 2013, Thompson et al. 1998, Varrin et al. 2007). Depending on the rate of climate change, there may be increased forest mortality for species that are unable to adapt to changes

fast enough (Thompson et al. 1998). Species that are adapted to regenerate following fire, such as Pine and Aspen, are predicted to increase in the landscape leading to a loss of diversity (Thompson et al. 1998, Iverson and Prasad 2001, Varrin et al. 2007). Consequently, in the Cumulative Effects Assessment, Traditional Use Plant habitat availability could be further reduced in the effects assessment Regional Study Area and beyond the effects assessment Regional Study Area due to climate change, although the magnitude is difficult to predict.

8.2.2.1.6 Species at Risk and Species of Conservation Concern

Black Ash

The Project and the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove **1,820.2 ha** of suitable habitat for Black Ash, which equates to **5%** of the suitable habitat available within the effects assessment Local Study Area (**Table 8-10**) (**Figure 8-5**).

It is expected that there is additional suitable habitat for Black Ash throughout the effects assessment Regional Study Area. Coniferous swamp, thicket swamp and moist coniferous forest were assessed to be the most common vegetation communities that provide habitat for Black Ash (**Table 8-101**). A total of 3% of coniferous forest and 2% of swamp vegetation communities are predicted to be removed within the effects assessment Regional Study Area by the Project and other reasonably foreseeable developments (**Section 8.2.2.1**).

Effects from direct vegetation loss from the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain and footprints are unknown.

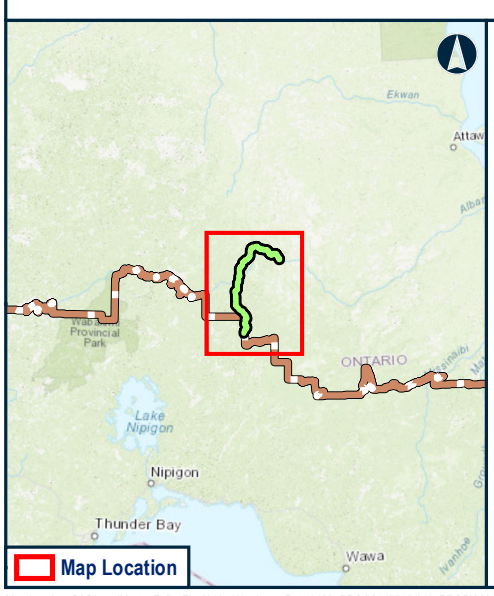
Overall, habitat for Black Ash is predicted to remain abundant (a 5% change from existing conditions) in the effects assessment Local Study Area after addition of the Project and other reasonably foreseeable developments. Therefore, changes to availability, distribution and composition of suitable habitat and on the regional population of Black Ash are predicted in the effects assessment Regional Study Area.

ALBANY RIVER PROVINCIAL PARK

OGOKI RIVER PROVINCIAL PARK (WATERWAY CLASS)

LITTLE CURRENT RIVER PROVINCIAL PARK

LITTLE CURRENT RIVER PROVINCIAL PARK



Legend

- CONSTRUCTION DISTURBANCE AREA
- BLACK ASH OBSERVATION
- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- SUITABLE BLACK ASH HABITAT
- SUITABLE NORTHERN MARSH VIOLET HABITAT

PHYSICAL ACTIVITIY PROJECT INCLUSION

- ANACONDA AND PAINTER LAKE FORESTRY ACCESS ROAD UPGRADES
- NORTHERN ROAD LINK
- RAPID LYNX BROADBAND PROJECT

Notes:
None

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Species at Risk and Species of Conservation Concern Habitat Suitability Cumulative Effects

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:480,000 * when printed 11"x17"
Rev:0	

Figure 8-5

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Map location: S:\Clients\MartenFalls_FirstNation\Northern_Ontario\99_PROJ\21455151\40_PROD\0031_Vegetation_EA_Reporting\21455151-0031-RT-0016_8-5.mxd
Date Saved: 10/28/2024 1:03:25 PM User Name: INGU06951

Table 8-11: Changes to Black Ash Suitable Habitat Availability in the Effects Assessment Local Study Area due to Direct Vegetation Loss

Ecosite	Ecosite Description	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Ecosite within the Effects Local Study Area
B005X	Active Mineral Shoreline	30.0	<1%	0.5	2%
B059TI	Dry to Fresh, Coarse: Mixedwood	0.0	0%	0.0	0%
B059Tt	Dry to Fresh, Coarse: Mixedwood	82.3	<1%	4.1	5%
B063S	Moist, Coarse, Shrub	0.0	0%	0.0	0%
B065	Moist, Coarse: Black Spruce – Pine Conifer	41.3	<1%	33.4	81%
B065TI	Moist, Coarse: Black Spruce – Pine Conifer	633.7	<1%	19.1	3%
B065Tt	Moist, Coarse: Black Spruce – Pine Conifer	1,018.3	<1%	122.6	12%
B066Tt	Moist, Coarse: Cedar (Hemlock) Conifer	11.9	<1%	0.0	0%
B067Tt	Moist, Coarse: Spruce – Fir Conifer	36.7	<1%	12.6	34%
B068TI	Moist, Coarse: Conifer	38.3	<1%	15.6	41%
B068Tt	Moist, Coarse: Conifer	64.7	<1%	1.4	2%
B070	Moist, Coarse: Aspen – Birch Hardwood	12.8	<1%	12.8	100%
B070TI	Moist, Coarse: Aspen – Birch Hardwood	6.4	<1%	0.0	0%
B070Tt	Moist, Coarse: Aspen – Birch Hardwood	56.0	<1%	0.0	0%
B076Tt	Moist, Coarse: Mixedwood	227.7	<1%	104.4	46%
B119	Moist, Fine: Aspen – Birch Hardwood	2.4	<1%	0.0	0%
B127	Organic Poor Conifer Swamp	305.5	<1%	6.2	2%
B127TI	Organic Poor Conifer Swamp	52.4	<1%	0.6	1%
B127Tt	Organic Poor Conifer Swamp	1,170.0	1%	90.1	8%
B128	Organic Intermediate Conifer Swamp	5,603.6	5%	34.3	<1%
B128TI	Organic Intermediate Conifer Swamp	2,507.0	2%	141.6	6%

Ecosite	Ecosite Description	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of Ecosite within the Effects Local Study Area
B128Tt	Organic Intermediate Conifer Swamp	13,979.0	12%	959.2	7%
B129	Organic Rich Conifer Swamp	0.0	<1%	0.0	0%
B129Tl	Organic Rich Conifer Swamp	86.1	<1%	24.5	29%
B129Tt	Organic Rich Conifer Swamp	211.7	<1%	22.3	11%
B134	Mineral Thicket Swamp	21.5	<1%	0.0	0%
B134S	Mineral Thicket Swamp	25.3	<1%	1.2	5%
B135	Organic Thicket Swamp	1.7	<1%	0.0	0%
B135S	Organic Thicket Swamp	234.9	<1%	11.9	5%
B222	Mineral Poor Conifer Swamp	7,768.8	7%	75.9	1%
B222Tl	Mineral Poor Conifer Swamp	185.7	<1%	16.9	9%
B222Tt	Mineral Poor Conifer Swamp	889.4	<1%	95.6	11%
B223	Mineral Intermediate Conifer Swamp	19.9	<1%	0.2	1%
B223Tt	Mineral Intermediate Conifer Swamp	47.3	<1%	13.0	27%
B224	Mineral Rich Conifer Swamp	13.4	<1%	0.0	0%
B224Tt	Mineral Rich Conifer Swamp	4.7	<1%	0.2	4%
TOTAL		**35,390.2**	**31%**	**1,820.2**	**5%**

Notes:

(a) Cumulative residual effects represent the amount of each ecosite representing suitable Black Ash habitat that remains after construction of the Project and reasonably foreseeable developments.

(b) The change in area in the study areas are a result of the assumed project footprints (i.e., direct effect on each ecosite).

% = percent; ha = hectare; < = less than.

Forest Management Plans

Black Ash occurs in a variety of upland and wetland habitats where future forestry activities would change the availability, distribution and composition of these host ecosystems in the effects assessment Regional Study Area. The Ogoki Forest Management Plan is further discussed in **Section 8.2.2.1.1** for Upland Ecosystems and in **Section 8.2.2.1.2** for Wetland Ecosystems.

Climate Change

Climate change will also have an impact on black ash. Black Ash is a facultative species that occurs in moist to wet sites but is found most commonly in swamps in northern Ontario. As discussed in **Section 8.2.2.1** wetlands are considered to be one of the ecosystems most sensitive to predicted climate changes. Increases in temperature might lead to increases in evapotranspiration combined with decreases in surface water flow, which would negatively impact wetlands (Dove-Thompson et al., 2011; Environment and Climate Change Canada, 2017; Mortsch, 1998; Lemmon and Warre, 2004). Any hydrological changes, such as flooding or drying out of suitable habitat, could impact the health and even cause mortality of Black Ash as it is sensitive to changes in water availability (Ministry of the Environment, Conservation and Parks, 2022).

Climate change could also expose Black Ash to emerald ash borer, an invasive beetle that is the primary threat to this tree where they both occur in southern Ontario. In that area, large-scale ash mortality has occurred (50-99%) due to the emerald ash borer infestation (Ministry of the Environment, Conservation and Parks, 2022). The current northern boundary of the emerald ash borer's distribution is limited by the cold temperatures; however, as temperatures increase with climate change it will allow further spread of the emerald ash borer in the north. It is predicted that by 2100 53-99% of the Ontario Black Ash range will be susceptible to infestation by the emerald ash borer and there could be a population and decline of between 44 and 82 million mature individuals (Ministry of the Environment, Conservation and Parks, 2022).

Additionally, climate change is predicted to result in greater frequency of extreme weather conditions and this could further decrease of Black Ash populations due to stresses such as increased fires, drought, heatwaves, late spring frost, strong winds and erratic winter weather (Ministry of the Environment, Conservation and Parks, 2022). Black Ash, like other trees species of the boreal region, may begin to shift north where weather and habitat conditions are more favourable (Ministry of the Environment, Conservation and Parks, 2022). However, this range shift is not expected to offset the predicted dieback of Black Ash trees from habitat loss, the emerald ash borer and other threats to the species.

The magnitude of climate change effects on Black Ash and its habitat is difficult to predict. However, climate change is expected to negatively influence Wetland Ecosystems and consequently, habitat availability for Black Ash could be further reduced in the effects assessment Regional Study Area and beyond the effects assessment Regional Study Area due to climate change.

Northern Marsh Violet

The Project and the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to remove **3,520.9 ha** of suitable habitat for Northern Marsh Violet, which equates to **4%** of the suitable habitat available within the effects assessment Local Study Area (**Table 8-12)** (**Figure 8-5**).

It is expected that there is additional suitable habitat for Northern Marsh Violet throughout the effects assessment Regional Study Area. Wetland vegetation communities characterize most of the suitable habitat for Northern Marsh Violet (**Table 8-12).** A total of 1% of Wetland Ecosystems are predicted to be removed within the effects assessment Regional Study Area by the Project and other reasonably foreseeable developments (**Section 8.2.2.1**).

Effects from direct vegetation loss from the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project. It is uncertain how much concurrent direct vegetation loss will occur during the Construction of the Project because the start dates for Construction of other reasonably foreseeable activities are uncertain and footprints are unknown.

Overall, habitat for Northern Marsh Violet is predicted to remain abundant (a 4% change from existing conditions) in the effects assessment Local Study Area after addition of the Project and other reasonably foreseeable developments. Wetland Ecosystems, which account for the majority of suitable habitat for Northern Marsh Violet, are also predicted to remain abundant (a 1% change from existing conditions) in the effects assessment Regional Study Area. Therefore, changes to the availability, distribution and composition of suitable habitat and on the regional population of Northern Marsh Violet are predicted in the effects assessment Regional Study Area.

Table 8-12: Changes to Northern Marsh Violet Suitable Habitat Availability in the Effects Assessment Local Study Area due to Direct Vegetation Loss

Ecosite	Ecosite Description	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of the Effects Local Study Area
B005X	Active Mineral Shoreline	30.0	<1%	0.5	2%
B065	Moist, Coarse: Black Spruce – Pine Conifer	41.3	<1%	33.4	81%
B065Tl	Moist, Coarse: Black Spruce – Pine Conifer	633.7	<1%	19.1	3%
B065Tt	Moist, Coarse: Black Spruce – Pine Conifer	1,018.3	<1%	122.6	12%
B066Tt	Moist, Coarse: Cedar (Hemlock) Conifer	12.0	<1%	0.0	0%
B067Tt	Moist, Coarse: Spruce – Fir Conifer	51.6	<1%	27.6	53%
B068Tl	Moist, Coarse: Conifer	23.4	<1%	0.7	3%
B068Tt	Moist, Coarse: Conifer	77.5	<1%	14.2	18%
B126	Low Treed Bog	21.8	<1%	0.0	0%
B126Tl	Low Treed Bog	218.9	<1%	1.9	<1%
B126Tt	Low Treed Bog	86.3	<1%	13.9	16%
B127	Organic Poor Conifer Swamp	305.5	<1%	6.2	2%
B127Tl	Organic Poor Conifer Swamp	52.4	<1%	0.6	1%
B127Tt	Organic Poor Conifer Swamp	1,170.0	1%	90.1	8%
B128	Organic Intermediate Conifer Swamp	5,603.6	5%	34.3	<1%
B128Tl	Organic Intermediate Conifer Swamp	2,507.0	2%	141.6	6%
B128Tt	Organic Intermediate Conifer Swamp	13,979.0	12%	959.2	7%
B129	Organic Rich Conifer Swamp	0.0	0%	0.0	0%
B129Tl	Organic Rich Conifer Swamp	86.1	<1%	24.5	28%
B129Tt	Organic Rich Conifer Swamp	211.8	<1%	22.3	11%
B136	Sparse Treed Fen	19.6	<1%	0.7	6%
B136Tl	Sparse Treed Fen	39,102.6	34%	904.2	2%

Ecosite	Ecosite Description	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[a]	Percentage (%) of the Effects Local Study Area
B136Tt	Sparse Treed Fen	2,013.7	2%	135.1	7%
B137Tl	Sparse Treed Bog	943.9	<1%	9.6	1%
B137Tt	Sparse Treed Bog	42.4	<1%	4.3	10%
B138	Open Bog	81.0	<1%	0.0	0%
B138N	Open Bog	150.0	<1%	0.0	0%
B139	Poor Fen	10.2	1%	0.0	0%
B139N	Poor Fen	119.6	<1%	0.0	0%
B139S	Poor Fen	76.7	<1%	0.5	<1%
B140	Open Moderately Rich Fen	34.9	<1%	0.0	0%
B140N	Open Moderately Rich Fen	1,771.6	2%	22.9	1%
B140S	Open Moderately Rich Fen	132.8	<1%	3.5	3%
B142	Mineral Meadow Marsh	17.8	<1%	0.5	3%
B142N	Mineral Meadow Marsh	733.9	<1%	11.7	2%
B144	Organic Meadow Marsh	249.8	<1%	3.9	2%
B144N	Organic Meadow Marsh	1,246.8	1%	22.5	2%
B146N	Open Shore Fen	207.4	<1%	35.6	17%
B146S	Open Shore Fen	14.6	<1%	0.0	0%
B148N	Mineral Shallow Marsh	9.5	<1%	0.0	0%
B149N	Organic Shallow Marsh	14.2	<1%	0.0	0%
B222	Mineral Poor Conifer Swamp	7,768.8	7%	75.9	<1%
B222Tl	Mineral Poor Conifer Swamp	185.7	<1%	16.9	9%
B222Tt	Mineral Poor Conifer Swamp	889.4	<1%	95.6	11%
B223	Mineral Intermediate Conifer Swamp	19.9	<1%	0.2	1%
B223Tt	Mineral Intermediate Conifer Swamp	47.3	<1%	13.0	27%

Ecosite	Ecosite Description	Existing Conditions Area (ha)	Percentage (%) of the Effects Local Study Area	Cumulative Effects (ha)[(a)]	Percentage (%) of the Effects Local Study Area
B224	Mineral Rich Conifer Swamp	13.4	<1%	0.0	0%
B224Tt	Mineral Rich Conifer Swamp	4.7	<1%	0.2	4%
Total		**82,052.1**	**71**%	**3,520.9**	**4%**

Notes:
(a) Cumulative residual effects represent the amount of each ecosite representing suitable Northern Marsh Violet habitat that remains after construction of the Project and reasonably foreseeable developments.
(b) The change in area in the study areas are a result of the assumed project footprints (i.e., direct effect on each ecosite).
% = percent; ha = hectare; < = less than.

Forest Management Plans

Northern Marsh Violet occurs primarily in wetland habitats. Future forestry activities in these habitats will change their availability, distribution and composition in the effects assessment Regional Study Area. The Ogoki Forest Management Plan is further discussed in **Section 8.2.2.1.2** for Wetland Ecosystems.

Climate Change

Northern Marsh Violet occurs primarily in wetland habitats. Climate change effects on Wetland Ecosystems is discussed in **Section 8.2.2.1.2**.

The magnitude of climate change effects on Northern Marsh Violet and its habitat is difficult to predict. However, climate change is expected to negatively influence Wetland Ecosystems and consequently, habitat availability for Northern Marsh Violet could be further reduced in the effects assessment Regional Study Area and beyond the effects assessment Regional Study Area due to climate change.

8.2.2.2 Mitigation Measures

It is anticipated that mitigation measures that will be implemented to minimize the effects from direct vegetation loss on vegetation Valued Components during the construction and operations of the Northern Road Link project, upgraded Anaconda and Painter Lake Roads, and the Rapid Lynx Broadband project will be similar to those implemented for the Project. No additional mitigation measures are proposed to further mitigate cumulative effects.

It is expected that the effectiveness of mitigation measures for these activities will be evaluated throughout construction, operations and maintenance, and will be modified or enhanced as necessary through adaptive management.

8.2.2.3 Predicted Cumulative Effects

Measures to minimize the residual effects of direct vegetation loss to vegetation Valued Components will be implemented, but direct losses due to the Project and other reasonably foreseeable developments cannot be avoided. Therefore, there are predicted cumulative residual effects on the availability, distribution, composition and function of vegetation Valued Components because of direct vegetation loss. Climate change might also have negative effects on the availability, distribution, composition and function of vegetation Valued Components. Therefore, potential cumulative effects from vegetation loss are carried forward in the assessment of predicted cumulative effects on vegetation Valued Components**.**

8.2.2.4 Characterization of Predicted Cumulative Effects

8.2.2.4.1 Upland, Wetland and Riparian Ecosystems

The Project and other reasonably foreseeable developments will result in the removal of:

- **3,140 ha** of Upland Ecosystems, representing **3%** of the Upland Ecosystems available within the effects assessment Regional Study Area at existing conditions;
- **3,921.6 ha** of Wetland Ecosystems, representing **1%** of the Wetland Ecosystems available within the effects assessment Regional Study Area at existing conditions; and
- **163.6 ha** of Riparian Ecosystems, representing **1%** of the Riparian Ecosystems available within the effects assessment Regional Study Area at existing conditions.

Although some temporary work areas may be restored or will revegetate naturally, the changes from the Project, the Northern Road Link, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will be mostly permanent as the all-season roads and the right-of-way for the Rapid Lynx Broadband project (i.e., for access and maintenance purposes) will remain disturbed in perpetuity. However, the calculation of loss is a conservative estimate as it assumes the effects in the full footprint area of the Project, and the footprint plus a buffer area for each of the other reasonably foreseeable developments, will be concurrently and permanently affected (i.e., cleared, grubbed, and not restored). However, the true footprint area of each reasonably foreseeable developments is unknown.

As the Project's Preliminary Biodiversity Offset Plan is further developed, it is anticipated that restoration and offsetting measures will contribute to minimizing the long-term residual effects of direct vegetation loss on Upland, Wetland and Riparian Ecosystems. It is anticipated that the Northern Road Link project will implement a Biodiversity Offset Plan similar to the one that will be developed for the Project, and other reasonably foreseeable developments will implement mitigation measures that will limit effects on Upland, Wetland and Riparian Ecosystems.

Changes to Upland, Wetland and Riparian Ecosystems are predicted to be small, but discernible and therefore low in magnitude. Further, Wetland and Riparian Ecosystems are not rare in this landscape and no net loss of function of these ecosystems is anticipated.

The effect of direct vegetation loss resulting from the Project and from other reasonably foreseeable developments on Upland, Wetland and Riparian Ecosystems is considered **negative**, and **permanent** (irreversible) for the majority of the area within the anticipated footprints; however, it is expected that some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**.

Effects from reasonably foreseeable developments are likely less than certain (i.e., probable or possible) due to the uncertainty around if and when the construction and operation of these projects will occur. However, to avoid underestimating the potential significance of effects (i.e., using a precautionary approach), changes in ecosystem availability and distribution from other reasonably foreseeable developments are classified as **certain**. Effects are considered to be **low** in magnitude, **continuous** and confined to the effects assessment Regional Study Area.

Climate change and related effects are uncertain but **probable**, and may have **continuous**, **permanent** effects on the availability, distribution, composition and function of Upland, Wetland and Riparian Ecosystems that occur beyond the regional scale. Effects from changes to the availability of Upland, Wetland and Riparian Ecosystems from loss due to wildfire and other natural disasters (e.g., storms) in the effects assessment Regional Study Area are expected to be **frequent** and **reversible** in the long-term.

8.2.2.4.2 Designated Areas

The Project and other reasonably foreseeable developments will result in the removal of:

- **5.7 ha** of the Albany River Provincial Park, representing **<1%** of the total Provincial Park area, and **<1%** of the Provincial Park that occurs within the effects assessment Regional Study Area; and
- **750.9 ha** of Critical Landform / Vegetation associations, representing **1%** of the Critical Landform / Vegetation associations within the effects assessment Regional Study Area.

Although some temporary work areas may be restored or will revegetate naturally, the changes from the Project, the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will mostly be permanent as the all-season roads and the right-of-way for the Rapid Lynx Broadband project (i.e., for access and maintenance purposes) will remain disturbed in perpetuity. However, the calculation of loss is a conservative estimate as it assumes that area within the full footprint of the Project, and the footprint plus a buffer area for other reasonably foreseeable developments, will be permanently affected (i.e., cleared, grubbed, and not restored) but the footprint of each reasonably foreseeable developments is unknown.

As the Project's Preliminary Biodiversity Offset Plan is further developed, it is anticipated that restoration and offsetting measures will help to minimize the long-term residual effects of direct vegetation loss on Designated Areas. It is anticipated that the Northern Road Link project will implement a Biodiversity Offset Plan similar to the one that will be developed for the Project, and other reasonably foreseeable developments will implement mitigation measures that will limit effects on Designated Areas.

Changes to Designated Areas are predicted to be small, but discernible and therefore low in magnitude.

The effect of direct vegetation loss resulting from the Project and the other reasonably foreseeable development on Designated Areas is considered **negative**, and **permanent** (irreversible) for most of the anticipated footprints; however, it is anticipated that some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. Effects from reasonably foreseeable developments are likely less than certain (i.e., probable or possible) due to the uncertainty in the construction and operation of these projects. However, to avoid underestimating the potential significance of effects (i.e., using the precautionary approach), changes in ecosystem availability and distribution from other reasonably foreseeable developments have been classified as **certain**. Effects are considered to be **low** in magnitude, **continuous** and confined to the effects assessment Regional Study Area.

Climate change and related effects are uncertain but **probable**, and may have **continuous**, **permanent** effects on the availability, distribution, composition and function of Upland, Wetland and Riparian Ecosystems, and therefore Designated Areas, that occur beyond the regional scale. Effects from changes to the availability of Designated Areas from vegetation loss due to wildfire and other natural disasters (e.g., storms) in the effects assessment Regional Study Area are expected to be **frequent** and **reversible** in the long-term.

8.2.2.4.3 Traditional Use Plants

Habitat for Traditional Use Plants is available throughout the effects assessment Local Study Area. Although not mapped, suitable and accessible habitat is likely also available throughout the effects assessment Regional Study Area.

While some temporary work areas may be restored or will revegetate naturally, the changes from the Project, the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will be mostly permanent as the all-season roads and the right-of-way for the Rapid Lynx Broadband project (i.e., for access and maintenance purposes) will remain disturbed in perpetuity. Therefore, the calculation of loss is a conservative estimate that assumes the full footprint area of the Project and the footprint plus a buffer area for each reasonably foreseeable development will be permanently affected (i.e., cleared, grubbed, and not restored). However, the true footprint area of each reasonably foreseeable development is unknown.

As the Project's Preliminary Biodiversity Offset Plan is further developed, it is anticipated that restoration and offsetting measures will help to minimize the long-term residual effects on habitat for Traditional Use Plants as a result of direct vegetation loss. It is anticipated that the Northern Road Link project will implement a Biodiversity Offset Plan similar to the one that will be developed for the Project, and other reasonably foreseeable developments

will implement mitigation measures that will limit effects on habitat for Traditional Use Plants.

Changes to habitat availability for Traditional Use Plants within the effects assessment Local Study Area are predicted to be small, but discernible and likely to have small but discernible effects on the regional populations of Traditional Use Plants given the small anticipated loss of habitat relative to what is available in the remainder of the effects assessment study areas. The magnitude is therefore considered to be **low.**

The effect of direct vegetation loss resulting from the Project and the other reasonably foreseeable developments on habitat for Traditional Use Plants is considered **negative**, and **permanent** (irreversible) for most of the anticipated footprints; however, it is anticipated that some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. Effects from reasonably foreseeable developments are likely less than certain (i.e., probable or possible) due to the uncertainty in the construction and operation of these projects. However, to avoid underestimating the potential significance of effects, changes in ecosystem availability and distribution from other reasonably foreseeable developments were classified as **certain** as a precautionary approach. Effects are considered to be **low** in magnitude, **continuous** and confined to the effects assessment Regional Study Area.

Climate change and related effects are uncertain but **probable**, and may have **continuous**, **permanent** effects on the availability, distribution, composition and function of habitat for Traditional Use Plants beyond the regional scale. Effects from changes to habitat availability for Traditional Use Plants from vegetation loss due to wildfire and other natural disasters (e.g., storms) in the effects assessment Regional Study Area are expected to be **frequent** and **reversible** in the long-term.

8.2.2.4.4 Species at Risk and Species of Conservation Concern

The Project and other reasonably foreseeable developments will result in the removal of:

- **1,820.2** ha of suitable habitat for Black Ash, representing **5%** of the suitable habitat available within the effects assessment Local Study Area at existing conditions; and
- **3,520.9** ha of suitable habitat for Northern Marsh Violet, representing **4%** of the suitable habitat available within the effects assessment Local Study Area at existing conditions.

Although some temporary work areas may be restored or will revegetate naturally, the changes from the Project, the Northern Road Link project, the Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will be mostly permanent as the all-season roads and the right-of-way for the Rapid Lynx Broadband project (i.e., for access and maintenance purposes) will remain disturbed in perpetuity.

Further, the calculation of loss is a conservative estimate in that it assumes the full footprint area of the Project, and footprint plus a buffer area of other reasonably foreseeable developments, will be permanently affected (i.e., cleared, grubbed, and not restored). However, the true footprint area of each reasonably foreseeable developments is unknown.

As the Project's Preliminary Biodiversity Offset Plan is further developed, it is anticipated that restoration and offsetting measures will also serve to reduce or minimize the long-term residual effects on habitat for Black Ash and Northern Marsh Violet because of direct vegetation loss. It is anticipated that the Northern Road Link project will implement a Biodiversity Offset Plan similar to the one that will be developed for the Project, and other reasonably foreseeable developments will implement mitigation measures that will limit effects on habitat for Black Ash and Northern Marsh Violet. As discussed in **Section 0**, since the Project and other reasonably foreseeable developments are at the northern limit of the known range for Black Ash and the only Black Ash observations were in the south portion of the Local Study Area, the affected area represents both current and future suitable Black Ash habitat. Changes to habitat availability for Black Ash within the effects assessment Local Study Area are predicted to be small, but discernible and likely to have small but discernible effects on the regional populations of Black Ash given the limited anticipated loss of current and future habitat relative to what is available in the remainder of the effects assessment study areas. The magnitude is therefore considered to be **low.**

Changes to habitat availability for Northern Marsh Violet within the effects assessment Local Study Area are also predicted to be small but discernible and likely to have small but discernible effects on the regional population of Northern Marsh Violet given the limited anticipated loss of habitat relative to what is available in the remainder of the effects assessment study areas. The magnitude is therefore considered to be **low.**

The effect of direct vegetation loss resulting from the Project and the other reasonably foreseeable developments on habitat for Black Ash and Northern Marsh Violet is considered **negative**, and **permanent** (irreversible) for most of the anticipated footprints; however, it is expected that some temporary work areas will be restored or will revegetate naturally. Where the effects are permanent, the effect of direct vegetation loss is **long-term**. Where reclamation of temporary work areas occurs, and for vegetation community types where restoration is possible, the effect is **medium-term**. Effects from reasonably foreseeable developments are likely less than certain (i.e., probable or possible) due to the uncertainty in the timing of construction and operation of these projects. However, to avoid underestimating the potential significance of effects (i.e., using a precautionary approach), changes in ecosystem availability and distribution from other reasonably foreseeable developments were classified as **certain**. Effects are considered to be **low** in magnitude, **continuous** and confined to the effects assessment Regional Study Area.

Climate change and related effects are uncertain but **probable**, and may have **continuous**, **permanent** effects on habitat availability, distribution, composition and function for Black Ash and Northern Marsh Violet beyond the regional scale. Effects from changes to habitat availability for Black Ash and Northern Marsh Violet from vegetation loss due to wildfire and other natural disasters (e.g., storms) in the effects assessment Regional Study Area are expected to be **frequent** and **reversible** in the long-term.

8.2.3 Changes in Groundwater

8.2.3.1 Potential Cumulative Effects

8.2.3.1.1 All Vegetation Valued Components

The Project, the Northern Road Link project and the Anaconda and Painter Lake Road upgrades may cause alterations to groundwater quality, drainage patterns, recharge rates and increased or decreased groundwater levels due to activities such as road construction through wetlands, changes to topography, short-term water-taking, pit / quarry dewatering and discharge of water.

It is expected that the Northern Road Link and Anaconda and Painter Lake road upgrades would also require development of aggregate pits and quarries to complete their construction. However, no additional pits or quarries are expected to be required where the projects overlap. Therefore, no additional cumulative changes to groundwater quantity due to pit or quarry dewatering in the areas of spatial or temporal overlap between the Project and the Northern Road Link and Anaconda and Painter Lake road upgrades are expected.

It is expected that the road crossings in Wetland Ecosystems (specifically peatlands) for the Project, the Northern Road Link, and the Anaconda and Painter Lake road upgrades would have similar potential to result in residual effects. The road projects would not be expected to cross the same peatland area in more than one location with the possible exception of the junction between the Project and the Northern Road Link. Therefore, no additional cumulative changes to groundwater quantity due to road construction in peatland areas in the areas of spatial or temporal overlap between the Project and the Northern Road Link and Anaconda and Painter Lake road upgrades are expected. A more detailed discussion of potential effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

Because the Rapid Lynx Broadband project is anticipated to be buried approximately 1 m underground and underneath waterbodies, only temporary and minimal changes in groundwater are expected during construction. Any groundwater effects would be expected to be local and short-term and would not be expected to overlap temporally with the Project.

A further discussion on cumulative effects on groundwater quality and quantity is provided in the *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP 2026c).

As discussed in **Section 7.3.1.4**, changes to groundwater can cause changes to soils and vegetation health / composition thereby changing the composition and function of retained Upland, Wetland and Riparian Ecosystems. If changes to groundwater regimes are sufficient to change the composition of a vegetation community, then the availability, distribution, composition, and function of that altered vegetation community type will also eventually be affected within the effects assessment Regional Study Area. These indirect effects on retained vegetation communities are difficult to quantify as they largely depend on the effectiveness of the mitigation measures that are implemented.

A groundwater monitoring and water budget study will be developed and implemented during detailed design to determine groundwater flow and influence on Wetland Ecosystems. The additional information obtained from these studies will further inform the assessment of the potential Project impacts on Wetland Ecosystems and the associated mitigation recommendations that will be confirmed and refined at detailed design. The effectiveness of mitigation measures will also be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

8.2.3.2 Mitigation Measures

It is anticipated that the mitigation measures that will be implemented to minimize changes to groundwater during the construction of the Northern Road Link, the upgraded Anaconda and Painter Lake Roads, and the Rapid Lynx Broadband project will be similar to those implemented for the Project. No additional mitigation measures are proposed to further mitigate cumulative effects.

As a best practice, it is suggested that the monitoring programs of the Project and any reasonably foreseeable developments share relevant monitoring data for areas where predicted effects may overlap.

8.2.3.3 Predicted Cumulative Effects

Due to the predicted similar aggregate requirements and residual effects of the Project and the Northern Road Link and Anaconda and Painter Lake road upgrades it is not expected that there would be any additional pit or quarry development and dewatering in the areas where the projects overlap.

Due to the limited spatial and temporal overlaps of the Project and reasonably foreseeable developments, it is not generally expected that there would be any additional cumulative effects due to road construction in peatland areas. There may be potential for additional cumulative effects beyond the predicted residual effects levels in the area where the Project and the Northern Road Link would meet if they both cross the same peatland area.

A more detailed discussion of potential effects on peatlands is provided in the *Peatlands Existing Conditions and Effects Assessment Report* (WSP & AECOM, 2026).

8.2.3.4 Characterization of Predicted Cumulative Effects

The Project and other reasonably foreseeable developments may cause alterations to groundwater quality, drainage patterns and increase or decrease groundwater levels, thereby affecting associated vegetation communities. However, with the effective implementation of the mitigation measures and the use of best management practices, it is anticipated that cumulative residual effects on vegetation Valued Components from changes to groundwater will be minimized and will be regulated through permitting.

Changes to vegetation Valued Components resulting from changes in groundwater that may alter groundwater quality, drainage patterns and increase or decrease groundwater levels from the Project and from other reasonably foreseeable developments are expected to be **negative** in direction, **medium** in magnitude, **regional** in geographic extent, **long-term**, **continuous**, **irreversible**, and **probable** to occur.

8.2.4 Fragmentation and Edge Effects

8.2.4.1 Potential Cumulative Effects

8.2.4.1.1 All Vegetation Valued Components

The Project and the Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will result in additional direct vegetation loss (**Section 8.2.2**). All of these projects will create new linear corridors for at least some portion of their alignments, and therefore introduce new fragmentation and edge effects on the landscape. As described in **Section 7.3.1.6**, edge effects influence the composition and function of the retained vegetation communities resulting in secondary effects (e.g., altering habitat use by certain wildlife species).

The Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will introduce additional fragmentation and edge effects primarily in the south and some northern portions of the effects assessment Regional Study Area. These are represented in the cumulative effects assessment as an additional 2,555.9 ha layered on the existing disturbance regime within the effects assessment Regional Study Area (i.e., 30,365.1 ha of natural disturbance and 540.4 ha of anthropogenic disturbances) and the Project Effects Assessment Construction Disturbance Area footprint (i.e., 4,700.2 ha). The proportion of new fragmentation attributed to the Northern Road Link project is expected to be greater because it will be a new disturbance on the landscape. However, it is possible that the Anaconda and Painter Lake Road upgrades may also require realignment of a portion of the road which would also represent a new disturbance that is more extensive than if works were limited to upgrades along the existing footprint. It should also be noted that the majority of the Rapid Lynx Broadband

project footprint follows an existing winter road, which is an existing linear disturbance on the landscape. Furthermore, that project involves a buried fibre-optic cable; therefore, ongoing surface-level disturbances will be limited (relative to a maintained road surface), which is expected to cause less disruption to functional landscape connectivity.

As discussed in **Section 7.3.1.6**, edge effects in the boreal landscape are less influential than those in tropical and temperate forests because boreal forests typically have a short canopy height, more widely spaced trees, natural vegetation community heterogeneity and are adapted to large-scale natural disturbances. Nevertheless, cumulative edge effects are assumed to have an impact on vegetation community composition and function where they occur. Details regarding effects on wildlife habitat function are found in the *Birds Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026a), *Ungulates Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026f), and *Wildlife Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP, 2026g).

8.2.4.2 Mitigation Measures

It is anticipated that mitigation measures that will be implemented to minimize effects from fragmentation and edge effects associated with linear disturbances on retained vegetation communities during the construction of the Northern Road Link, upgraded Anaconda and Painter Lake Roads, and the Rapid Lynx Broadband project will be similar to those implemented for the Project. No additional mitigation measures are proposed to further mitigate cumulative effects.

It is expected that the effectiveness of mitigation measures for these activities will be evaluated throughout construction, and operations, and will be modified or enhanced as necessary through adaptive management.

8.2.4.3 Predicted Cumulative Effects

Measures to minimize the effects of fragmentation and edge effects on vegetation Valued Components will be implemented, but these effects cannot be fully avoided by the construction of the Project and other reasonably foreseeable developments. Therefore, there are predicted to be cumulative residual effects on the availability, distribution, composition and function of vegetation Valued Components because of fragmentation and edge effects. These effects are carried forward in the assessment of predicted cumulative effects on vegetation Valued Components**.**

Climate change may have additional negative effects on the availability, distribution, composition and function of vegetation Valued Components, although these effects are expected to occur even in the absence of further fragmentation and edge effects.

8.2.4.4 Characterization of Predicted Cumulative Effects

Secondary effects on retained vegetation communities, particularly forested communities, may occur following vegetation clearing during construction of the Project and other reasonably foreseeable developments. These include changes to community composition and function because of sunscald, desiccation, and windthrow. After implementation of mitigation, edge effects are predicted to be **probable**, **reversible** in the medium-term, **frequent**, and limited to the effects assessment Regional Study Area. These edge effects are anticipated to be **negative**, but **negligible** in magnitude, particularly given that boreal forests are generally adapted to large-scale natural disturbances (Harper et al., 2015) and are less influenced by fragmentation and edge effects than temperate and tropical forests (Franklin et al., 2021).

8.2.5 Fugitive Dust Emissions

8.2.5.1 Potential Cumulative Effects

8.2.5.1.1 All Vegetation Valued Components

The Project and the Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project are predicted to result in fugitive dust emissions. Fugitive dust emissions from construction of these activities, such as land clearing, blasting, and infrastructure implementation, and traffic on the all-season and access roads (e.g., Community Access Road, Northern Road Link, and the Anaconda and Painter Lake Road upgrades) are anticipated. Effects from fugitive dust emissions from other reasonably foreseeable developments will begin during Construction of the Project and continue through the Operation and Maintenance Phase of the Project.

As described in **Section 7.3.1.10**, dust accumulation may locally and directly impact vegetation by smothering plant tissues, hindering gas exchange, and reducing photosynthesis by blocking sunlight (Hirano et al., 1995; Prajapati, 2012). Dust often contains metals or pollutants, which can leach into the soil, causing toxicity or nutrient imbalances in plants. This can also degrade plant health and alter plant species composition, structure, and biomass in affected areas.

Air quality modelling as described in the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* (Dillon, 2026a), predicted that the Project will result in threshold exceedances for emissions of total suspended particulates, particulate matter less than 2.5 µm and particulate matter less than 10 µm, in the absence of mitigation. During construction, these threshold exceedances are predicted to be reached at less than 300 m from the emission source. During operations and maintenance, threshold exceedances are predicted to be reached between 115 m and up to 3,004 m from the road. It is assumed that the construction and

operations of the Northern Road Link and Anaconda and Painter Lake Road upgrades will produce similar levels of dust and metal deposition as estimated for the Project.

In the absence of mitigation, measurable changes to the availability, distribution, function, and composition of vegetation Valued Components may occur from increased fugitive dust emissions associated with the Project and the Northern Road Link project, Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project within the effects assessment Regional Study Area.

8.2.5.2 Mitigation Measures

It is anticipated that mitigation measures that will be implemented to minimize effects from fugitive dust emissions on retained vegetation communities during the construction of the Northern Road Link project, the upgraded Anaconda and Painter Lake Road upgrades, and the Rapid Lynx Broadband project will be similar to those implemented for the Project. This also applies to operations and maintenance of the Northern Road Link project and the Anaconda and Painter Lake Road upgrades. Specifically, it is expected that these activities will implement mitigations following best industry practices and that adhering to relevant government threshold values for deposition of acidifying compounds on specific plant species, as will be carried out for the Project (refer to the *Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report* [Dillon, 2026a]). No additional mitigation measures are proposed to further mitigate cumulative effects.

It is expected that the effectiveness of mitigation measures for these activities, including the Project, will be evaluated throughout Construction and Operation and Maintenance, and will be modified or enhanced as necessary through adaptive management.

8.2.5.3 Predicted Cumulative Effects

After mitigation, the Project and reasonably foreseeable activities are expected to result in an increased residual effect from fugitive dust emissions on the conditions of vegetation Valued Components during the Construction and the Operation and Maintenance Phases relative to existing conditions. Therefore, potential cumulative effects from fugitive dust emissions are carried forward in the assessment of predicted cumulative effects on vegetation Valued Components**.**

8.2.5.4 Characterization of Predicted Cumulative Effects

The Project and other reasonably foreseeable developments are expected to increase fugitive dust emissions. Although mitigations will be implemented to reduce dust emissions, dust deposition during the Construction and the Operation and Maintenance Phases is predicted to degrade vegetation immediately adjacent to each project. Effects from dust emissions are predicted to be **certain, permanent** (irreversible), **continuous**, and confined to the effects assessment Regional Study Area. Effects from dust emissions

on the vegetation Valued Components in the effects assessment Regional Study Area are anticipated to be **negative** but **negligible** in magnitude as they will impact only a relatively small area of vegetation.

8.2.6 Assessment of Significance

The Project and other reasonably foreseeable developments would contribute to negative changes in the availability, distribution, composition and function of vegetation Valued Components. These changes are predicted to be either negligible, low or medium in magnitude and within the resilience limits and adaptive capacity of the existing Upland, Wetland and Riparian Ecosystems, Designated Areas, Traditional Use Plant populations, and Species at Risk and Species of Conservation Concern populations.

Relative to existing conditions, most vegetation Valued Components are expected to remain abundant, intact, and well distributed across the effects assessment Regional Study Area. The contribution of the Project and other reasonably foreseeable developments to cumulative residual effects on vegetation Valued Components in the Effects Assessment Regional Study Area is not expected to change the self sustaining and ecologically effective status of most vegetation Valued Components. Consequently, cumulative residual effects on most vegetation Valued Components are predicted to be **not significant**. The exception to this result is for Wetland Ecosystems, and specifically peatland ecosystems that comprise a large component of Wetland Ecosystems. The cumulative residual effects to Wetland Ecosystems resulting from changes to groundwater are dependant on the success of the proposed mitigations, including the implementation of the “floating road” construction technique for crossing peatland ecosystems. While it is predicted that the contribution of the Project and other reasonably foreseeable developments to cumulative residual effects on Wetland Ecosystems in the effects assessment Regional Study Area are not expected to change the self-sustaining and ecologically effective status of Wetland Ecosystems, there is still a high level of uncertainty surrounding the Projects cumulative residual effect on Wetland Ecosystems. As a result, a precautionary approach has been applied and cumulative residual effects on Wetland Ecosystems are predicted to be **significant**.

The effects related to climate change are uncertain, but probable to occur and may alter the processes that influence the availability and distribution of vegetation Valued Components. Effects of climate change would likely occur beyond the effects assessment Regional Study Area. However, climate change is not expected to significantly influence the availability and distribution of vegetation Valued Components relative to existing conditions and does not alter the assessment of no significant cumulative residual effects from the Project and other reasonably foreseeable developments as these effects are expected to occur regardless of whether the Project and other reasonably foreseeable projects are constructed.

8.2.7 Prediction Confidence and Uncertainty

Within a cumulative effects assessment, there is inherently a level of uncertainty due to the lack of information available regarding other potential projects, including reasonably foreseeable developments. Primary factors affecting confidence in the predictions made in the Vegetation assessment include:

- Availability and accuracy of existing conditions data (e.g., accuracy of vegetation mapping);
- Level of understanding of existing vegetation conditions, range of natural variation, and the resilience of vegetation Valued Components to disturbance;
- Understanding of project-related effects on complex ecosystems that contain interactions across different scales of time and space (e.g., exactly how the Project and other reasonably foreseeable developments would influence vegetation Valued Components);
- Level of certainty associated with the effectiveness of proposed mitigations, where applicable; and
- Level of understanding of the cumulative drivers of change in measurement indicators.

It is anticipated that the existing conditions data are sufficient for understanding existing conditions and future changes not related to the Project, and Project-related effects are mostly understood. There is a good understanding of effects on vegetation related to permanent roads, road upgrades, and fibre-optic cable installation projects. Similarly, the mitigation measures and best management practices for these types of projects are standard and have been routinely and effectively implemented across Canada. One notable exception is the “floating road” construction methodology and the uncertainty regarding the effectiveness of this method in relation to groundwater movement. This type of road design is relatively novel with only one known recent example in northern Manitoba. While the project in northern Manitoba indicates promising results approximately ten years post-construction, long term effectiveness of this design is unknown. This has resulted in low confidence in the predictions made about its ability to maintain groundwater flow and in turn groundwater quality on either side of the road within peatland ecosystems. This is coupled with the lack of available data specific to peatland hydrogeology and water balance also have resulted in low confidence in the predictions within this residual effect pathway at this time. For all other vegetation Valued Components, there is moderate confidence in the predicted cumulative effects resulting from changes to groundwater.

However, there is uncertainty regarding the design, permanent footprints, and activities associated with the other reasonably foreseeable developments. Similarly, the magnitude of effects related to climate change are uncertain.

When considering the predictions on the effects of the Project and other reasonably foreseeable developments on vegetation Valued Components, sources of uncertainty were reduced by:

- Rolling-up the vegetation mapping from ecosites to vegetation community groupings for ecosystem-level indicators where possible (i.e., uplands and wetlands) and completing the cumulative effects assessment on these groupings;
- Completing quality assurance and quality control of existing conditions data; and
- Comparing assessment results to relevant published scientific literature.

In addition to the measures listed above, conservative assumptions were implemented that overestimate potential direct vegetation loss and fragmentation to increase confidence that the effects were not underestimated. Vegetation loss was assumed to occur over the entire footprint of the Project and other reasonably foreseeable developments even though some temporary work areas are anticipated to be restored or vegetated in accordance with Rehabilitation Plans. Vegetation loss was also overestimated by assuming larger than expected footprints for developments. For example, a 100 m buffer was applied to all-season roads and utility lines to account for impacts on each side of the line. However, the actual footprints are anticipated to be narrower.

Overall, confidence levels for the cumulative effects assessment are **moderate** because there were existing conditions data for the effects assessment Local and Regional Study Areas, the Project-related effects are mostly understood, the level of certainty associated with the effectiveness of proposed mitigations is moderate to high, and conservative assumptions have been applied.

8.2.8 Summary

The characterization of predicted cumulative effects for vegetation Valued Components is provided in **Table 8-13**.

Table 8-13: Characterization of Predicted Cumulative Effects for Vegetation Valued Components

Valued Component	Predicted Cumulative Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty
Upland Ecosystems	Changes to ecosystem availability, distribution, composition and function as a result of **direct vegetation loss**	Construction	Upland ecosystems represent approximately 28% of the effects assessment Regional Study Area	Negative	**Low** 3,140 ha or 2% of the Upland Ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Moderate
Wetland Ecosystems			Wetland ecosystems represent approximately 66% of the effects assessment regional study area	Negative	**Low** 3,921.6 ha or 1% of the Wetland Ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Moderate
Riparian Ecosystems			Riparian ecosystems represent approximately 4% of the effects assessment Local and Regional Study Areas	Negative	**Low** 163.6 ha or 1% of the Riparian Ecosystems within the effects assessment Regional Study Area will be directly affected. Loss of functional area might reduce the ability of remaining areas to carry out ecosystem functions.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Moderate
Designated Areas			Three Provincial Parks are located within the effects assessment Regional Study Area, but only one Provincial Parks will be directly affected by the Project. Critical Landform / Vegetation Associations aim to protect a representative example of Ontario's biodiversity. Loss of	Negative	**Low** 5.7 ha or <1% of Albany River Provincial Park within the effects assessment Regional Study Area will be directly affected. 750.9 ha or 1% of the Critical Landform / Vegetation Associations that occur within the effects assessment Regional Study Area will be directly affected.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Low (reasonably foreseeable developments) Moderate (climate change)

Valued Component	Predicted Cumulative Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty
			these protected areas reduces their contribution to biodiversity protection.								
Traditional Use Plants	Changes to population availability, distribution, composition and function as a result of **direct vegetation loss**	Construction	Traditional Use Plants are of importance to Indigenous communities and are generally well distributed across the landscape.	Negative	**Low** 5,599.8 ha or 5% of habitat for Traditional Use Plant species within the effects assessment Local Study Area will be directly affected. However, this includes habitats with a score of 0 that may be unsuitable for Traditional Use Plant species and / or inaccessible. Small changes to regional populations.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Moderate
Species at Risk and Species of Conservation Concern			Only Species at Risk plant (Black Ash) is known to be present in the effects assessment Local Study Area. One Species of Conservation Concern plant (Northern Marsh Violet) has good potential to occur within the effects assessment Local Study Area	Negative	**Low** 1,820.2 ha or 5% of the suitable habitat for Black Ash in the effects assessment Local Study Area will be directly affected. Small changes are expected to regional populations. 3,520.9 ha or 4% of the suitable habitat for northern Marsh Violet within the effects assessment Local Study Area will be directly affected. Small changes to regional populations are expected.	**Regional** (reasonably foreseeable developments) **Beyond regional** (due to climate change)	**Long-term** and **Irreversible** (for permanent impacts) **Medium-term** and **Reversible** (for temporary impacts where vegetation communities can and will be restored)	Continuous	**Certain** (reasonably foreseeable developments) **Probable** (climate change)	Not significant	Moderate
Wetland Ecosystems	Changes to Wetland Ecosystem availability, distribution, composition and function as a result of **changes in groundwater**	Construction, Operations and Maintenance	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways. However, there is uncertainty about the effectiveness of the “floating road” construction methodology.	Negative	**Medium** Measurable changes to groundwater quality and quantity possible that result in changes to ecosystem changes to the availability, distribution, composition, and function of Wetland Ecosystems in the effects assessment Regional Study Area	Regional	Long-term and Irreversible	Continuous	Probable	Significant	High

Valued Component	Predicted Cumulative Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty
All Vegetation Valued Components (except Wetland Ecosystems)	Changes to ecosystem or population availability, distribution, composition and function as a result of **changes in groundwater**	Construction	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways.	Negative	**Medium** Measurable changes to groundwater quality and quantity possible that result in changes to ecosystem and population changes to the availability, distribution, composition, and function of vegetation Valued Components in the effects assessment Regional Study Area	Regional	Long-term and Irreversible	Continuous	Probable	Not significant	Moderate
All Vegetation Valued Components (except Wetland Ecosystems)	Changes to ecosystem or population availability, distribution, composition and function as a result of **changes in groundwater**	Operation and Maintenance	Mitigations to limit changes to groundwater are well understood and the methods have been demonstrated to be effective for the majority of effect pathways.	Negative	**Medium** Measurable changes to groundwater quality and quantity possible that result in changes to ecosystem and population changes to the availability, distribution, composition, and function of vegetation Valued Components in the effects assessment Regional Study Area	Regional	Long-term and Irreversible	Continuous	Probable	Not significant	Moderate
All Vegetation Valued Components	Changes to ecosystem or population availability, distribution, composition and function as a result of **fragmentation and edge effects**	Construction	The existing landscape is largely intact, however there are natural disturbances (e.g., fire) that have influenced the landscape as well as some small areas of anthropogenic disturbances. New anthropogenic disturbances will be introduced that will cause fragmentation and edge effects.	Negative	**Negligible** changes to the availability, distribution, composition, and function of vegetation Valued Components in the effects assessment Local and Regional Study Areas	Beyond regional (due to climate change)	Medium-term and Irreversible	Frequent	Probable	Not significant	Moderate
All Vegetation Valued Components	Changes to ecosystem or population availability, distribution, composition and function as a result of **fugitive dust emissions**	Construction	Construction of the Project are expected to produce fugitive dust emissions.	Negative	**Negligible** changes to the availability, distribution, composition, and function of vegetation Valued Components in the effects assessment Local and Regional Study Areas	Regional	Long-term and Irreversible	Continuous	Certain	Not significant	Moderate

Valued Component	Predicted Cumulative Effect	Phase	Context	Direction	Magnitude	Geographic Extent	Duration / Reversibility	Frequency	Likelihood of Occurrence	Significance	Uncertainty
All Vegetation Valued Components	Changes to ecosystem or population availability, distribution, composition and function as a result of **fugitive dust emissions**	Operation and Maintenance	Operation and maintenance of the Project are expected to produce fugitive dust emissions.	Negative	**Negligible** changes to the availability, distribution, composition, and function of vegetation Valued Components in the effects assessment Local and Regional Study Areas	Regional	Long-term and Irreversible	Continuous	Certain	Not significant	Moderate

ha = hectare; % = percent; < = less than.

9. Monitoring Programs and Future Commitments

A monitoring program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. Monitoring programs also include future commitments related to mitigating residual effects and addressing uncertainty. A Project-specific Environmental Monitoring Program will be developed and implemented that includes the monitoring commitments related to vegetation Valued Components presented in this section.

9.1 Pre-Construction Monitoring Program

During detailed design, the following tasks will be undertaken to minimize effects on vegetation Valued Components:

- Refine vegetation community mapping and field-verify the locations of sensitive or difficult to restore vegetation communities (e.g., organic wetlands) to inform the micro-siting of temporary access roads, staging areas, camps, debris and / or timber stockpiles, as well as the centreline of the Community Access Road within the 100 m cleared right-of-way;
- Collaborate with the design team during the micro-siting of temporary access roads, staging areas, camps, and debris and / or timber stockpiles to minimize effects on known Traditional Use Plant harvesting areas, where possible;
- Reassess the status of Black Ash protection. If Schedule 1 of *Ontario Regulation 6/24* has been updated to include the Construction Disturbance Area, a search for Black Ash trees shall be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment and Climate Change Canada) shall be consulted on next steps; and
- Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on vegetation communities within the radius of influence for dewatering programs.

In addition, the following pre-construction monitoring programs and additional studies will be developed and initiated:

- A peatlands groundwater monitoring and water budget study will be developed and implemented during detailed design to determine groundwater flow and influence on peatland ecosystems (a component of Wetland Ecosystems). This will further inform

the assessment of the potential Project impacts on Wetland Ecosystems and the associated mitigation recommendations that will be confirmed and refined at detailed design.

- Airborne Electromagnetic (AEM) Surveying to produce continuous peat depth mapping which is critical for construction planning such as identifying saturated or sensitive areas that may require specialized engineering solutions.
- A program designed to monitor groundwater on both sides of the Community Access Road and in areas of dewatering programs to establish pre-construction groundwater levels, as well as monitor groundwater levels during and post construction. This program will include pre-construction, during-construction and post-construction components.
- Locations of groundwater monitoring instruments (e.g., piezometers), will be also determined in consultation with vegetation ecologists and Indigenous communities so that effects on vegetation Valued Components are considered when determining their placement.
- Any programs as identified in the *Peatlands Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP & AECOM, 2026).

9.2 Construction Monitoring Program

During construction, the following monitoring programs will be required. These programs will be further developed during the preparation of the Environmental Protection Plan in consultation with Indigenous communities:

- An invasive species monitoring program designed to prevent, detect, and control (i.e., remove) invasive species and monitor areas where invasive species were removed;
- A program designed to monitor any rare plant, or species at risk protection measures that have been implemented (e.g., check for damage or failure of protection fencing and make repairs);
- A program designed to monitor groundwater on both sides of the Community Access Road to determine whether water flow beneath the road is being maintained throughout construction will be carried out where the “floating road” construction method is used through peatland communities. Additional details are provided in the *Peatlands Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP & AECOM, 2026);
- A program to monitor vegetation community response to any potential changes in hydrology or hydrogeology throughout construction (e.g., in the vicinity of dewatering activities and either side of “floating road” segments); and

- A program to monitor whether erosion and sedimentation control measures are functioning as intended and to direct repair and adaptive management measures, where required.

9.3 Operations Monitoring Program

During operations, the following monitoring programs will be required. These programs will be further detailed during subsequent Project phases, in consultation with Indigenous communities:

- A program designed to monitor and manage rehabilitated and restored vegetation communities as well as any wetland offset areas. Details regarding the number of monitoring locations, level of effort and length of the monitoring period will be determined in subsequent project phases;
- A program designed to monitor installed groundwater wells to confirm water flow beneath the road is being maintained. The number of monitoring locations, their placement and the length of the monitoring period will be determined in subsequent project phases; and
- A program designed to monitor vegetation community responses to any potential changes in hydrology or hydrogeology. Details regarding the number of monitoring locations and the length of the monitoring period will be determined in subsequent project phases.

9.4 Future Commitments

All mitigation measures outlined in **Section 7.0** will be adhered to. Mitigation measures are summarized in **Table 7-15**. The effectiveness of mitigation measures will be evaluated during construction and operations and will be modified or enhanced as necessary through adaptive management.

Additional consultation with Ontario Parks will be completed at the detailed design stage to determine permitting, mitigation and / or compensation or offsetting expectations for direct impacts to the Albany River Provincial Park and impacts to Critical Landform / Vegetation Associations.

A Preliminary Biodiversity Offset Plan has been developed and will be implemented for the Project to provide a net positive increase in wetland habitat (*Appendix AB – Preliminary Biodiversity Offset Plan*). The specific approach will be determined through consultation with Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, but will generally follow a hierarchy of restoration, reclamation and offset alternatives (e.g., financial compensation directed towards wetland research or inventory work to fill existing information gaps). The Preliminary Biodiversity Offset Plan will focus activities within the same Ecoregions as the Project (i.e., Ecoregions 2W and 2E), to the extent feasible,

followed by opportunities available in adjacent Ecoregions (e.g., Ecoregions 1E, 3W, and 3E) or other Ecoregions where Wetland Ecosystems are rare (e.g., Ecoregion 6E or 7E) and offset activities may provide a larger overall benefit.

In addition, a Vegetation Restoration Plan will be developed at detailed design. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols. The seeding and / or planting of Traditional Use Plants will be included in the Vegetation Restoration Plan.

Table 9-1: Summary of Future Commitments

Valued Component	Commitment	Phase or Period	Section Reference
Upland, Wetland and Riparian Ecosystems	Refine vegetation community mapping and field-verify the locations of sensitive or difficult to restore vegetation communities (e.g., organic wetlands) to inform the micro-siting of temporary access roads, staging areas, camps, debris and / or timber stockpiles, as well as the centreline of the Community Access Road within the 100 m cleared right-of-way.	Detailed Design	**Section 7.3.1.1.2**
Traditional Use Plants	Collaborate with the design team during the micro-siting of temporary access roads, staging areas, camps, and debris and / or timber stockpiles to minimize effects on known Traditional Use Plant harvesting areas, where possible.	Detailed Design	**Section 7.3.1.1.2**
Species at Risk	Reassess the status of Black Ash protection and determine the scope for additional surveys to search for Black Ash trees in consultation with regulatory agencies. Prepare and implement a Vegetation Management Plan at detailed design that contains measures to protect rare plants, including protocols specific to Black Ash (e.g., commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented.	Detailed Design	**Section 7.3.1.1.2**
Upland, Wetland and Riparian Ecosystems	Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on vegetation communities within the	Detailed Design	**Section 7.3.1.4.2**

Valued Component	Commitment	Phase or Period	Section Reference
	radius of influence for dewatering programs.		
Wetland Ecosystems	Implement a program designed to monitor groundwater on both sides of the Community Access Road and in areas of dewatering programs to establish pre-construction groundwater levels, as well as monitor groundwater levels during and post construction. Implement any programs as identified in the *Peatlands Technical Support Document: Existing Conditions & Effects Assessment Report* (WSP & AECOM, 2026).	Detailed Design, Construction and Operations and Maintenance	**Section 7.3.1.4.2**
All Vegetation Valued Components	Prepare a Vegetation Restoration Plan This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols. Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.	Detailed Design	**Section 7.3.1.1.2**

m = metre.

9.5 Future Permits and Approvals

To facilitate the construction of the Community Access Road, including construction activities and temporary infrastructure, permits and approvals from provincial, federal government and other jurisdictional agencies will need to be acquired. A preliminary list of permits and approvals anticipated to be applicable or potentially applicable to the Project for vegetation are detailed in **Table 9-2**. This list is based on a conceptual level of design, and the final determination of permits and approvals that will be required will occur as the design has progressed further.

Table 9-2: Summary of Potential Permits and Approvals List

Permit / Approval	Issuing Authority	Purpose / Scope	Considerations / Next Steps
Authorization under the *Endangered Species Act, 2007*	Ministry of the Environment, Conservation, and Parks	If the Project affects a plant species that is listed on the Species at Risk in Ontario List as an extirpated, endangered, or threatened species	To be confirmed at detailed design
Permit Under the *Species at Risk Act, 2002*	Environment and Climate Change Canada	If the Project activities will destroy or remove a plant Species at Risk listed under the *Species at Risk Act 2002* or its habitat	To be confirmed at detailed design
Works Permits; Land Use Occupational Authority; Letter of Authorization; *Lakes and Rivers Improvement Act, 2019*	Ministry of Natural Resources	Consult with Ontario Parks at detailed design to determine permitting, mitigation and /or compensation / offsetting expectations for direct impacts to Provincial Parks.	To be confirmed at detailed design, in consultation with Ontario Parks

The pits and quarries that are proposed through the Community Access Road Project will be subject to permitting requirements outlined within the *Aggregate Resources Act* and its regulations. For a permit to be issued, additional studies, mitigation plans, consultation and monitoring commitments may be required. In addition to permitting requirements under the *Aggregate Resources Act*, permitting and approvals under other pieces of legislation may also be required for pit and quarry development, including:

- Ontario *Planning Act*;
- Ontario *Water Resources Act*;
- Ontario *Environmental Protection Act*;
- Ontario *Endangered Species Act*; and
- Federal *Species at Risk Act.*

10. Summary and Recommendations

The potential effects summary and recommendations for vegetation Valued Components is provided in **Table 10-1.** Through the permitting stage of the Project, a Project-specific Environmental Protection Plan and Environmental Monitoring Plan will be developed and implemented that includes an implementation plan for the mitigation and monitoring commitments related to vegetation Valued Components that are presented in **Table 10-1.**

Mitigation, Protection, Monitoring, and Study Commitments described **Table 10-1** are assumed to be applicable to the detailed design and Construction, Operation and Maintenance Phases of reasonably foreseeable developments included in the Cumulative Effects Assessment (**Section 8**).

Table 10-1: Potential Effects Summary and Recommendations

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
V-01	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of direct vegetation loss	Construction	Ministry of the Environment, Conservation and Parks Ministry of Natural Resources Environment and Climate Change Canada	■ Refine vegetation community mapping and field-verify the locations of sensitive or difficult to restore vegetation communities (e.g., organic wetlands) to inform the micro-siting Project footprint. ■ Reassess the status of Black Ash protection during future study phases. If Schedule 1 of *Ontario Regulation 6/24* has been updated to include the area of the Project, a search for Black Ash trees shall be completed at the Ogoki River crossing. Other suitable habitat in the south portion of the Construction Disturbance Area may also need to be searched. The scope of this additional assessment will be determined in consultation with regulatory agencies. If Black Ash trees are anticipated to be affected by the Project, regulatory agencies (Ministry of the Environment, Conservation and Parks, Environment Canada and Climate Change) shall be consulted on next steps. ■ Consult with Ontario Parks at detailed design to determine permitting, mitigation and / or compensation / offsetting expectations for direct impacts to the Albany River Provincial Park. ■ Consult with Ontario Parks at detailed design to determine permitting, mitigation and / or compensation / offsetting expectations for impacts to Critical Landform / Vegetation Associations. ■ Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles away from known Traditional Use Plant harvesting areas, where possible. ■ Complete an assessment of pit / quarry locations to identify potential effects due to changes in hydrogeology / hydrology on vegetation communities within the radius of influence for dewatering programs. ■ Develop and implement a Project-specific Environmental Protection Plan. ■ Prepare and implement a Vegetation Management Plan at detailed design that contains measures to protect rare plants, including protocols specific to Black Ash (e.g., commitments to Emerald Ash Borer prevention measures and long-term surveillance). In the event a rare plant species is encountered unexpectedly, or cannot be avoided, the rare plant protection measures outlined in the Vegetation Management Plan will be implemented. ■ Prepare and implement a Vegetation Restoration Plan;. This plan will be developed through engagement and consultation with Indigenous communities and integration of local Indigenous Knowledge and stewardship protocols. Include the seeding and / or planting of Traditional Use Plants in the Vegetation Restoration Plan.	■ Prepare a program designed to monitor any rare plant, or species at risk protection measures that have been implemented (e.g., check for damage or failure of protection fencing and make repairs). ■ Perform clearing and construction activities in winter months where feasible. ■ Limit vegetation clearing to within the 100 m right-of-way and reduce to less than this width to the extent possible. Specifically, ○ Minimize clearing widths in more sensitive ecosystems (e.g., riparian ecosystems) and more difficult to restore vegetation community groups (e.g., fen and bog) to the extent possible. ○ Adjust the alignment or clear off centre within the right-of-way where warranted, to minimize effects on more sensitive or difficult to restore vegetation communities. These details will be refined during detailed design, prior to construction. ○ Limit clearing of riparian vegetation (i.e., within 30 m of waterbodies) to the extent possible and to the requirement of the access road and alignment clearing width only. ○ Locate temporary access roads, staging areas, camps, and debris and / or timber stockpiles in less sensitive ecosystems (e.g., upland ecosystems), where possible. Avoid peatland communities for temporary features wherever feasible. ■ Have Environmental Monitors and Indigenous Environmental Monitors on-site during construction to confirm that all mitigation measures are being implemented appropriately. Details regarding Environmental Monitors and their role during the project will be determined through the development of the Environmental Protection Plan. ■ Upon completion of construction, sand and gravel pits, including temporary access roads leading to the pits will be rehabilitated (progressive and final rehabilitation) and surrendered in accordance with the *Aggregate Resource Act*, which will include backfilling, levelling, recompacting, and redistributing organic materials to encourage natural revegetation. Temporary access roads leading to temporary quarry areas will also be decommissioned. Temporary quarries not required for maintenance activities will be vegetated in accordance with the Rehabilitation Plan. Quarries maintained for operations will be blocked to discourage public use but facilitate access for ongoing road maintenance. The number of quarries required for maintenance will be determined during the detailed design phase.

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
V-02	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of direct vegetation loss	Operation and Maintenance	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Environment and Climate Change Canada	■ Prepare and implement a Vegetation Management Plan to keep vegetation from interfering with the safe and reliable operation and maintenance of the road.	■ Avoid re-entry and disturbance of restored temporary access areas post-construction. ■ Implement a program designed to monitor and manage rehabilitated and restored vegetation communities as well as any wetland offset areas. Details regarding the number of monitoring locations, level of effort and length of the monitoring period will be determined in subsequent Project phases.
V-03	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of changes to hydrology	Construction, Operation and Maintenance	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Fisheries and Oceans Canada	■ Design and implement a pre-, during and post-construction monitoring program that assesses surface movement and helps to ensure that pre-construction conditions are maintained to the extent feasible (**Section 9**).	■ Mitigation measures as outlined in the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026e). ■ Design and implement a program to monitor vegetation community response to any potential changes in hydrology throughout construction (e.g., in the vicinity of dewatering activities). ■ Implement adaptive management measures if drainage patterns are determined to be significantly altered. Adaptive management measures will be determined through the development of the Environmental Protection Plan.
V-04	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of changes to groundwater	Construction, Operation and Maintenance	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Fisheries and Oceans Canada	■ Construct the Community Access Road through peatland communities using a “floating road” construction methodology to allow for groundwater movement below and through the road embankment. This approach will involve: ○ Completion of a detailed ground survey, characterizing the peat and local hydrology at detailed design. ○ Site-specific identification of appropriate values for peat strength. ○ Use of a geogrid base to act as a separator and strengthener between the road subgrade fill materials and the peat. ○ Use of additional geogrid and geotextile materials in layers combined with road aggregate material above the embankment fill to form a mechanically stabilized layer. This layer will provide the required strength and stiffness for the road to perform during all seasons, including spring thaw. ○ Design the Floating Road Plan, profile and cross-section for each road section based on context-sensitive design standards, geometry and loading. ○ Provide transitions between floating road sections, excavated and fill sections. ○ Schedule construction to allow for primary settlement of the peat without risk of shear failure. ○ Monitor the work through construction, measuring and recording lateral movement and settlements. Be	■ Mitigation measures as outlined in the *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026c) ■ Design and implement a pre-, during and post-construction monitoring program that assesses surface and groundwater movement and helps to ensure that pre-construction conditions are maintained to the extent feasible (**Section 9**). Locations of groundwater monitoring instruments (e.g., piezometers), will be determined in consultation with vegetation ecologists and Indigenous communities so that effects on vegetation Valued Components are considered when determining their placement. ■ Design and implement a program to monitor vegetation community response to any potential changes in hydrogeology throughout construction (e.g., in the vicinity of dewatering activities). ■ Implement adaptive management measures if groundwater flow patterns are determined to be significantly altered.

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
					prepared to adjust the design based on observation and monitoring. ○ Airborne Electromagnetic (AEM) Surveying to produce continuous peat depth mapping which is critical for construction planning such as identifying saturated or sensitive areas that may require specialized engineering solutions.	
V-05	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of introduction and spread of invasive plant species	Construction	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Environment and Climate Change Canada	■ Develop and implement an Environmental Protection Plan during construction to prevent, detect, control (i.e., remove), and monitor areas with invasive species. The plan will also include the following measures: ○ Thoroughly inspect and clean construction equipment and vehicles prior to bringing them to the work area and when moving between work areas within the Project. Cleaning shall be completed in accordance with the most up to date version of the Clean Equipment Protocol for Industry (Halloran et al., 2013). Documentation of the results of each inspection will be a requirement of the Environmental Protection Plan. Additional recommendations for the cleaning of equipment (e.g., the use of specific cleaning stations and their location) will be determined through the development of the Environmental Protection Plan. ○ Use reduced disturbance techniques to prevent topsoil removal and preserve adequate substrate to promote natural revegetation. ○ Contour disturbed areas to minimize soil and water erosion and encourage growth of native vegetation. ○ Limit off-road vehicle use by contractors during Construction, Operation and Maintenance. Inspections and maintenance activities will include cleaning of off-road vehicles before and after each use to prevent the spread of invasive species. Recommendations related to the use of off-road vehicles will be determined at detailed design and / or through the development of the Environmental Protection Plan. ○ Use seed mixes with appropriate native species for all seeding and restoration works. Seed mixes must be tested / certified to be free of invasive species. Native seed should be sourced from local populations whenever possible. ○ Follow Ministry of Transportation Ontario *Provincial Standard Specification 803* to avoid spreading invasive plant species	■ Implement all components of the Environmental Protection Plan

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
V-06	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of introduction and spread of invasive plant species	Operation and Maintenance		N/A	■ Require that the road operator follows Ministry of Transportation Ontario *Provincial Standard Specification 803* to avoid spreading invasive plant species. ■ Remove and manage invasive species using manual and mechanical means. Herbicides will not be used As Design and implement post-construction invasive species monitoring program that aims to detect invasive species presence and control (i.e., remove) new introductions. Details of the post-construction invasive species monitoring program will be included in the Environmental Protection Plan.
V-07	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of fragmentation and edge effects	Construction	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Environment and Climate Change Canada	■ Adjust the alignment or clear off centre within the right-of-way to minimize forest fragmentation and the creation of new forest edges, where feasible. These details will be refined during detailed design. ■ Construct temporary laydown areas and temporary construction camps on existing disturbed areas, wherever possible. The availability of existing disturbed areas for the construction of temporary laydown areas and temporary construction camps will be determined at detailed design.	■ Avoid grubbing along newly created forest edges to promote natural regeneration which will quickly “seal” the new forest edge. ■ Use reduced disturbance techniques during construction to prevent topsoil removal, preserve adequate substrate to promote natural revegetation (e.g., use low impact method to leave surface vegetation root mat intact until a site is proven for further development). ■ Use progressive restoration on-site once staging areas are no longer needed. Progressive restoration techniques will be provided in the Environmental Protection Plan.
V-08	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of release of sediment	Construction, Operation and Maintenance	■ Ministry of Transportation ■ Fisheries and Oceans Canada	■ Develop and implement a project-specific Environmental Protection Plan. ■ Develop and implement a Project-specific Erosion and Sediment Control Plan. Erosion and sediment control measures will be developed and implemented in accordance with Ontario Provincial Standard Specifications for erosion and sediment control measures (Ontario Provincial Standard Specifications OPSS.PROV.804 and OPSS.MUNI.805). Environmental approval conditions, permits, or authorizations issued for the Project, including those issued from Environment and Climate Change Canada, Ontario Ministry of the Environment, Conservation and Parks and Ontario Ministry of Natural Resources, will be followed during Construction.	■ Regularly inspect and maintain Erosion and Sediment Control structures (e.g., sediment fences, rip rap or other sediment control structures) in accordance with Ontario Provincial Standard Specification *OPSS.PROV 804* during all phases of the Project and modify measures as necessary. If control measures are not functioning properly, no further work will occur until the problem is resolved. ■ Stabilize disturbed areas through revegetation with native plant species or other appropriate means (e.g., erosion control blankets) following completion of the works. ■ Reschedule work or reduce traffic in areas where soils are considered to be excessively wet or where there is a heavy rainfall risk. Areas where a reduction in traffic are required will be determined during the detailed design phase. ■ Earthworks should be avoided during periods of heavy rainfall, particularly in areas adjacent to watercourses and wetlands. ■ Adhere to all mitigation measures outlined in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026b) and the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026e).

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
V-09	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of spills of fuel or other contaminants	Construction, Operation and Maintenance	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Environment and Climate Change Canada	■ Develop and implement a Project-specific Environmental Protection Plan.	■ Mitigation measures as outlined in the *Fish & Fish Habitat Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026b), *Groundwater & Geochemistry Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026c) and the *Surface Water Technical Support Document: Existing Conditions & Effects Assessment* (WSP, 2026e). ■ Adherence to federal and provincial regulations and guidelines regarding fuel and residue, chemical product, petroleum product, and hazardous substance collection and storage, use and handling, and disposal and treatment, such as the federal *Transportation of Dangerous Goods Act,* Ontario *Dangerous Goods Transportation Act* and the Ontario *Environment Protection Act*.
V-10	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of the deposition of air contaminants and fugitive dust emissions	Construction, Operation and Maintenance	■ Ministry of Transportation	N/A	■ A list of mitigation measures that will be implemented to limit air particulate emissions during construction is provided in the Air Quality and Greenhouse Gas Technical Support Document: Existing Conditions & Effects Assessment Report (Dillon, 2026). The effectiveness of mitigation measures will be evaluated during construction, and mitigation measures will be modified or enhanced as necessary through adaptive management. ■ Environmental approval conditions, permits, or authorizations issued for Project Construction, including those issued from Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks and the Ontario Ministry of Natural Resources, will be followed during the Construction Phase.
V-11	All Vegetation Valued Components	Changes to availability, distribution, composition and function of ecosystems and plant populations as a result of increased public access	Construction, Operation and Maintenance	■ Ministry of the Environment, Conservation and Parks ■ Ministry of Natural Resources ■ Environment and Climate Change Canada	■ Limit the Project footprint, vegetation clearing and access road requirements to the extent feasible (e.g., share / coordinate access, concentrate temporary activities spatially, leave habitat outside of scoped Construction Disturbance Area, selective clearing, use existing access roads when available). Reducing cleared areas and the number of access roads through coordination, can reduce the number of cleared areas and access roads that will be present during and following construction that may provide access to previously inaccessible lands.	■ Use progressive restoration on-site once staging areas are no longer needed and prevent ongoing use of inactive areas through combined use of physical control measures (rollback, remove of creek crossings, recontouring to surrounding topography, revegetation / reforesting and / or barriers at junctions with active access). ■ Develop a policy for Project personnel while on shift or at temporary construction camps in regards to any plant or timber harvesting activities. ■ Develop a wildfire prevention plan for the construction works that outlines protocols for hot works or any other activity with potential to trigger a fire, required fire suppression equipment, and a response plan if a fire is triggered.

ID	Valued Component	Environmental Concern and Potential Effect	Project Phase	Concerned Agencies	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Detailed Design	Mitigation, Protection, Monitoring, and Study Commitments to be Carried Forward to Construction / Operation
						■ Install access controls (e.g., gates and boulders) to control public vehicle travel on some temporary access routes and trails. Marten Falls First Nation continues to engage in discussions with the Province regarding the ownership and future operations and maintenance of the Community Access Road. Access and ownership including gating security/ID system will require further dialogue between the communities and the Province. ■ Install signage at regular intervals stating that any dumping is prohibited.

m = metre; N/A = not applicable.

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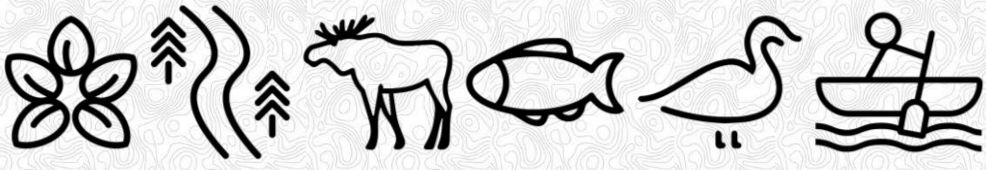
Attachment A – Draft Study Plan, Workplan and Regulator Comments

MARTEN FALLS FIRST NATION
ALL SEASON COMMUNITY ACCESS ROAD

FINAL

Vegetation Study Plan

May 2021



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Revision History

Rev #	Date	Revision Description
Draft	May 2020	Submitted “Study Plan – Vegetation DRAFT FOR DISCUSSION” to the Agency
Final	May 2021	Revised to address federal and provincial agency comments

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Authors

Report Prepared By:

Stefano Strapazzon
Terrestrial Ecologist
AECOM

Claire Atherton, B.Sc. (Hons)
Ecologist
AECOM

Carsten Slama, M.Sc., M.B.A.
Wetland Ecologist
AECOM

Report Reviewed By:

Kristan Washburn, MES
Senior Terrestrial Ecologist
AECOM

Shawna Kjartanson, M.Sc., EP, P.Biol
Senior Environmental Scientist
AECOM

Amber Sabourin
Ecologist
Golder Associates Ltd.

Erin Greenaway, B.Sc.
Senor Ecologist
Golder Associates Ltd.

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Appendices

Appendix A. Preliminary List of Data Sources

Appendix B. Agency Comments on the Draft Study Plan

Acronyms

Agency, the ... Impact Assessment Agency of Canada
CAR ..... Community Access Road
EA ..... Environmental Assessment
ELC ..... Ecological Land Classification
GIS ..... Geographic Information System
IA ..... Impact Assessment
IS ..... Impact Statement
ISO ..... International Organization for Standardization
km ..... kilometre
LiDAR ..... Light Detection and Ranging
LSA ..... Local Study Area
m ..... metre
MECP ..... Ontario Ministry of the Environment, Conservation and Parks
MFFN ..... Marten Falls First Nation

MNRF ..... Ontario Ministry of Natural Resources and Forestry
PDA ..... Project Development Area
RSA ..... Regional Study Area
SAR ..... Species at Risk
SOCC ..... Species of Conservation Concern
TISG ..... Tailored Impact Statement Guidelines
ToR..... Terms of Reference
VC..... Valued Component

1. Introduction

The Proponent of the Community Access Road (CAR or the Project) is Marten Falls First Nation (MFFN), a remote First Nation community in northern Ontario located at the junction of the Albany and Ogoki rivers, approximately 430 kilometres (km) from Thunder Bay, Ontario. The MFFN community is proposing an all-season Community Access Road that will connect the MFFN community to Ontario's provincial highway network (Highway 643) to the south via the existing Painter Lake Road. MFFN, as the Proponent of the Project, has formed a MFFN CAR Project Team that includes MFFN CAR Community Member Advisors and MFFN CAR Project Consultants who act with input, guidance and direction from the MFFN Chief and Council.

This document outlines the Study Plan for Vegetation to support a coordinated Impact Assessment (IA) required for Project review by the Impact Assessment Agency of Canada (the Agency) under the federal *Impact Assessment Act* and Environmental Assessment (EA) required for Project review by the Ontario Ministry of the Environment, Conservation and Parks (MECP) under the Ontario *Environmental Assessment Act*.

1.1 Federal and Provincial Terminology

The study plans have been prepared using federal terminology, however, the respective provincial terminology has been provided in **Table 1-1** for reference. The terms can be used interchangeably.

Table 1-1: Equivalent Federal and Provincial Terms

Provincial Term	Federal Term
Criteria	Valued Component
Impact Management Measure	Mitigation Measure
Net Effects	Residual Effects
Record of Consultation	Record of Engagement

For the purposes of this study plan, Species at Risk (SAR) and Species of Conservation Concern (SOCC) are defined as the following:

- **SAR:**
  - Any species listed under Schedule 1 of the federal *Species at Risk Act*, S.C. 2002, c. 29 as Threatened, Endangered, or Extirpated; and / or,

- Any species listed under the provincial *Endangered Species Act, 2007*, S.O. 2007, c. 6 as Threatened, Endangered, or Extirpated.

- **SOCC:**
  - Any species listed under Schedule 1 of the federal *Species at Risk Act* as Special Concern;
  - Any species designated Threatened, Endangered, or Extirpated by the Committee on the Status of Endangered Wildlife in Canada (unless otherwise listed as SAR under the *Species at Risk Act* or the *Endangered Species Act*);
  - Any species listed under the *Endangered Species Act* as Special Concern (unless otherwise listed as SAR under *Species at Risk Act*); and / or
  - Any species with a subnational rank (SRank[1]) of S1 – S3[2] as designated by the Natural Heritage Information Centre (MNRF 2010)

The *Provincial Policy Statement, 2020* protects Significant Wildlife Habitat in Ontario. Significant Wildlife Habitat is defined in the *Natural Heritage Reference Manual* (MNRF, 2010) as the following:

- Habitats of seasonal concentrations of animals
  - areas where animals occur in relatively high densities for the species at specific periods in their life cycles and / or in particular seasons; and
  - seasonal concentration areas, which tend to be localized and relatively small in relation to the area of habitat used at other times of the year.
- Rare vegetation communities or specialized habitat for wildlife
  - rare vegetation communities include:
    - areas that contain a provincially rare vegetation community; and
    - areas that contain a vegetation community that is rare within the planning area.

1. *A Subnational rank or SRank is a conservation status of a species or plant community within Ontario considering factors such as abundance, distribution, population trends and threats.*
2. *S1 **Critically Imperiled** — Critically imperilled in Ontario. Species with S-ranks of S1 usually have 5 or fewer occurrences in the province or very few remaining individuals. Such species are often especially vulnerable to extirpation.*
   *S2 **Imperiled** — in Ontario. Such species usually have between 6-20 occurrences in the province or have many individuals in fewer occurrences. These species are often susceptible to extirpation.*
   *S3 **Vulnerable** — in Ontario. Such species usually have between 21-100 occurrences in the province. They may also have fewer occurrences but have a large number of individuals in some populations. These species may be susceptible to large-scale disturbances.*

  - specialized wildlife habitats include:
    - areas that support wildlife species that have highly specific habitat requirements;
    - areas with exceptionally high species diversity or community diversity; and
    - areas that provide habitat that greatly enhances species' survival.

- Habitat of SOCC
  - includes the habitat of species that are rare or substantially declining, or have a high percentage of their global population in Ontario;
  - includes Special Concern species identified under the *Endangered Species Act* on the SAR in Ontario (SARO) List, which were formally referred to as "vulnerable" in the Significant Wildlife Habitat Technical Guide;
  - species identified as nationally Endangered or Threatened by Committee on the Status of Endangered Wildlife in Canada, which are not protected in regulation under Ontario's *Endangered Species Act*; and
  - excludes habitats of Endangered and Threatened species covered under *Provincial Policy Statement* policy 2.1.3(a).
- Animal movement corridors
  - habitats that link two or more wildlife habitats that are critical to the maintenance of a population of a particular species or group of species; and
  - habitats with a key ecological function to enable wildlife to move, with minimum mortality, between areas of Significant Wildlife Habitat or core natural areas.

1.2 Project Study Plans

This Study Plan is one of a group of study plans created for the Project. **Table 1-2** includes the study plans for each environmental[3] discipline currently planned for the Project and the valued components (VCs) covered by the study plans where applicable.

3. *The use of the term environment in this document is inclusive of the components of the environment that are included in the Ontario Environmental Assessment Act definition, which includes a general description of the social, cultural, built and natural environments.*

Table 1-2: Project Study Plans and Valued Components

Environmental Discipline	Study Plan Name	Valued Component(s)
Aboriginal and Treaty Rights and Interests	■ Aboriginal and Treaty Rights and Interests Study Plan	■ Indigenous Current Use of Lands and Resources for Traditional Purposes ■ Cultural Continuity (ability to practice and transmit cultural traditions)
Atmospheric Environment	■ Atmospheric Environment Study Plan	■ Air Quality ■ Greenhouse Gas Emissions
Climate Change	■ Climate Adaptation and Resiliency Study Plan	■ Climate Change
Acoustic and Vibration Environment	■ Acoustic and Vibration Environment Study Plan	■ Noise ■ Vibration
Physiography, Geology, Terrain and Soils	■ Physiography, Terrain and Soils Study Plan	■ Physiography, Terrain and Soils
Surface Water	■ Surface Water Study Plan	■ Surface Water
Groundwater and Geochemistry	■ Groundwater and Geochemistry Study Plan	■ Groundwater
Vegetation	■ Vegetation Study Plan	■ Wetland and Riparian Ecosystems ■ Upland Ecosystems ■ Designated Areas (Areas of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations) ■ Traditional Use Plants and SAR Plant Populations (including species with special conservation status or rarity in the province)
	■ Peatlands Study Plan	■ Peatland Ecosystems (bogs and fens)
Wildlife	■ Wildlife Study Plan	■ Bats (including SAR-bats such as: Little Brown Myotis [*Myotis lucifugus*], Northern Myotis [*Myotis septentrionalis*] and Tricolored Bat [*Perimyotis subflavus*]) ■ Fur Bearers (proxy VC[4] American Marten [*Martes americana*], Beaver [*Castor canadensis]* and Wolverine [*Gulo gulo*]) ■ Amphibians and Reptiles ■ Pollinating Insects
	■ Ungulates (Moose and Caribou) Study Plan	■ Moose (*Alces alces*) ■ Caribou, boreal population (*Rangifer tarandus*)
	■ Bird Study Plan	■ Forest Birds (proxy VC of Red-eyed Vireo [*Vireo olivaceus*] for deciduous forest, Ovenbird [*Seirus aurocapilla*] for mixedwood forest, Dark-eyed Junco [*Junco hyemalis*] for coniferous forest and disturbed forest

[4] *A proxy VC is used when looking at the effects of one species that represents many others.*

Environmental Discipline	Study Plan Name	Valued Component(s)
		■ Raptors (proxy VC of Osprey [*Pandion haliaetus*] for diurnal raptors and Boreal Owl [*Aegolius funereus*] for nocturnal raptors ■ Shorebirds (proxy VC of Wilson's Snipe [*Gallingo delicata*]) ■ Waterfowl (proxy VC of Mallard [*Anas platyrhynchos*]) ■ Bog / Fen Birds and Other Wetland Birds (proxy VC of Palm Warbler [*Setophaga palmarum*] for bogs, Common Yellowthroat [*Geothlypis trichas*] for fens; and Northern Waterthrush [*Parkesia noveboracensis*] for swamps . ■ SAR birds: Canada Warbler (*Cardellina canadensis*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Whip-poor-will (*Antrostomus vociferous*), Eastern Wood-Pewee (*Contopus virens*), Evening Grosbeak (*Coccothraustes vespertinus*), Olive-sided Flycatcher (*Contopus cooperi*), Bald Eagle (*Haliaeetus leucocephalus)*, Peregrine Falcon (*Falco peregrinus*), Short-eared Owl (*Asio flammeus)*, Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Black Tern (*Childonias niger*), Rusty Blackbird (*Euphagus carolinus*), Yellow Rail (*Coturnicops noveboracensis*)
Fish and Fish Habitat	■ Fish and Fish Habitat Study Plan	■ Lake Sturgeon (*Acipenser fulvescens*) ■ Walleye (*Sander vitreus*) ■ Brook Trout (*Salvelinus fontinalis*) ■ Northern Pike (*Esox lucius*) ■ Lake Whitefish (*Coregonus clupeaformis*) ■ Chain Pickerel (*Esox niger*) ■ Yellow Perch (*Perca flavescens*) ■ Cisco (*Coregonus artedii*) ■ Burbot (*Lota lota*) ■ Longnose Sucker (*Catostomus catostomus*) ■ White Sucker (*Catostomus commersonii*) ■ Forage / Prey Species (including species such as Lake Chub [*Couesius plumbeus*]) ■ Lower Trophic Organisms (e.g., benthic invertebrates)
Social	■ Social Study Plan	■ Housing and Accommodation ■ Community Service and Infrastructure ■ Transportation ■ Community Well-being ■ Populations and Demographics
Economy	■ Economic Study Plan	■ Regional Economy ■ Labour Force and Employment ■ Government Finances

Environmental Discipline	Study Plan Name	Valued Component(s)
Land and Resource Use	■ Land and Resource Use Study Plan	■ Land Use Compatibility ■ Parks and Protected Areas ■ Extractive Industry ■ Forestry Industry ■ Energy and Linear Infrastructure ■ Recreation and Tourism
Human Health and Community Safety	■ Human Health and Community Safety Study Plan	■ Public Safety ■ Public Health ■ Diet ■ Environmental Factors Influencing Health
Visual Aesthetics	■ Visual Aesthetics Study Plan	■ Visual Contrast / Character ■ Visibility ■ Visual Sensitivity
Archaeological and Cultural Heritage	■ Cultural Heritage Study Plan	■ Archaeological Sites and Resources ■ Built Heritage Resources and Cultural Heritage Landscapes

It should be noted that while there is not a consultation study plan, the Project has developed the *Consultation and Engagement Plan to Support the Environmental Assessment / Impact Statement* (AECOM 2020) (referred to as the Impact Statement [IS] / EA Consultation Plan).

2. Purpose and Objectives

The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative, direct and indirect) of the Project and alternatives on the environment, determine measures needed to avoid or minimize adverse Project effects, and enhance beneficial Project effects where feasible, and to undertake consultation and engagement throughout.

The purpose of this Study Plan is to explain:

- A baseline[5] study methodology that will result in a comprehensive description of the existing environment potentially impacted by the Project;
- How efficient and transparent data management and analysis will be undertaken;
- Effects assessment scoping inputs specific to Vegetation that will allow for potential effects of the Project on the existing environment to be appropriately assessed in the IS / EA Report; and
- How the Study Plan aligns with federal and provincial requirements and guidance, including the Agency's Tailored Impact Statement Guidelines (TISG), dated February 24, 2020 (the Agency 2020b), for this Project and applicable provincial agency comments on the Draft Terms of Reference (ToR)[6].

As required by the *Impact Assessment Act* and referenced in TISG Section 7.3, work plans will also be developed for disciplines as required. It is anticipated the work plans will include further details on how to action the study plans; for example, they would contain such information as location of sampling sites, scheduling, and sequencing.

For the purposes of establishing appropriate context, the Study Plan begins with background and relevant information on:

- Study-plan related discussions with the Agency, the MECP and applicable agencies to date (**Section 3**);
- The approach to Project consultation and engagement (**Section 4**);
- How Indigenous Knowledge will be collected and used in the IA / EA (**Section 5**); and
- The spatial and temporal boundaries that will be used for the IA / EA (**Section 6**).

5. *Baseline refers to the current conditions of the environment potentially impacted by the Project. Baseline conditions serve as a reference against which changes due to the Project are measured.*
6. *If necessary, the Study Plan will be updated to reflect the approved ToR if approval is obtained.*

2.1 Approach to Handling Confidential Information

2.1.1 Indigenous Knowledge

Permission from the Indigenous community will be sought before including Indigenous Knowledge in the IS / EA Report, regardless of the source of the Indigenous Knowledge. Sensitive and / or confidential information will be specifically collected through the Indigenous Knowledge Program to inform the IS / EA Report, and its use and publication will be governed by Indigenous community-specific Indigenous Knowledge Sharing Agreements. Sensitive and / or confidential information collected through Indigenous Knowledge Sharing Agreements will be protected from public or third-party disclosure and will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information. Instances where Indigenous Knowledge sharing has taken place during consultation activities (e.g., meetings) will be recorded in the Record of Consultation and Engagement, including where Indigenous Knowledge was incorporated into Project decisions and into the IS / EA Report (i.e., specifics will not be included in the Record of Consultation and Engagement given the potential sensitivity and / or confidentiality of the information shared).

2.1.2 Species at Risk

Sensitive information related to SAR, such as those provided by the MECP or by the MNRF, will be presented in materials in accordance with the Sensitive Data Licence Agreements applicable to this Project.

3. Study Plan Technical Discussions

To facilitate the development of satisfactory study plans and eventually a satisfactory IS / EA Report, MFFN previously submitted a draft version of this document which was reviewed and commented on by the Agency, the MECP and applicable agencies (**Table 3-1**). There have been no technical meetings to date to discuss the content of this this study plan.

Table 3-1: Study Plan Technical Review

Attendees / Responsible Party	Correspondence	Discussion Point (s)	Solution
The Agency	■ Comments received following submission and review of draft study plan	■ **10-July-2020:** Comments and clarification questions received, including editorial comments, additional information requirements regarding study plans, assessment and desktop analysis. Specifically requested for further details on the 2019 vegetation surveys and the planned future surveys, along with any vegetation control alternatives as part of the baseline studies.	■ Additional details and clarification provided within this Study Plan, and responses to these comments are attached in **Appendix B**.
MECP	■ Comments received following the MECP review of draft study plan	■ **23-July-2020:** Comments and clarification questions received, including editorial comments, additional information requirements regarding study plan, assessment and desktop analysis.	■ Additional details and clarification provided within this Study Plan, and responses to these comments are attached in **Appendix B**.

4. IS / EA Report Consultation and Engagement Process

4.1 Interested Persons and Government Agencies

The Proponent will provide Project notices and advise of opportunities for consultation and engagement with interested persons[7] which includes, at a minimum, members of the public outlined in the *Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020) (referred to as the Public Participation Plan). This will include the opportunity to provide input on the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures as applicable. A variety of activities will be offered so that members of the public are informed of the IS / EA Report as it progresses and are aware of the opportunities and means to provide their input. The study plans have recognized public and agency input received on the Project to date. Government agencies and interested persons will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process. The Project's approach to handling confidential and sensitive information is outlined in **Section 2.1**.

4.2 Indigenous Communities

The Proponent will provide Project notices and opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020a) (referred to as the Indigenous Engagement and Partnership Plan).

Indigenous communities will be provided the opportunity to be involved at critical decision-making points throughout the IS / EA Report so that the Proponent can consider and incorporate, where appropriate Indigenous Knowledge and Indigenous land and resource use information into the Project as it pertains to the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures. A variety of activities will be offered so that Indigenous communities are

7. *Interested persons, as defined in the IS / EA Consultation Plan, are individuals and groups (e.g., associations, non-governmental organizations, industry and academia) who could have an interest in the Project, including but not limited to communities in the region, those with commercial interests (e.g., forestry, trappers, outfitters, other mineral tenure holders in the area) and recreational users or those with recreational interest (e.g., campers, hunters and environmental groups).*

informed of the IS / EA Report as it progresses and are aware of the opportunities, means and timelines to provide their input. The study plans have recognized Indigenous community input received on the Project to date. Indigenous communities will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process.

Table 4-1: Identified Neighbouring Indigenous Communities, including their Provincial Territorial Organizations and / or Tribal Council Affiliations

Tribal Council Affiliation	Indigenous Community or Organization
Matawa First Nations Management *(Nishnawbe Aski Nation)*	■ **Marten Falls First Nation** (Proponent and potentially affected Indigenous community) ■ Aroland First Nation ■ Constance Lake First Nation ■ Eabametoong First Nation ■ Ginoogaming First Nation ■ Neskantaga First Nation ■ Nibinamik First Nation ■ Webequie First Nation
Matawa First Nations Management and the Union of Ontario Indians / Nishnawbe Aski Nation	■ Long Lake #58 First Nation**
Mushkegowuk Council *(Nishnawbe Aski Nation)*	■ Attawapiskat First Nation ■ Fort Albany First Nation ■ Kashechewan First Nation
Shibogama First Nations Council *(Nishnawbe Aski Nation)*	■ Kasabonika Lake First Nation ■ Kingfisher Lake First Nation ■ Wapekeka First Nation ■ Wawakapewin First Nation ■ Wunnumin Lake First Nation
Independent First Nations Alliance *(Nishnawbe Aski Nation)*	■ Kitchenuhmaykoosib Inninuwug First Nation
Independent First Nations *(Nishnawbe Aski Nation)*	■ Mishkeegogamang First Nation ■ Weenusk First Nation
Nokiiwin Tribal Council	■ Animbiigoo Zaagi'igan Anishinaabek First Nation*
Métis Nation of Ontario	■ Métis Nation of Ontario; Region 2*
Independent Métis Nation	■ Red Sky Independent Métis Nation*

Notes: This table is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a)
** Indigenous communities or organizations identified by the MECP who should be consulted on the basis that they may be interested in the Community Access Road.*
*** The MECP indicated in a letter to MFFN that Long Lake #58 First Nation was moved from interest-based to rights-based.*

4.3 Consideration of Identity and Gender-Based Analysis Plus in Engagement

To fulfill requirements of the *Impact Assessment Act*, the Consultation and Engagement Program will consider a diverse range of perspectives from interested persons and interested Indigenous communities and their members identified in the Agency's Indigenous Engagement and Partnership Plan and the Public Participation Plan. This will include at a minimum providing ongoing opportunities for engagement to:

- **Neighbouring Indigenous communities, including relevant subpopulations:**
  - Women;
  - Youth; and
  - Elders.
- **Non-Indigenous communities including:**
  - Women;
  - Youth; and
  - Activity-based subgroups (e.g., recreationalists, snowmobilers, tourism establishment operators).

The Proponent will also consult and engage with other subpopulations identified by communities during consultation and engagement. The information from these activities and any additional identity groups identified by communities through consultation and engagement will be considered by applicable environmental disciplines for the purposes of data collection and considering disproportionate effects.

During consultation and engagement, these aforementioned groups will be consulted and engaged with on targeted input**.** Specialized knowledge will be gathered through other disciplines such as Social, Economic, Land and Resource Use and Aboriginal and Treaty Rights and Interests. The Socio-economic Data Collection Program is expected to include targeted interviews, focus groups, questionnaires and other niche tools to gather information from diverse populations to resolve gaps in socio-economic secondary data. These diverse populations include the aforementioned identity groups, which are also referenced in the IS / EA Consultation Plan, and those identified by communities during consultation and engagement. The importance of soliciting inputs and perspectives from diverse subgroups has also been factored into the Indigenous Knowledge Program and associated materials (**Section 5**).

When feedback is received from interested persons and Indigenous communities, issues, comments and questions will be tracked, which is consistent with the process described in the IS / EA Consultation Plan. Specific to Gender-Based Analysis Plus objectives, this will include efforts to engage with diverse populations. It is expected this will include activities specific to subgroups and tabulation of consultation and engagement participation with respect to identity factors. This will provide summary statistics to demonstrate the diversity achieved in consultation and engagement.

5. Consideration of Indigenous Knowledge in the IS / EA Report

The following provides a general description of how Indigenous Knowledge will be considered in the IA / EA process. The extent to which Indigenous Knowledge is considered by each specific VC will vary depending on the nature of the VC, the potential for Project effects on the VC and whether Indigenous knowledge that relates to a VC is provided / obtained. As such, not all aspects of the general approach described below may apply to all VCs / study plans.

There are two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. Both programs serve to support the collection of Indigenous perspectives, values, and input on the Project, including Aboriginal and Treaty Rights and how they may be impacted by the Project, to be integrated throughout the IA / EA process. However, the Indigenous Knowledge Program specifically aims to solicit and incorporate information that is considered sensitive and may have confidentiality requirements, including Indigenous Knowledge and information on Indigenous land and resource use. Indigenous Knowledge Sharing Agreements will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information.

All Indigenous communities and groups identified by the MECP and the Agency through the *Indigenous Engagement and Partnership Plan* (The Agency 2020) have the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provides interested Indigenous communities an opportunity to: share existing Indigenous Knowledge and information on Indigenous land and resource use and cultural values that may be relevant to the Project, and / or complete Project-specific studies to collect and share Indigenous Knowledge and information on Indigenous land and resource use and cultural values. The Indigenous Knowledge Program includes opportunities for Indigenous communities and groups to meet with the Proponent to discuss the program, ask questions, and share concerns and interests. In support of this, the Proponent has created an Indigenous Knowledge Program Guidance Document (the Guidance Document) that provides:

- An overview of the Indigenous Knowledge Program and information on how Indigenous Knowledge, Indigenous land and resource use, and cultural values and practices can be collected and / or shared;

- Information on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values and practices may be used in the planning and design processes; and
- A suite of guidance materials that were developed based on the information requirements of both the federal and provincial assessment processes, including: question guides to support the collection of information on historical and current community context, Indigenous Knowledge that may be relevant to the various technical disciplines; information on Indigenous land and resource use, cultural values and practices and associated spatial data; and perspective on potential Project-related effects and associated mitigation and / or enhancement measures.

The Guidance Document will also support participating Indigenous communities in providing Project-specific information in a manner that facilitates meaningful incorporation into the IS / EA Report.

The IS / EA Consultation Plan outlines the process for obtaining information and feedback about the Project from Indigenous communities (i.e., the Consultation and Engagement Program). Indigenous communities identified by the MECP and the Agency have the opportunity to participate in the Consultation and Engagement Program through community-specific meetings, Public Information Centres, web conferences, and other formats. All Indigenous communities identified by the MECP and the Agency will be provided information related to the Project and invited to participate at various points throughout the IA / EA process.

There are also opportunities for technical teams to engage with Indigenous communities to solicit perspectives and information relevant to the Project, including information related to collection of existing information and the development of the IS / EA Report. The Proponent also invites feedback and inputs throughout the Project via the Project website and ongoing communications with the Proponent.

The Indigenous Knowledge and Consultation and Engagement programs are designed to be complementary and provide multiple opportunities for communities to offer feedback and information, including perspectives on Aboriginal and Treaty Rights and how these may be impacted by the proposed Project. Relevant information collected through both the Indigenous Knowledge and Consultation and Engagement programs, including potential effect pathways on Aboriginal and Treaty Rights and interests, will be shared with each of the relevant disciplines throughout the IA / EA to: guide and inform VCs; support characterization of the existing environment; identify the potential effects of the Project on VCs; help identify mitigation measures and potential monitoring programs; and ultimately guide Project planning. The nature of how the Indigenous Knowledge becomes integrated into the IS / EA Report will be dictated by the specific information provided by each Indigenous community and the parameters set out in the Indigenous Knowledge Sharing Agreements. A description of how Indigenous Knowledge was considered in the IA / EA and in each of the technical discipline areas will be included in the IS / EA Report.

It is also important to note that information collected through the various activities (e.g., field studies and programs, effects assessments) of each discipline area (e.g., wildlife, vegetation, cultural heritage) will be shared with the Indigenous Knowledge Program leads. This will support the establishment of the existing environment and the effects assessment for the Aboriginal and Treaty Rights and Interests environmental discipline, as well as the identification of potential mitigation measures and monitoring programs, given the interrelated nature of Indigenous peoples and other environmental disciplines.

The Proponent will strive to respectfully collaborate with Indigenous communities on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values will become part of the IS / EA Report, and how potential effects to Aboriginal and Treaty Rights and interests will be assessed. It is expected that measures to support this may include but are not limited to: engaging Indigenous communities to solicit information on Indigenous Knowledge and Indigenous land and resource use and cultural values to inform baseline conditions, providing Indigenous communities with draft sections of the IS / EA Report to illustrate how Indigenous Knowledge and information on Indigenous land and resource use and cultural values has been integrated and to confirm it has been presented appropriately, and completing collaborative working sessions with Indigenous communities for the effects assessment on Aboriginal and Treaty Rights and Interests. Further information on how potential effects on Indigenous rights will be assessed is provided in the Aboriginal and Treaty Rights and Interests Study Plan.

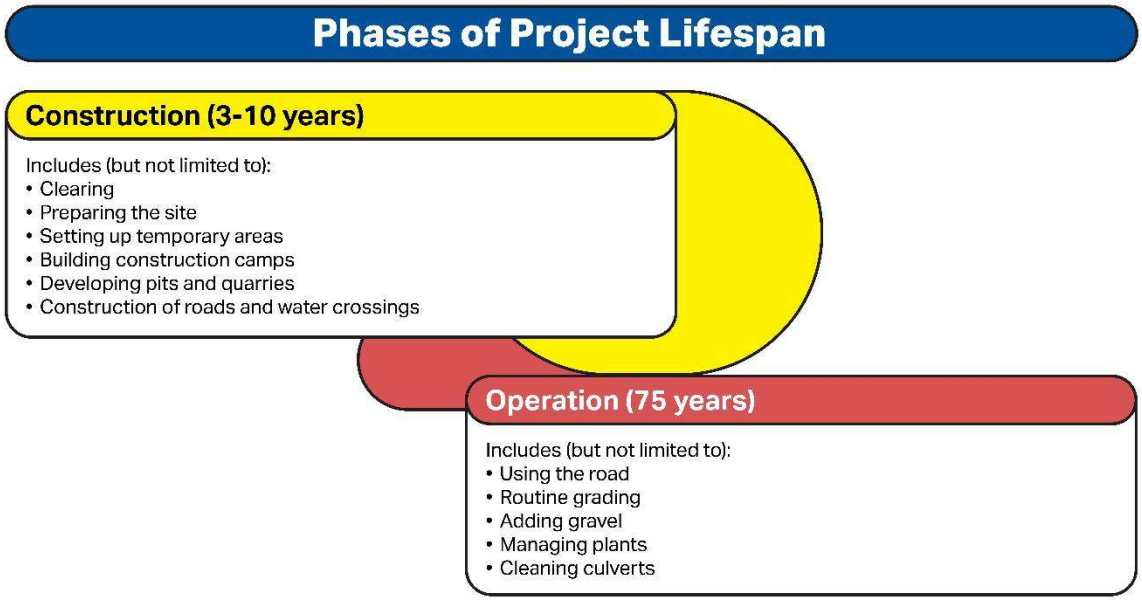
6. Assessment Boundaries

6.1 Temporal Boundaries: Project Phases

Project phases, which are temporal boundaries, are developed to establish the timeframes within which potential effects of the Project will be considered in the IS / EA Report. The Project is planned to occur in two phases, which are briefly described below and shown in **Figure 6-1**.

- **Construction Phase:**
  The time from start of construction, including site preparation activities, to the start of operations and maintenance of the CAR. Decommissioning of construction works is included in the construction phase. The construction phase is anticipated to take approximately 3 to 10 years to complete.
- **Operations and Maintenance Phase:**
  The operations and maintenance phase starts once construction activities are complete and lasts for the life of the Project. The operations and maintenance phase of the Project is considered to be 75 years based on the expected timeline for when major refurbishment of road components (e.g., bridges), is anticipated.

Figure 6-1: Project Schedule



There are currently no plans to decommission the CAR as there is no expected / known end date for its need. Therefore, future suspension, decommissioning and eventual abandonment of the CAR will not be considered in the IS / EA Report. It will be considered if and when a decommissioning or abandonment application is made for the road.

In determining the temporal boundaries, in particular the long operations and maintenance phase, consideration was given to the long-term effects on the well-being of present and future generations (Sustainability Principle #2[8]). The final temporal boundaries to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation process.

6.2 Spatial Boundaries: Study Areas

6.2.1 General Information

Study areas identify the geographic extents within which potential effects of the Project are likely to occur and will be considered in the IS / EA Report. The existing conditions and potential effects are documented for three study areas selected for the Project:

- **Project Development Area (PDA):** area of direct disturbance;
- **Local Study Area (LSA):** the area where most of the direct effects of the Project are likely to occur; and
- **Regional Study Area (RSA):** the area where indirect effects of the Project are likely to occur.

The PDA encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The preliminary LSA currently being considered within the scope of the ongoing provincial regulatory review process generally includes the area within 2.5 km of the centreline of Alternative 1 and Alternative 4. The preliminary study area generally allows for the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide study area also allows for route refinements during development of Project design (e.g., adjustment of the alignment to avoid sensitive features).

The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report. While most of the Project

8. *Sustainability Principles #2 is one of four sustainability principles included in Section 25 of the Project's TISG (the Agency 2020b) as further elaborated on* ***Section 9.7****.*

components are expected to be located within the preliminary 5 km wide study area, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the IA / EA process. If the need to locate Project components outside the study area is determined to be required or of benefit to the Project, the study area would be adjusted.

The study area for each environmental discipline may vary from the above-described general study area based on the potential for the Project to directly or indirectly affect each environmental discipline; therefore, discipline-specific LSAs and RSAs have been defined for the Project. In defining the final LSAs and RSAs, each environmental discipline will consider:

- Location and other characteristics of the environmental discipline relative to the Project;
- The anticipated extent of the potential Project effects;
- Federal, provincial, regional, and local government administrative boundaries;
- Indigenous groups listed in **Table 4-1**;
- Community knowledge and Indigenous Knowledge;
- Current or traditional land and resource use by Indigenous communities;
- Exercise of Aboriginal and Treaty Rights of Indigenous peoples, including cultural and spiritual practices; and
- Physical, ecological, technical, social, health, economic and cultural considerations.

The study areas included in this document are preliminary, covering the extent to which readily available information suggests the Project may have noticeable effects on the environment. The size, nature and location of past, present and reasonably foreseeable projects will be taken into consideration in the development of the cumulative effects assessment study area(s). The appropriate study area(s) to assess cumulative effects are dependent on the VCs predicted to have direct residual adverse effects as a result of the Project, and therefore, cannot be defined until the IS / EA Report has sufficiently advanced.

As further detailed in **Section 4**, the Proponent will continue to provide opportunities for neighbouring Indigenous communities and interested persons to provide input and inform the effects assessment, including the LSAs and RSAs.

6.2.2 Vegetation Study Areas

The LSA and RSA boundaries for Vegetation are detailed in **Table 6-1** and shown on **Figure 6-2**.

Table 6-1: Vegetation Study Areas

Study Area	Geographic Extent	Rationale
Local Study Area	■ 3 km buffer on either side of the centreline of Alternative 1 and Alternative 4	■ Designed to address the area where direct effects of the Project are likely to occur beyond the Project footprint.
Regional Study Area	■ 11 km buffer on either side of the centreline of Alternative 1 and Alternative 4	■ Using a boundary of 11 km will allow for assessment of cumulative and indirect effects of the Project on the broader landscape, while remaining representative of the types of habitats found within the Project Area.

LSA boundaries for the Vegetation VCs were defined following the methods outlined in Section 7.4.1 of the TISG. Land cover within the PDA was calculated using the *Ontario Far North Land Cover* (MNRF 2014). Buffers were applied to the PDA in increments of 100 m, continuing up to 15 km, and the percentage of each of the major land cover types within each increment was calculated. The first buffer increment was calculated using the percent difference between the PDA and that buffer increment (100 m). The rate of change between successive buffers was calculated to determine the maximum calculated rate of change across all buffer increments. Once the maximum calculated rate of change for each land cover type was calculated, the LSA boundary was defined as the buffer width that was the maximum of:

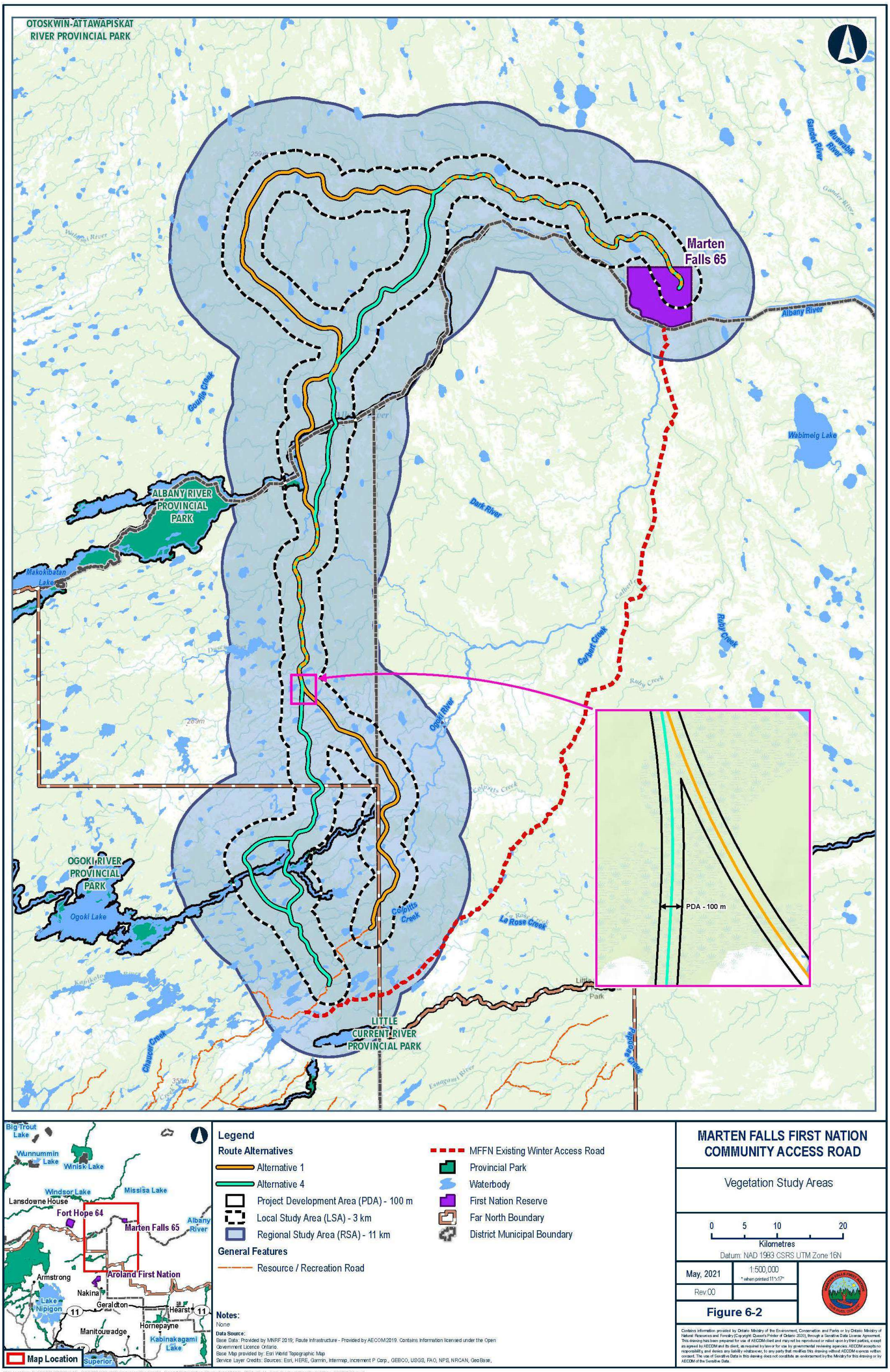
- 500 metres (m) from the PDA, or
- the buffer increment where:
  - All major land cover types have a rate of change in land cover composition of less than or equal to 5% of the maximum rate of change, and
  - The increment is beyond (i.e., further away from the PDA) where the maximum rate of change is found.

Based on this analysis, the LSA boundary was estimated to extend to 2.8 km from the limits of the PDA. The LSA has been conservatively rounded to 3 km either side of centreline (6 km total).

A similar approach was employed to define the boundary of the RSA, using the calculated percent cover within the LSA (3 km) as a starting point. Percentages of each land cover type were calculated in buffer increments of 100 m from the LSA, continuing up to 15 km, to determine the rate of change between increments and identify the maximum rate of change for each land cover type between the LSA and 15 km boundary. Based on this analysis, the RSA was estimated to extend to 7.7 km from the limits of the LSA and 10.7 km from the limits of the PDA (i.e., 11 km from either side of the centreline).

This approach is intended to lead to a LSA that represents land covers found within the PDA and an RSA that represents the land cover within both the PDA and LSA (especially rarer habitats), represent the rapid land cover change that occurs along the edges of these features, and represent a portion of the broader landscape matrix.

Figure 6-2: Vegetation Local and Regional Study Areas



7. Baseline Study Design

7.1 Desktop Assessment

A desktop review of existing information sources will be completed to identify information gaps that will need to be addressed through further study. A preliminary list of applicable information sources has been included in **Appendix A** and reflects federal and provincial guidance received to date. This Study Plan focuses on the additional studies that are anticipated to be required to gather information beyond what is currently available through existing information sources, including those as described in Section 7.2 'Sources of baseline information' in the Agency's TISG for this Project.

The Project is proposed within the Hudson Bay Lowlands Ecozone and the Ontario Shield Ecozone. The Hudson Bay Lowlands Ecozone is Ontario's most northern Ecozone and encompasses approximately 25% of the province (Crins et al., 2009). It is estimated that approximately 90% of the Ecozone's landscape is saturated peatland plains (Crins et al., 2009). The Ontario Shield Ecozone is characterized by mixed, deciduous, and coniferous forests. Forests are dominated by widespread mixedwood species, with a greater diversity of hardwood species further south (Crins et al. 2009).

Within the Hudson Bay Lowlands Ecozone, the Project lies within the Lower Kenogami River Ecodistrict (2E4) in the James Bay Ecoregion (2E). Ecoregion 2E is dominated by fens (22% treed and 7% open) and bogs (21% treed and 17% open) (Crins et al. 2009). Coniferous forest covers approximately 12% while sparse forest covers 7% (Crins et al. 2009). Open water covers approximately 5% of the Ecoregion (Crins et al., 2009). Forested areas are generally composed of stunted black spruce and tamarack (Crins et al. 2009). More developed stands of coniferous and mixedwood boreal species are found on well-drained ridges along streams and rivers and in valleys (Crins et al., 2009).

Within the Ontario Shield Ecozone, the Project can be found within the Kasabonika Lake (2W2) and Wunnumin Lake (2W3) Ecodistricts in the Big Trout Lake Ecoregion (2W). Approximately 21% of Ecoregion 2W is covered by sparse forest (Crins et al., 2009). Coniferous forests cover approximately 19% of the area while mixed forests cover 8% (Crins et al. 2009). Small pockets of deciduous forest grow in river valleys (Crins et al. 2009). Wetlands cover more than 30% of the Ecoregion, consisting of 12% water and 9% treed bog (Crins et al. 2009). Burns cover approximately 8% of the Ecoregion, which is the highest percentage in the province (Crins et al. 2009). Forested areas are typically dominated by black spruce, with Jack pine and white pine (*Pinus strobus*) also present at upland sites (Crins et al. 2009). Warmer sites along the shores of lakes and large rivers harbour stands of white spruce (*Picea glauca*), black spruce, balsam fir, and poplar

(*Populus* sp.) (Crins et al., 2009). Fens and bogs are dominated by mosses (*Bryophyta* sp.*)*, ericaceous shrubs (*Ericaceae* sp.*)*, and graminoid species (*Poales* sp.*)* (Crins et al. 2009).

Designated areas may include features such as: Area of Natural and Scientific Interests, Environmentally Significant Areas, Critical Landform / Vegetation Associations. These features may be identified at a federal or provincial level and will be documented through the desktop assessment methods.

The desktop assessment is ongoing, and the results will be presented at a later date.

7.2 Recent Field Investigations

For the Vegetation VCs, baseline data for one year of study was collected in the form of desktop and field studies for vegetation. The field studies carried out in 2019 were conducted in advance of finalization of this Study Plan, however the data collected through these surveys remain relevant and will be used to assess the potential impacts of the Project on the Vegetation VCs.

Vegetation community surveys were completed at a total of 80 sites, between June 13 and 17, 2019 in conjunction with wildlife survey locations (refer to the Wildlife Study Plan and the Bird Study Plan), which were selected to:

1. Provide broad coverage of the study area (which at the time was considered to be 5 km buffer around the centreline);
2. Include a diversity of plant communities (including peatland / wetlands); and,
3. Target communities that have the potential to support the growth of rare plant species and / or traditional use plant species.

Vegetation surveys in 2019 were conducted within the Ogoki River Provincial Park as well as the Albany River Provincial Park following previous MNRF recommendations on the Project (MNRF 2017). A Research Authorization to conduct surveys within provincial parks was obtained from the MECP for this study.

Vegetation surveys were conducted during the growing season and in each station the vegetation data that were collected included plant community type, dominant species, and a brief plant inventory. Information on invasive or rare species was also noted. Field notes, incidental wildlife observation, and representative photographs were documented and used to provide an overall characterization of the plant communities. Sensitive or significant natural features, such as significant wildlife habitats were also noted to provide a description of the ecological function of the communities.

The most common tree species observed in 2019 include Jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), paper birch (*Betula papyrifera*), trembling aspen (*Populus tremuloides*), black spruce (*Picea mariana*), speckled alder (*Alnus incana*), tamarack (*Larix laricina*), American mountain ash (*Sorbus americana*), and willow (*Salix* spp.). The most common shrub and herbaceous species observed include red-osier dogwood (*Cornus sericea*), wild sarsaparilla (*Aralia nudicaulis*), prickly tree clubmoss (*Dendrolycopodium dendroideum*), common clubmoss (*Lycopodium clavatum*), low-sweet blueberry (*Vaccinium angustifolium*), bunchberry (*Cornus canadensis*), bush honeysuckle (*Diervilla lonicera*), caribou lichen (*Cladina rangiferina*), and twinflower (*Linnaea borealis*).

Detailed results of the field program in 2019 will be provided at a later date.

7.3 Future Field Investigations

This study plan is proposing further vegetation surveys beyond those surveys conducted in 2019 (**Section 7.2**). Dramatic changes in vegetation that would affect the baseline vegetation community description for the purpose of informing the IA / EA, are not anticipated to occur except where these changes might potentially occur through forest fires or forestry operations. Data regarding these vegetation influences are generally well documented through desktop resources and will be considered in the IA / EA as required. It is anticipated that the 2019 surveys combined with the desktop information gathered and future field investigations proposed below will be sufficient to identify baseline conditions among years, within and among seasons, and within a 24 hour cycle to take into account variation in temporal patterns throughout the PDA, LSA and RSA.

The sections that follow describe the methodology to be used for future field investigations.

7.3.1 Field Survey Site Selection

The following sections describe the process for selecting sites for field surveys in both the PDA and the LSA.

The field study design for the LSA has generally follow the *Standard for Terrestrial Ecosystem Mapping in British Columbia* (Ecosystems Working Group 1998). Although these guidelines originate in British Columbia, a similar guideline to provide consistency across Projects has not been developed for Ontario and therefore is considered to be an acceptable approach.

To confirm the number of sample sites that would be representative of the entire LSA and to support future modelling, a simulation-based analysis was conducted to identify areas that should be visited in the field with respect to landcover and Ecological Land Classification (ELC) Ecosite distributions in the LSA. Sites were randomly selected for Far North Land Coverage polygons from:

1. 'upland' (Disturbance Treed, Sparse Treed / Shrub, Coniferous Trees, Deciduous Treed, and Mixed Treed Coverages);
2. 'wetland' (Coniferous or Thicket Swamp, Treed or Open Fen, Treed or Open Bog, Freshwater marsh Coverages); and
3. 'riparian' (any Coverage 30 m from waterbody) groups separately.

To compare the distribution from the sub-sample to the overall ELC counts, two tests will be run: the Kruskal-Wallis non-parametric comparisons test and a Poisson regression. The minimum sample size will be representative of the entire LSA but will also support adequate spatial coverage (as assessed through distributions of latitude and longitude between sub-sample and all polygons across the LSA).

Although every effort will be made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the proposed CAR will only be available by air, therefore survey locations will be limited to within 1 km of where a helicopter is capable of landing (e.g., cut helicopter landing pads, open grassy riparian areas). Considering that not all randomly selected points will be accessible, a number of oversample sites will be selected. The intent will be to provide the best chance of obtaining a robust sample but also visiting each potential ecosite.

The bird survey program will require some ELC data collection. As such, a number of sample points will be selected to overlap with the bird program considering survey site selection for the birds will be conducted through a similar stratified random sampling technique. Additional information on the bird survey program can be found in the Birds Study Plan.

Vegetation field surveys will be most intensive within the PDA, with somewhat less effort within the LSA. Ground investigations will occur at 25% of the selected field investigation locations with the remaining 75% being conducted through Visual Checks (**Section 7.3.2**), either through helicopter aerial surveys or breeding bird survey locations photographs. Site selection during Work Plan development will finalize the number of field survey locations. We are currently assuming 60% of the field survey locations will occur within the PDA and the remaining 40% within the LSA. Site selection during Work Plan development will finalize the number and distribution of sites within the PDA and LSA and which field survey method will be selected each site.

7.3.1.1 Regional Study Area

Baseline information for the RSA will need to be robust enough to support an assessment of indirect effects on vegetation. Considering the level of existing information on vegetation communities within the RSA (Far North Land Cover and Forest Resource Inventory [FRI] mapping), field investigations for vegetation will not be conducted within the broader RSA. Effects on vegetation within the RSA are not expected to be wide ranging and therefore effects can adequately be assessed using the existing and desktop derived information.

7.3.2 Field Methodology

Two types of field verification surveys will be conducted which are described in more detail in **Section 7.3.2.1.2**:

1. **Ground Inspections** will consist of a point sample[9] taken from a representative location within a desktop delineated and classified vegetation community polygon
2. **Visual Checks** will consist of an aerial assessment from helicopter or an assessment of representative photographs taken during other field programs (e.g., bird survey) of an individual pre-typed vegetation community to assess whether the pre-type was accurate or to adjust to a more suitable classification. Visual checks may also be completed on the ground, where possible (e.g., while walking from one ground plot to another).

The vegetation program will be completed in conjunction with the soils and terrain field program. This will allow for the consistent collection of field data and to establish correlations between soil / terrain and vegetation communities in the field. Field survey locations will be determined based on critical ecological parameters, including soil moisture and soil nutrient regime which are two key drivers of vegetation communities.

The Ground Inspection plots, and some Visual Check plots, will be established along transects extending out from pre-cut helicopter landing pads. Field plot locations will be identified during the initial terrain and vegetation community mapping exercise and will consider both access (i.e., proximity to existing helipad locations) and the need to survey all vegetation community types present within the LSA. Methods for delineating vegetation communities to be investigated are described in **Sections 7.3.2.1.1** and **7.3.2.2.1**.

9. A point sample refers to sampling a geographical area by selecting points on a map or through an aerial photograph.

Upland Vegetation Communities

For the purposes of this Study Plan, vegetation communities will be split into upland ecosystems and wetland / riparian communities. Upland communities include open, shrub, and treed communities containing mainly facultative upland and / or obligate upland plant species (i.e., non-wetland communities). Within upland ecosystems, the water table is rarely above the substrate surface and vernal pooling[10] is minimal.

7.3.2.1.1 Pre-Typing

Prior to field verification, upland vegetation communities will be pre-typed and delineated by GIS analysts and vegetation specialists through a desktop exercise for both the PDA and LSA. The delineation of individual vegetation communities will be completed using background information such as: Far North Land Cover Mapping (MNRF 2014), FRI mapping – Ogoki Forest (MNRF 2020) and surficial geology and terrain information, as well as highly detailed light detection and ranging (LiDAR) data that has been procured for the PDA and LSA. The individual vegetation communities will be delineated and classified to ecosite level following the Ecosites of Ontario methods (Banton et al. 2009). The criteria that will be used to delineate and classify the various vegetation communities include but may not be limited to:

- Tree species composition (tone, texture, colour, size, shape);
- Canopy characteristics (tone, texture, colour);
- Topography and terrain (Digital Elevation Model); and
- Soils (surficial geology information).

The RSA will not be delineated through ELC but will be left to the scale of the Far North Land Cover mapping; no additional desktop delineation or classification will occur.

The current level of both anthropogenic and natural disturbance associated with vegetation will be assessed to determine the level of habitat fragmentation, historical and current fire disturbance, and any proximate activities that have resulted in changes to fires regimes in order to predict changes in forest fire risk as a result of the Project.

10. Vernal pooling refers to small and shallow seasonal pools which are filled in the spring by snow melt and rain and often dry up during summer months.

7.3.2.1.2 Field Surveys

Field verification will be completed to confirm pre-typed vegetation communities and to collect data to inform the IA / EA. During the appropriate season (i.e., leaf on season which typically occurs from June through September), vegetation field verification will be conducted within the PDA and LSA at a representative subset of locations to further refine the pre-typed vegetation communities (refer to **Section 7.3.2.1.1** for details). Standard ELC forms (digital or paper) will be used to record observed characteristics in a consistent manner.

Ground Inspection

Ground Inspections will include a point sample from a representative location within a pre-selected vegetation community polygon (polygons defined in **Section 7.3.1**). At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen and moss will be recorded to the greatest extent possible. Particular attention will be paid to documenting locations and abundance of federal and provincial SAR, traditional use plants and rare plants. As part of the ELC method, the following data will be gathered:

- Photographs;
- Dominant plant form and canopy height;
- Soil texture, moisture regime, and degree of decomposition using a soil pit or auger;
- Stand description (dominant species, height and % cover);
- Abundance of standing snags and deadfall;
- Estimate of community age; and,
- Basal area calculation.

The rarer habitats found within the study area, such as the eskers and other geological features will be documented and key habitat information for species important to baseline land use and resources for traditional purposes will be collected. Should a SAR, SOCC or rare vegetation community be identified, their locations (Universal Transverse Mercator [UTM] coordinates) and boundary delineation, abundance (% cover) and habitat conditions (microclimate characteristics such as: shape and slope) will be recorded.

Vegetation community boundaries delineated using desktop GIS methods will be adjusted following the Ground Inspections, where necessary.

Ground Inspections will occur at a subset of pre-typed vegetation communities as noted in **Section 7.3.2.1.1**

Visual Checks

Visual Checks will be conducted through two separate methods.

1. **A fly-over of the pre-typed vegetation communities.**
   Aerial helicopter surveys of vegetation communities will occur to collect photos, and dominant species (those that can be identified from air), estimate of community age and stand composition, and an estimate of soil moisture regime where possible. Significant landforms including eskers will be documented from the air.
2. **Photograph interpretation from photos collected during breeding bird investigations.**
   Each breeding bird site visited between June 10 and August 30 will be photographically documented with 13 photos. At each cardinal direction: 1 photo at shoulder height with arm and camera extended parallel to ground, 1 photo with arm at 45-degrees (from body position) pointing down, and 1 photo with arm extended at 135-degrees (from body position) pointing up, and 1 photo with arm extended straight up (i.e., vertically). The photos will be interpreted to confirm the pre-typed vegetation community, estimate community age and stand composition, and estimate soil moisture regime.

Visual Checks will occur at a subset of pre-typed vegetation communities as noted in **Section 7.3.2.1.1**

7.3.2.2 Wetland and Riparian Communities

Wetland and riparian communities include open, shrub, and treed communities consisting of mainly facultative wetland plant species. Within wetland ecosystems, the water table is seasonally or permanently at, near or above the substrate surface. Peatlands will be examined independently as discussed in the Peatlands Study Plan.

Wetlands are an integral part of the landscape often providing multiple functions throughout complex ecosystems that are felt at a much larger scale. The main objective of the *Federal Policy on Wetland Conservation* (Environment Canada 1991) is to “promote conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and in the future” and strives for “no net loss” of wetland function on Crown land (Environment Canada 1991, Lynch-Stewart 1992, Lynch-Stewart et al. 1996).

7.3.2.2.1 Pre-typing

Wetlands

Wetlands within the PDA and LSA will be delineated using ArcGIS software, through a detailed desktop review of a combination of aerial photo interpretation, LiDAR data, terrain mapping and other existing

information. Each delineated wetland will be categorized using the wetland class (bog, fen, marsh, swamp, or shallow water) and ecosite classification definitions outlined in the *Canadian Wetland Classification System* (CWCS) (National Wetland Working Group 1997) and *Ecosites of Ontario* (Banton et al. 2009). Wetlands will be identified using available provincial datasets and key indicators, including geomorphology, surficial hydrology and vegetation.

Riparian

Riparian areas within the PDA and LSA will be digitized using ArcGIS, through a detailed desktop review of a combination of aerial photo interpretation, LiDAR data, terrain mapping, and other existing information. Each delineated riparian vegetation community will be categorized based on stand structure (e.g., initial succession, shrub, pole sapling, mature forest). Riparian habitat will be identified based on provincial datasets of waterbody and watercourse features, and key indicators, including geomorphology, surficial hydrology and vegetation. Riparian habitat assessed will include the vegetation assemblage that falls within 30 m of a watercourse or waterbody (e.g., stream or lake) edge (MNRF 2010, Environment Canada 2013).

7.3.2.2.2 Field Surveys

Wetlands

The *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson et al. 2008) provides a summary of potential methods that can be used to assess wetland function, indicates the type of data that should be collected, and provides a list of functions that can be expected for each of the different wetland classes (Hanson et al. 2008). These wetland function assessments help to inform the IS / EA Report by providing baseline conditions of the relative functions that the wetland provides to the landscape. The quantitative analysis of wetland function will provide a better understanding of the potential effects to wetlands as a result of the proposed CAR and will be detailed in the IS / EA Report.

Field verification will be completed to confirm pre-typed wetland communities and to collect data to inform the wetland functions assessment and for the IS / EA Report. During the appropriate season (i.e., leaf-on season, which is typically June through September), Ground Inspections will be conducted within the PDA and LSA at a representative subset of locations to further refine the pre-typed wetland communities (refer to **Section 7.3.2.2.1** for details). Standard forms (digital or paper) will be used to record observed characteristics in a consistent manner.

This data collection protocol is adapted from the *Wisconsin Rapid Assessment Methodology* (Wisconsin Department of Natural Resources 2001), *Ontario Wetland Evaluation System* (MNRF 2014a), and the

Wetland Ecological Functions Assessment: An Overview of Approaches (Hanson et al. 2008) which are complementary of recommended approaches from Environment and Climate Change Canada.

The following information will be collected at each Ground Inspection sites, to the extent possible:

General Information

- Wetland location coordinates.
- At each point location, and while travelling through the polygon to reach a representative point a botanical inventory of plant, fungi, lichen and moss will be collected to the extent possible. Particular attention will be paid to documenting locations for federal and provincial SAR and rare plants.
- Representative photographs.
- Wetlands will be classified according to the CWCS and ELC ecosites based on vegetation, hydrology, and soils.

Habitat Function Information

- Dominant vegetation type, community composition, and presence of invasive or species of special interest (Indigenous importance or SOCC or SAR) species will be recorded.
- Habitat suitability (emergent vegetation for waterfowl nesting, standing water for amphibian breeding, vegetation suitable for ungulate grazing) will be documented.
- Wildlife observations and evidence of wildlife activity will be documented. The majority of this will be captured as part of the Wildlife Study Plan.

Hydrological Function Information

- Geomorphology of the wetland (e.g. depressional, riverine, lake fringe, extensive peatland).
- Presence of surface water, flow patterns, connectivity, inputs, outputs, water depth, and evidence of ground water influence will be noted.
- Existing hydrology alterations (e.g. ditching, beaver activity).
- Biogeochemical function information.
- Soil moisture regime will be recorded.
- Substrate composition (mineral or organic) will be documented.
- Substrate decomposition rates will be described using the von Post scale (Ekono 1981).

Visual Checks will be primarily used to confirm and refine the wetland class or ecosite that was pre-typed, and identify dominant vegetation type, where possible.

Each wetland visited during Ground Inspections will be assigned a function ranking / score (i.e. high, moderate, low) based on its relative contribution of various wetland functions (i.e. habitat, hydrology, biogeochemical) to the surrounding ecological systems. The following will be considered when determining a ranking:

- Width, composition, and integrity of riparian habitat;
- Surrounding land use types and existing disturbances;
- Hydrological connectivity (flow, isolated wetland vs. wetland complex);
- Hydraulic conductivity (water permanence);
- Vegetation density and open water components;
- Biodiversity, presence of sensitive species or species of cultural importance and habitat suitability; and,
- Water storage and decomposition rates.

This methodology will provide a qualitative and quantitative measure of wetlands within the PDA and LSA and anticipated to include sufficient information to describe baseline conditions of wetland abundance and function.

Riparian

Similar to wetlands, field verification will be completed to confirm pre-typed riparian communities and to collect data to inform the riparian functions assessment and the effects assessment for the IA / EA Report. During the appropriate season (June through September), field verification will be conducted within the PDA and LSA at a representative subset of locations to further refine the pre-typed riparian communities (Refer to **Section 7.3.2.2.1)**. Standard forms (digital or paper) will be used to record observed characteristics in a consistent manner.

The goal of these field verifications is to obtain site-specific information for representative riparian areas and riparian vegetation ecological function information within the PDA and LSA. In addition, the field verifications will refine the results of the desktop review and riparian pre-type, where warranted. This data collection protocol is adapted from *Riparian Assessment and Prescription Procedures* (Ministry of Environment, Lands and Parks 1999).

The following information will be collected at each Ground Inspection site, to the extent possible:

- Overstory vegetation characteristics (tree species, densities and heights, % cover);
- Understorey vegetation characteristics (shrub, herb, and moss species, % cover and height);

- Soil properties (horizon depths, textures, degree of decomposition % coarse fragments);
- Indicators of disturbance;
- Site gradient and aspect; and
- Stream gradient and width.

The Visual Checks from helicopter surveys or field photo interpretation will be limited to confirming and refining the pre-typed vegetation type, documenting overstory vegetation characteristics and indicators of disturbance.

Each riparian site visited during the Ground Inspections will be assigned a function ranking / score (e.g. high, moderate, low) based on its relative level of functioning to the surrounding ecological systems. The following will be considered when determining a ranking:

- Large Woody Debris / Coarse Woody Debris;
- Stream Shading;
- Small Organic Debris;
- Surface Sediment Filtering;
- Channel Stability;
- Bank stability; and
- Disturbance indicators

This method will provide a qualitative and quantitative measure of riparian communities within the PDA and anticipated to include sufficient information to describe baseline conditions of wetland abundance and function.

7.4 Traditional Use Plants and SAR Plant Populations

Local indigenous communities will be engaged to develop an understanding of Traditional Use Plants and plants of importance to the various communities. This information combined with the botanical inventory collected during vegetation surveys will be used to describe the use of local vegetation for medicinal or cultural purposes or as a source of traditional (country) foods as well as baseline abundance information. The TISG notes that the following species may have particular cultural importance: black spruce, white spruce, Jack pine, tamarack, balsam poplar (*Populus balsamifera*), eastern white cedar (*Thuja occidentalis*), dwarf birch (*Betula nana*), red willow (*Salix laevigata*), trembling aspen, cottongrass (*Eriophorum angustifolium*), black crowberry (*Empetrum nigrum*), blueberry (*Vaccinium* spp.), raspberry

(*Rubus* spp.), northern Labrador tea (*Ledum palustre)*, bearberry (*Arctostaphylos* spp.), gooseberry (*Ribes spp*.), dogwood (*Cornus* spp.), small cranberry (*Vaccinium oxycoccos*), wild rice (*Zizania palustris*), sweetflag (*Acorus* spp.) sweetgrass (*Anthoxanthum nitens*), waterlilies (*Nymphaea* sp.), mosses, sphagnum moss (*Sphagnum* spp.) and caribou lichen. This information may not represent every species important to indigenous tradition and knowledge.

Engagement with local Indigenous communities may identify additional plant species to those listed above, as well as any other plant species of concern for consumption or those of Indigenous cultural importance.

Rare plants including SAR and SOCC will be documented throughout the vegetation surveys; their locations, population and habitat conditions will be recorded. The SAR Public Registry will be consulted for information on the list of SAR and available recovery documents. The information gathered from background existing data and field surveys will be combined to describe the distribution and abundance of rare plants and communities in relation to the PDA and LSA. All SAR information gathered through ground surveys will be provided to MNRF's Natural Heritage Information Centre, and in addition, any information on species listed as Threatened or Endangered under the *Endangered Species Act* will be provided to the MECP Species at Risk Branch.

7.5 Invasive Plant Species

The background review will identify, delineate and classify potential invasive, noxious, persistent and non-native plants species that may be present within the study areas. Using the information collected on the baseline condition of any observed non-native species, invasive species, and / or introduced species of concern, alternate vegetation control approaches for the construction and operations stage of the Project will be developed in consultation with Indigenous communities and incorporated into the IA / EA.

8. Data Management and Analysis

Data management including quality assurance / quality control (QA / QC) will be employed to minimize potential for data entry and analysis errors, prepare data sets for analysis and limit sensitive data distribution in accordance to established agreements.

8.1 Field Surveys

To maintain consistency and for quality assurance / quality control of the data collected, standardized datasheets (either digital or paper) paired with mapping software will be used in the field. Field studies will follow technical protocols that will outline specific work instructions and will be / have been developed to follow provincially and federally acceptable methods. Completeness and accuracy of field data will be verified daily during field verification and field photos and coordinate information will be backed up daily.

8.2 GIS

Where baseline data are available in GIS format, this information will be provided to the Agency as electronic geospatial data file(s) compliant with the International Organization for Standardization (ISO) 19115 standard. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada as applicable with exclusion of sensitive SAR and Indigenous Knowledge.

Complete data sets from all survey sites will be provided. They will be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation / visit information and with observations and measurements in un-summarized form. Databases and GIS files will be accompanied by detailed metadata that meets ISO 19115 standards. Documentation and digital files will be provided for all results of analyses that allow for a clear understanding of the methods and a replication of the results. All geographic data, along with accompanying metadata, pertaining to SAR will be provided to Natural Heritage Information Centre and the MECP Species at Risk Branch.

8.3 Vegetation Community (Upland, Wetland and Riparian) Extrapolation

During the initial desktop pre-typing of vegetation communities as outlined in **Section 7.3.2,** a remote sensing technique will be completed using image classification analysis through a tool such as ArcGIS Spatial Analyst Extension. LiDAR and other existing information will be reviewed by vegetation specialists to classify each type of vegetation community. These defined features will then be used to create training samples which will be evaluated by the tool to apply the classification to the remainder of the PDA and LSA. Modelling will also include covariates such as estimated biomass, elevation, and light detection and ranging-derived canopy information. As additional field investigation data is obtained, we can further strengthen and refine models to support extrapolation to the overall PDA and LSA. A machine learning approach will likely be taken to extrapolate ELC using the covariates as identified above.

After model training / testing, maps of the various variable will be used to extrapolate likely areas where each vegetation community may exist across the PDA and LSA.

The wetland and riparian function rankings obtained during the ground-based field surveys will be extrapolated for the remaining wetlands identified within the PDA and LSA during the desktop review in the same manner as the extrapolation and modelling of the vegetation community data noted above. Mapped wetlands and covariate data will be reviewed by biostatisticians and wetland specialists to identify and classify wetland communities. These defined features will then be used to create training samples which will be evaluated by a tool to apply classifications to the remainder of the wetlands within the PDA and LSA. Abundance information of wetlands and vegetation communities will also be inferred through the use of this tool.

Modelling methods are still in development but will be clearly documented within the IS / EA Report to include assumptions, calculations of margins of error and other relevant statistical information.

Data files, mapped wetlands and vegetation classification features as well as SAR critical habitat and residences will be provided depicting their presence and relative predicted abundance within the study areas.

9. Effects Assessment

The following sections provide discipline-specific input and considerations as they pertain to the methodology for effects assessment. The Project is in the early stage of the IS / EA Report preparation and it is expected that the effects assessment methodology will be refined iteratively based on regulatory agency guidance, professional judgment and input received through the Project consultation and engagement process.

9.1 Project-Environment Interactions

The Project activities that may result in changes to the environment are described within the identified temporal and spatial boundaries. This includes identification of both direct and indirect changes by comparing the existing setting to the conditions anticipated to occur as a result of the Project. For each environmental discipline, the likely Project-environment interactions will be identified based on professional judgment, activities listed in TISG Section 3.2 as well as projects of similar magnitude and / or location.

A preliminary analysis of Project-environment interactions for Vegetation is provided in **Table 9-1** and will be confirmed during the IA / EA process to identify the Project-environment interactions that are likely to have a potential effect, and to identify measures to avoid or minimize potential negative effects and enhance benefits.

Table 9-1: Project – Environment Interactions

Project Phases	Project Activities	Vegetation
Construction Phase	*Mobilization of Equipment and Supplies*	**x**
	Temporary Construction Staging Areas[1]	**x**
	Temporary Access Roads and Trails[1]	**x**
	Temporary Construction Camps[1]	**x**
	ROW Clearing and Grubbing	**x**
	Brush and Timber Disposal	**x**
	Pits and Quarries[1]	**x**
	Drilling / Blasting / Aggregate Production	**x**
	Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	**x**
	Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	**x**
	Construction Site Restoration	**x**

Project Phases	Project Activities	Vegetation
Construction Phase: Decommissioning	*Pits and Quarries*	**x**
	Temporary Camps, Roads / Trails and Staging Areas	**x**
Operations Phase	*Road Usage*	**x**
	Maintenance[2]	**x**

Notes: 1. Includes construction and use of
2. Includes General Maintenance (e.g., grading, erosion control, quarrying, pits), Seasonal Maintenance (e.g. snow clearing, bridge and culvert maintenance), and Special Maintenance (e.g. slope failures, road settlement / break-up.).

9.2 Valued Components and Indicators

The indicators and rationale for selection and measurement of potential effects, to be used to assess and evaluate the alternative routes in the IS / EA Report are provided in **Table 9-2**. The table includes both quantitative and qualitative indicators. The final list of indicators to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

The VCs for Vegetation have been determined through consideration of the following factors listed in the TISG[11]:

- VC presence in the Project study areas;
- the extent to which the VC is linked to the interests or exercise of Aboriginal and Treaty Rights of Indigenous peoples, and whether an Indigenous group has requested the VC;
- the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the VC;
- the extent to which the VC may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes;
- the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies);
- the possibility that adverse or positive effects on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and
- whether the potential effects of the Project on the VC can be measured and / or monitored or would be better ascertained through the analysis of a proxy VC.

11. The TISG (the Agency 2020b) also states that information from ongoing and completed regional assessments in the proposed area of the Project should be used to inform VCs for the Project. In February 2020 a regional assessment of the Ring of Fire region commenced; however, it is not sufficiently advanced at this time to inform the Project VCs. The VCs will be consulted and engaged on early in the IA/ EA process and finalized taking into consideration the input received. Therefore, only information relevant to the Project that arises from the regional assessment of the Ring of Fire within an appropriate timeline will inform the VCs for the Project.

Inputs received to date from Indigenous communities, agencies and interested persons through the Consultation and Engagement Program, including inputs received on the Draft ToR, have also been used to inform the selection of the VCs and indicators for Vegetation.

Table 9-2: Vegetation Indicators

Valued Component	Indicators	Rationale for Selection
Wetland and Riparian Ecosystems	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and/or social implications associated with this VC, where applicable. ■ Provides ecosystems support (habitat for flora, fauna, hydrological functions, air & water purification, carbon & nitrogen storage) ■ Habitat for Traditional Use and SAR plants ■ Indicator of wetland health
Upland Ecosystems	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and/or social implications associated with this VC, where applicable. ■ Provides ecosystems support (habitat for flora, fauna, hydrological functions, air & water purification, carbon & nitrogen storage) ■ Habitat for SAR plants
Designated Areas *(Area of Natural and Scientific Interests, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations)*	■ Availability (abundance spatially and temporally) ■ Distribution ■ Function and Composition	■ Cultural, economic, and/or social implications associated with this VC, where applicable ■ Indicator of ecosystem health
Traditional Use Plants and SAR Plant Populations *(Including species with special conservation status or rarity in the province)*	■ Species presence ■ Persistence of population ■ Accessibility to traditional use of plants	■ Species at Risk (provincial or federal) ■ Cultural, economic, and/or social implications associated with this VC, where applicable ■ Indicator of ecosystem health

9.3 Potential Effects

A direct effect occurs through the direct interaction of an activity with an environmental discipline. The Project-environment interactions currently anticipated, based upon preliminary analysis, to result in direct effects to the Vegetation discipline have been identified in **Table 9-1**. The potential direct effects resulting from the Project-environment interactions will be confirmed during the IA / EA process and will be based on input received through the Indigenous Knowledge Program and Consultation and Engagement Program, regulatory agency guidance, and professional judgement.

An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (i.e., changes in vegetation could indirectly affect wildlife). **Table 9-3** provides a preliminary identification of how changes to Vegetation may result in indirect effects to other environmental disciplines.

9.4 Methods for Predicting Future Conditions

With respect to quantitative models and predictions, the IS / EA Report will detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained.

Assessments of biodiversity metrics, relative abundance and distribution of vegetation communities of ecological, economic or social importance will be included in the prediction of future conditions. Percentage of land cover types and changes to land cover can provide critical information on broad-scale ecosystem changes. In addition, the extent of wetland cover and amount of wetland loss are also strong indicators of change in biodiversity (Ontario Biodiversity Council 2020). To predict future conditions for the Vegetation VCs, an assessment of the level of pre-existing disturbance versus new disturbance will be assessed. Burned areas, and forestry cut blocks will be included as existing disturbance. The baseline data gathered in terms of area of vegetation communities and abundance, minus existing disturbed areas will be compared to the area and abundance of vegetation communities that will be lost or affected by the Project within the PDA, LSA, and RSA.

Landscape fragmentation affects both plants and animals by depriving them of habitat. Fragmentation also causes indirect effects which together can result in declines of species populations and richness as well as changes to community composition. Therefore, an assessment of fragmentation prior to Project development and predicted effects post-development will be included within the IS / EA Report. This will include an effective mesh size[12] assessment similar to that completed by Jaeger 2000.

12. "Effective mesh size" is a term introduced by Jaeger, 2000 to describe the effects of fragmentation "[…] based on the ability of two animals – placed in different areas somewhere in a region – to find each other within the landscape." The effective mesh size "[…] denotes the size of the areas when the region under investigation is divided into S areas (each of the same size […]) with the same degree of landscape division".

Table 9-3: Potential Discipline Interactions

Discipline and Associated Valued Components	Aboriginal Treaty Rights and Interests	Atmospheric Environment	Climate Change	Acoustic Environment	Physiology, Terrain and Soils	Surface Water	Groundwater	Vegetation	Wildlife	Fish and Fish Habitat	Social	Economy	Land and Resource Use	Human Health and Community Safety	Visual Aesthetics	Archaeological and Cultural Heritage
Vegetation ■ Wetland and Riparian Ecosystems ■ Upland Ecosystems ■ Designated Areas ■ Traditional Use Plants and SAR Plant Populations	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X

Notes: X = Potential pathway for indirect effect as a result of the Project.
- = No pathway for indirect effect is anticipated as a result of the Project.

Wetland and riparian predicted effects will rely heavily on data gathered by surface and groundwater assessments that will be conducted and provided under separate study plans. The data gathered under these study plans will be used to assess wetland capacities to perform hydrological and water quality functions. Data will be collected to describe hydrological or drainage changes as a result of the Project that may alter moisture regimes and affect vegetation and wetland function. Wetland assessments will also consider whether wetlands within the study areas are within an area where wetland loss or degradation has reached critical levels, or are considered ecologically, socially or economically important to the region.

The IS / EA Report will describe the anticipated activities during the construction and operations phase and will consider the resilience of relevant species populations, communities and associated habitats to the effects of the Project. Ecological process will be evaluated for potential susceptibility which will include consideration for: patterns and connectivity of habitat patches; continuation of key natural disturbance regimes; structural complexity; hydrogeological patterns; nutrient cycling; abiotic -biotic and biotic interactions; population dynamics, genetic diversity, Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats including geological features.

9.5 Mitigation and Enhancement Measures

Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects beyond those that are already inherent to the design. These measures will consist of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, Indigenous and community recommendations and recommendations from industry and environmental professionals based on expertise, scientific publications, experience and judgement.

It is important that mitigation and enhancement measures are achievable, measurable and verifiable and monitored for compliance and effectiveness during all temporal phases as part of the Project follow-up monitoring plan. Required environmental monitoring will verify the potential environmental effects predicted in the IS / EA Report, evaluate the effectiveness of mitigation and enhancement measures, and identify the process the Proponent will follow if mitigation and enhancement measures are not effective.

9.5.1 TISG Section 20 Requirements

The TISG Section 20 requirements for Vegetation are listed below. The applicability of these requirements will be evaluated during the IA / EA and will be adapted to the needs of the site, environment and Project activities.

- Include measures to address sensory disturbance and the resulting functional loss of habitat.
- Include measures to prevent the road from being a conduit for the spread of invasive species such as European Common Reed (*Phragmites australis*).
- Provide best technically and economically feasible mitigation approaches to habitat mitigation that follow the hierarchy:
  - Avoid potential impact.
  - Minimize potential impact.
- Provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and provide justification for moving from one mitigation alternative to the next.
- Provide offsetting or compensation plans to address all residual effects to SAR, and their critical habitat, migratory birds, fish and fish habitat and / or wetland functions (if applicable) for review during IA / EA process; the plans should:
  - Describe the baseline condition of the SAR, critical habitat, migratory birds and wetland functions potentially impacted by the Project;
  - Apply the mitigation hierarchy;
  - Identify and describe residual effects;
  - Identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial authorities and Indigenous groups have been considered;
  - Identify the location and timing of implementation of compensation projects (where feasible);
  - Identify and describe the success criteria;
  - Identify and detail non-habitat measures;
  - Describe how the proposed measures align with published provincial and federal recovery, management, or action plans and strategies for SAR;
  - Identify the parties responsible for implementation, including monitoring and review;

- Identify indicator species for setting compensation objectives. Identification should be based on baseline data, Bird Conservation Strategies, and other information where available (note: SAR should not be used as indicator species; compensation efforts need to be directed specifically to these species);
- Describe the functions gained at the compensation site(s);
- Provide evidence that functions can be replaced by the proposed offset activities;
- Describe the process of selecting proposed compensation site(s) and associated baseline condition(s); and
- Provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities.

9.6 Residual Effects

Residual effects are the effects remaining after the application of mitigation measures. The IS / EA Report will describe in detail the potential adverse and positive residual effects in relation to each temporal phase of the Project (i.e., construction, operation). Residual effects will be described using criteria to quantify or qualify adverse and positive effects, taking into account any important contextual factors. The residual effects will therefore be described in terms of the direction, magnitude, geographic extent, duration, frequency, likelihood, and whether effects are reversible or irreversible[13]. Ecological and socio-economic context may also be relevant when describing a residual effect. Context relates to the existing setting, its level of disturbance and resilience to adverse effects. Context can also relate to timing as it applies to assessing the worst-case scenario (e.g., effect during migratory or calving season for wildlife). Where appropriate, information regarding residual effects will be disaggregated by sex, gender, age and other community relevant identifying factors to identify disproportionate residual effects for diverse subgroups.

9.6.1 Magnitude

For magnitude, environmental discipline-specific definitions are required and are proposed below in **Table 9-4**.

13. TISG Section 13.1 (the Agency 2020b) identifies additional effects characteristics for certain disciplines (e.g., wetlands, birds, terrestrial wildlife, SAR). These additional effects characteristics are described in the respective discipline-specific study plans.

Table 9-4: Vegetation Magnitude Definition

Magnitude Level	Definition	Rationale
Negligible	■ Small scope of effect and slight severity of effect to Vegetation VCs.	■ Vegetation species and / or communities will be affected across 1% to 10% of their occurrence or population within the study area and are likely to be only slightly degraded or reduced in population by 1% to 10% within ten years or three generations (one generation being approximately 3 years).
Low	■ Restricted scope of effect and moderate severity of effect to Vegetation VCs.	■ Vegetation species and / or communities will be affected across 11% to 30% of their occurrence or population within the study area and will likely be moderately degraded or reduced in population by 11% to 30% within ten years or three generations.
Medium	■ Large scope of effect and serious severity of effect to Vegetation VCs.	■ Vegetation species and / or communities will be affected across 31% to 70% of their occurrence or population within the study area and will likely be seriously degraded or reduced in population by 31% to 70% within ten years or three generations.
High	■ Large to pervasive scope and high to extreme severity of effect to Vegetation VCs.	■ Vegetation species and / or communities will be affected across all or most (71% to 100%) of their occurrence or population within the study area and will likely be destroyed or eliminated or reduced in population by 71% to 100% within ten years or three generations.

9.7 Consideration of Sustainability Principles

The following provides a generic description of how sustainability principles will be considered in the effects assessment. The extent to which sustainability principles apply to a specific VC will vary depending on the nature of the VC and the potential for Project effects on the VC.

The effects assessment approach for the Project has included the consideration of the sustainability principles outlined in the Project TISG and the Agency's guidance on sustainability. The sustainability principles that have been considered include:

1. Consider the interconnectedness and interdependence of human-ecological systems;
2. Consider the well-being of present and future generations;
3. Consider positive effects and reduce adverse effects of the Project; and
4. Apply the precautionary principle by considering uncertainty and risk of irreversible harm.

The interconnectedness and interdependence of human-ecological systems will be considered through the assessment of potential indirect effects of each alternative. An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental

discipline (e.g., changes in vegetation could indirectly affect wildlife). A preliminary assessment of indirect effects has been included in **Section 9.3**.

The well-being of present and future generations will be considered in the effects assessment through the application of the long-term operations phase temporal boundary of 75 years (**Section 6.1**) and through the effects characteristics description of duration and reversibility for each residual effect predicted.

The consideration of positive effects and reducing adverse effects of the Project is fundamental to the effects assessment methodology through the identification of mitigation measures to reduce potential adverse effects and the identification of the preferred alternative through the evaluation of advantages (i.e., positive effects) and disadvantages (i.e., adverse effects).

The effects assessment will apply the precautionary principle by clearly describing and documenting all uncertainties and assumptions underpinning the analysis and identifying information sources. The effects assessment will consider risk of irreversible harm through the effects characteristics description of reversibility for each residual effect predicted and will describe any uncertainty associated with the assessment of residual effects.

The scope of the sustainability assessment will be defined by issues of importance identified by Indigenous communities and interested persons through consultation and engagement activities, while also ensuring to be inclusive of the diversity of views expressed. The selection of VCs that will be the focus of the sustainability assessment will be aligned with the issues of importance identified by Indigenous communities and interested persons, as well as residual effects identified through the effects assessment process. The sustainability assessment will describe how the planning and design of the Project, in all phases including follow-up monitoring, considered the sustainability principles.

9.8 Consideration of Identity and Gender-Based Analysis Plus in Effects Assessment

The Proponent recognizes that communities and sub-populations within those communities may be impacted differently by the Project with respect to VCs and indicators. As such, the Project aims to collect baseline information for the purpose of assessing differential effects and establishing relevant mitigation measures, as further elaborated on in **Section 4.2**. Gender-Based Analysis Plus will not be limited to community feedback, when offered or discussed in secondary texts, additional sub-population information as is applicable to the relevant assessment will be incorporated.

9.9 Follow-up Programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. Identification of follow-up programs for the Project are not described in this Study Plan as the information needed to determine environmental monitoring requirements is dependent on the outcome of the effects assessment and consultation with Indigenous communities, agencies and interested persons. For instance, offsets required as part of *Endangered Species Act* or *Species at Risk Act* permitting will incorporate a follow up program, however an effects assessment and consultation will need to take place prior to formalization of a program. Therefore, the Proponent will include information on follow-up programs that address the requirements outlined in Section 26 of the TISG, in the IS / EA Report and will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required.

The need for and content of a monitoring plan(s) specific to wetlands and vegetation will consider the requirements in Section 26 of the TISG. Any recommended monitoring plans will be presented in the IS / EA Report.

10. Assumptions

Any assumption used in the effects assessment, for example the assumed average daily traffic on the CAR, will be clearly identified and a rationale provided in the IS / EA Report.

11. Concordance with Federal and Provincial Guidance

This section provides the best information currently available on how federal and provincial requirements identified for the Project to date will be addressed. The final concordance with federal and provincial requirements will be included in the IS / EA Report, and will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

Table 11-1: Study Plan Federal Concordance – Conformance with Requirements

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
1	TISG Section 1.1 page 4	■ The Guidelines correspond to factors to be considered in the IA. These factors are listed in subsection 22(1) of The Agency and prescribe that the IA of a designated project must take into account: – any change to the designated project that may be caused by the environment;	■ The potential effects of the Project on Vegetation and the potential effects of the environment on the Project will be assessed in accordance with applicable standards and guidance.	■ Section 9
2	TISG Section 2.3, pages 6-7	■ The description should focus on aspects of the Project and its setting that are important in order to understand the potential environmental, health, social and economic effects and impacts of the Project. The following information must be included and, where appropriate, located on map(s): – geographic coordinates (i.e., longitude/latitude using international standard representation in degrees, minutes, seconds) for the beginning and end points of the proposed road; – current land and/or aquatic uses within the Study Areas; – distance of the project components to any federal lands and the location of any federal lands within the Study Areas; – all waterbodies and their location on a map; – navigable waterways; – the environmental significance and value of the geographical setting in which the Project will take place and the Study Areas; – environmentally sensitive areas, such as national, provincial, territorial and regional parks, [United Nations Educational, Scientific and Cultural Organization] UNESCO World Heritage Sites, geological heritage sites, ecological reserves, ecologically and biologically sensitive areas, wetlands, and habitats of federally or provincially listed species at risk and other sensitive areas; – Dedicated Protected Areas3 and any other areas of ecological and social significance identified by the community during the community-based land use planning processes with the Province of Ontario (e.g., Enhanced Management Areas; see Section 6.1 for requirements related to confidentiality); – lands subject to conservation agreements; – current mineral development proposals, and areas of early and advanced mineral exploration in the Study Areas; – current areas of aggregate extraction; – description and locations of all potable drinking water sources (i.e., municipal or private), including spring water sources; – description of local communities and Indigenous groups that is culturally relevant and gender sensitive; – if the information is not confidential, provide a description and location of Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, Indian Reserve lands, Indigenous harvesting regions (with permission of Indigenous groups), Métis settlements; and – culturally important features of the landscape.	■ The information related to landscape features, sensitive or protected areas and select others listed in the TISG will be illustrated on detailed maps and / or described within the IS / EA Report, where appropriate. This information will be gathered through the desktop analysis, consultation and community engagement and field studies as described in the Study Plan.	■ Section 7 ■ Section 8
3	TISG Section 3.1, page 11	■ The Impact Statement must describe all project components including but not limited to: – borrow pits, gravel or aggregate pits and quarries (footprint, geographic location, ownership, and development plans including pit phases and lifespan), including their location in relation to upland habitats and the presence of rare, limited and/or significant habitat (e.g., federal, provincial, or Indigenous protected and conserved areas, ANSIs (Areas of Natural and Scientific Interest), Ramsar sites, critical habitat identified under the Species at Risk Act, etc.;	■ The information related to landscape features, sensitive or protected areas and other items listed in the TISG will be illustrated on detailed maps and / or described within the IS / EA Report, where appropriate. This information will be gathered through the desktop analysis, consultation and community engagement and field studies as described in the Study Plan.	■ Section 6.2
4	TISG Section 5.1, page 22	■ Any proposed mitigation measures are to be clearly linked, to the extent possible, to valued components in the Impact Statement as well as to specific project components or activities, as well as comments raised during engagement activities	■ Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects.	■ Section 9.5

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
5	TISG Section 7.1, page 29	■ In describing the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the Project may affect the structure and functioning of biotic and abiotic components with the ecosystem using scientific, community and Indigenous knowledge regarding ecosystem health and integrity, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity, identified during early planning and reflected in the TISG. The presence of habitat (e.g., federal, provincial, or Indigenous protected areas, ANSIs, RAMSAR sites, critical habitat identified under the SARA, etc.), such as but not limited to spawning shoals, aquatic vegetation or overwintering pools, potentially effected by the Project should be included in the description of the biophysical baseline conditions.	■ We will take an ecosystem approach that considers how the Project may affect structure and functioning of biotic and abiotic ecosystem components. This includes areas of indigenous cultural importance, descriptions of ecosystem health and integrity, the presence of protected areas and critical habitat for SAR species.	■ Section 9
6	TISG Section 7.1, page 30	■ The Impact Statement must establish appropriate Study Area boundaries to describe the baseline conditions. The Study Area boundaries need to encompass the spatial boundaries of the Project, including any associated project components or activities, and the anticipated boundaries of the Project effects, including all potentially impacted local communities, municipalities and Indigenous groups. Considerations in assigning appropriate Study Areas or boundaries would include, but not be limited to: – areas potentially effected by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters; – areas potentially effected by airborne emissions or odours; – areas determined by dispersion and deposition modelling; – areas within the range of vision, light and sound and the locations and characteristics of the most sensitive receptors; – species habitat areas, usage timing and migratory patterns; – emergency planning and emergency response zones; – the geographic extent of local and regional services; – any impacted local communities, including municipalities; – all potentially impacted Indigenous groups; – areas of known Indigenous land, cultural, spiritual and resource use; and – existing effected infrastructure.	■ The study areas are defined and described in the Study Plan.	■ Section 6
7	TISG Section 7.1, page 30	■ The Impact Statement must consider the resilience of relevant species populations, communities and associated habitats to the effects of the Project. Ecological processes should be evaluated for potential susceptibility to adverse effects from the Project. Considerations include patterns and connectivity of habitat patches; continuation of key natural disturbance regimes; structural complexity; hydrogeological or oceanographic patterns; nutrient cycling; abiotic-biotic and biotic interactions; population dynamics, genetic diversity, Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.	■ The IA / EA will consider the resilience of relevant populations, communities and associated habitat to the effects of the Project. Ecological processes will be evaluated for potential susceptibility to adverse effects from the Project such as considerations for: patterns and connectivity of habitat patches, continuation of key natural disturbance regimes.	■ Section 8 ■ Section 9
8	TISG Section 7.1, page 30	■ If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the Study Area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional Study Areas. Ensure baseline data is representative of project site conditions. If surrogate data from reference sites are used rather than site-specific surveys, the proponent should demonstrate that the data are representative of project site conditions.	■ We will include details on modeling methods and discuss confidence in using desktop and / or field studies when describing baseline conditions.	■ Section 7 ■ Section 8
9	TISG Section 7.1, page 31	■ Where baseline data are available in geographic information system (GIS) format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada.	■ Data provided will meet ISO 19115 standards.	■ Section 8

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
10	TISG Section 7.2, pages 31-33	■ Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following sources of information. For specific sources of baseline information, see Appendix 1. – Federal government (e.g., Environment and Climate Change Canada, Health Canada, Indigenous Services Canada, Statistics Canada, Women and Gender Equality Canada); – Ontario provincial government (e.g., Ministry of Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry; – Bird Conservation Region plans; – academic institutions; – field studies, including site-specific survey methods; – database searches, including: – federal, provincial, territorial, municipal and local data banks; – Breeding Bird Atlas - Ontario (2001-2005)22 – monitoring program databases protected areas, watershed or coastal management plans; – natural resource management plans; – species recovery and restoration plans; – field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape); – land cover data, including: ▪ terrestrial ecosystem mapping products; ▪ forest cover maps; ▪ remote sensing resources; ▪ important habitats and features to include: ▪ water bodies, wetlands, watercourses; ▪ riparian habitat; ▪ river banks or other eroded habitats; ▪ artificial water sources; ▪ forest, tree patches, solitary trees (especially old decaying trees); ▪ forest edges and tree rows; ▪ ridges, including eskers; ▪ caves and mines; ▪ cliffs, rock outcrops, exposed bedrock, talus, and other karst topography; ▪ buildings, bridges, and other anthropogenic features, including linear features; ▪ sources of artificial lighting attracting insects; ▪ critical habitat; and ▪ and any other habitat features known to be important in the area. – Published literature, such as peer reviewed journals, reports by think tanks, non-government organizations and government reports; – EA documentation, including monitoring reports, from prior projects in the area and similar projects outside the area; – regional studies, project assessments and strategic assessments; – renewable harvest data; – Indigenous knowledge, including oral histories and knowledge gathered by spending time on the land with knowledge holders; – community based monitoring and studies conducted by Indigenous communities; – expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys; – qualitative information gathered from interviews, focus groups or observation; – census data; – baseline human health risk assessments; – community and regional economic profiles; – community well-being studies; and – statistical surveys, as applicable.	■ Data sources are being reviewed for their appropriateness and will be included in study plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7 ■ Appendix A

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
11	TISG Section 7.2, page 32	■ The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 ■ Appendix A
12	TISG Section 7.2, page 33	■ If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads.	■ Data sources are being reviewed for their appropriateness and will be included in study plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7 ■ Appendix A
13	TISG Section 7.2, page 33	■ Consult the Species at Risk Public Registry for information on the list of species at risk and available recovery documents and reference the documents and dates consulted. Ensure the most up to date documents are used and species statuses are up to date	■ The information requested will be provided in the IS / EA Report.	■ Section 9
14	TISG Section 7.2, page 33	■ Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IS / EA Report and are summarized in this Study Plan.	■ Section 7
15	TISG Section 7.2, page 33	■ With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data should be considered as a limited augmentation of this new data. See the “Establishing Baseline Conditions” (sections 8.5, 8.9, 8.10, 8.11) in this TISG for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IS / EA Report and are summarized in this Study Plan.	■ Section 7
16	TISG Section 7.3, page 34	■ The list of valued components must be informed, validated and finalized through engagement with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities, and other interested parties. The Impact Statement must describe valued components, processes, and interactions that are identified to be of concern or that the Agency considers likely to be impacted by the Project and are included in the Guidelines.	■ A summary of the Consultation & Engagement Plan to Support the Environmental Assessment / Impact Statement (AECOM 2020) has been provided in **Section 4** of the Study Plan; further details can be found in the Appendix B of the ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available.	■ Section 4
17	TISG Section 7.3, pages 34-35	■ In selecting a valued component to be included, the following factors should be considered: – valued component presence in the Study Area; – the extent to which the valued component is linked to the interests or exercise of Aboriginal and Treaty rights of Indigenous peoples, and whether an Indigenous group has requested the valued component; – the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the valued component; – the extent to which the valued component may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes; – the extent to which the valued component is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies); – the extent to which the valued component is being addressed through any ongoing or completed regional assessment processes; – the possibility that adverse or positive effects on the valued component would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and – whether the potential effects of the Project on the valued component can be measured and/or monitored or would be better ascertained through the analysis of a proxy valued component.	■ The IS / EA Report will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the Project.	■ Section 9
18	TISG Section 7.3, page 35	■ The valued components must be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential adverse and positive environmental, health, social and economic effects and impacts arising from the Project activities.	■ The IS / EA Report will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the Project.	■ Section 9

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
19	TISG Section 7.3, page 35	■ For each of the valued components that will be assessed in the Impact Statement, the proponent must create a Study Plan and a Work Plan to be validated by the Agency. Upon receipt of a Study Plan, the Agency may request that the proponent present and discuss the Study Plan at technical meetings, which will be scheduled during the impact statement phase.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan.	■ Section 3
20	TISG Section 7.4.1, pages 35-36	■ The Impact Statement must describe the spatial boundaries, including project, local and regional Study Areas, for each valued component included in assessing the potential adverse and positive environmental, health, social and economic effects of the Project and provide a rationale for each boundary. Spatial boundaries are defined taking into account the appropriate scale and spatial extent of potential effects and impacts of the Project; community knowledge and Indigenous knowledge; current or traditional land and resource use by Indigenous groups; exercise of Aboriginal and Treaty rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations. The size, nature and location of past, present and foreseeable future projects and activities are factors that should be included in the definition of spatial boundaries. It should be noted that in some cases, spatial boundaries might extend to areas outside of Canada. These transboundary spatial boundaries should be identified where transboundary effects are expected.	■ The study areas are defined and described in the Study Plan.	■ Section 6
21	TISG Section 7.4.1, page 36	■ For valued components establish three Study Area spatial boundaries to assess impacts to each valued component: 1) Project Study Area: defined as the project footprint for each alternative route; " 2) Local Study Area: defined for each valued component – see below; 3) Regional Study Area: defined for each valued component – see below ■ Provide a rationale for boundaries of the project Study Area, local Study Area, and regional Study Area for each valued component and indicate how the above objectives were met in establishing the boundaries.	■ The study areas are defined and described in the Study Plan.	■ Section 6
22	TISG Section 7.4.1, page 36	■ For biophysical valued components, spatial boundaries should be defined using an ecosystem-centered approach for the project Study Area, local Study Area, and regional Study Area, as wetlands and eskers are features that are likely to be most effected. Ecoregion boundaries or their derivatives should not be used since the Project occurs on, near and across ecoregion boundaries. See Technical Guidance for Assessing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act, 2012* for more guidance on determining spatial boundaries. Delineate spatial boundaries (i.e., regional Study Area, local study area, and project Study Area) to meet the following objectives: a. range of land cover types should be representative of the defined spatial extent; b. the spatial pattern of the land cover types should be well distributed across the defined spatial extent (e.g., revise if one or more land cover types is concentrated in one sub-area and uncommon in other parts of the area); and c. low to moderate rate of change in the prevalence of one or more land cover types with increasing distance from the (i.e., to use land cover patterns to constrain the distances within which comparisons should be made).	■ The study areas are defined and described in the Study Plan.	■ Section 6
23	TISG Section 7.4.1, page 37	■ For Habitat valued components: The spatial extent of the habitat and the habitat functions should influence the determination of an appropriate local Study Area and regional Study Area, considering objectives a-c above. The local Study Area should be at a minimum: project Study Area plus a 500-metre buffer. For habitat valued components potentially affected by the Project, a land cover analysis should be conducted to determine if a 500-metre buffer appropriately reflects ecological boundaries.	■ The study areas are defined and described in the Study Plan.	■ Section 6
24	TISG Section 7.4.1, page 37	■ For Species valued components: The local Study Area should correspond to the project Study Area plus a buffer defined with objectives a-c above. Use simulation modeling to help define a buffer that captures objectives a-c for each species or species group.	■ The study areas are defined and described in the Study Plan.	■ Section 6
2	TISG Section 7.4.2, page 37	■ For valued components related to wetlands, eskers, birds, wildlife, and Species at Risk, define temporal boundaries in a manner that enables detection of all species that use the project Study Area, local Study Area, and regional Study Area throughout the year and between years, and to estimate their temporal pattern of use (e.g., breeding, or migrants stopping on northward and/or southward migration). Baseline data collection for all biophysical valued components is to be provided for a minimum of two years, unless specified otherwise. Temporal boundaries spanning more than one year will enable accounting for variation due to irregular events (e.g., masting events, storms on migration, late snowfalls).	■ Data (desktop and field-based) will be collected to represent temporal sources of variation. Data collected will be representative of the temporal perspective of multi-years of study by using baseline data from previous years / seasons and desktop studies to supplement proposed field studies.	■ Section 7.1 ■ Section 7.2 ■ Section 7.3
25	TISG Section 7.4.2, page 37	■ The temporal boundaries of the impact assessment span all phases of the Project determined to be within the impact assessment. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. In order to assess a project's contribution to sustainability, consideration should be given to the long-term effects on the well-being of present and future generations. When defining temporal boundaries, the proponent should consider how elements of environmental, health, social and economic well-being that local communities, including municipalities, and Indigenous groups identify as being valuable could change over time.	■ The temporal boundaries that will be considered in the IS / EA Report are defined and described in the Study Plan.	■ Section 6.1

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
26	TISG Section 8.5, page 42	■ identify and describe wetland capacities to perform hydrological and water quality functions, – provide for wildlife and wildlife habitat or other ecological functions;	■ Impacts associated with the degradation of ecosystem components (including Vegetation) due to hydrological or drainage changes will be described in the IS / EA Report.	■ Section 9.4 ■ Surface Water Study Plan
27	TISG Section 8.5, page 42	■ identify and map all wetlands on federal lands, and all wetlands potentially directly or indirectly effected by the Project and within the scope of federal permits, authorizations, or other approvals;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ Section 8.3
28	TISG Section 8.5, page 42	■ The Impact Statement must determine whether these wetlands are within a geographic area of Canada where wetland loss or degradation has reached critical levels, or considered ecologically or socially or economically important to a region;	■ The IA / EA will consider whether wetlands within the Project study areas are within a geographic region where wetland loss or degradation has reached critical levels, or are considered ecologically, socially or economically important to the region.	■ Section 9.4
29	TISG Section 8.5, page 42	■ The Impact Statement must provide pre-project characterization of the shoreline, banks, current and future flood risk areas, wetland catchment boundaries;	■ Further information on hydrological characterization of the project areas is provided in the Surface Water Study Plan.	■ Surface Water Study Plan
30	TISG Section 8.5, page 42	■ The Impact Statement must quantify, delineate and describe wetlands (fens, marshes, peat lands, bogs) within the local Study Area potentially directly, indirectly and / or cumulatively effected by the Project in the context of: – wetland class, ecological community type and conservation status; – biodiversity with respect to both flora and fauna; – abundance at local, regional and provincial scales; – distribution; and – current level of disturbance.	■ This information will be provided in the IS / EA Report.	■ Section 7.3
31	TISG Section 8.5, page 43	■ Collect data from representative wetlands in a manner that enables reliable extrapolations in space (i.e., at minimum to Project, local and regional Study Areas) and in time (i.e., across years): – design surveys so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of mitigation effectiveness. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e., project Study Area, local Study Area, and regional Study Area), any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature; – survey protocol planning for representative wetlands should include modeling and simulations to estimate sampling requirements, and analysis to evaluate resulting design options; and – sample size must be planned to support evaluation of the project Study Area within the context of the local Study Area and regional Study Area. Appropriate design of surveys will need to consider multiple survey locations in order to represent the wetland heterogeneity of the regional Study Area, and to yield multiple survey locations per wetland type, without requiring aggregation of habitat classes post-hoc.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7.3 ■ Section 8.3
32	TISG Section 8.5, page 43	■ The Impact statement must provide a wetland functions assessment in accordance with the guiding principles of Wetland Ecological Functions Assessment: An Overview of Approaches or any subsequent approved guidelines by which to determine the most appropriate functions assessment methodology to use: – complete this assessment prior to the start of Project construction for a representative selection of wetlands that the Project would directly affect and for a representative selection of wetland(s) that are hydrologically connected. In conducting this assessment, the Proponent should show that wetlands are considered in the context of: i. the larger watersheds of which they are a part; ii. adjacent land use with a focus on hydrological and other functions; iii. landscape and / or watershed considering topography, soil types and hydrological linkages; and iv. the global significance of peatlands across the regional Study Area.	■ The wetland functional assessment is summarized in this Study Plan.	■ Section 7.3
33	TISG Section 8.5, page 44	■ identify a regional Study Area of sufficient size to capture effects to wetlands within the larger drainage area and include wetlands located outside of the local Study Area that may be effected by hydrological changes as a result of cumulative effects.	■ The study areas are defined and described in the Study Plan.	■ Section 6
34	TISG Section 8.5, page 44	■ Submit complete data sets from any survey sites, including GIS files. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standard. Contact provincial and/or local government authorities to determine if other wetland conservation policies, regulations or wetland compensation guidelines apply (refer to The Wetland Network); and	■ Data provided will meet ISO 19115 standards.	■ Section 8.2

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
35	TISG Section 8.5, pages 43-44	■ This assessment should be quantitative and include the collection of site-specific baseline information on wetland functions, including: – Surveys to assess for the presence, abundance, density, and distribution of migratory birds and federally listed species at risk, provincially listed species at risk, and species assessed by COSEWIC as at-risk in relation to potentially effected wetlands and associated riparian areas. Surveys should meet appropriate standards (see sections 8.9, 8.10, and 8.11), be species or bird group specific as appropriate, and be conducted during the appropriate times of the year as specified in section 8.9-8.11 of this document. Surveys for species at risk should assess species individually where possible (typically, an indicator approach is not appropriate for species at risk). Surveys should not be limited to species or groups of species that are wetland-obligate, but rather should include any species known to use wetland habitats as part of its lifecycle. Data should be sufficiently robust to identify which wetland classes are important to which species (and for how many). – The spatial location and a description of the biological characteristics of each potentially effected wetland and the ecological services and functions (hydrology, biochemical cycling, habitat, and climate) they provide. The functions assessment should be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides. – A supporting rationale and detailed description of the methods used in completing the wetland functions assessment, including sampling design.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7.3 ■ Section 8.3
36	TISG Section 8.7, page 46	■ The Impact Statement must:- within the local Study Area of the Project, provide a description of: – the biodiversity, relative abundance and distribution of vegetation species and communities of ecological, economic or human importance (e.g., traditional use, forestry, tame pasture, native prairie, wetland or old growth); – the conservation status (i.e., listed under the SARA or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to be 'at risk', including species of concern) applicable to any particular species or communities; – the species critical habitat as described in final or draft recovery strategies or action plans; – the current level of both anthropogenic and natural (fire, flood, drought, etc.) disturbance associated with vegetation, including a description of: ▪ level of habitat fragmentation;o historical and current fire disturbance;o any proximate activities that have resulted in changes to fire regimes (e.g., fire suppression, flooding, insect infestations, etc.); ▪ Consult Ontario's Provincial Satellite Derived Disturbance Mapping digital resource31; and ▪ Consult Ontario's Far North Land Cover layer.	■ The information requested will be provided in the IS / EA Report, if applicable.	■ Section 7
37	TISG Section 8.7, page 47	■ Identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline vegetation biodiversity and discuss the rationale for their selection;	■ The information requested will be provided in the IS / EA Report and is summarized in this Study Plan.	■ Section 9.4
38	TISG Section 8.7, page 47	■ The Impact Statement must: – summarize information available from the Far North Biodiversity Project;	■ Information on specific data sources and their relevance to the Project will be included in the IA / EA Report.	■ Section 7 ■ Appendix A
39	TISG Section 8.7, page 47	■ The Impact Statement must: – provide data files of mapped features depicting vegetation presence within the Study Area;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3
40	TISG Section 8.7, page 47	■ The Impact Statement must: – describe the use of local vegetation for medicinal or cultural purposes or as a source of country foods (traditional foods). The following species have known cultural importance to Indigenous communities: black spruce, white spruce, tamarack, balsam poplar, cedar, dwarf birch, red willow, trembling aspen, cottongrass, moss, black crowberry, blueberries, raspberries, reindeer moss, sphagnum moss, northern Labrador tea, caribou lichen, bearberry, dogwood, small cranberry, sage, sweetgrass, and lily pads; and any other plant species of concern for consumption or where use has any Indigenous cultural importance; and	■ The presence of vegetation species of economic, traditional, cultural and / or heritage importance, and Project-related effects on those vegetation species, will be described in the IS / EA Report. Additional information can be found in the Aboriginal Treaty Rights and Interests Study Plan, Human Health and Community Safety Study Plan, and Land and Resource Use Study Plan.	■ Section 4.2 ■ Section 5 ■ Aboriginal Treaty Rights and Interests Study Plan ■ Human Health and Community Safety VC Study Plan ■ Land and Resource Use Study Plan

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
41	TISG Section 8.7, page 47	■ The Impact Statement must: – describe any other plant species of concern for consumption or where use has any Indigenous cultural importance; and	■ Presence of and Project-related impacts of vegetation species of economic, traditional, cultural and / or heritage importance will be described in the IS / EA Report. Additional information can be found in the Aboriginal Treaty Rights and Interests Study Plan, Human Health and Community Safety Study Plan, and Land and Resource Use Study Plan.	■ Section 4.2 ■ Section 5 ■ Aboriginal Treaty Rights and Interests Study Plan ■ Human Health and Community Safety VC Study Plan ■ Land and Resource Use Study Plan
42	TISG Section 8.7, page 47	■ The Impact Statement must: – describe any considered vegetation control alternative (including manual vegetation control methods).	■ Feasible vegetation control approaches for the construction and operations stage of the Project will be described in the IS / EA Report.	■ Section 7.5
43	TISG Section 8.9, page 53	■ The Impact Statement must:¡ design suggestions for Project Study Area and Local Study Area scales. The following should be considered as inputs to design planning and evaluation: – Geomatics and habitat typing:o each site visited at any time between the dates of June 10 and August 30 should be photographically documented with 13 photos. At each cardinal direction (N, E, S, W): 1 photo at shoulder height with arm and camera extended parallel to ground, 1 photo with arm at 45-degrees (from body position) pointing down, and 1 photo with arm extended at 135-degrees (from body position) pointing up. And finally, one photo with arm extended straight up (i.e., vertically). Photos should be interpreted by qualified individuals as precisely as possible according to one or each of the classification schemes: Ontario Ministry of Natural Resources and Forestry's Boreal Ecosites, Wetland Ecosystem Classification for Northern Ontario (W-type), Forest Ecosystem Classification for Northern Ontario (V-type), and [Natural Resources Canada] NRCan's Canadian National Vegetation Classification (vegetation association);use the Ontario Ministry of Natural Resources and Forestry's Far North Land cover (version 1.4 or later, as available) and augmentation with fire history, digital elevation models, surficial geology and other data sources	■ The Study Plan meets this requirement.	■ Section 7.3
44	TISG Section 8.9, page 54	– use the Ontario Ministry of Natural Resources and Forestry's Far North Land cover (version 1.4 or later, as available) and augmentation with fire history, digital elevation models, surficial geology and other data sources	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section. 7.3
45	TISG Section 8.9, page 57	■ The Impact Statement must provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3
46	TISG Section 8.11, page 60	■ The Impact Statement must [identify] key habitat associated with species at risk should be considered valued components, including eskers and similar geologic features, wetlands and peatlands;	■ The information requested will be provided in the IS / EA Report.	■ Section 9.2
47	TISG Section 8.11, page 60	■ Collect species at risk data to represent the following temporal sources of variation: – among years; ■ within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and within the 24 hour daily cycle.	■ Data (desktop and field-based) will be collected to represent temporal sources of variation. Data collected will be representative of the temporal perspective of multi-years of study by using baseline data from previous years / seasons and desktop studies to supplement proposed field studies.	■ Section 7.1 ■ Section 7.2 ■ Section 7.3
48	TISG Section 8.11, page 61	■ Contain complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards;	■ Data provided will meet ISO 19115 standards.	■ Section 8

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
49	TISG Section 8.11, page 61	■ Account for the fact that rare species will require more survey effort to detect, which should be reflected in survey design by increasing the number and duration of surveys: – collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is being suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability; – Sample size must be planned to support a robust evaluation of the project Study Area within the context of the local Study Area and regional Study Area; – Design of surveys will need to consider multiple number of survey locations in order to represent the habitat heterogeneity of the regional Study Area, and to plan the number of survey locations per land cover or habitat class so that aggregation of habitat classes post-hoc is not required; – In terms of sampling effort per unit area, field survey effort should be most intensive within the project Study Area. The level of effort per unit area may be similar or somewhat less within the remainder of the local Study Area but should be scaled to the likelihood that project effects will impact species at risk within that zone. Efforts outside the project Study Area should be carefully designed to ensure that estimates comparing and across the project Study Area, local Study Area and regional Study Area are unbiased and precise; – A habitat-stratified random sampling approach should be used. Sample sites should be selected with a randomization procedure such as a GIS grid overlay; and – Where Critical Habitat has not been defined or has been partially identified, a Schedule of Studies may have been created to identify gaps in information for these species. The Schedule of Studies information should be referred to when implementing or assessing survey protocols, in order to provide necessary information for these species.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition (including SAR or rare species) will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7
50	TISG Section 8.11, page 61	■ Ensure that, at minimum, the combined information from existing data and field surveys must be able to describe the distribution and abundance of species at risk in relation to the Study Areas;	■ The information requested will be provided in the IS / EA Report.	■ Section 7
51	TISG Section 8.11, page 61	■ provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation);	■ The results of analyses will be adequately documented in the IS / EA Report to allow for a clear understanding of the methods. Digital files (e.g. raw script; workflows) will be provided on request to regulatory agencies to facilitate replication of the results analyses as needed.	■ Section 8
52	TISG Section 8.11, page 65	■ Identify and map all species at risk, critical habitat, and residences on federal land within the project Study Area and local Study Area (provincial and/or local government authorities should be contacted to determine any additional data sources and survey methodologies)	■ The information requested will be provided in the IS / EA Report.	■ Section 7 ■ Section 8
53	TISG Section 8.11, page 65	■ The project Study Area and local Study Area, as defined above for each valued component, constitutes the appropriate scale.	■ The study areas are defined and described in the Study Plan.	■ Section 6
54	TISG Section 8.11, page 65	■ The Impact Statement must provide a list of all provincially listed protected species at risk and species assessed by the COSEWIC that have the status of extirpated, endangered, threatened or of special concern and that may be directly or indirectly effected by the Project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability;	■ The information requested will be provided in the IS / EA Report.	■ Section 7 ■ Section 8
55	TISG Section 13, pages 80-83	■ This section of the TISG describes the methodology for the effects assessment, including definitions of scope, severity, and irreversibility.	■ This information will be included in the IS / EA Report and is summarized in the Study Plan.	■ Section 9
56	TISG Section 14.3, page 88	■ The Impact Statement must: – describe any hydrological or drainage changes that may alter moisture regimes and how that may affect vegetation and wetland function; – describe any contaminants of concern (e.g., arsenic, chromium, mercury) potentially associated with the Project (including from spills or accidental discharges) that may affect soil, sediment, wetlands, and surface and ground water (including substances used during summer and winter maintenance activities);	■ The Project will be designed to minimize or avoid changes in water flow and / or drainage - further information is available in the Surface Water Study Plan. Impacts associated with the degradation of ecosystem components (including Vegetation) due to hydrological or drainage changes will be described in the IS / EA Report.	■ Section 9.4 ■ Surface Water Study Plan

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
57	TISG Section 14.3, page 88	■ The Impact statement must describe direct, incidental and cumulative predicted positive and/or adverse effects to riparian, wetland (including separate description relevant to peatlands) and terrestrial biodiversity metrics, effects of fragmentation, changes to regional biodiversity that could be caused by all project activities, including but not limited to effects to wetland ecological functions, including effects that may alter the wetland's capacity to perform hydrological, biogeochemical cycling, habitat, and climate functions.	■ The IA / EA will assess direct, incidental and cumulative predicted positive and/or adverse effects that could be caused by all Project activities that may alter wetland capacity to perform hydrological and water quality functions.	■ Section 9.4
58	TISG Section 14.3, page 89	■ Describe any changes in risk to forest fires that may result from the Project;	■ The Study Plan describes how the change in risk to forest fires will be determined	■ Section 7.3
59	TISG Section 14.3, page 89	■ Describe the methodology used to identify effects;	■ Methodology related to effects assessment has been provided in the Study Plan.	■ Section 9
60	TISG Section 14.3, page 89	■ The Impact Statement must: – describe any changes to plant species of cultural importance	■ Impacts associated with vegetation species of social economic, traditional, cultural and / or heritage importance will be described in the IS / EA Report.	■ Section 7.4
61	TISG Section 14.3, page 89	■ The Impact Statement must: – describe the vegetation standards and controls to be implemented while constructing and operating the Project. Describe any integrated vegetation management programs, including: ▪ the criteria and circumstances for applying chemical, biological or mechanical control methods; ▪ potential effects on country foods, animal browse, surface waters, wetlands and soil and proposed mitigation measures to herbicide application; ▪ the methods to be used to prevent spread of non-native, invasive species such as Phragmites australis (European Common Reed); and ▪ the selection of plant species to be kept and planted to promote naturally low growing plant communities.	■ Possible vegetation control approaches for the construction and operations stage of the Project will be described in the IS / EA Report.	■ Section 7.5
62	TISG Section 14.3, page 89	■ The Impact Statement must: – describe any revegetation procedures to be implemented as part of the Project, including: ▪ revegetation techniques and the locations where they would be implemented; ▪ seed mixes to be used, application rates and location of application; ▪ fertilizers to be used, application rates and locations, and criteria for determining ▪ these specifications; and ▪ contingency planting and seeding plans that include a description of species to be replanted, the locations for replanting and criteria for determining these specifications.	■ The IS / EA Report may include an environmental monitoring program for reclamation plantings and include requirements for monitoring and follow up programs.	■ Section 9.4
63	TISG Section 14.3, page 89	■ The Impact Statement must: – Describe any positive changes (e.g., from offsets that result in re-vegetation, new wetlands etc.).	■ The IS / EA Report will assess the potential negative, neutral and positive residual effects of the Project.	■ Section 9
64	TISG Section 15.2, page 93	■ The Impact Statement must: – describe the effects caused by the new habitat types created in the project area by clearing vegetation. The new habitats created may attract migratory birds, which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how these SAR may be impacted by the project.	■ How wildlife species will be impacted by the Project will be addressed in the Wildlife Study Plan.	■ Wildlife Study Plan; Birds Study Plan
65	TISG Section 15.3, page 94	■ The Impact Statement must: – describe changes to vegetation species important to Indigenous peoples; and	■ Impacts associated with vegetation species of economic, traditional, cultural and / or heritage importance will be described in the IS / EA Report. Additional information can be found in the Aboriginal Treaty Rights and Interests Study Plan, Human Health and Community Safety Study Plan, and Land and Resource Use Study Plan.	■ Section 9.2 ■ Table 9-2 and Table 9-3 ■ Aboriginal Treaty Rights and Interests Study Plan ■ Human Health and Community Safety Study Plan ■ Land and Resource Use Study Plan

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
66	TISG Section 15.4, page 100	– provide an account of how the project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
67	TISG Section 15.4, page 95	■ The Impact Statement must: – describe the potential direct, incidental and cumulative adverse effects of the project on species at risk listed under Schedule 1 of the Species at Risk Act and, where applicable, its critical habitat (including its extent, availability and presence of biophysical attributes); – analyses predicted effects for each species at risk. To fully understand the effects and/or benefits of one alternative versus another, all relevant metrics and evaluators for species at risk should be considered; – include separate analyses for each project activity, component, and phase; – consider potential effects to species at risk from bioaccumulation and biomagnification of contaminants of dust and other pollutants resulting from the project; and conduct post-construction surveys to verify predicted effects. – conduct post-construction surveys to verify predicted effects.	■ Effects to SAR will consider potential direct, incidental and cumulative adverse effects of the Project on SAR and, where applicable, its critical habitat. A thorough list of impact management measures including offsetting and compensation as necessary that will be employed by the Project will be included in the IS / EA Report.	■ Section 9
68	TISG Section 15.4, page 99	■ clearly identify the locations of federal lands/non-federal lands within the Study Area and differentiate between these land tenures in the presentation of information regarding all species at risk. For example, total habitat disturbance for boreal caribou should be presented at the range scale, but it should also be presented in a way that clearly indicates habitat disturbance specifically within federal lands;	■ The information requested will be provided in the IS / EA Report.	■ No reference
69	TISG Section 15.4, page 99	■ identify provincial, territorial or federal permits or authorizations that may be required in relation to the species at risk;	■ The information requested will be provided in the IS / EA Report.	■ No reference
70	TISG Section 15.4, page 99	■ describe the potential adverse effects of the Project on species protected by provincial statutes and assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat that are not currently listed under the Species at Risk Act;	■ The information requested will be provided in the IS / EA Report.	■ Section 7 ■ Section 8
71	TISG Section 15.4, page 99	■ describe all feasible measures that will be taken to avoid or lessen the impact of the Project on the species and its critical habitat;	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
72	TISG Section 15.4, page 99	■ describe all reasonable alternatives to the Project that would avoid the potential effects on species and their habitat, with particular attention to critical habitat, and important habitats such as upland habitat which is used as movement corridors by caribou, breeding areas for birds, and which contains roosting habitat for bats;	■ The reasonable alternatives that were or are considered to the Project will be described, rationalized and evaluated by several criteria, which may include potential effects on SAR.	■ No reference
73	TISG Section 15.4, page 99	■ Describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted); describe all feasible measures that would be taken to eliminate the effects of the work or activity on species and their habitats, including critical habitat; and	■ The IS / EA Report will describe the biophysical attributes and locations of habitat and outline measures that will be used to avoid or limit effects on habitat.	■ Section 7 ■ Section 8 ■ Section 9
74	TISG Section 15.4, page 99	■ demonstrate that avoidance and minimization measures will be applied for species at risk. Recovery Strategies will provide information such as Population and Distribution Objectives, and Strategic Direction for recovery.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or Recovery Strategy, Indigenous input, and industry standards.	■ Section 9.5
75	TISG Section 15.4, page 99	■ provide survey results and detailed mapping of each species at risk and their habitat, including important habitat features, for all federal lands;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ No reference
76	TISG Section 15.4, page 99	■ describe the effects of construction pits and quarries on or near esker deposits on species at risk;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ Section 6.2
77	TISG Section 16.1, Page 103	■ With respect to biophysical determinants of health, the Impact Statement must provide an assessment of adverse and positive effects on human health in current and future availability (including contamination/quality) of country foods (i.e., food that is trapped, fished, hunted, harvested or grown for subsistence, cultural or medicinal purposes)	■ Vegetation contamination studies have not been completed, nor are they proposed. Details regarding potential bioaccumulation of contaminants and consumption by Indigenous groups will be discussed in the Human Health and Community Safety Study Plan.	■ Human Health and Community Safety Study Plan

ID #	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
78	TISG Section 17.6, page 110	■ The Impact Statement must assess potential impacts to surrounding communities, including local Indigenous communities. The spatial and temporal boundaries for the assessment should be determined with the input from the community based on pre-contact in consideration of aspects that are relevant to the community's understanding of their culture. The Impact Statement must assess changes to: – culturally significant plants or wildlife.	■ Impacts associated with vegetation species of economic, traditional, cultural and / or heritage importance will be described in the IS / EA Report. Additional information can be found in the Aboriginal Treaty Rights and Interests Study Plan, Human Health and Community Safety Study Plan, and Land and Resource Use Study Plan.	■ Section 9.2 ■ Table 9-2 ■ Table 9-3 ■ Aboriginal Treaty Rights and Interests Study Plan ■ Human Health and Community Safety Study Plan ■ Land and Resource Use Study Plan
79	TISG Section 20, page 119-128	■ Section 20 of the TISG describes the requirements around mitigation and enhancement measures that must be considered in the Impact Statement.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or Recovery Strategy, Indigenous input, and industry standards.	■ Section 9.5
80	TISG Section 21, pages 129-130	■ Section 21 of the TISG describes the requirements and guidance associated with determining residual effects.	■ Residual effects will be assessed in the IA / EA Report.	■ Section 9
81	TISG Section 26, Page 141	■ Section 26 of the TISG includes a description of the considerations for developing a follow-up program for environmental, health, social or economic effects, as applicable.	■ The IS / EA Report will include descriptions of follow up programs, as required by VC.	■ Section 9
82	TISG Section 26.2, page 143	■ The Impact Statement must describe the environmental, health, social and economic monitoring to be established, as part of the follow-up program. Specifically, the Impact Statement must present an outline of the preliminary environmental, health, social and economic monitoring program, including, but not limited to the:- in relation to wetlands: – if reclamation plantings are created, monitor the plantings biannually (i.e., late spring and fall) during consecutive years, and undertake supplementary planting, as necessary, until the vegetation cover becomes established and continues to grow without further intervention; and – monitor post-construction effects to wetland functions. A program to monitor wetland functions should be designed in such a way as to ensure that the type and amount of each wetland function would be considered individually in determining recovery success and that each wetland function would be recovered to at least the same type and amount of function as assessed during baseline.	■ Mitigation measures created specifically for peatlands will be developed in collaboration with federal authorities and described in the IS / EA Report. Offset and compensation plans related to Peatlands will be similarly developed, as required.	■ Section 9.5.1 ■ Peatlands Study Plan
83	TISG Section 26.2, page 144	■ The Impact Statement must describe the anticipated activities during the construction phase of the Project, including: – Vegetation clearing earth excavation and other roadbed preparation activities, earth grading and granular placement for road construction	■ The anticipated activities during the construction phase of the Project are outlined in **Table 9-1** of this Study Plan.	■ Table 9-1

Table 11-2: Study Plan Provincial Concordance – Conformance with Requirements

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
1	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Study areas are missing and lack clarity – maps show Study Area for 4 routes even though only 2 (or 1?) routes are proposed to be assessed; no indication of local and regional Study Areas for each environmental component (e.g. ground water, surface water, caribou, etc.).	■ The study areas are defined and described in the Study Plan.	■ Section 6
2	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ In the identification of alternative methods, the Environmental Assessment should document consideration of methods including an assessment of potential impacts to species at risk and their respective habitats and identify methods that can avoid or minimize potential impacts to individuals of the species and all categories or protected habitat to the extent possible.	■ Potential effects to SAR and their habitats will be included in the IS / EA Report.	■ Section 9
3	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ For each potential impact to species at risk or their habitat, measures will have to be identified to first avoid any adverse effects and in cases where there are no practical or feasible alternatives, identify measures that minimize or mitigate the adverse effects. Such measures may be general, site-specific, or activity-specific in nature. For caribou, the province has developed Best Management Practices (BMPs) for some sectors to provide guidance to avoid, minimize or mitigate adverse effects to the species and their habitat. Where possible, it is always preferential to avoid, given that if any adverse impacts exist, the associated activities would require authorization under the ESA.	■ The IS / EA Report will identify suitable impact management measures to avoid, eliminate or minimize potential effects of the Project, including potential effects on SAR.	■ Section 9
4	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ MECP recommends that the EA contain commitments to monitoring to verify the expected effects of the proposed undertaking on species at risk and their habitat and to determine if additional impact mitigation measures or adjustments to any measures are required. Monitoring methodology for these species and their habitat should be included in the monitoring plan developed as part of the EA. If impact management measures are proposed, monitoring of the effectiveness of these measures should be included in the monitoring plan. The monitoring plan should include steps the proponent will take if impact management measures are not effective (e.g. application of additional impact management measures, changing how and where the activity will be performed, etc.).	■ The IS / EA Report will include a monitoring framework to verify the prediction of effects and the effectiveness of the impact management measures implemented, including those related to SAR and their habitat.	■ Section 9
5	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ In addition to land use policy, any resource management direction for the Study Area including forest management plans and fisheries management plans/objectives should be reviewed and considered	■ Applicable resource management plans will be reviewed and considered in the IA / EA.	■ Appendix A
6	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Project documentation will need to consider the direction within the Ogoki [Forest Management Plan] FMP regarding forestry activities, wildlife objectives and access, and address how the proposed project may impact those activities and objectives. There is also the need to consider the impacts to Kenogami Forest with respect to existing roads and the associated use management and responsibility.	■ The effects assessment and identification of mitigation measures will be informed by best management practices, applicable resource management and / or Recovery Strategy, Indigenous input, and industry standards.	■ Section 9
7	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ There are likely a number of species that are considered provincially rare which occur within and adjacent to the proposed road corridor. The MNRF encourages using the best conservation measures available to protect these species.	■ Potential effects to SAR and their habitats will be included in the IS / EA Report.	■ Section 9
8	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ The project proposal and other documentation will need to identify these natural heritage features and fully consider potential impacts to and mitigation for the respective features.	■ The IS / EA Report will recommend impact management measures to avoid, eliminate or minimize potential effects of the Project to natural heritage features.	■ Section 9
9	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Project planning should consider the potential introduction and establishment of invasive species via construction and use of the road, impacts that could result, and measures that will be taken to avoid or minimize their spread and resultant negative environmental effects.	■ Mitigation measures to limit the spread and / or introduction of invasive species will be considered in the IS / EA Report.	■ Section 9.5
10	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ 2.1 Peatlands/wetlands – Peatlands/wetland in Ontario's Far North are important on local through to global scales. The alternatives analysis should consider not only the length of road corridor that will cross through peatlands for each of the alternatives considered, but also consider how impacts to peatland/wetland function may be minimized. This should include, for example, identification and consideration of concentrated areas of peat that function as carbon sinks; impacts to biological functions of wetlands in providing wildlife habitat; effects of the project on client change and vice versa; etc.	■ The IS / EA Report will assess potential impacts of the Project on wetland function, ecologically and hydrologically. Peatland impacts associated with climate change are described in the Peatlands Study Plan.	■ Section 9 ■ Peatlands Study Plan

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
11	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #17 Section 8 Page 54Consultation on Assessment Methodology – MFFN acknowledges that the proposed methodology will be open to input during the draft ToR review, but also says a more detailed method will be presented in the EA. Page 47 indicates the effects assessment criteria will be developed during the EA. While it is appropriate to defer some detailed work planning to the EA phase, the ToR should include commitments for how technical reviewers, and other interested persons, will be consulted during the development of specific evaluation methodologies or technical Work Plans. It is strongly recommended that those opportunities for review occur prior to the completion of studies (e.g. prior to the submission of a draft or final EA document).It is not clear whether MFFN plans to consult on the more detailed methodology and criteria during the EA phase or if the ToR phase is the main opportunity to provide input.Please indicate how consultation on the ToR has informed the preliminary criteria and indicators. Please clarify when MFFN will consult and provide opportunity for input on the detailed assessment method, including criteria and indicators (and Work Plans as MECP has proposed), with agencies, communities and stakeholders during the EA phase in order to finalize the methodologies before EA studies get advanced.	■ The Study Plan meets this requirement. As identified in **Section 4.2** of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020a). Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in **Section 5** of the Study Plan. **Section 5** of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: The Indigenous Knowledge Program; and the Consultation and Engagement Program.	■ Section 4 ■ Section 5
12	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #21 Section 10.2.4 Page 73 – Technical Work Plans - Page 73 states that MECP has indicated it will not be commenting on Work Plans associated with field work until the ToR is finalized. This statement does not reflect MECP's guidance to the project team. MECP's guidance, which is documented on page 69 of the RoC, is that the ToR is the mechanism to seek technical review of Work Plans and that discipline- specific Work Plans should be included with the ToR. As well, discussions that MECP has had with the project team to date are considered pre-consultation, since it is the ToR that sets out what work is to be done during the EA phase. – Please revise the statement on page 73 to state: "MFFN provided MECP and MNRF Work Plans associated with field Work Planned during 2019 for review, however MECP advised this is considered-consultation and that discipline-specific Work Plans should be appended to the ToR to allow full technical review. "As the draft ToR did not include detailed discipline-specific Work Plans, the other option the ministry strongly recommends is to include commitments to develop workplans at the outset of the EA phase, including opportunities for technical review.	■ The Study Plan meets this requirement.	■ No Reference
13	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Additional information should be provided, in table format, for each SAR that have the potential to occurin the area of the Project, including, but not limited to: Scientific names, Common names, Species Status under SARA (Federal), Species Status under ESA (Provincial), Conservation Ranking (i.e., N-Rank, S- Rank), Information Source(s) used to identify potential occurrence within the area of the Project Indication of whether a field survey(s) has been conducted already to identify species presence and, if so, whether or not it was observed. General list of habitat requirements§ Indication of whether the required habitat exists within the Study Area (i.e., as per comment 5, should include Project Footprint, Local Study Area and Regional Study Area)Update the draft ToR to include additional information for each SAR that have the potential to occur in thearea of the Project.	■ The information requested was included in the ToR and will be included in the IS / EA Report.	■ No Reference
14	■ Kevin Green, SAR Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Email from the Ministry of the Environment, Conservation and Parks with comments of the Draft ToR, received on 24-Jan-2020	■ #2 Recommendation to prevent delays should ESA authorization be required. ■ It is strongly recommended that the project be planned, and the EA prepared, with the requirements of the *Endangered Species Act, 2007* (ESA) in mind. This can potentially facilitate the authorization process under the ESA, where authorization is required. In order to inform any future ESA authorization requirements, reasonable route/project alternatives should be assessed for impacts to all SAR and their respective habitats, and at least one avoidance alternative should be included. Please refer to the MECP "Avoidance Alternatives Form" for activities that may require an overall benefit permit under clause 17(2)(c) of the Endangered Species Act" and accompanying guide for reference. (http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/s sbforms.nsf/MinistryResults?Openform&SRT=T&MAX=5&ENV=WWE&STR=1&TAB=PROFILE&MIN=018&BRN=21&PRG=31)	■ The requirements of the *Endangered Species Act, 2007* (ESA) process were considered in the development of this Study Plan.	■ No Reference

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
15	■ Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Email from the Ministry of the Environment, Conservation and Parks with comments of the Draft ToR, received on 24-Jan-2020	■ #18 Table 7-4 / s. 7.2 / pg. 47 and s.7.2.9 / pg. 52 – Preliminary consideration of potential effects to SAR needs to be included, above and beyond those applicable to vegetation (s.7.2.6), wildlife (s.7.27) and fish and fish habitat (s.7.2.8). Both Table 7-4 and s.7.2.9 are lacking any information specific to SAR (e.g., increased mortality risk to caribou resulting from predator efficiencies related to additional linear features, increase in predator/prey populations, etc.). – This should include a preliminary list of potential effects, in a table format, including, but not limited to, the following: • Project Component or Activity ▪ Field surveys, staking, layout ▪ Vegetation clearing and grubbing ▪ Construction of supportive infrastructure (e.g. storage and laydown yards, temporary access roads, construction camps, aggregate extraction areas) ▪ Construction of the road ▪ Aggregate extraction and production ▪ Emissions, discharge and waste ▪ Operations and maintenance • Potential Effects • Mitigation Measures – Update the draft ToR to include additional information for preliminary potential effects of the Project components specific to SAR.	■ Potential effects of the Project on SAR and mitigation measures specific to individual species or cohorts where applicable (beyond those that generally apply), will be identified in the IS / EA Report.	■ Section 9
16	■ Madhi Ramadoss, Ph.D., Regional Pesticides Specialist, Northern Region, Email from the Ministry of the Environment, Conservation and Parks with comments of the Draft ToR, received on 24-Jan-2020	■ #1 Pesticides: – As requested, I reviewed draft terms of reference for the proposed Marten Falls Community Access Road Project. Proposed 190-230 km all season road construction shall clear forest vegetation mainly in Ogoki Forest and Kenogami Sustainable Forest Management units (Page 21 and Page 50). The vegetation expects to be cleared are black spruce, jack pine, white spruce, and poplar species (Page 23). The proponent expect to get cutting permit from MNRF (Page 91). The D-TOR proposal did not mention use of Pesticides; it is my understanding the vegetation is expected to be cleared by manual cutting, or mechanical means.To clear vegetation in the managed forest lands in Ogoki and Kenogami Forests, the proponent is encouraged to approach MNRF-District office and Ogoki and Kenogami forest management units to include in their annual work schedule as per Crown Forest Sustainability Act 1994 (Forest Management Planning Process). This approval facilitates the use pesticides if needed to clear conifer trees for road construction.	■ The identification of mitigation measures will be informed by best management practices, applicable resource management and / or Recovery Strategy, Indigenous input, and industry standards.	■ Section 9
17	■ Nikki Boucher, A/Species at Risk Specialist, Permissions and Compliance, Species at Risk Branch, Email from the Ministry of the Environment, Conservation and Parks with comments of the Draft ToR, received on 24-Jan-2020	■ We have carried out our review with a view to both the EA and future regulatory authorizations in order to provide you with information that will help enable an efficient approach to project planning and preparation of applications for any necessary Endangered Species Act (ESA) authorizations. Specifically, attention should be paid to the following requirements that form the basis of many of our ESA authorizations: – Minimize adverse effects – you must take reasonable steps to minimize the adverse effects of your activity on the SAR and their habitat that are likely to be affected by your activity. – Ways to minimize adverse effects of your activity on SAR & their habitat may include modifying the: • location of the activity • geographic scale of the potential effects • activity design (e.g. engineering and technological) • timing of the activity • duration and frequency of the effects • approaches and timing for any site restoration or rehabilitation (such as doing progressive rehabilitation while other parts of the activity are still happening) • general operational protocols	■ The IS / EA Report will identify suitable impact management measures to avoid, eliminate or minimize potential effects of the Project, including potential effects on SAR.	■ Section 9

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
		– Consider reasonable alternatives – you will need to show the Ministry of the Environment, Conservation and Parks that you have considered reasonable alternatives to your activity. – Alternative approaches to your activity include: • Changing the location of the activity • Using alternative methods, equipment or technical designs • Changing the timing of the activity to avoid times when the species is there or is most sensitive to disturbance • Changing the geographic scale, duration and/or frequency of the potential adverse effects • Adding or changing approaches and timing of site restoration or rehabilitation after the activity is done – When considering reasonable alternatives to your activity, you must: • Consider at least one alternative that would completely avoid any adverse effects on SAR • Identify alternatives that you considered but did not think were reasonable because of biological, technical, social or economic limitations • Explain why the approach you have chosen is the best alternative – In addition, should an Overall Benefit Permit be required for the project, as determined through MECP's review and assessment of all the project details, the following requirement would also need to be considered: • Achieve overall benefit – providing an overall benefit to a species means undertaking actions that contribute to improving the circumstances for the species. It must include more than steps to minimize adverse effects on the species or habitats. – Achieving an overall benefit to a species may involve providing the species with a range of benefits, such as: • increasing the number of individuals of the species living in the wild and capable of reproducing • increasing the distribution of the species within its natural range • increasing the viability or resilience of existing populations of the species • slowing or reversing population declines by addressing key threats to the species' survival • increasing the quality or amount of habitat for the species – Activities such as filling information gaps, education and outreach may contribute to an overall benefit plan for a SAR. However, alone they are unlikely to meet the overall benefit requirement. – Recovery strategies and government response statements, where available provide information that can be used to form plans to achieve an overall benefit for SAR.		
18	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ Sec. 7.1.4.6 pg. – Ontario's current ELC System at the EcoSite level has limited application in the area of the Hudson Bay Lowlands.• For consideration in the development of the EA.	■ The ELC system will be applied as the majority of the study areas fall outside of the Hudson Bay Lowlands Ecozone.	■ Section 7.3
19	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ Consider including a map identifying the project and Study Area in relation to the Ecozones and Ecoregions it traverses. This would be helpful at EA phase. A map of where this project falls in relation to Ecozones and Ecoregions could provide all interested parties with a better spatial understanding of the landcover and ecological characteristics associated with the project alternatives. ■ A map showing routing alternatives and including Ontario Shield, Hudson Bay Lowlands Ecozones and Big Trout Lake James Bay Ecoregions could be included somewhere in this section (MNRF may be approached for this data if not already obtained by the project team).	■ The information requested was included in the ToR and will be included in the IS / EA Report.	■ Section 8
20	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ The EA should also describe the vegetation at the EcoDistrict scale. The project is proposed within 2w2 (Kasabonika Lake Ecodistrict), 2w3 (Wunnummin Lake Ecodistrict) and 2e4 (Lower Kenogami River Ecodistrict).Include description in the EA.	■ The information requested was included in the ToR and will be included in the IS / EA Report.	■ Section 7.1

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
22	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ Draft Criteria and Indicators for Alternatives Evaluation Appendix A – Available resources to help inform the draft criteria and indicators include research publications and expert knowledge on topics such as stressor-effects pathways, cumulative effects, and associated environmental components and indicators. Contacting researchers such as Rob Mackereth (MNRF) who has published research on these topics and related subjects is encouraged. - Rempel, R.S., et. al. 2016. Support for development of a long term environmental monitoring strategy for the Ring of Fire area. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Information Report IR-08. 34 p. + append. Catalogue-natural-resource-scientific-and-technical-publicationsWhile no specifics are provided in this submission, MNRF welcomes a discussion with MECP and ENDM to explore what (if any) role this project could play in advancing baseline information and long-term environmental monitoring for the Ring of Fire in partnership with First Nations communities.	■ Data sources are being reviewed for their appropriateness and will be included in study plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Appendix A
23	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ Sec. 7.1.4.9 Pg. 31 – It is recommended a more thorough review is conducted of species that have the potential to be impacted by the proposed undertaking that are listed as Special Concern on the SARA list of Ontario as well as species that are currently only listed under the SARA. For consideration in the EA.	■ The information requested will be included in the IS / EA Report.	■ Section 7.4
24	■ Dave Barker, Resources Management Supervisor, Nipigon District, Letter received from MNRF on the Draft Terms of Reference, received on 06-Feb-2020	■ Sec. 7.1.4.4 pg 26 – The proponent indicates, “The wetlands within the area of the Project are not designated as provincially significant. Considering the remote landscape of the Project and abundance of wetland features, it is likely that the wetlands within the area of the Project have not been evaluated”. – This statement is somewhat misleading because the evaluation system does not apply to the extensive wetlands in the Lowlands. This statement needs to be clarified by recognizing the Ontario wetland evaluation system cannot be used to evaluate the extensive wetlands in the Lowlands portion of the project area (as stated on pg 27 in the Ontario Wetland Evaluation System – Northern Manual 2014 - https://www.ontario.ca/page/wetlands-evaluation). – Instead, the wetlands in the Far North are often described in terms of cultural and provincial-global importance for a range of ecosystem services and ecological functions including carbon storage as described in references such as Riley, J. 2011. Wetlands of the Hudson Bay Lowland: An Ontario Overview. link and Far North Science Advisory Panel (2010). Science for a Changing Far North. link)	■ A wetland function assessment will be conducted as an alternative to an Ontario Wetland Evaluation System (OWES) evaluation as part of the IA / EA.	■ Section 7.3
26	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 14 - References 85+ Additional resources from: – Catalogue of natural resource scientific and technical publications. Search a list of the scientific and technical publications issued since 2004 see Catalogue-natural-resource-scientific-and-technical-publications – To request a publication issued by the MNRF, or if you have a question related to MNRF scientific and technical publications, please contact us by email with the title of the publication. For journal articles, please contact the journal publisher directly. – For MNRF climate change publications see MNRF_Climate_Change_Publications – Information about Ontario’s species of conservation concern, plant communities, wildlife concentration areas and natural areas see https://www.ontario.ca/page/get-natural-heritage-information – Ontario Geohub https://geohub.lio.gov.on.ca/ provides spatial data and mapping applications such as OFAT (Ontario Flow Assessment Tool) that is used to better understand water flow in Ontario.. https://www.ontario.ca/page/watershed-flow-assessment-tool ■ Some selected publications that may be of interest: – Wester, M.C. et al. 2018. The Ecosystems of Ontario, Part 2: Ecodistricts. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Technical Report TR-26. 474 p. + appendices Catalogue-natural-resource-scientific-and-technical-publications – Ontario Ministry of Natural Resources and Forestry. 2019. Far North Information Knowledge Management Plan Progress Report 2008-2018. Ontario Ministry of Natural Resources and Forestry, Far North Branch, Peterborough, ON. 80p. contact: farnorthfeedback@ontario.ca	■ Data sources are being reviewed for their appropriateness and will be included in study plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Appendix A

ID#	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
		– Riley, J. 2011. Wetlands of the Hudson Bay Lowland: An Ontario Overview. Nature Conservancy of Canada, Toronto ON 156 pp. ISBN 978-1-897386-27-9 link – Marshall, T.R. and Jones, N.E. 2011. Aquatic ecosystems of the Far North of Ontario state of knowledge. Ontario Ministry of Natural Resources. 43 p.+ appends. ISBN 978-1-4435-6512-7 Catalogue-natural-resource-scientific-and-technical-publications – Metcalfe, R.A. et al., 2013. Aquatic Ecosystem Assessments for Rivers. Science and Research Branch, Ministry of Natural Resources, Peterborough, Ontario. 210 pp.link		
27	■ Jennifer Fisk, Policy Specialist, Email from Ministry of Transportation with comments on Draft ToR, received on 20-Jan-2020	• Physiography, Terrain and Soils (page 49, section 7.2.3) – Consider adding potential impact of salt on roadside vegetation.	■ The identification of mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9

Table 11-3: Study Plan Federal and Provincial Concordance – Requirement Deviations

ID #	Federal TISG Reference or Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response (Rationale for not meeting requirement)	Justification (for not complying with requirement including for example scientific research, precedence)	Proposed TISG Amendment
1	TISG Section 14.1, Page 85	▪ The Impact Statement must assess the potential for emissions from the Project to contribute to acid deposition and exceedances of critical loads for terrestrial and aquatic ecosystems;	▪ There will be no assessment of emissions from the project to contribute exceedances of critical loads for terrestrial and aquatic ecosystems. There is no threshold established to determine that a specific concentration of NOX and SO2 would be detrimental to the terrestrial and aquatic VCs.	▪ There is no threshold established to determine that a specific concentration of NOX and SO2 would be detrimental to the terrestrial and aquatic VCs. Studies to establish these thresholds have never been undertaken.	▪ Remove Requirement

12. References

AECOM Canada Ltd., 2020:

Marten Falls First Nation Proposed Terms of Reference Marten Falls Community Access Road – Environmental Assessment, Appendix B: Consultation & Engagement Plan to Support the Environmental Assessment / Impact Statement.

Alberta Wetland Policy, 2020:

Canadian Wetland Classification System. Developed by the National Wetlands Working Group. Available at http://www.wetlandpolicy.ca

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Crins, W.J., P.A. Gray, P.W.C. Uhlig and M.C. Wester, 2009:

The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources, Peterborough Ontario, Inventory, Monitoring and Assessment, SIB TER IMA TR-01, 71 pp.

Ecosystems Working Group, Terrestrial Ecosystems Task Force, Resources Inventory Committee. 1998:

Standard for Terrestrial Ecosystem Mapping in British Columbia. Resources Inventory Committee, Province of British Columbia. x + 100 pp.

Ekono, 1981:

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Environment Canada, 2008:

Wetland Ecological Functions Assessment: An Overview of Approaches. Available Online: http://publications.gc.ca/site/eng/343283/publication.html

Environment Canada, 1991:

The Federal Policy on Wetland Conservation. Catalogue No. CW66-116/1991E. Environment Canada, Canadian Wildlife Service. Ottawa, ON. 13 pp.

Environment Canada, 2013:

How Much Habitat is Enough? Third Edition. Environment Canada, Toronto, Ontario. 130 pp.

Government of Ontario, 2020:
Ontario GeoHub. Fire Disturbance Area layer. Available Online: https://geohub.lio.gov.on.ca/datasets/fire-disturbance-area. Last Updated February 2020.

Hanson, A., L. Swanson, D. Ewing, G. Grabas, S. Meyer, L. Ross, M. Watmough and J. Kirkby, 2008:
Wetland Ecological Functions Assessment: An Overview of Approaches. Canadian Wildlife Service Technical Report Series No. 497. Atlantic Region. Sackville, NB. 59 pp.

Impact Assessment Agency of Canada, 2020:
Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment.

Impact Assessment Agency of Canada, 2020a:
Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment.

Impact Assessment Agency of Canada, 2020b:
Tailored Impact Statement Guidelines for the Marten Falls Community Access Road Project Impact Assessment.

iNaturalist Network, 2020:
Observations Mapping. Available Online: https://www.inaturalist.org/observations

Jaeger, J., 2000:
Landscape division, splitting index, and effective mesh size: ne measures of landscape fragmentation. Landscape ecology. 15: 115-130.

Leclair, M., P. Whittington and J. Price, 2015:
Hydrological functions of mine-impacted and natural peatland-dominated watershed, James Bay Lowlands. Journal of Hydrology. Volume 4, Part B. Pages 732-747. September 2015.

Long Lake Forest Products Inc., 2008:
Forest Management Plan for the Ogoki Forest Management Unit. Nipigon District, Northwestern Region. Final Plan. 2008-2018. 270 pp.

Lynch-Stewart, P., 1992:
No Net Loss: Implementing “No Net Loss” Goals to Conserve Wetlands in Canada. Sustaining Wetlands Issues Paper, No. 1992-2. North American Wetlands Conservation Council (Canada). Ottawa, ON. 35 pp.

Lynch-Stewart, P., P. Neice, C. Rubec and I. Kessel-Taylor, 1996:
Federal Policy on Wetland Conservation: Implementation Guide for Federal Land Managers. Environment Canada, Canadian Wildlife Service, Wildlife Conservation Branch. Ottawa, ON. 33 pp.

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Crown Land Use Policy Atlas. Policy Report. G2697: Geraldton Area. Last Updated: December 14, 2005.http://www.gisapplication.lrc.gov.on.ca/services/CLUPA/xmlReader.aspx?xsl=web-primary.xsl&type=primary&POLICY_IDENT=G2697.

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Effects of a changing climate on Peatlands in Permafrost: A Literature Review and Application to Ontario's Far North. Climate Change Research Report CCRR-34. Available Online: https://cfs.nrcan.gc.ca/pubwarehouse/pdfs/34839.pdf

Ontario Ministry of Natural Resources and Forestry, 2014:
Far North Land Cover Layer. Available Online: https://geohub.lio.gov.on.ca/datasets/far-north-Ontario Ministry of Natural Resources and Forestry. 2014.

Ontario Ministry of Natural Resources and Forestry, 2014a:
Ontario Wetland Evaluation System Northern Manual. 1st Edition, Version 1.3. Toronto, ON. 280 p. Website: https://files.ontario.ca/environment-and-energy/parks-and-protected-areas/ontario-wetland-evaluation-system-northern-manual-2014.pdf.

Ontario Ministry of Natural Resources and Forestry, 2017:
Marten Falls First Nation All Season Community Access Road Preferred Route Selection and Preliminary Environmental Work - Ministry of Natural Resources and Forestry Project Proposal Review. Letter addressed to Mary Hennessy, Director, Northern Environmental Initiatives Office, Ministry of Environment and Climate Change. Letter written by Grant Ritchie, Director, Far North Branch, and Amanda Holmes, Director, Northwest Region, Ministry of Natural Resources and Forestry, dated June 19, 2017.

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Ontario Ministry of Natural Resources and Forestry, 2020c:
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Carbon Storage and Potential Methane Projection in Hudson Bay Lowlands. Nature Communications 5:5078. June 2014.

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Wisconsin Department of Natural Resources, 2001:
Rapid Assessment Methodology for Evaluating Wetland Functional Values. Madison, WI. 8 pp.

Appendix A

Preliminary List of Data Sources

Information requests and publicly available data (i.e. data banks and databases) from the following sources:

- Federal government (e.g., Environment and Climate Change Canada, Health Canada)
- Ontario provincial government (e.g., MECP, MNRF, ENDM)
- Natural Heritage Information Centre Make-a-Map: Natural Heritage Areas and Rare Species Records (MNRF, 2020a)
- Crown Land Use Policy Atlas (MNRF, 2005)
- Land Information Ontario (LIO) base mapping data for Area of Natural and Scientific Interests (MNRF, 2020b),
- Ontario Land Cover Compilation V 2.0 (MNRF, 2020c)
- Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario, 2020)
- Ontario's Far North Land Cover Layer (MNRF, 2014) Ramsar Canada Sites (Ramsar Canada, 2020)
- Local Governments [e.g. Municipalities of Greenstone and Thunder Bay and local First Nations (e.g. Indigenous Knowledge)]
- Natural Resource Management Plans; Wetland guidance documents from other Canadian Provinces, and federal guidance documents [i.e. Far North Biodiversity Project (Ontario Biodiversity Council, 2020); Forest Management Plans (Long Lake Forest Products Inc, 2008), Alberta Wetland Policy (2020); The Wetland Ecological Functions Assessment (EC, 2008), The Wetland Network (2020)]
- Species Recovery and Restoration Plans
- Atlases (i.e. Ontario Reptile and Amphibian Atlas, iNaturalist [2020])

Other sources of data

- Academic institution and academic journal articles (e.g., Packalen et al., 2014; Leclair et al., 2015; MNRF, 2013)
- Field studies, including site-specific survey methods.
- Monitoring program databases protected areas, watershed or coastal management plans (e.g. Ring of Fire Baseline Environmental Monitoring Program).

- Land cover data, including: terrestrial ecosystem mapping products, forest cover maps, remote sensing resources.
- Important habitats and features to include:
  - water bodies, wetlands, watercourses;
  - riparian habitat;
  - river banks or other eroded habitats;
  - artificial water sources;
  - forest, tree patches, solitary trees (especially old decaying trees);
  - forest edges and tree rows;
  - ridges, including eskers;
  - caves and mines;
  - cliffs, rock outcrops, exposed bedrock, talus, and other karst topography;
  - buildings, bridges, and other anthropogenic features, including linear features;
  - sources of artificial lighting attracting insects;
  - critical habitat; and
  - any other habitat features known to be important in the area.
- Published literature, such as peer reviewed journals, reports by think tanks, nongovernment organizations and government reports (e.g., Committee on the Status of Endangered Wildlife in Canada Recovery Strategies).
- Environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area, regional studies, project assessments and strategic assessments.
- Renewable harvest data.

Appendix B

Agency Comments on the Draft Study Plan

Draft Study Plan Comments – Federal

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
GC	■ GC	■ Sections 5,6,7,13,19.2 and 25	■ In addition to the required actions detailed below, other required actions to be addressed in the update to this study plan are detailed in a separate table titled "2020-07-02 – The Agency to MFFN CAR - General Comments on MFFN CAR Draft Study Plans". The Agency has provided these other required actions to highlight common sections of the Guidelines where requirements were not met in the draft study plans submitted to the Agency. These additional actions must be addressed in the updated study plans.	-	■ We have reviewed the relevant comments and incorporated where appropriate. Please refer to the Comment Table for "General Comments" for specific responses.	■ Various Sections
VE-01	■ Section 3 Spatial Boundaries: Study Areas ■ Table 3-1: Vegetation Study Areas "Project Study Area 100 m from centerline" ■ Figure 3-1: Vegetation Local and Regional Study Areas	■ Section 7.4 – "…The spatial and temporal boundaries to be used in the impact assessment are outlined and discussed through the tailoring process, and include comments and input from federal and provincial government departments and agencies…"	■ It is unclear if the Project Study Area is 100 m from centerline (i.e., 200 m wide) as described in Table 3-1 or 100 m wide as shown on Figure 3-1.	■ Clarify the size of the Project Study Area.	■ The description provided in **Section 6.2** has been updated to "100 m wide".	■ Section 6.2
VE-02	■ Section 4.1 2019 Vegetation Surveys ■ Section 4.3.2 Field Survey Site Selection – "Based on the anticipated size of the PSA (greater than 4000 hectares (ha), the intent of the field program is to complete field verification on 15 to 25% of the vegetation communities within the PSA. Ground Inspections and Visual Checks will be conducted in accordance with the survey intensity levels (Ecosystems Working Group 1998) at a ratio of 25:75 respectively. Although every effort will be made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the proposed CAR will only be available by air, therefore survey locations will be limited to where a helicopter is capable of landing (i.e. cut helicopter landing pads, grassy riparian areas). Based on the anticipated size of the PSA (approximately 160,000 ha), the intent of the field program is to complete field verification on 2-4% of the vegetation	■ Section 7.2 – "Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options." ■ Section 7.2 – "With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data	■ More detail is needed about the 2019 vegetation surveys and the planned future surveys to assess whether they meet the requirements in the Guidelines. It is unclear if multiple visits to each location occurred in 2019 or if the proposed future studies will include the locations from the 2019 survey to meet this requirement. ■ Detailed information is needed on the areal coverage of the habitat classes, and the numbers of samples intended for each habitat class under the selected sampling design.	■ Provide information on the 2019 surveys, including survey locations, season/dates and number of visits. ■ Provide detail to demonstrate that survey/ sampling designs meet the requirements in Section 7.2 of the Guidelines. ■ Provide a schedule to demonstrate when all future surveys are planned to be conducted. ■ Provide detail to demonstrate that two years of collected baseline data will be provided to inform the Impact Statement, as per the requirements in Section 7.2 and Section 7.4.2 of the Guidelines.	■ More details have been provided regarding the 2019 vegetation studies and proposed survey / sample design. Future surveys will be representative of the temporal perspective of multi-years of study by using baseline data from previous years / seasons and desktop studies to supplement proposed field studies. A detailed schedule for future field sampling will be outlined in an upcoming and separate Work Plan.	■ Section 7

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	communities within the PSA. Considering the level of existing information on vegetation communities within the RSA (Far North Land Cover and FRI mapping), field investigations for vegetation will not be conducted within the broader RSA. Effects on vegetation within the RSA are not expected to be wide ranging and therefore effects can adequately be assessed using the existing and desktop derived information." ■ Section 4.3.5 – Traditional use plants and SAR plant populations"Local indigenous communities will be engaged to develop an understanding of Traditional Use Plants and plants of importance to the various communities."	should be considered as a limited augmentation of this new data" ■ Section 7.4.2 – "Baseline data collection for all biophysical valued components is to be provided for a minimum of two years, unless specified otherwise. Temporal boundaries spanning more than one year will enable accounting for variation due to irregular events (e.g., masting events, storms on migration, late snowfalls)." ■ Section 6 – "The proponent must engage with all Indigenous groups that may be impacted by the Project. The Indigenous Engagement and Partnership Plan (IEPP), issued by the Agency, is available to assist the proponent in further developing or refining their engagement strategy and supporting ongoing trust and relationship-building. In addition to the requirements set out in section 6.1, 6.2 and 6.3, the proponent must provide Indigenous groups with an opportunity to: provide Indigenous knowledge during baseline data collection; comment on the list of valued components and indicators; inform the effects assessment and review its conclusions; and inform the development of mitigation measures and follow-up programs."					
VE-04			■ It is unclear which Indigenous communities are considered "local". As per Section 6 of the Guidelines, the Agency expects the proponent to engage with, at a minimum, the Indigenous groups listed in the IEPP.	■ Provide details to demonstrate that all of the Indigenous groups listed in the IEPP will be engaged with, including to develop an understanding of Traditional Use Plants and plants of importance. Provide details to demonstrate how Indigenous knowledge and input will be incorporated in data and information gathering, as well as the effects assessment and identifying mitigation measures and follow-up programs.	■ As identified in **Section 4.2** of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (The Agency 2020a). Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in **Section 5** of the Study Plan. Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program; and the Consultation and Engagement Program.	■ Section 4.2 ■ Section 5
VE-05	■ Section 4.3.5 Traditional use plants and SAR plant populations – "Using the information collected on the baseline condition of any observed non-native species, invasive species, and/or introduced species of concern, possible vegetation control approaches for the construction and operations stage of the Project will be described. Such controls may include manual vegetation control"	■ Section 8.7 – "describe any considered vegetation control alternative (including manual vegetation control methods)."	■ Section 8.7 of the Guidelines requires that the study plan describe any vegetation control alternatives as part of the baseline studies.	■ Provide detail to demonstrate how baseline information will be collected to meet all of the requirements of Section 8.7 of the Guidelines, including any vegetation control alternative. Provide details to demonstrate how Indigenous knowledge and input will be incorporated in the assessment of vegetation control alternatives.	■ Detailed baseline botanical inventories will be completed at each ground investigation location including a thorough invasive species inventory. Vegetation control alternatives will be explored during future consultation with indigenous communities and will be incorporated into the effects assessment phase of the Project	■ Section 7.5

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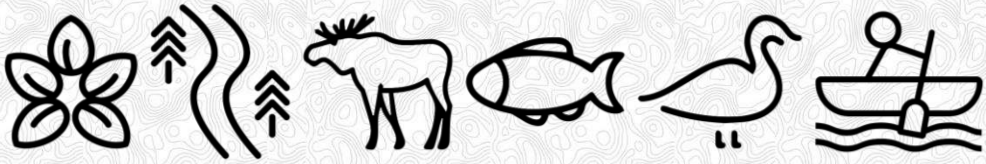
	■ Section 6.1 Indicators and Expression of Change ■ Table 6-1: Vegetation Indicators – "Wetland and Riparian Ecosystems Upland Ecosystems Designated Areas Traditional Use Plants & SAR Plant Populations"	■ Section 8.11 – "key habitat associated with species at risk should be considered valued components, including eskers and similar geologic features, wetlands and peatlands"	■ Eskers are not specifically mentioned in the study plan. It is assumed that they would be included in Upland Ecosystems, but not enough information is provided to verify this assumption or to assess whether the study plan adequately accounts for baseline conditions and effects assessment of eskers.	■ Provide details to demonstrate how the studies that will be conducted to estimate baseline conditions and the conduct effects assessment for eskers.	■ Eskers are discussed in greater depth in the Wildlife Study Plan as they relate directly to SAR and wildlife habitat. Baseline information collection regarding eskers have been added to this Study Plan. Vegetation as it relates to eskers will be explored as part of the upland ecosystems. The LSA has been designed to allow for adequate field investigation of these rarer habitats on the landscape.	■ Section 7.3
VE-06	■ Concordance table – "Impacts associated with…...will be described'	■ Refer to the Guidelines for additional relevant requirements of Section 14.3	■ Methodologies for many of the requirements in Section 14.3 of the Guidelines are not included in the effects assessment section of the study plan. The effects assessment must consider the effects of each of the project components and physical activities, in all phases, and be based on a comparison to the proposed baseline work.	■ Provide detail to demonstrate the proposed approach and methods used to integrate the requirements from Section 14.3 of the Guidelines in the study plan.	■ Effects assessment describes the methodologies for addressing Section 14.3 of the TISG (the Agency 2020b) and considers the effects of each Project component and physical activities and will be compared to the proposed baseline investigations.	■ Section 9

Draft Study Plan Comments – Provincial



Comment # / Ref #	Draft Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
1	■ Page 2, s. 2 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Key objectives of conducting an EA include the elements mentioned in the work plan and also describing the existing environment, describing potential effects (positive and negative) of the project and alternatives, and consult about the project.	■ Suggest the following revisions to add additional key objectives of the EA process: – *The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative) of the project and alternatives on the environment, ~~on Ungulates (moose and woodland caribou) and~~ determine measures needed to avoid or minimize adverse Project effects and enhance beneficial Project effects where feasible, and undertake consultation.*	■ The MECP's updated wording for the purpose and objectives have been incorporated.	■ Section 2
2	■ Page 2, footnote – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The footnote is appreciated though requires clarification. Will the study plans be updated to reflect any other comments during the ToR review process or post-ToR, e.g. federal, Indigenous, public?	■ Please clarify if the study plans will be included with the ToR submission. – If not included in the ToR submission, please clarify if and when the project team intends to consult broadly on the work plans. The footnote should also be revised to state that the study plans will be updated to reflect the approved ToR if approval is obtained.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in **Section 4** of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and The Agency once available.	■ Section 4
3	■ Page 5, Figure 3-1 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Figure 3-1 is missing locations for other project infrastructure – can this be added to the map?	■ Please add locations of other project infrastructure and associated study areas to Figure 3-1, or clarify when these locations will be known.	■ Locations cannot be provided at this time. The locations of other Project infrastructure are unknown at this stage of Project design.	■ NA
4	■ Page 18, s. 6.2	■ MECP, Environmental Assessment Branch	■ Page 18, 3rd paragraph in section 6.2, refers to “an effective mesh size assessment” in a paragraph that talks about assessment of potential landscape fragmentation effects. It is not clear what this means.	■ Can the paragraph please describe briefly what “mesh size assessment” is for the benefit of the reader?	■ Wording in **Section 9.4** of the Study Plan has been revised to indicate that the “The fragmentation assessment will consider relevant previous methods for the assessment of fragmentation (e.g. Jaeger 2000).	■ Section 9.4
5	■ Page 19, s. 6.3 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ A few comments on the first paragraph: – It is stated that project phases include construction and operation. It would be helpful if this section clarifies that the construction phase includes decommissioning of temporary infrastructure, per page 14 of the draft ToR. – Residual effects are mentioned but not explained. For clarity, there should be a statement that residual effects (net effects using provincial language) are the effects left over after application of impact management measures, per Ontario’s EA Code of Practice. – The paragraph states the residual effects will “be described in terms of the magnitude, geographic extent, **timing, duration**, frequency, **social and ecological context,** likelihood, and whether effects are reversible or irreversible.” These characteristics	■ Please add to this section that the construction phase includes decommissioning of temporary infrastructure, using consistent language as the ToR. ■ Please add to this paragraph that ‘residual (net) effects are the effects remaining after the application of impact management measures.’ ■ Please align the work plan methodology with the final ToR methodology in terms of assessing effects and alternatives, or provide sufficient rationale if methodologies are different. Per Ontario’s EA Code of Practice, the evaluation method(s) chosen must be able to produce an assessment that is clear, logical and traceable.	■ Decommissioning of construction works is included in the construction phase as noted in **Section 6.1**. ■ Residual effects are defined further in **Section 9.6.**	■ Section 6.1 ■ Section 9.6

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			are not all the same as what was stated in the draft ToR: "**direction**, magnitude, geographic extent, **direction** [sic], frequency, reversibility and likelihood" (p. 54-55 of draft ToR). Bolded font added to show differences. The remainder of section 6.3 describes further effects assessment methodology. The work plan and final ToR should align in methodology.			
6	■ Indigenous knowledge – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The work plan indicates that the EA will consider Indigenous knowledge to inform the effects assessment. The work plan does not provide a proposed methodology for how the proponent intends to seek Indigenous knowledge, from whom, and how it will be incorporated.	■ Please provide further details about how Indigenous knowledge will be collected and incorporated. Alternatively it may be helpful to include a reference to the relevant components of the ToR and ToR consultation plan that provide further details.	■ Consideration of Indigenous Knowledge and the methodology for seeking it is described in **Section 5.**	■ Section 5
7	■ Criteria and indicators table – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ For the tables containing criteria and indicators, some work plans include the three columns Valued Component, Indicators and Rationale for Selection. Other work plans include the columns Indicator, Expression of Change and Rationale for Selection. The table formats of criteria and indicators should be consistent across work plans. There are also differences between the criteria/indicators in the draft work plans vs. the criteria and indicators in the draft ToR.	■ Please review draft work plans to achieve consistent format in how criteria and indicators are presented in the tables. Where there are differences between the criteria/indicator tables in the draft work plans and the draft ToR Appendix A, please ensure the work plans and final ToR align so that the assessment methodology is consistent and to avoid confusion.	■ Criteria and Indicator tables have been streamlined across study plans and with the ToR.	■ Section 9.2
8	■ Pg. 6 / s.4.1 – 2019 Vegetation Community Surveys	■ MECP, Species at Risk Branch	■ As per comments provided by MECP-SARB on the draft Wildlife Work Plan (e.g., comment #2 regarding Eastern Whip-poor-will, comment #11 regarding bat acoustic survey stations, etc.), insufficient information is provided on the proposed surveys (e.g., number of survey stations/monitoring locations, a map illustrating these locations, dates of surveys, etc.). This information is necessary to appropriately inform components of proposed SAR surveys (e.g., Automatic Recording Unit placement for Bat surveys and, where appropriate, Eastern Whip-poor-will surveys, etc.).	■ Update draft Work Plan accordingly.	■ Information on proposed surveys including number of stations / monitoring locations, maps, dates of surveys will be provided in the Work Plan.	■ NA
9	■ Pg. 13 / s.4.3.5 – Traditional Use Plants & SAR Plant Populations ■ Pg. 15 / s.5.2 – GIS	■ MECP, Species at Risk Branch	■ In addition to IAAC, should any SAR plants be identified through ground surveys all relevant information should be provided to MNRF's Natural Heritage Information Centre (NHIC). If the species is listed as Threatened or Endangered under the ESA (O.Reg. 230/08), all relevant information should also be provided to MECP's Species at Risk Branch.	■ Update the draft Work Plan to indicate that all SAR information will be provided to NHIC and/or MECP's SARB.	■ All SAR information gathered through ground surveys will be provided to MNRF's Natural Heritage Information Centre (NHIC), and in addition, any information on species listed as Threatened or Endangered under the *Endangered Species Act, 2007 (*ESA) will be provided to MECP's Species at Risk Branch. ■ All geographic data, along with accompanying metadata, pertaining to SAR will be provided to Natural Heritage Information Centre (NHIC) and MECP's Species at Risk Branch.	■ Section 7.3

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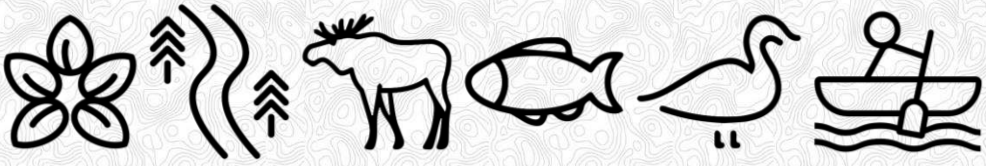
10	■ Pg. 8 / s.4.3.3 – Vegetation Communities – Upland ■ Pg. 15-16 / s.5.3 – Vegetation Community (Upland, Wetland and Riparian) Extrapolation	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that LiDAR data has been procured for the PSA and LSA and that this will be reviewed by vegetation specialists to delineate individual vegetation communities along with other background information (e.g., Far North Land Cover Mapping, etc.). Similar to identifying potential hibernacula (as identified in section 4.3.2.1 of the draft Wildlife Work Plan), LiDAR data also provides some unique opportunities for the identification of high potential bat habitat (e.g., large diameter trees, density of large diameter trees, etc.) that, where possible, should be considered in the placement of Automatic Recording Units that could increase the likelihood of identifying maternity roost habitat.	■ Consider the relevant information through available LiDAR data in determining high potential bat maternity roost habitat to inform the placement of ARU's planned.	■ Relevant information related to potential bat maternity roost habitat (e.g., large tree diameter, density of large diameter trees) gathered through the analysis of LiDAR data will be considered during the placement of Automatic Recording Unit (ARUs) and will be discussed in the Wildlife Study Plan.	■ Wildlife Study Plan
11	■ Comment on Wildlife, Ungulates and Vegetation work plans	■ MNRF, Nipigon District	■ MNRF staff have reviewed these draft field work plans. We found that they address the field work needs related to our mandates. However, MNRF may have items/comments to contribute during the further development of the ToR and the EA.	■ N/A	■ Any further items / comments provided by the MNRF during the development of the ToR and the EA will be addressed at that time.	■ NA

Phone: 1-800-764-9114 **Email:** info@martenfallsaccessroad.ca **Web:** http://www.martenfallsaccessroad.ca



Comments Table

Proposal: Marten Falls Community Access Road Project – Draft Technical Study Plan _ Vegetation
Proponent: Marten Falls First Nation

Study Plan Title: [Vegetation – May 2021]
Commenter Name, Job Title and Ministry: [Natural Resources and Forestry arm of the Ministry of Northern Development and Mines, Natural Resources and Forestry**]**

General Comment (applies to more than just this study plan):

Although at the start of the reports, both the Wildlife and the Vegetation Study Plans reference the definition of Significant Wildlife Habitat (SWH), the term and consideration of its defined features are not carried forward well throughout the study plans. Overall, SWH related items (e.g., Species of Conservation Concern and other associated features) seem to receive little consideration in the Vegetation and Wildlife Study Plans. The features lack coverage in desktop analysis, modelling and effects assessment (e.g., S1-S3 species except for Special Concern SAR and some limited discussion of rare vegetation communities). NRF would like to see a more thorough discussion of SWH across all applicable study plans. The Natural Heritage Reference Manual and the Ecoregional Criterion Schedule 3W and 3E are mentioned, but the direction therein regarding SWH needs to be considered more clearly in the study plans. Candidate habitat could be modelled and mapped to improve field surveying efforts, and to assist in identify these features on the ground.

Page or Section Specific Comments:

Note: Page numbers indicated in this table are overall Adobe Page numbers, not page numbers on the document pages.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
1.	Pg.14 Table 1-2	Vegetation Study Plan valued components does not specifically name Provincially Significant Wetlands (PSWs) under Designated Areas.	Recommend PSWs be identified as a designated area, whether within the “Wetland and Riparian Ecosystem” section or under the “Designated Areas” section.
2.	Pg.14	Vegetation Study Plan VCs	Recommend not grouping conservation concern

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
	Table 1-2		species with SAR. Although there is some crossover, species in these categories do not always occur together. They may also need to be treated differently. As such it would be better to speak to them as separate groups.
3.	Pg. 27 6.2.1 General Information	The following text included in Peatland Study Plan, but excluded from Vegetation Study Plan: "Location for Project components other than the route itself (e.g., temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads) are unknown at this time; however, the PDA and LSA will be adjusted accordingly as the Project design progresses and as required."	Ensure commitments between study plans are the same. For consistency among study plans, and to demonstrate that disturbance from activities other than the route itself will be considered appropriately during the environmental assessment, it is recommended this text be added back into the vegetation study plan.
4.	Pg. 32 7.1 Desktop Assessment	This section does not list provincially significant wetlands, or significant wildlife habitat as a potential designated area.	Designated areas may also include provincially significant wetlands. The desktop assessment should also look to identify any potential significant wildlife habitat features that may be present within the study area.
5.	Pg. 32 7.2 Recent Field Investigations	Point 1 on page 32 indicates a 5 km buffer around the center line was considered the study area, however previously on page 29 a 3 km buffer on each side of the centre line is noted. Although this change seem to be related to some kind of assessment, it is unclear what was considered when changing this buffer area.	Include more a more detailed description of how it was determined that the buffer area should change from 5 km to 3 km on either side of the centerline.
6.	Pg. 34	There are several instances where this Study Plan makes reference to other study plans, in this section for instance direct reference to the Birds Study Plan is provided. When referencing material from other	Cross-reference study plans where connections are listed.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
	7.3.1 Field Survey Site Selection	study plans, the sections/subsections should be included and referenced to allow for easier cross-referencing by the reader.	
7.	Pg. 34 7.3.1 Field Survey Site Selection	This section does provide a description of how sample sites will be selected, however some key items for understanding the study remain absent. For instance, there is no estimate of the number sites that will be surveyed. Also, it remains unclear if the sampling will be strictly to visit randomly selected plots or a portion of these site will be chosen to verify suspected candidate features.	This section could be modified to address question such as: • Can a rough estimate of the number of sites to be surveyed be provided or perhaps a range? • Will sites be confirming suspected candidate features or strictly visiting randomly selected plots?
8.	Pg. 35 7.3.1.1 Regional Study Area	Limited information is provided regarding the data available for the RSA and about why this level of information is sufficient for the needs of this project.	Please provide more detail as to why existing information within the RSA is deemed sufficient to meet assessment needs. Describe the existing information and what information will be derived. If described elsewhere, reference the appropriate section.
9.	Pg. 38 7.3.2.1.2 Field Surveys	Visual Checks The description of sampling methods provided in the section on visual checks is limited so it is difficult to understand the level of effort that will be dedicated to this work.	Please describe what percentages of visual checks will be fly-overs compared to photo interpretation. The number of sampling sites should also be provided here, or a direct reference to this information in the Birds Study Plan should be provided to allow readers a clear understanding of proposed methods.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
10.	Pg. 39 7.3.2.2.1 Pre-typing	Wetlands This section does not mention the Ontario Wetland Evaluation System for pre-typing wetlands, yet this would seem to be an appropriate tool for the study.	Recommend Ontario Wetland Evaluation System be used as a resource as well when delineating and classifying the wetlands.
11.	Pg. 39 7.3.2.2.1 Pre-typing	Riparian This section seems to indicate that information available to a desktop review will be utilised to describe riparian areas. Will any unmapped streams or waterways spotted be mapped during aerial surveying?	Please clarify if unmapped streams or waterways otherwise spotted will be mapped during aerial surveying efforts.
12.	Pg. 39 7.3.2.2.2 Field Surveys	Wetlands The Ontario Wetland Evaluation System is not mentioned as providing methods that can be used to assess wetland function, or as a source of appropriate terminology.	Recommend the Ontario Wetland Evaluation System be used as a resource when assessing wetland function and classifying wetland type for areas where applicable.
13.	Pg. 41 7.3.2.2.2 Field Surveys	Wetlands A high-level description of a function ranking/scoring system for wetlands is provided, however insufficient detail is provided to understand weightings, or otherwise how different functions will be considered during assignment of rankings.	Please provide more detail regarding how ranking scores will be assigned and weighted along with the associated rationale which will be used.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
14.	Pg. 42 7.3.2.2.2 Field Surveys	Riparian A high-level description of a function ranking/scoring system for riparian areas is provided, however insufficient detail is provided to understand weightings, or otherwise how different functions will be considered during assignment of rankings.	Please provide more detail regarding how ranking scores will be assigned and weighted along with the associated rationale that will be used.
15.	Pg. 43 7.4 Traditional Use Plants and SAR Plant Populations	This section does not indicate that surveys for rare plants will include conservation concern plant communities (S1-S3).	This approach should be updated to indicate that surveys for rare plants will also look for conservation concern species and plant communities (S1-S3).
16.	Pg. 44 8.2 GIS	This section indicates that baseline data will be provided to the Agency as electronic geospatial data files.	Request baseline data be shared with provincial authorities as well.
17.	Pg. 47 9.2 Valued Components and Indicators	Following text is included in Peatland Study Plan, but excluded from Vegetation Study Plan: “VCs are the environmental, health, social, economic or additional elements or conditions of the natural and human environment that may be impacted by a proposed project and are of concern or value to the public, Indigenous peoples, federal authorities and interested parties (the Agency 2020b).”	Recommend keeping applicable sections of text the same between study plans for consistency (i.e. so this section which appears in the Peatland Study Plan should be added here in the Vegetation Study Plan).

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
18.	Pg. 48 Table 9-2	Designated Areas should include Significant Wildlife Habitat features and Provincial Significant Wetlands.	Recommend adding Significant Wildlife Habitat features and Provincial Significant Wetlands to the list of Designated Areas on Table 9-2.
19.	Pg. 48 Table 9-2 (and generally, in this study plan)	It is unclear if Species of Conservation Concern will be considered separately from SAR. Although there may be some overlap with these categories, they are different and should be considered separately.	Request Species of Conservation Concern be addressed separately from SAR, rather than always grouping them together.
20.	Pg. 48 Table 9-2	Rationale for Selection: Wetland and Riparian Ecosystems Upland Ecosystems Recommend also considering instances where the habitat may support provincially or regionally rare species or vegetation communities	Include a bullet indicating that selection will occur when, “habitat supports provincially or regionally rare species or vegetation communities”.
21.	Pg. 51 9.5 Mitigation and Enhancement Measures	Following text included in Peatland Study Plan, but excluded from Vegetation Study Plan: “Proposed mitigation measures will be clearly linked to the extent possible to mitigating potential effects on Peatlands resulting from specific Project components or activities (e.g., vegetation removal, design of equalization culverts, maintenance of hydrological functions) and will be updated as appropriate based on comments received from federal and provincial	Recommend keeping applicable sections of text the same between study plans for consistency. Recommend treating vegetative areas in the same manner as described for peatlands in the Peatlands Study Plan.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
		agencies and stakeholders through the engagement activities."	
22.	Pg. 52 9.5.1 TISG Section 20 Requirements	It is unclear what is included as "biodiversity offsets in Bullet 4	Please describe or provide an example of what is meant by biodiversity offsets.
23.	Pg. 52 9.5.1 TISG Section 20 Requirements	Significant Wildlife Habitat and Species of Conservation Concern are not mentioned in this section.	Request Significant Wildlife Habitat be considered as well, where applicable to this study plan, such as Species of Conservation Concern. For example, Bullet 5.
24.	Pg. 53 9.6 Residual Effects	Following text is included in Peatland Study Plan, but excluded from Vegetation Study Plan: "In this context, direction indicates the positive or negative change from existing conditions. Magnitude indicates the expected change from existing conditions. The geographic extent indicates the spatial area that the effect is expected to occur within. Duration is the period of time an effect occurs, and frequency is how often an effect occurs over time. The reversibility of an effect defines its ability to return to existing conditions and the likelihood indicates the probability that an effect will occur."	Recommend maintaining a consistent approach among the study plans. For consistency we suggest keeping applicable sections of text the same between study plans.
25.	Pg. 54 Table 9-4	There is substantial detail provided in this table regarding what potential impact levels will be considered negligible, low, medium and high.	It is recommended that a description be provided to explain how the magnitudes in the level of impact table were determined. What standards

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
		This approach is, however, general in nature. There may be a much larger level of concern if for instance 10% of the habitat or population of a Special Concern Species will be impacted as opposed to the same level of impact to a more common species. What rationale was utilised to determine the criteria in this table?	and guidelines where utilized and does this approach apply regardless of the rarity of a species or habitat?
26.	Pg. 74 Table 11-2 MNRF 19/20	Inclusion of ecoregion and ecozone boundaries on a map of the study area would be beneficial for understanding proposed study methodologies and ecological considerations.	Recommend including these maps in the Study Plans in addition to in the ToR and IS/EA Report.
27.	Pg. 75 Table 11-2 MNRF 24	While the Ontario Wetland Evaluation System is not appropriate for evaluating extensive wetlands in the Hudson Bay Lowlands, the system should be used as a resource when considering wetland features within the Canadian Shield.	Recommend that the Ontario Wetland Classification System be used as a reference where applicable while maintaining the necessary consistency of methodology for the entire project study area.
28.	Pg. 79 12. References	Ontario's GeoHub is listed as a reference for fire disturbance areas only.	GeoHub can be used for numerous other data layers beyond the listed Fire Disturbance Area, including the Forest Resource Inventory. GeoHub could be referenced with this broader application in mind.
29.	Pg. 81 12. References	Natural Heritage Information Centre provides tracked species records in addition to the Make-a-Map (MaM) website	Recommend utilizing and referencing the http://www.ontario.ca/page/get-natural-heritage-information website in the vegetation study plan. The data available in the MaM website does not house the most comprehensive list of tracked species. NHIC should be contacted directly for provincially tracked species and plant community data.

Comment #	Page/Section # in Work Plan	Comments & Rationale	Proposed Action/Solution
30.	Pg. 84 Appendix A	This appendix lists information sources	Recommend adding the Ontario GeoHub to this list. Also, the NHIC, the Make a Map application, and provincially tracked data should be listed as separate sources.

Attachment B – Vegetation Technical Support Document

MARTEN FALLS FIRST NATION
COMMUNITY ACCESS ROAD

Attachment B: Vegetation Technical Support Document

Version #5

February 2026

Disclaimer: WSP Canada

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The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP Canada Inc. at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP Canada Inc. and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

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Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, and development.

Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of testing and / or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

This limitations statement is considered an integral part of this report.

Authors

Revision	Name	Title	Company
Original	Corey Burt	Terrestrial Ecologist	WSP Canada Inc.
Original	Amber Sabourin	Lead Ecologist	WSP Canada Inc.
Original	Heather Drost	Lead Ecologist	WSP Canada Inc.
Approval	Erin Greenaway	Principal Ecologist	WSP Canada Inc.

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1. Introduction and Objectives

Marten Falls First Nation is a remote First Nation community in northern Ontario, approximately 430 km from Thunder Bay, Ontario, located at the junction of the Albany and Ogoki Rivers. The Marten Falls First Nation community is proposing a Community Access Road (the Project) that will connect the Marten Falls First Nation community to the Ontario provincial highway network (**Figure 1-1**). The Project includes construction and operation of a multi-purpose Community Access Road consisting of:

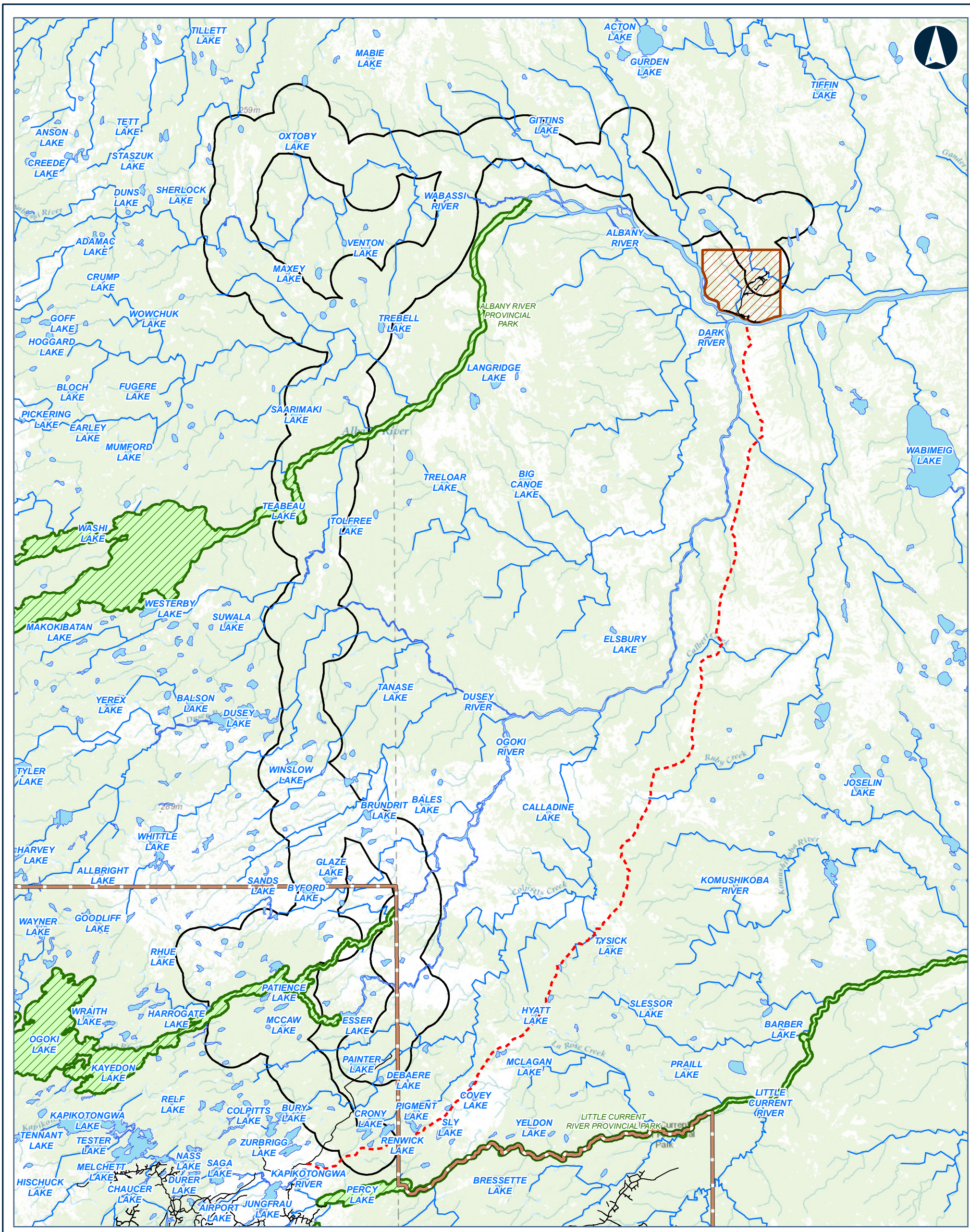
- approximately 190 to 230 kilometres (km) (depending on the chosen route) of two-lane gravel all-season road on a new right-of-way;
- approximately 100 m wide right-of-way cleared to a width of 60 m; and
- proposed designated speed limit of 80 kilometres per hour (km/h).

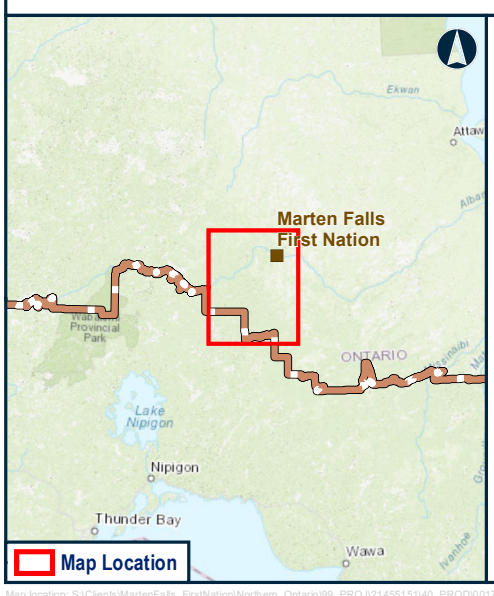
The Marten Falls First Nation community is currently accessible year-round by air transportation out of Thunder Bay and Nakina and by a winter access road constructed yearly, if conditions permit. Since the 1990s, Marten Falls First Nation has received provincial funding to maintain 140 km of winter road to the community. However, the North[1] is noted as vulnerable to the effects of climate change in *Building Better Lives: Ontario's Long-Term Infrastructure Plan* (MOI, 2018). Therefore, interests and concerns of the Marten Falls First Nation community have identified a desire for all-season community access to the provincial highway network in the south, near Painter Lake.

Marten Falls First Nation has retained a Consultant Project Team consisting of AECOM Canada Ltd., Dillon Consulting, WSP Canada Inc., KGS Group Consulting Engineers (KGS), KBM Resources Group, GreenForest Management Inc., and CE Strategies to provide Environmental Assessment and preliminary design services for the Project. As part of these services, WSP Canada Inc. is undertaking studies to characterize the existing vegetation environment.

This report has been prepared to further describe the methods and results of the desktop review and field investigations that were undertaken to characterize the vegetation communities within the study areas. Data are presented to the ecosite level in this technical support document. However, for the *Vegetation Existing Conditions and Effects Assessment Report* (WSP, 2024), the ecosite information has been rolled up into five upland and four wetland community groupings to inform the vegetation Valued Components effects assessment. The information presented here is discussed in the context of the vegetation Valued Components in the *Vegetation Existing Conditions and Effects Assessment Report* (WSP, 2024) as part of the *Environmental Assessment / Impact Statement Report.*

[1] Northern Ontario is a geographic and administrative region of Ontario referred to as "the North."





Legend

- ROAD
- WINTER ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK
- PROJECT STUDY AREA

Notes:
None

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

PROJECT LOCATION

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:450,000 * when printed 11"x17"
Rev:0	

Figure 1-1

Contains information provided by Ontario Ministry of the Environment, Conservation and Parks or by Ontario Ministry of Natural Resources and Forestry (Copyright: King's Printer of Ontario 2023), through a Sensitive Data License Agreement. This drawing has been prepared for use of AECOM client and may not be reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM express written consent. The use of Sensitive Data in this drawing does not constitute an endorsement by the Ministry for this drawing or by AECOM of the Sensitive Data.

Map location: S:\Clients\MartenFalls_FirstNation\Northern_Ontario\99_PROJ\21455151\40_PROD\0017_Vegetation_EC_Reporting\21455151-0017-RT-0001_1-1.mxd
Date Saved: 2/10/2026 9:37:12 PM User Name: INGU06951

2. Methods

This section describes the methods used to complete the desktop vegetation mapping, and field surveys in detail. Refer to **Section 2** of the *Vegetation Existing Conditions and Effects Assessment Report* (WSP, 2024) for a summary of the Study Methods and Assessment Scope.

2.1 Desktop Vegetation Community Mapping Methodology

An iterative process was used to develop the desktop vegetation community mapping for the Construction Disturbance Area and the Local Study Area. The process first involved development of the preliminary terrain mapping (as summarized below, and further described in the *Physiography, Terrain, and Soils Technical Support Document* [WSP, 2024]), with ecosite classification completed by KBM Resources Group. The mapping methodology is summarized in the following sections.

2.1.1 Vegetation community mapping in the Regional Study Area was assembled using the Ontario Land Cover Compilation Version 2.0. Terrain Mapping (Preliminary)

Terrain mapping combines terrain, soil, and landscape features with biological features to delineate areas with similar topography and soil properties. It subdivides the landscape into relatively homogenous terrain units based on the following:

- soil parent materials;
- overburden thickness/depth to bedrock;
- underlying surficial material;
- surface expression (topography);
- slope;
- aspect;
- soil drainage; and
- ongoing geomorphological processes.

Detailed preliminary terrain mapping was completed at a 1:5,000 scale using 3-D softcopy mapping tools (ArcGIS and PurVIEW) using the following:

- 1:60,000 scale black and white aerial photos acquired in 1973, 1975, and 1976 from the National Air Photo Library in Ottawa, Ontario;
- 1:33,000 scale 20 cm resolution colour aerial photographs acquired in 2019 by KBM Resource Group's aerial survey division; and

- 1 m Light Detection and Ranging data (20 to 80 cm Vertical Accuracy) and associated hillshade.

This preliminary terrain mapping informed the ecosite mapping, as described below. The terrain mapping process is further described in the *Physiography, Terrain, and Soils Technical Support Document* (WSP, 2024).

2.1.2 Ecosite Classification

Preliminary terrain mapping was provided in digital format to KBM Resources Group, who assigned ecosite types to each of the polygons identified in the terrain mapping (the ecosite-typing process is further described below). The original intent was to provide KBM Resources Group with a completed preliminary terrain mapping dataset for the full Local Study Area, to inform the desktop ecosite classification process. However, due to time constraints, the polygon delineation and ecosite classification became an iterative process whereby KBM Resources Group also completed some of the polygon delineation which WSP Canada Inc.'s soils and terrain specialists then integrated into their terrain mapping dataset. The mapping dataset was updated and expanded by both teams until all polygons were delineated and classified within the Local Study Area (refer to **Section 2.3** in the *Vegetation Existing Conditions and Effects Assessment Report (*WSP 2024) for further information on the spatial boundaries).

The ecosite mapping product that formed the basis of the vegetation mapping was completed by KBM Resources Group in September 2021.

The desktop photo interpretation vegetation mapping exercise completed by KBM Resources Group involved assessment using two imagery sources viewed in 3D, using software called Summit Evolution (S. Audet, personal communication 2023):

- 1:60,000 scale black and white aerial photos acquired in 1973, 1975, and 1976 from the National Air Photo Library in Ottawa, Ontario (covering the Local Study Area); and
- 1:33,000 scale 20-cm resolution colour aerial photographs acquired in 2019 by KBM Resource Group's aerial survey division (within 1 km either side of the Project centreline).

The vegetation mapping was completed using the specifications outlined in the *Ontario Forest Resources Inventory Photo Interpretation Specifications* (OMNR, 2012a) and all polygon attribution was completed by experienced Ontario Boreal Certified photo interpreters (S. Audet, personal communication, 2023). Where not already delineated by WSP Canada Inc.'s soil and terrain specialists, polygons were delineated by KBM Resources Group based on the defined criteria for forested and non-forested land types.

All the delineated polygons (excluding water) were assigned a primary ecosite code (PRI_ECO) based on the Ecosites of Ontario ecosite keys (Banton et al. 2009). An ecosite is defined as "*an ecological unit comprised of relatively uniform geology, parent material, soils, topography, and hydrology and consists of related vegetation conditions*" (OMNR, 2012a). Where a secondary ecosite represents at least 20% of the area of a polygon and

is not equal to or greater than eight hectares (ha), a secondary ecosite was assigned (SEC_ECO) to the polygon.

Polygons were first divided into upland vs lowland (wetland) polygons. Polygons were then grouped into areas with similar species, height, age, densities, and crown closures. Forested polygons were typed based on standard forestry inventory metrics including species composition, stocking, stand height, site class, year of origin, depletion type, and development stage. The *Ecosites of Ontario* (Banton et al. 2009) ecosite keys were then used to choose an appropriate ecosite for each polygon. Given the limitations of desktop ecosite classification, some default ecosite key selections were made based on interpreter experience and expected conditions within the Local Study Area, as follows (S. Audet, personal communication, 2023):

- Key 5: Fresh, Sandy or Dry to Fresh Coarse Loamy Ecosites was the default key used for upland ecosites. Exceptions to this rule were
  - Key 4: Dry, Sandy Ecosites was used for areas that appeared dry and sandy.
  - Key 6: Moist, Sandy to Coarse Loamy Ecosites was used for areas that appeared moist.
- Key 10: Permanently Flooded or Hydric Ecosites was used for wetlands.

Additionally, ecosites were further refined in 2023 using a combination of data from field investigations**,** soils data from field-verified borehole locations, and light detection and ranging mapping. This work was undertaken by the soils and terrain and peatlands teams, as further detailed in the *Peatlands Existing Conditions & Effects Assessment Report* (WSP, 2024).

2.1.2.1 Desktop Mapping Limitations

It must be recognized that there are limitations to desktop ecosite classification, particularly when using older, low-resolution imagery. Key assumptions and limitations are outlined below:

- A higher confidence should be applied to ecosite classification within 1 km of the Community Access Road route alternatives centreline where higher resolution 2019 colour imagery was available;
- A lower confidence should be applied to ecosite classification within the outer 2 km of the Local Study Area where only low resolution black and white imagery from the mid-1970s was available;
- A typical *Forest Resource Inventory* desktop mapping approach involves a process of ground-truthing / calibration according to the *Calibration Plot Specifications* (OMNR, 2012b). No field verification occurred *during* the desktop ecosite classification exercise to validate the desktop mapping process; and
- The default ecosite key selection for upland ecosites (i.e., Keys 4, 5, and 6), was a decision by KBM Resources Group based on the dominant substrate conditions across

the province and is a typical process when ground truth data are not available at the time of desktop ecosite-typing. As a result, ecosites on silty, fine loamy, or clay soils (i.e., Keys 7, 8, and 9) may be under-represented in the Local Study Area.

An assessment of the accuracy of desktop upland and wetland ecosite classification was completed using a confusion matrix analysis. A detailed description of this process is provided in **Annex A**, and a summary provided in **Section 2.3.4.**

2.2 Field Investigation Methodology

2.2.1 2019 Field Methodology

Preliminary field studies were conducted in 2019 prior to the finalization of the *Vegetation Study Plan*. These surveys consisted of high-level rapid plant community assessments in conjunction with wildlife survey locations (refer to the *Wildlife Study Plan* and the *Bird Study Plan*). Stations were selected to provide broad coverage of the vegetation Local Study Area (which at the time was considered to be 2.5 km buffer around the centreline of the Community Access Road route alternatives), as well as to include a diversity of vegetation communities (including peatland / wetlands) and specifically target communities with potential to support rare plant species and / or traditional use plant species.

Vegetation surveys in 2019 were conducted within the Ogoki River Provincial Park as well as the Albany River Provincial Park following previous Ministry of Natural Resources and Forestry recommendations on the Project (OMNRF, 2017). A Research Authorization to conduct surveys within provincial parks was obtained from the Ministry of the Environment, Conservation and Parks for this study.

Vegetation surveys included documentation of dominant plant species and a high-level assessment of plant community type. Information on invasive or rare species was also noted. Field notes, incidental wildlife observations, and representative photographs were documented and used to provide an overall characterization of the vegetation communities.

The 2019 field program informed the development of the *Vegetation Study Plan*. At the time of the 2019 field work, the Local Study Area was smaller (i.e., 2.5 km buffer) than the final Local Study Area (3 km buffer). The subsequent field programs and assessment therefore supersede this analysis.

2.2.2 2021-2023 Field Methodology

Field investigations in 2021 through 2023 were completed to assess a subset of the pre-typed[2] ecosites and to collect soil and botanical data to characterize plant community composition in a sub-set of each ecosite type. Field surveys were conducted during the appropriate season (i.e., leaf-on season which typically occurs from June through September). Field sites were located within the Project Development Area and the Local Study Area. No field investigations were completed within the Regional Study Area.

2.2.2.1 Site Selection

Field verification survey plot site selection considered both access (i.e., proximity to existing helipad locations) and the objective to survey all ecosite types present within the Local Study Area, based on the pre-typed ecosite mapping. The following sections describe the process for selecting sites for vegetation field surveys helping to ensure coverage in both the Construction Disturbance Area and the Local Study Area.

The field study design for the Local Study Area generally followed the *Standard for Terrestrial Ecosystem Mapping in British Columbia* (Ecosystems Working Group, 1998). Although these guidelines originate in British Columbia, a similar guideline to provide consistency across projects has not been developed for Ontario and therefore is considered to be an acceptable approach. Establishing the field survey intensity varies depending on the purpose of the surveys, size of the Study Area, project objectives, and funding; the British Columbia standards describe six survey intensity levels (Ecosystems Working Group, 1998). Based on the size of the Vegetation Local Study Area (197,960 ha), the survey intensity for the Project falls within the ”reconnaissance level” intensity range with the percentage of polygon inspections falling between 0% and 4%, and a ground inspection to visual check ratio of 25:75 (Ecosystems Working Group, 1998).

Although every effort was made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the Local Study Area was only available by air, therefore survey locations were limited to within 1 km of where a helicopter was capable of landing (e.g., cut helicopter landing pads, open grassy riparian areas). Considering that not all randomly selected points were accessible, a number of oversample sites were also selected. The intent was to provide the best chance of obtaining a robust sample size but also with the objective of visiting a sub-set of each pre-typed ecosite.

As outlined in the *Vegetation Study Plan*, vegetation field surveys were selected to be most intensive within the Project Development Area (approximately 60% of the survey locations), with a reduced level of effort within the Local Study Area (approximately 40% of the survey locations). No field surveys were completed within the Regional Study Area.

[2] **Pre-typed ecosites** refer to the ecosites assigned by KBM Resources Group to each of the desktop-delineated polygons.

Field sites were also divided between upland, wetland, and riparian ecosystems. While all ecosites were mapped as either a wetland or upland ecosite, those that were within 30 m of a watercourse were also identified as riparian ecosystems based on the recommended minimum natural vegetation cover adjacent to waterbodies (MNRF, 2010; Environment Canada, 2013). Riparian communities were identified by buffering all watercourses and waterbodies by 30 m.

2.2.2.2 Field Surveys

Two types of field surveys were conducted: ground inspections and visual checks. Each survey type is described in more detail below.

- **Ground Inspections** – Ground inspections consisted of a point sample at a representative location within a desktop delineated and classified vegetation community polygon. The purpose of ground inspections was to confirm or correct the desktop ecosite classification and to collect data to inform the riparian, wetland, and peatland functional assessments. Ground inspection methodologies are described in more detail for each ecosystem type below (**Upland Ecosystems**, **Wetland Ecosystems**, and **Riparian Ecosystems**); and
- **Visual Checks** – Visual checks consisted of an assessment from helicopter as well as assessments of representative photographs taken during other field programs (e.g., bird surveys). Visual checks were also completed on the ground, where possible (e.g., while walking from one ground plot to another). The purpose of visual checks was to assess whether the desktop ecosite mapping was accurate or needed to be revised to the proper classification.

Where visual checks were completed by helicopter, data collected consisted of (where possible) location (Universal Transverse Mercator coordinates), photos, dominant species (those that could be identified from air), estimate of community relative age (e.g., mature, semi-mature, immature, recent burn), and stand composition.

Where visual checks were completed by photo interpretation, surveyors photographically documented the vegetation community with 13 photos. At each cardinal direction: one photo at shoulder height with arm and camera extended parallel to ground, one photo with arm at 45 degrees (from body position) pointing down, and one photo with arm extended at 135 degrees (from body position) pointing up, and one photo with arm extended straight up (i.e., vertically). The photos were interpreted (where possible) to confirm the pre-typed vegetation community, estimate of community age and stand composition, and estimate of soil moisture regime.

2.2.2.2.1 Upland Ecosystems

Ground inspections in upland ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular

attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants, when encountered. As part of the Ecological Land Classification method, the following data were gathered to the extent possible:

- Photographs;
- Dominant plant form and canopy height;
- Soil texture, moisture regime, and degree of decomposition using a soil pit or auger;
- Stand description (dominant species, height, and percentage cover);
- Abundance of standing snags and deadfall;
- Estimate of community age;
- Basal area calculation; and
- Ecosite classification according to *Ecosites of Ontario* (Banton et al., 2009).

Key habitat information for species important to existing land use and resources for traditional purposes were collected. Where a Species at Risk, rare species, or rare vegetation community was identified, their locations (Universal Transverse Mercator coordinates) and boundary delineation, abundance (percentage cover), and habitat conditions (microclimate characteristics such as: shade and slope) were recorded to the extent possible.

2.2.2.2.2 Wetland Ecosystems

The data collection protocol for Wetland Communities was adapted from the *Wisconsin Rapid Assessment Methodology* (Wisconsin Department of Natural Resources 2001), *Ontario Wetland Evaluation System* (OMNRF, 2014), and the *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson et al., 2008) which are complementary of recommended approaches from Environment and Climate Change Canada.

Ground inspections in wetland ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants. Specifically, the following data were gathered in wetland ecosystems, to the extent possible:

<u>General Information</u>

- Photographs;
- Dominant vegetation type;
- Community composition; and

- Ecosite classification according to *Ecosites of Ontario* (Banton et al., 2009).

Habitat Function Information

- Presence of invasive species or species of special interest (Indigenous importance or Species of Conservation Concern or Species at Risk);
- Habitat suitability (emergent vegetation for waterfowl nesting, standing water for amphibian breeding, vegetation suitable for ungulate grazing); and
- Incidental wildlife observations and evidence of wildlife activity.

Hydrological Function Information

- Geomorphology of the wetland (e.g., depressional, riverine, lake fringe, extensive peatland);
- Presence of surface water, flow patterns, connectivity, inputs, outputs, water depth, and evidence of ground water influence;
- Existing hydrology alterations (e.g., ditching, beaver [Oji-Cree translation, *amik*] [*Castor canadensis*] activity);
- Biogeochemical function information;
- Soil moisture regime;
- Substrate composition (mineral or organic); and
- Substrate decomposition rates described using the von Post scale (Ekono, 1981).

2.2.2.2.3 Riparian Ecosystems

The data collection protocol for riparian ecosystems was adapted from *Riparian Assessment and Prescription Procedures* (British Columbia Ministry of Environment, Lands and Parks and Ministry of Forests, 1999). Data collected in riparian communities will be used to inform the functional assessment and effects assessment.

Ground inspections in riparian ecosystems included a point sample from a representative location within a pre-selected vegetation community polygon. At each point location, and while travelling through the polygon to reach a representative point, a botanical inventory of plant, fungi, lichen, and moss was recorded to the greatest extent possible. Particular attention was paid to documenting locations and abundance of federal and provincial Species at Risk, traditional use plants, and rare plants. As part of the Ecological Land Classification method, the following data were gathered to the extent possible:

- Overstory vegetation characteristics (tree species, densities, and heights, percentage cover);
- Understorey vegetation characteristics (shrub, herb, and moss species, percentage cover, and height);

- Soil properties (horizon depths, textures, degree of decomposition, % coarse fragments);
- Indicators of disturbance;
- Site gradient and aspect;
- Stream gradient and width; and
- Ecosite classification according to *Ecosites of Ontario* (Banton et al. 2009).

2.3 Data Management and Analysis Approach

Data management, including quality assurance and quality control was employed to minimize potential for data entry and analysis errors, prepare datasets for analysis, and limit sensitive data distribution in accordance with established agreements.

2.3.1 Field Investigations

To maintain consistency and for quality assurance / quality control of the data collected, standardized datasheets paired with mapping software were used in the field. Field studies followed technical protocols that outlined specific work instructions that were developed for the Project. Completeness and accuracy of field data were verified daily during field verification, and field photos and coordinate information were backed up daily. Field datasheets were scanned and filed digitally in the appropriate Project folder.

2.3.2 Data Management

Field data were manually entered into excel spreadsheets for future collation and analysis. When the data analysis and reporting were undertaken, any data anomalies were cross-checked back with the field datasheets and / or field mapping to correct the anomaly.

A manual check of the species list was completed for 10% of the sites surveyed during the field investigation. The entire species list was also checked for taxonomic errors.

2.3.3 Ecosite Refinement

Pre-typed ecosites were further refined in 2023 using a combination of data from vegetation field investigations as described in **Section 2.2.2**, from of soils data from field-verified borehole locations, and light detection and ranging mapping. This work was undertaken by the soils and terrain and peatlands teams, further detailed in *the Peatlands Existing Conditions & Effects Assessment Report* (AECOM / WSP, 2024).

2.3.4 Desktop Mapping

Mapping accuracy was assessed post hoc using a confusion matrix approach. Confusion matrix analysis is a simple method for quantifying the accuracy of data obtained from aerial photo interpretation or remote sensing by comparing them against reference data (Knudby, 2021).

For this analysis, each field survey location was paired with a mapped polygon that encompassed that location. Each pairing was then checked to determine if the vegetation community in each data set was the same (i.e., in agreement). The total number of agreements as a percentage of occurrences of that vegetation community in the mapping data is the indicator of mapping accuracy for that community. A measure of the overall accuracy of mapping can be estimated from these data by summing the agreement frequencies for each community and calculating what percentage that sum is of the total number of polygons.

A detailed description of this process is provided in **Annex A**.

3. Results

3.1 Desktop Vegetation Community Mapping

The desktop vegetation community mapping prepared by KBM Resources Group, in association with the WSP Canada Inc. soils and terrain specialists produced a digital map for Project use. The full Local Study Area was delineated to ecosite level, with a total of 15,027 polygons delineated and classified to ecosite (including water and anthropogenic polygons).

3.2 Field Investigation Results

3.2.1 Field Investigation Distribution and Coverage

Vegetation field investigations were carried out in the Local Study Area and Project Development Area in four separate field programs from 2021 through 2023, as outlined in **Table 3-1** through **Table 3-3**. These tables provide the level of effort for ecosite verification at ground inspection sites, visual checks completed during aerial (helicopter) surveys and visual checks completed through photo interpretation from site photos taken during wildlife surveys. A total of 481 survey sites were assessed, as further detailed in **Table 3-1** through **Table 3-3**. The distribution of Vegetation Field Sites is also presented visually on **Figure 3-1.**

- A total of 90 ground inspection sites were completed;
- A total of 316 visual checks (aerial surveys) were completed; and
- A total of 75 visual checks (photo interpretation) were completed.

Table 3-1: Vegetation Field Investigations – Ground Inspections

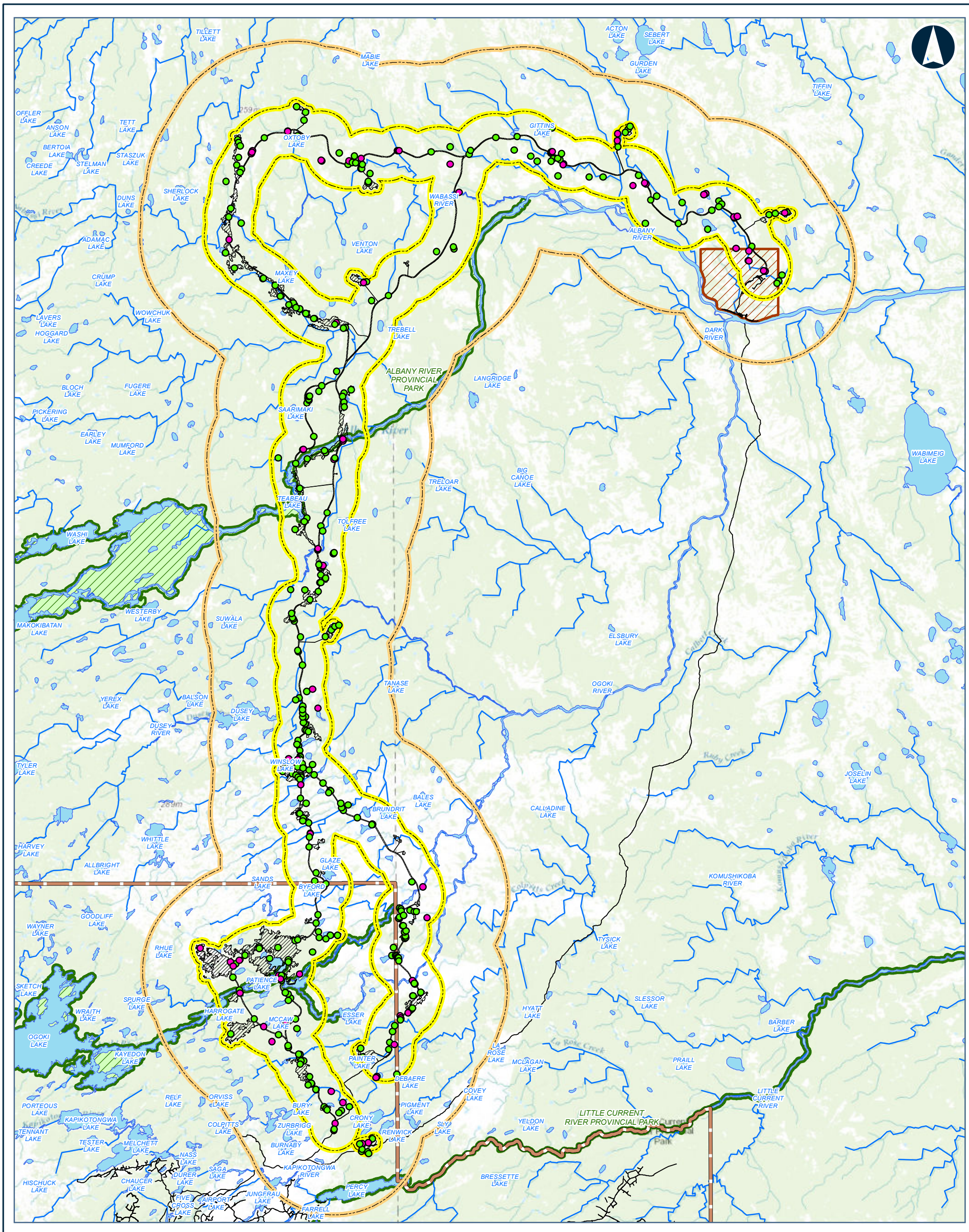
Year	Field Dates	Upland	Wetland	Riparian	Total
2021	September 19 and 21 to 29 (10 days)	10	6	8	**24**
2022	July 13 to 18 and 22 (7 days)	14	5	11	**30**
2023	June 15, 17, and 18 (3 days)	1	10	0	**11**
2023	August 3 to 5 (3 days)	0	18	7	**25**
	Total	**25**	**39**	**26**	**90**

Table 3-2: Vegetation Field Investigations – Visual Checks (Aerial)

Year	Field Dates	Upland	Wetland	Riparian	Total
2021	September 19 and 21 to 29 (10 days)	34	32	32	**98**
2022	July 13 to 18 and 22 (seven days)	43	33	22	**98**
2023	June 15, 17, and 18 (3 days)	28	52	9	**89**
2023	August 3 to 5 (3 days)	3	27	1	**31**
	Total	**108**	**144**	**64**	**316**

Table 3-3: Vegetation Field Investigations – Visual Checks (Photo Interpretation)

Year	Photograph Dates	Upland	Wetland	Riparian	Total
2022	June 1-10 and August 10-13	34	41	0	**75**



Legend

VEGETATION SURVEY SITES

- GROUND ASSESSED
- VISUAL ASSESSED
- CONSTRUCTION DEVELOPMENT AREA
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ROAD
- WATERBODY
- WATERCOURSE
- FAR NORTH BOUNDARY
- FIRST NATION COMMUNITY
- PROVINCIAL PARK

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Aerial photography provided by:
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Vegetation Field Sites 2021-2023

0 5 10 20
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-1

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Date Saved: 2/10/2026 9:23:53 PM User Name: gld_rduval

3.3 Vegetation Communities

3.3.1 Upland / Wetland Ecosystems Overview

The Local Study Area is dominated by wetland ecosystems, with 73.4% (145,206.9 ha) mapped as wetland communities. Upland ecosystems represent 22.8% (45,279.1 ha) of the Local Study Area, with water representing a further 3.8% (7,506.6 ha), and anthropogenic (human-altered) lands representing <0.1% (53.0 ha). **Table 3-4** presents the availability of uplands and wetlands within the Local Study Area. **Figure 3-2** displays the distribution of wetland and upland ecosystems within the Local Study Area. A list of plant, fungi, lichen, and moss species recorded during the field investigations is provided in **Annex B**.

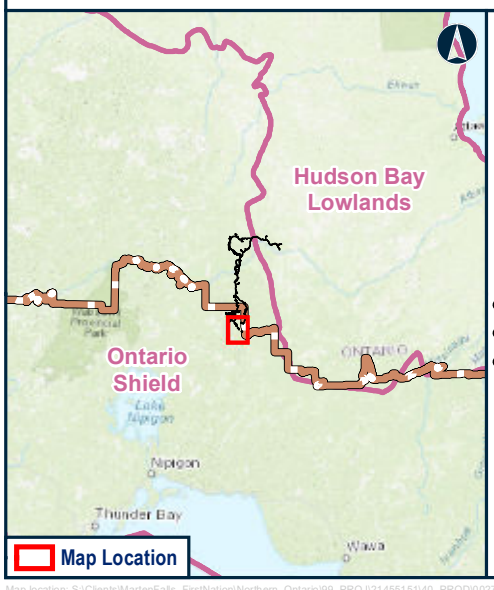
As can be seen by the predominance of blue shading on **Figure 3-2,** the highest concentration of wetlands is in the northern portion of the Local Study Area, north of Dusey Lake. Likewise, **Figure 3-2** has more green shading south of Dusey Lake, illustrating greater prominence of upland ecosystems.

Table 3-4: Availability of Ecosystems within the Local Study Area

Ecosystem	Area (ha)	% Local Study Area
Upland	45,279.1	22.8
Wetland	145,206.9	73.4
Water	7,506.6	3.8
Anthropogenic	53.0	<0.1
Total	**197,960.4**	**100.00**

ha = hectare; % = percentage; < = less than.

HARROGATE LAKE
MCCAW LAKE
OGOKI RIVER
ESSER LAKE
PAINTER LAKE
DEBAERE LAKE
ORVISS LAKE
COLPITTS LAKE
BURY LAKE
ZURBRIGG LAKE
BURNABY LAKE
Ontario Shield
CRONY LAKE
PIGMENT LAKE
RENWICK LAKE
SAGA LAKE
KAPIKOTONGWA RIVER
JUNGFRAU LAKE
PERCY LAKE
LITTLE CURRENT RIVER
LITTLE JUNGFRAU LAKE
FARRELL LAKE
MURIEL RIVER
RUNWAY LAKE



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

50 PERSONS

200 PERSONS

APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

ALTERNATIVE 1

ALTERNATIVE 4

ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

BEDROCK

SAND AND GRAVEL

APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE

FAR NORTH BOUNDARY

WATERCOURSE

WATERBODY

PROVINCIAL PARK

ECOZONE

UPLAND ECOSYSTEMS

WETLAND ECOSYSTEMS

WATER

RIPARIAN ECOSYSTEMS

REGIONAL STUDY AREA (11 KM)

LOCAL STUDY AREA (3 KM)

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Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 2.25 4.5
Kilometres
Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-2.1

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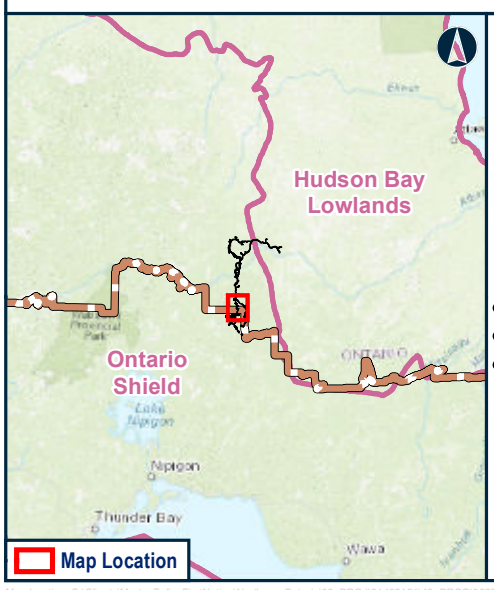
Date Saved: 2/10/2026 9:28:05 PM User Name: gld_rduval

DUSEY LAKE
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
Ontario Shield
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
PATIENCE LAKE
OGOKI RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 — 2.25 — 4.5
Kilometres

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Figure 3-2.2

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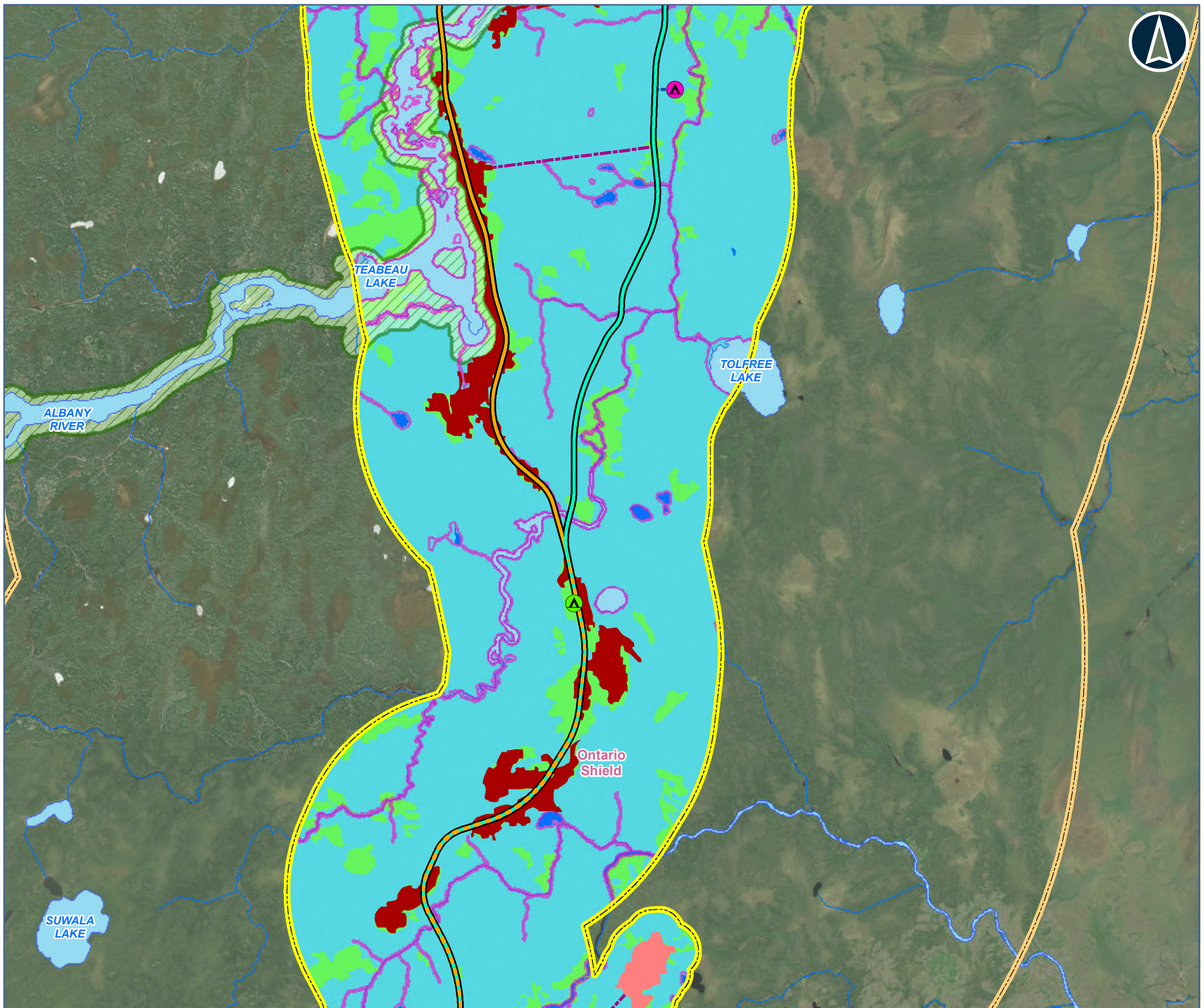

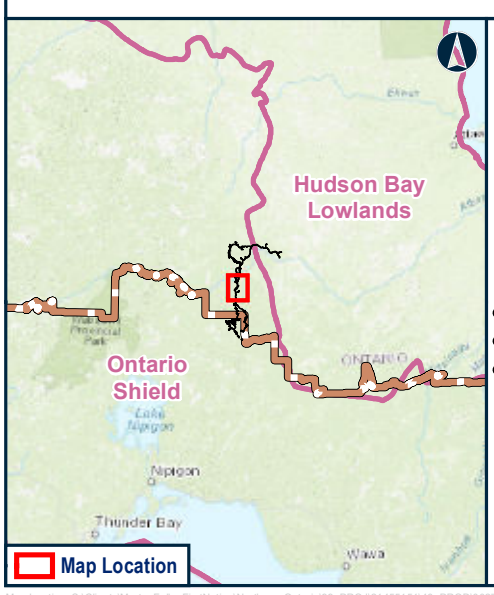

Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-2.3

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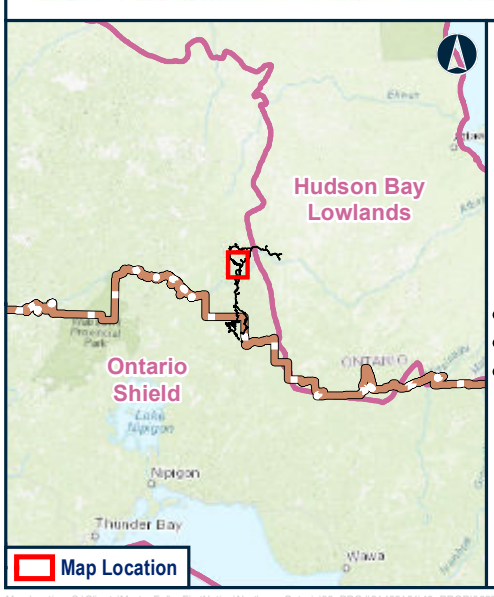
WABASSI RIVER
VENTON LAKE
MAXEY LAKE
Ontario Shield
TREBELL LAKE
SAARIMAKI LAKE
ALBANY RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 — 2.25 — 4.5
Kilometres

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Figure 3-2.4

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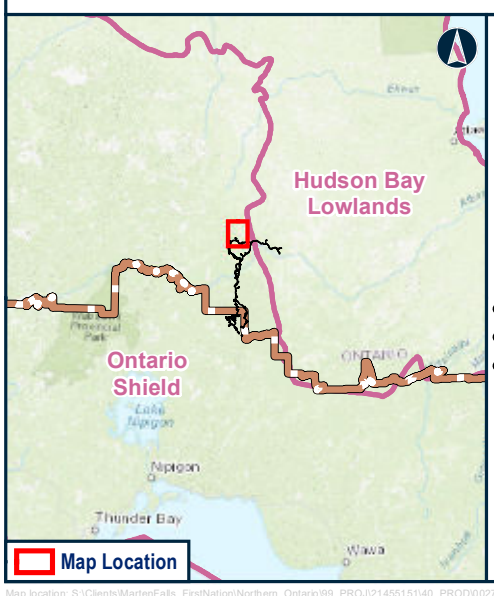
GARVEY LAKE

SLADE LAKE

Ontario Shield

MABIE LAKE

OXTOBY LAKE



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 — 2.25 — 4.5
Kilometres

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Figure 3-2.5

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Date Saved: 2/10/2026 9:28:05 PM User Name: gld_rduval

GURDEN LAKE

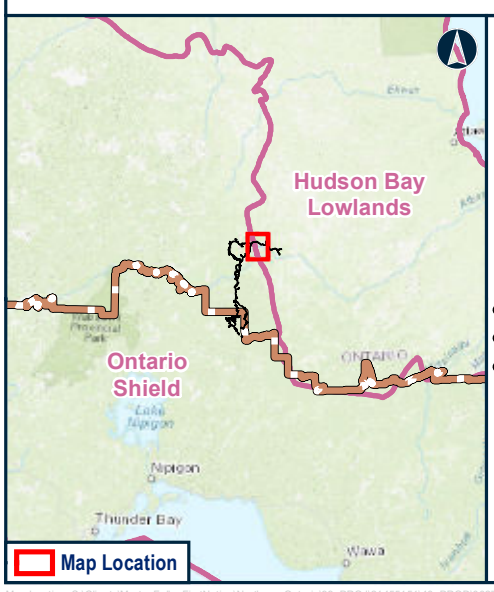
GITTINS LAKE

Hudson Bay Lowlands

WABASSI RIVER

Ontario Shield

ALBANY RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-2.6

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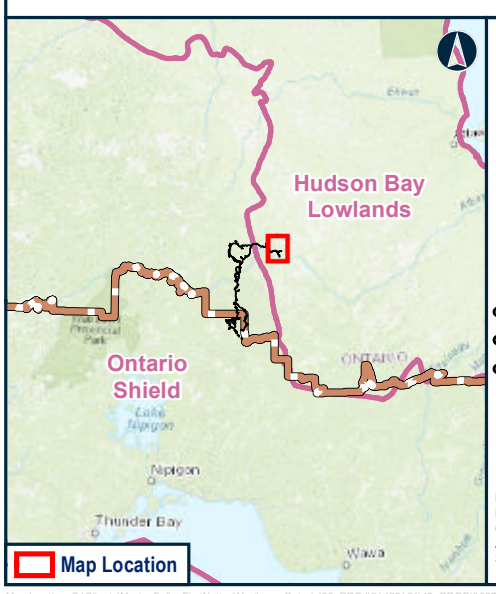
Date Saved: 2/10/2026 9:28:05 PM User Name: gld_rduval

SEBERT LAKE
GURDEN LAKE
TIFFIN LAKE
Hudson Bay Lowlands
ALBANY RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP

ROUTE ALTERNATIVES

(100 m Right-of-Way)

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE

POTENTIAL AGGREGATE SOURCE

- BEDROCK
- SAND AND GRAVEL
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- FIRST NATION COMMUNITY
- ECOZONE
- UPLAND ECOSYSTEMS
- WETLAND ECOSYSTEMS
- WATER
- RIPARIAN ECOSYSTEMS
- REGIONAL STUDY AREA (11 KM)
- LOCAL STUDY AREA (3 KM)

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Wetland and Upland Ecosite Distribution

0 2.25 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Rev:0	

Figure 3-2.7

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Map location: S:\Clients\MartenFalls_FirstNation\Northern_Ontario\99_PROJ\21455151\40_PROD\0027_Vegetation_TSD_Reporting\21455151-0027-RT-0003-2.mxd
Date Saved: 2/10/2026 9:28:05 PM User Name: gld_rduval

3.3.2 Upland Ecosystems

Through the desktop ecosite mapping and field verification, a total of 31[3] upland ecosite types were identified within the Local Study Area. These ecosites are presented in Table 3-5. Given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analyses purposes, ecosites have been rolled up into five upland vegetation community groupings, including coniferous forest, deciduous forest, mixed forest, rock / barren, and early successional / sparse treed ecosites. The distribution of these upland vegetation communities is illustrated on Figure 3-3**.** As detailed in Table 3-5, the greatest proportion of the upland ecosites within the Local Study Area are composed of coniferous forest ecosites, and specifically, coniferous forests dominated by Black Spruce (Oji-Cree translation *shikobaatik*) (*Picea mariana*) and Jack Pine (Oji-Cree translation *okikatik*) (*Pinus banksiana*). The following is a summary of the upland ecosystems:

- Coniferous forests make up 39,212.8 ha or 19.8% of the Local Study Area, which represents 86.8% of the upland ecosystems;
  - The majority of the coniferous forests are mapped as Dry-Fresh, Coarse: Jack Pine – Black Spruce Dominated (B049Tl / B049Tt), representing 10.8% of the Local Study Area.
  - The second most common coniferous forest ecosite is Dry-Fresh, Coarse: Pine – Black Spruce Conifer (B050Tl / B050Tt), representing 6.1% of the Local Study Area.
  - The third most common coniferous forest ecosite is Moist, Coarse: Black Spruce – Pine Conifer (B065Tl / B065Tt), representing 2.1% of the Local Study Area.
  - The remaining coniferous forest ecosites compose <1% of the Local Study Area and include ten ecosite types, each representing ≤ 0.3% of the Local Study Area. Most of these ecosite types have a similar tree composition to the dominant three coniferous forest ecosites but differ in terms of their substrate materials.
  - One coniferous forest could not be confidently identified to ecosite level and was classified as unknown (UNK).
- Deciduous forests compose 5,408.4 ha or 2.7% of the Local Study Area which represents 12.0% of the upland ecosystems;
  - Dry to Fresh, Coarse: Aspen – Birch Hardwood (B055Tl / B055Tt) is the most abundant deciduous forest ecosite mapped, representing 5,048.6 ha or 2.5% of the Local Study Area.

[3]Ecosite count does not include ecosite modifiers. For example, B055Tt is not counted separately from B055Tl.

- Aspen – Birch Hardwood Forests on different substrates (e.g., Dry, Sandy; Moist, Coarse; and Fresh, Clayey) make up most of the remaining deciduous forest ecosites.
- Mixed forests compose 0.2% of the Local Study Area which represents 0.7% of the upland ecosystems; and
- Rock / barren, ecosites and early successional / sparse treed communities each represent ≤ 0.1% of the Local Study Area.

The less common upland vegetation community groupings (i.e., deciduous forest, mixed forest, rock / barren and early successional / sparse treed) are found primarily in the southern portion of the Local Study Area (i.e., from the Albany River, southwards).

3.3.2.1 Coniferous Forest Ecosites

3.3.2.1.1 Dry-Fresh, Coarse: Jack Pine – Black Spruce Dominated (B049Tl / B049Tt)

As the most abundant upland ecosite, this coniferous forest ecosite composes 10.8% of the Local Study Area, including both tall treed and low treed ecosites.

B049 is an upland coniferous forest ecosite dominated by Jack Pine and / or Black Spruce with White Birch (Oji-Cree translation *wigwaasatik*) (*Betula papyrifera*) making up less than 20% of the canopy cover. The ecosite may be nearly pure Jack Pine or Black Spruce stands. Understory species include Black Spruce, Balsam Fir (Oji-Cree translation *ini'naandag*) (*Abies balsamea*), and White Birch. This ecosite is generally shrub and herb poor, with a ground surface of mostly moss and conifer litter, woody debris, broadleaf litter, and lichen. Understory vegetation includes Velvet-leaf Blueberry (Oji-Cree translation *minan*), Low Sweet Blueberry, Creeping Snowberry (Oji-Cree translation *wabiminaan*), Bunchberry (Oji-Cree name *shashakominaan*), Wild Lily-of-the-valley, Feathermoss (Oji-Cree translation *wasekamik*), and Foliose Lichen. Substrates are sandy to coarse loamy with a moisture regime of 2-3 (i.e., fresh) (Banton et al., 2009).

A representative aerial image and site photo of this ecosite is presented in **Annex C – Representative Photographs**, (**Photos 1** and **2**).

3.3.2.1.2 Dry-Fresh, Coarse: Pine – Black Spruce Conifer (B050Tl / B050Tt)

As the second most abundant upland ecosite, this ecosite composes 6.1% of the Local Study Area, including both tall treed and low treed ecosites.

B050 is an upland coniferous forest ecosite dominated by Black Spruce and / or Jack Pine (>50% cover of conifer species), with Trembling Aspen (Oji-Cree translation *apijih pakoosh*) (*Populus tremuloides*), White Birch, Balsam Fir, and White Spruce (Oji-Cree translation *mihnaihk*) (*Picea glauca*) as associates. Understory species include Black Spruce, Balsam Fir, White Birch, and Trembling Aspen. This ecosite is generally shrub and herb poor, with a ground surface of moss and conifer litter, woody debris, and broadleaf litter. Understory vegetation includes Velvet-leaf Blueberry, Twinflower, Bush Honeysuckle,

Bunchberry, Wild Lily-of-the-valley, Wild Sarsaparilla, and Feathermoss. Substrates are sandy to coarse loamy with a moisture regime of 2-3 (i.e., fresh) (Banton et al., 2009).

A representative aerial photo and ground photo of this ecosite is presented in **Annex C** (**Photos 3** and **4**).

3.3.2.1.3 Moist, Coarse: Black Spruce – Pine Conifer (B065Tl / B065Tt)

As the third most abundant upland ecosite, this ecosite composes 2.1% of the Local Study Area, including both tall treed and low treed ecosites.

B065 is an upland coniferous forest ecosite dominated by Black Spruce and / or Jack Pine (>50% cover of conifer species). Understory species include Black Spruce and Balsam Fir. This ecosite is moderately shrub and herb poor, with a ground surface of moss and conifer litter, woody debris, and broadleaf litter. Understory vegetation includes Creeping Snowberry, Labrador-tea (Oji-Cree translation *kakikebak*), Velvet-leaf Blueberry, Bunchberry, Wild Lily-of-the-valley, Goldthread, Feathermoss, and *Sphagnum* spp. (Oji-Cree translation *maashkigwakamik*). Substrates are sandy to coarse loamy with a moisture regime of 4-5 (i.e., moist) (Banton et al., 2009).

This coniferous forest ecosite is similar to the most common two conifer forest ecosite types but differs in its moisture regime, which influences the vegetation composition.

A representative aerial photo and ground photo of this ecosite is presented in **Annex C** (**Photos 5** and **6**).

3.3.2.1.4 Other Coniferous Forest Ecosites

The remaining <1% of the coniferous forest ecosites are composed of ten ecosite types, each representing ≤ 0.3% of the Local Study Area. Most of these ecosite types have a similar tree composition to the dominant three coniferous forest ecosites (i.e., typically Black Spruce dominated with varying proportions of associate species including pine, hemlock, spruce, cedar, or fir), but differ in terms of their substrate materials. Rather than the dominant dry to fresh, coarse mineral substrates, the remaining ten coniferous forest ecosites are characterized by either very shallow, dry to fresh substrates; moist, coarse substrates; fresh clayey substrates; or moist, fine substrates. Many of these substrate characteristics were assigned to ecosites during the field-verification process, suggesting that the desktop ecosite-typing may have over-represented the dry to fresh, coarse substrates ecosites.

3.3.2.2 Deciduous Forest Ecosites

3.3.2.2.1 Dry to Fresh, Coarse: Aspen – Birch Hardwood (B055Tl / B055Tt)

As the most abundant deciduous forest ecosite, this ecosite composes 2.5% of the Local Study Area, including both tall treed and low treed ecosites.

B055 is an upland deciduous forest ecosite dominated by Trembling Aspen and / or White Birch (>50% cover of deciduous species) and often mixed with Balsam Fir, Black Spruce,

and White Spruce. Understory tree species include Balsam Fir, Trembling Aspen, White Birch, and Black Spruce. This ecosite is shrub rich and herb poor, with increasing richness on loamy substrates. It has a ground surface broadleaf litter with moss, woody debris, and conifer litter. Understory vegetation includes Bush Honeysuckle, Mountain Maple, Dwarf Raspberry (Oji-Cree translation *Miskomaang* / *oshkiizhikomin-naan*), Wild Lily-of-the-valley, Wild Sarsaparilla, Bluebead-lily (Oji-Cree translation *wabigwan*), Ground-pine, and Feathermoss. Substrates are sandy to coarse loamy with a moisture regime of 2-3 (i.e., fresh) (Banton et al. 2009).

A representative aerial photo and ground photo of this ecosite is presented in **Annex C** (**Photos 7** and **8**).

3.3.2.2.2 Other Deciduous Forest Ecosites

Aspen – Birch Hardwood Forests on different substrates (e.g., dry, sandy; moist, coarse; and fresh, clayey) compose most of the remaining deciduous forest ecosites. Similar to the coniferous forest ecosites, many of these ecosites on different substrates were assigned during the field-verification process, suggesting that that the desktop ecosite-typing may have over-represented the dry to fresh, coarse substrates ecosites.

The least common deciduous forest ecosites are Dry, Sandy: Maple Hardwood (B042Tl) and Dry to Fresh, Coarse: Oak Hardwood (B057Tt), with only one polygon classified as each ecosite type. Neither are based on field verification and may be errors in interpretation, requiring further review.

3.3.2.3 Mixed Forest Ecosites

Mixed forests make up 0.2% of the Local Study Area which represents 0.7% of the upland ecosystems. Only two ecosite types have been mapped: Dry to Fresh, Coarse Mixedwood (B059Tl / B059Tt) and Moist, Coarse: Mixedwood (B076Tt).

These ecosites are characterized by a mix of maple, ash, aspen, birch, elm, and / or oak species, with no dominant hardwood species evident. Coniferous species include Black Spruce, Balsam Fir, White Spruce, and Jack Pine. Ecosites vary from shrub and herb poor to moderately rich. Common understory vegetation includes Mountain Maple, Beaked Hazel, Bush Honeysuckle, Large-leaved Aster, Wild Sarsaparilla, Naked Mitrewort, and Feathermoss. Substrates are sandy to coarse loamy with a moisture regime that ranges from 2-3 (i.e., fresh) for B059 and 4-5 (i.e., moist) for B076 (Banton et al., 2009).

3.3.2.4 Rock / Barren Ecosites

Rock / Barren ecosites include a range of uncommon or infrequent ecosites (together representing 0.1% of the Local Study Area), including Active Mineral Shoreline (B005X), Active Mineral Barren (B007X), Cliff (B158Tt), Open Cliff (B159Tt), Rock Barren (B164Tt / Tl), and Open Talus or Historic Beach / Raised Beach (B168). These ecosites often support limited vegetation, particularly the Active Mineral Shoreline and Active Mineral Barren ecosites which are influenced by active shoreline processes (e.g., waves, currents, periodic flooding, ice scour, and high winds), or large-scale vegetation removal processes

that limit the establishment of vegetation. Substrates, texture, and moisture regime are variable (Banton et al., 2009).

Cliff (B158) and Open Cliff (B159) ecosites vary in the presence of trees and shrubs. Cliff ecosites have sparse tree or shrub communities, restricted to crevices and ledges. Tree species include White Cedar (Oji-Cree translation *kiishikatik*), White Birch, and Black Spruce; shrubs may include Bearberry (Oji-Cree translation *makoominan*), Common Juniper (Oji-Cree translation *kakakiwadaang*), and Velvet-leafed Blueberry. Open Cliff ecosites are dominated by herbaceous, lichen or bryophyte species, with ≤ 10% woody vegetation. Herbaceous species may include Rusty Woodsia, Pale Corydalis, and Fragrant Shield Fern. Substrates are rock and the moisture regime is xeric, humid, or saturated (Banton et al., 2009).

Rock Barren ecosites (B164) are sparsely vegetated tree or shrub-dominated communities on horizontal or slightly sloping bedrock exposures. Vascular plants are restricted to crevices, cracks and depressions where a thin layer of mineral or organic substrate may accumulate. The ground surface is mostly lichens and exposed bedrock. Tree species may include Jack Pine and White Birch, with Low Sweet Blueberry, Common Juniper, and Bearberry as common shrub species. Herbaceous plants may include Pale Corydalis, Poverty Oat Grass, and sedges (Oji-Cree translation *wabakamik*). Substrates are rock and the moisture regime is xeric, humid, or saturated (Banton et al., 2009).

Open Talus or Historic Beach / Raised Beach ecosites are sparsely vegetated communities in coarse fragments, typically at the base of cliffs or rock outcrops, or on historical / raised beaches that are not immediately adjacent to a waterbody. Woody cover is ≤ 10%, and when present include White Birch, Mountain Maple, and Red Raspberry (Oji-Cree translation *miskomaang* / *oshkiizhikomin-naan*). Herbaceous plants may include Rock Polypody, Fringed Black Knotweed, and Herb-Robert. Substrates are rock and the moisture regime is xeric, humid, or saturated (Banton et al., 2009).

3.3.2.5 Early Successional / Sparse Treed Ecosites

Two ecosites were mapped within the Local Study Area that are grouped under this upland vegetation community category, specifically: Moist, Coarse: Sparse Shrub (B063S) and Fresh, Clayey: Sparse Shrub (B079Tt). Combined, these ecosites represent <0.1% of the Local Study Area.

Sparse Shrub ecosites can be tall and/or short shrub communities with 10% to 25% shrub coverage, few trees, and moderately herb-rich. Shrubs may include willows (Oji-Cree translation *wiisihkobihmagoon*), Speckled Alder (Oji-Cree translation *wadopatik*), Pin Cherry (Oji-Cree translation *wiigwasesiminatik*), Chokecherry (Oji-Cree translation *sasadaweminatik*), wild roses (Oji-Cree translation *okinii wabigwanin*), and Red-osier Dogwood (Oji-Cree translation *wabiminaatik*). Herbaceous plants include sedges, horsetails, fleabanes, bedstraws, asters, goldenrods, and rushes. These ecosites often succeed to treed systems.

Table 3-5: Upland Ecosystems in the Local and Regional Study Areas

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Upland Community	Area (ha)	% Uplands	% Local Study Area	% Regional Study Area
B012	Very shallow, dry to fresh: Pine – Black Spruce Conifer	115.5	0.1	0	Coniferous forest	39,212.8	86.8	19.8	14.3
B012Tl	Very shallow, dry to fresh: Pine – Black Spruce Conifer	124.9	0.1	2					
B012Tt	Very shallow, dry to fresh: Pine – Black Spruce Conifer	233.0	0.1	4					
B049	Dry to fresh, coarse: Jack Pine – Black Spruce dominated	22.2	<0.1	0					
B049Tl	Dry to fresh, Coarse: Jack Pine – Black Spruce dominated	4,389.2	2.2	0					
B049Tt	Dry to fresh, coarse: Jack Pine – Black Spruce dominated	16,892.3	8.5	12					
B050Tl	Dry to fresh, coarse: Pine – Black Spruce Conifer	1,581.2	0.8	0					
B050Tt	Dry to fresh, coarse: Pine – Black Spruce Conifer	10,480.8	5.3	17					
B052Tt	Dry to fresh, coarse: Spruce – Fir Conifer	244.0	0.1	8					
B053Tl	Dry to fresh, coarse: Conifer	20.4	<0.1	0					
B053Tt	Dry to fresh, coarse: Conifer	256.5	0.1	2					
B065	Moist, coarse: Black Spruce – Pine Conifer	57.6	<0.1	0					
B065Tl	Moist, coarse: Black Spruce – Pine Conifer	1,410.5	0.7	1					
B065Tt	Moist, coarse: Black Spruce – Pine Conifer	2,690.7	1.4	15					
B066Tt	Moist, coarse: Hemlock – Cedar Conifer	11.9	<0.1	1					
B067Tt	Moist, coarse: Spruce - Fir Conifer	145.9	0.1	8					
B068Tl	Moist, coarse: Conifer	23.4	<0.1	0					
B068Tt	Moist, coarse: Conifer	229.9	0.1	4					
B083Tt	Fresh, clayey: Pine - Black Spruce Conifer	17.3	<0.1	1					

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Upland Community	Area (ha)	% Uplands	% Local Study Area	% Regional Study Area
B085Tt	Fresh, clayey: Spruce - Fir Conifer	158.8	0.1	2					
B086Tl	Fresh, clayey: Conifer	24.5	<0.1	1					
B086Tt	Fresh, clayey: Conifer	18.4	<0.1	0					
B101Tt	Fresh, silty to fine loamy: Fir Conifer	41.9	0.0	2					
UNK	Unknown	4.8	<0.1	3					
B040Tt	Dry, sandy: Aspen - Birch Hardwood	228.1	0.1	3	Deciduous forest	5,408.4	12.0	2.7	2.0
B042Tl	Dry, sandy: Maple Hardwood	2.4	<0.1	0					
B055	Dry to fresh, coarse: Aspen - Birch Hardwood	30.4	<0.1	1					
B055Tl	Dry to fresh, coarse: Aspen - Birch Hardwood	222.6	0.1	2					
B055Tt	Dry to fresh, coarse: Aspen - Birch Hardwood	4,795.7	2.4	22					
B057Tt	Dry to fresh, coarse: Oak Hardwood	8.5	<0.1	0					
B070	Moist, coarse: Aspen - Birch Hardwood	18.1	<0.1	0					
B070Tl	Moist, coarse: Aspen - Birch Hardwood	6.4	<0.1	0					
B070Tt	Moist, coarse: Aspen - Birch Hardwood	57.2	<0.1	0					
B088Tt	Fresh, clayey: Aspen - Birch Hardwood	36.7	<0.1	2					
B119	Moist, fine: Elm – Aspen – Birch Hardwood	2.4	<0.1	0					
B059Tl	Dry to fresh, coarse: Mixedwood	2.3	<0.1	0	Mixed forest	312.6	0.7	0.2	2.6
B059Tt	Dry to fresh, coarse: Mixedwood	82.4	<0.1	1					
B076Tt	Moist, coarse: Mixedwood	228.0	0.1	1					
B005X	Active mineral shoreline	50.7	<0.1	1	Rock / Barren	182.6	0.4	0.1	<0.1%
B007X	Active mineral barren	0.2	<0.1	0					
B158Tt	Cliff	6.8	<0.1	0					
B159N	Open cliff	45.9	<0.1	0					
B164Tl	Rock barren	5.3	<0.1	0					
B164Tt	Rock barren	36.7	<0.1	1					
B168	Open talus or historical / raised beach	36.9	<0.1	0					
B063	Moist, coarse: Sparse Shrub	48.8	<0.1	0		77.1	0.2	<0.1	0.2
B063S	Moist, coarse: Sparse Shrub	23.4	<0.1	1					

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Upland Community	Area (ha)	% Uplands	% Local Study Area	% Regional Study Area
B079S	Fresh, clayey: Sparse Shrub	4.9	<0.1	0	Early successional / Sparse treed				
Upland Community Summary		**45,193.5**	**22.8%**	**118**		**45,193.5**	**100**	**22.8**	**16.9**

ha = hectare; % = percentage; < = less than.

3.3.2.6 Field Verification of Upland Ecosites

Upland ecosystems mapped within the Local Study Area and summarized in the preceding sections is based on a combination of desktop pre-typed polygons and field-verified polygons. Upland ecosite classifications that were changed based on visual and ground investigations were updated in the digital mapping. Although the field-verified ecosites represent a very small proportion of the polygons in the Local Study Area, these corrections helped to ensure that revised mapping and analysis would be based on the best available information.

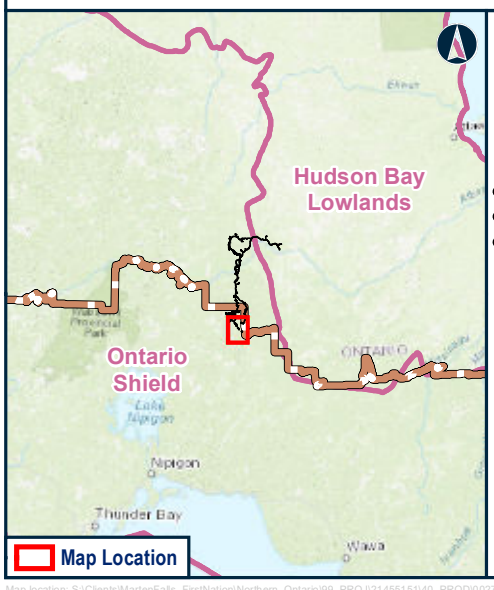
Annex D, Field Verified Ecosites, Table D-1 contains a list of the ecosites that were field-verified, including the desktop pre-typed ecosite and the field verified ecosite. Based on an assessment of the field verification process (**Annex A**), the following was determined:

- 74% of the desktop communities mapped as upland were field verified as upland;
- 29% of desktop pre-typed upland ecosites were correct based on field verification (i.e., exact ecosite match); and
- For incorrect upland ecosite matches that were still field verified as upland communities:
  - 40% had the correct cover type (i.e., conifer or hardwood).

As noted previously, given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analysis purposes, ecosites were rolled up into five upland vegetation community groupings, including coniferous forest, deciduous forest, mixed forest, rock / barren, and early successional / sparse treed ecosites. The results of the field-verification process summarized above, further support the decision to roll up the ecosites to broader vegetation community groupings.

Ecosites were further refined in 2024 through a combination of field and desktop investigations further detailed in the Peatlands Existing Conditions & Effects Assessment Report (AECOM/WSP, 2024), which resulted in an additional 267 changes in ecosite type for upland ecosystems.

HARROGATE LAKE
MCCAW LAKE
OGOKI RIVER
ESSER LAKE
PAINTER LAKE
DEBAERE LAKE
ORVISS LAKE
COLPITTS LAKE
BURY LAKE
PIGMENT LAKE
CRONY LAKE
RENWICK LAKE
Ontario Shield
ZURBRIGG LAKE
BURNABY LAKE
KAPIKOTONGWA RIVER
SAGA LAKE
PERCY LAKE
LITTLE CURRENT RIVER
JUNGFRAU LAKE
LITTLE JUNGFRAU LAKE
FARRELL LAKE
MURIEL RIVER
RUNWAY LAKE



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)
- 50 PERSONS
- 200 PERSONS

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- ROAD
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE
- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- ROCK / BARREN
- BOG
- FEN
- SWAMP
- MARSH
- WATER
- ANTHROPOGENIC

Notes:
None

Data Source:
Base Data: Provided by MNRF 2019; Route Infrastructure - Provided by AECOM 2019. Contains Information licensed under the Open Government Licence Ontario.
Aerial photography provided by:
Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:100,000 * when printed 11"x17"
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Figure 3-3.1

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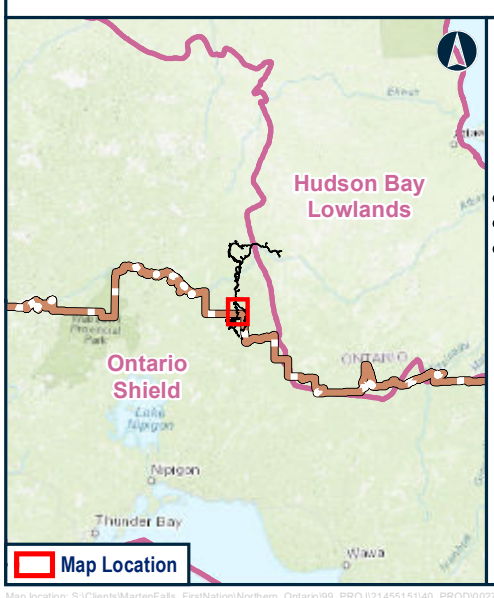
Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

DUSEY LAKE
WINSLOW LAKE
BALES LAKE
BRUNDRIT LAKE
Ontario Shield
GLAZE LAKE
SANDS LAKE
BYFORD LAKE
PATIENCE LAKE
OGOKI RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)
- 50 PERSONS
- 200 PERSONS

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL

- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE
- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- EARLY SUCCESSIONAL / SPARSE TREED
- ROCK / BARREN
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
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Aerial photography provided by:
Service Layer Credits: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community

MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:100,000 * when printed 11"x17"
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Figure 3-3.2

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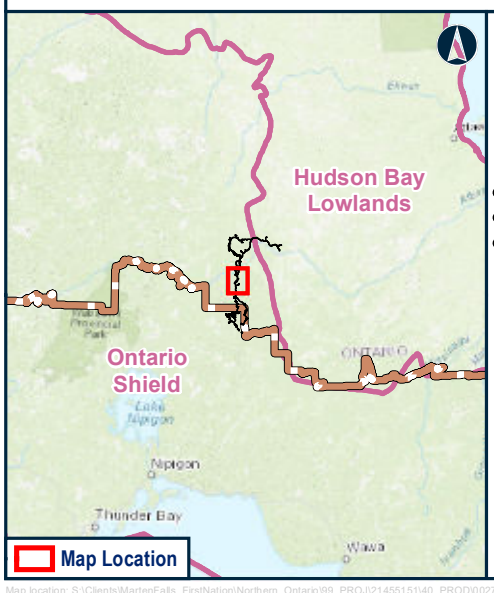
Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

TEABEAU LAKE
ALBANY RIVER
TOLFREE LAKE
Ontario Shield
SUWALA LAKE
DUSEY RIVER
DUSEY LAKE
TANASE LAKE



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)
- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE
- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 2.25 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:100,000 * when printed 11"x17"
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Figure 3-3.3

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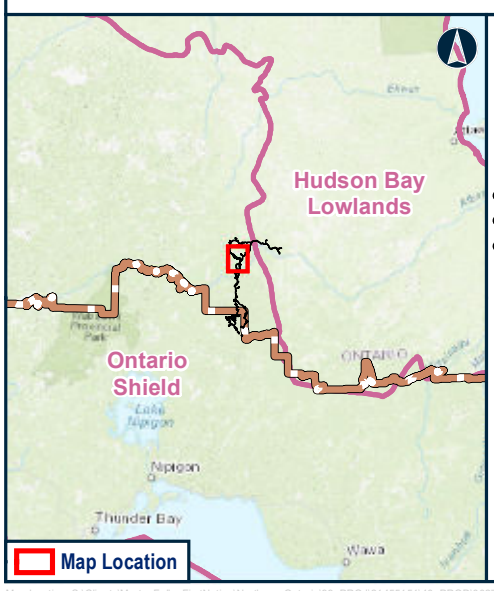
Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

WABASSI RIVER
VENTON LAKE
MAXEY LAKE
Ontario Shield
TREBELL LAKE
SAARIMAKI LAKE
ALBANY RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)
- 50 PERSONS
- 200 PERSONS

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE
- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- EARLY SUCCESSIONAL / SPARSE TREED
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:100,000 * when printed 11"x17"
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Figure 3-3.4

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Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

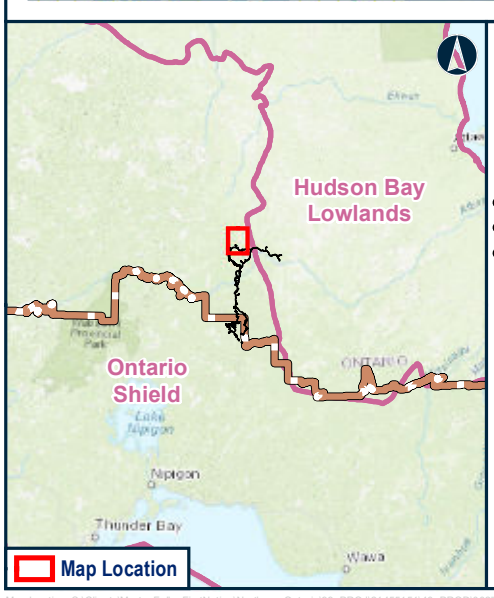
GARVEY LAKE

SLADE LAKE

Ontario Shield

MABIE LAKE

OXTOBY LAKE



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 2.25 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

Feb, 2026	1:100,000 * when printed 11"x17"
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Figure 3-3.5

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Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

GURDEN LAKE

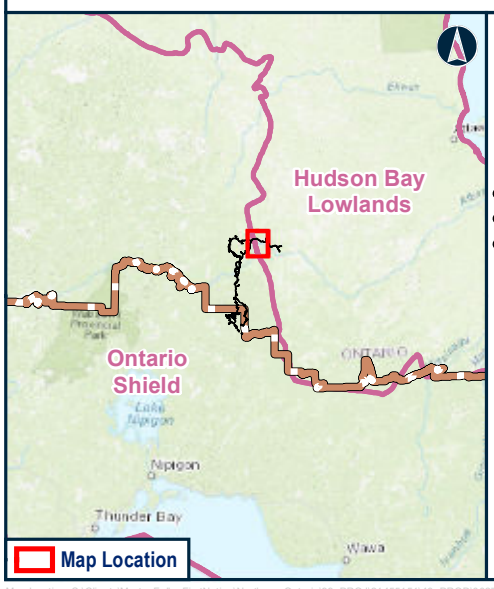
GITTINS LAKE

Hudson Bay Lowlands

WABASSI RIVER

ALBANY RIVER

Ontario Shield



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)

- 50 PERSONS
- 200 PERSONS
- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- WATERCOURSE
- WATERBODY
- PROVINCIAL PARK
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE

- CONIFEROUS FOREST
- DECIDUOUS FOREST
- MIXED FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 — 2.25 — 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-3.6

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Date Saved: 2/10/2026 9:22:19 PM User Name: gld_rduval

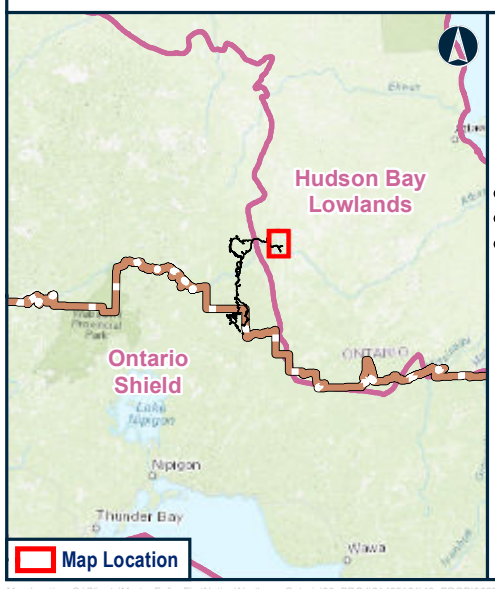
SEBERT LAKE

GURDEN LAKE

TIFFIN LAKE

Hudson Bay Lowlands

ALBANY RIVER



Legend

CONSTRUCTION DEVELOPMENT AREA

POTENTIAL CAMP SITE (SIZE)
- 50 PERSONS
- 200 PERSONS

- ALTERNATIVE 1
- ALTERNATIVE 4
- ALTERNATIVE 1 AND ALTERNATIVE 4
- APPROXIMATE ACCESS ROAD TO POTENTIAL CONSTRUCTIONS CAMP
- APPROXIMATE ACCESS ROAD TO POTENTIAL AGGREGATE SITE
- BEDROCK
- SAND AND GRAVEL
- FAR NORTH BOUNDARY
- ROAD
- WATERCOURSE
- WATERBODY
- FIRST NATION COMMUNITY
- LOCAL STUDY AREA (3 KM)
- REGIONAL STUDY AREA (11 KM)
- ECOZONE

VEGETATION COMMUNITY TYPE
- CONIFEROUS FOREST
- DECIDUOUS FOREST
- BOG
- FEN
- SWAMP
- MARSH
- WATER

Notes:
None

Data Source:
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MARTEN FALLS FIRST NATION COMMUNITY ACCESS ROAD

Existing Conditions - Vegetation Community Types in the Local Study Area

0 2.25 4.5
Kilometres

Datum: NAD 1983 CSRS UTM Zone 16N

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Figure 3-3.7

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3.3.3 Wetland Ecosystems

Through the desktop ecosite mapping and field verification, a total of 23[4] wetland ecosite types were identified within the Local Study Area. These ecosites are presented in **Table 3-6**and **Figure 3-3**. Given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analyses purposes, ecosites have been rolled up into four wetland vegetation community groupings, including swamp, bog, fen, and marsh. As detailed in **Table 3-6**, the greatest proportion of the wetland ecosites within the Local Study Area are composed of fen and swamp communities, and specifically, treed fen and conifer swamp ecosites. The following is a summary of the wetland ecosystems:

- Fen ecosites compose 73,917.2 ha or 37.3% of the Local Study Area which represents 50.9% of the wetland ecosystems;
    - The majority of the fen ecosites are mapped as Sparse Treed Fen (B136 / B136Tl / B136Tt), representing 34.1% of the Local Study Area.
    - The second most common fen ecosites are Open Fens, including Poor Fen (B139 / B139N / B139S), Open Moderately Rich Fen (B140N / B140S), and Open Extremely Rich Fen (B141 / B141N / B141S) together representing 3.1% of the Local Study Area.
    - The third most common fen ecosites are Shore Fens, including Open Shore Fen (B146N / B146S) and Shrub Shore Fen (B147S), together representing 0.2% of the Local Study Area.
- Swamp ecosites compose 65,084.6 ha or 32.9% of the Local Study Area which represents 44.8% of the wetland ecosystems:
    - The majority of the swamp ecosites are mapped as Organic Conifer Swamps, including Organic Poor Conifer Swamp (B127 / B127Tl / B127Tt), Organic Intermediate Conifer Swamp (B128 / B128Tl / B128Tt), and Organic Rich Conifer Swamp (B129 / B129Tl / B129Tt), together representing 20.1% of the Local Study Area.
    - The second most common swamp ecosites are mapped as Mineral Conifer Swamps, Mineral Poor Conifer Swamp (B222 / B222Tl / B222Tt) and Mineral Intermediate Conifer Swamp (B223 / B223Tl / B223Tt), and Mineral Intermediate Conifer Swamp (B224), together representing 9.9% of the Local Study Area.
    - A total of 2.3% of swamps in the Local Study Area were classified as “unknown”, due to lack of confidence when comparing soils and terrain data with the original desktop-mapped ecosite.

[4]Ecosite count does not include ecosite modifiers. For example, B223Tt is not counted separately from B223Tl.

  - The least common swamp ecosites thicket swamps, including Mineral Thicket Swamp (B134 / B134S), and Organic Thicket Swamp (B135 / B135S), together representing only 0.2% of the Local Study Area.
- Marsh ecosites compose 2.0% of the Local Study Area which represents 2.7% of the wetland ecosystems:
  - Mineral Marsh ecosites mapped as Mineral Meadow Marsh (B142 / B142N), Mineral Shallow Marsh (B148N), and Mineral Open Water Marsh (B151N), together represent 0.8% of the Local Study Area.
  - Organic Marsh ecosites mapped as Organic Meadow Marsh (B144 / B144N) and Organic Shallow Marsh (B149N), together represent 1.2% of the Local Study Area.
- Bog ecosites compose only 1.2% of the Local Study Area which represents 1.6% of the wetland ecosystems.
  - Sparse treed bog (B137Tl / B137Tt) is the most common bog ecosite, representing 0.8% of the Local Study Area.
  - Treed bog (B126 / B126Tl / B126Tt) represents 0.2% of the Local Study Area.
  - Open bog (B138 / B138N) represents 0.1% of the Local Study Area.

A review of the general distribution of the less common wetland vegetation community groupings (i.e., marsh and bog communities) revealed that while marsh communities are found throughout the Local Study Area, they are more common south of the Albany River, specifically in riparian zones surrounding watercourses and waterbodies. Likewise, while bog communities are found scattered in small pockets throughout the Local Study Area, these communities are larger and more abundant in the northern portions of the Local Study Area.

3.3.3.1 Fen Ecosites

3.3.3.1.1 Sparse Treed Fen (B136 / B136Tl / B136Tt)

As the most abundant wetland ecosite, this ecosite represents 37.3% of the Local Study Area, including both tall treed and low treed ecosites.

B136 is a treed fen community with a canopy consisting mostly of Black Spruce (>50% cover of canopy species) and Tamarack (Oji-Cree translation *maaskigwatik* / *wakinagan*) (*Larix laricina*) (≥10% cover of conifer species). Understory trees include Black Spruce and Tamarack and the ecosite is typically shrub, herb, and moss moderately rich. The ground surface is mostly moss with standing water and conifer litter. Understory vegetation includes Labrador-tea, Creeping Snowberry, Speckled Alder, Three-leaved False Solomon's Seal (Oji-Cree translation *sanamaan ihbaag*), Bunchberry, Naked Mitrewort, graminoids, sphagnum, and Feathermoss. Fen indicator species that may be present include Swamp Birch, Alder-leaved Buckthorn, Marsh Marigold, Blue-joint Grass, violets,

Marsh Cinquefoil, and Three-leaved Buckbean. Substrates are organic with a moisture regime of 6 - 9 (i.e., very moist to wet) or “s” (i.e., saturated) (Banton et al., 2009).

Representative aerial photos and ground photos of this ecosite are presented in **Annex C** (**Photos 9, 10, 11** and **12)**.

3.3.3.1.2 Open Fens (B139 / B139N / B139S, B140N / B140S, B141 / B141N / B141S)

As the second most common group of fen ecosites, open fen ecosites together represent 3.1% of the Local Study Area.

B139, B140, and B141 are all open fen communities with a tree cover of ≤10%. When present, trees are stunted Black Spruce and Tamarack, with cedar trees also sometimes present in extremely rich fens. These ecosites include both shrub (S) and non-woody (N) communities. When shrubs are present, they are typically ericaceous species. The ground surface is typically dominated by sedge species, sphagnum, and deciduous litter, with poor fen ecosites more sphagnum dominated and extremely rich fens more sedge and brown moss-dominated. Herbaceous species are less common in poor fens and more common in moderately and extremely rich fens. Common shrub species found in these ecosites include Leatherleaf, Bog Rosemary, Paul Laurel, Small Cranberry (Oji-Cree translation *mashkikominan*), Dwarf Birch, and Shrubby Cinquefoil. Common herbaceous species found in these ecosites include Slender Sedge, Pitcher Plant (Oji-Cree translation *aniigihjaash*), Few-seeded Sedge, White Beakrush, Buckbean, Flatleaf Bladderwort, and Livid Sedge. Bryophyte species in poor fen ecosites include Midway Peat Moss, Common Green Peat Moss, and Poor Fen Peat Moss, with moderately and extremely rich fens dominated by peat mosses and Scorpion’s Tail. Substrates are organic with a moisture regime of 6 - 9 (i.e., very moist to wet) or ‘s’ (i.e., saturated) (Banton et al. 2009).

Poor fens ecosites (B139) are weakly minerotrophic peatlands that occasionally flood or have low groundwater movement and a rooting zone in contact with minerotrophic groundwater. Moderately rich open fen ecosites (B140) have moderate nutrient availability, with periodic flooding, groundwater movement, and rooting zone in contact with mineral-rich groundwater. Extremely rich open fen ecosites (B141) have high nutrient availability and are subject to periodic flooding and groundwater movement and a rooting zone in contact with mineral-rich groundwater. Extremely rich open fen ecosites are often patterned with alternating raised ridges (strings) and depressions (flarks) that form perpendicular to the flow of water. The ridges (strings) are typically dominated by sedges, shrubs, and stunted trees, while the depressions (flarks) typically represented by saturated to inundated open areas composed of brown mosses, sedges, and rushes.

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 13** through **20**).

3.3.3.1.3 Shore Fens (B146 / B146N / B146S, B147S)

Shore fens were mapped infrequently, representing less than 0.2% of the Local Study Area. As shore fen communities are typically narrow communities adjacent to open water, they may be underrepresented in the mapping (i.e., they may have sometimes been lumped into the larger adjacent communities).

B146 and B147 are both shore fen communities that have moderate nutrient availability from contact with a pond, lake, or stream and are subject to low wave or current action. They typically do not support tree growth; however, if present, trees include stunted Tamarack and Black Spruce. These ecosites include both shrub (S) and non-woody (N) communities.

Open Shore Fens (B146) are typically dominated by graminoids on floating mats, usually of sedge origin. These communities are moderately herb poor, tree poor, and may have permanent surface pools and small hummocks with sphagnum and ericaceous shrubs. The ground surface is mostly sedge litter, water, bare peat, and sphagnum mosses. The ecosite may be dominated by one species or have a variable composition with shrubs such as Sweet Gale and Leatherleaf and herbaceous species such as Slender Sedge, Marsh Cinquefoil, Buckbean, and Canada Blue-joint. Bryophytes are dominated by sphagnum. Substrates are floating organic with a moisture regime of 9 (i.e., very wet) (Banton et al., 2009).

Shrub Shore Fens (B147) are low shrub dominated ecosites on floating mats of sedge or sphagnum origin. These communities are tree poor with a ground surface of leaf and sedge litter. The ecosite may be dominated by a single species or have a variable composition with shrubs such as Leatherleaf, Sweet Gale, Speckled Alder, and Dwarf Birch and herbaceous species such as Marsh Cinquefoil, Spender Sedge, and Beaked Sedge. Bryophytes are dominated by sphagnum. Substrates are floating organic with a moisture regime of 9 (i.e., very wet) (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 21** through **26**).

3.3.3.2 Swamp Ecosites

3.3.3.2.1 Organic Conifer Swamps (B127 / B127Tl / B127Tt, B128 / B128Tl / B128Tt, B129 / B129Tl / B129Tt)

Organic Conifer Swamps, including Organic Poor Conifer Swamp (B127 / B127Tl / B127Tt), Organic Intermediate Conifer Swamp (B128 / B128Tl / B128Tt), and Organic Rich Conifer Swamp (B129 / B129Tl / B129Tt), together represent 20.1% of the Local Study Area.

B127, B128, and B129 differ primarily in their nutrient availability which influences their vegetation composition. Regardless, they are all dominated by Black Spruce, with small amounts of other tree species and greater diversity in organic intermediate (B128) and organic rich conifer swamps (B129). Other canopy species that may be present in these

communities include Tamarack, Speckled Alder, and Eastern White Cedar (Oji-Cree translation *giishkaatig*) (B129 only). Understory shrub vegetation that may be present include Labrador-tea, Creeping Snowberry, Bunchberry, Velvet-leaf Blueberry, and Speckled Alder. Poor organic conifer swamps are herb poor, with increasing herb richness in intermediate and rich conifer swamps. Herbaceous species typically include, Three-leaved Solomon's Seal, Three-seeded Sedge, Wood Horsetail, Goldthread, Naked Miterwort, graminoids, sphagnum, and feathermoss. Rich swamps also include rich swamp indicators such as Eastern White Cedar, Red-osier Dogwood, current / gooseberry species (Oji-Cree translation *oshabomin*), Wood Anemone, and Oak Fern. Substrates are organic, mostly deep, and with a moisture regime of 7 or 8 (i.e., wet) or s (saturated) (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 27** through **30**).

3.3.3.2.2 Thicket Swamps (B134 / B134S, B135 / B135S)

Mineral Thicket Swamp (B134 / B134S) and Organic Thicket Swamp (B135 / B135S), together represent only 0.2% of the Local Study Area.

These two communities differ primarily in their substrate conditions (i.e., mineral versus organic) which influences vegetation composition. Mineral thicket swamps (B134S) are typically a tall shrub community with few trees (≤10%) and a moderately rich herbaceous layer. The ground surface is mostly broadleaf litter, dead wood, and mineral material, with evidence of vernal pooling or standing water. Shrub species include Speckled Alder, Red-osier Dogwood, willows, and Sweet Gale. Herbaceous species include bedstraws, Canada blue-joint, horsetails, and sedges, with sphagnum and mnium as the dominate mosses. Substrates are mineral, moderately deep to deep, with a moisture regime of 6 (i.e., very moist) (Banton et al., 2009).

Organic thicket swamps (B135 / B135S) are also typically a tall shrub community with few trees (≤10%) and a moderately rich herbaceous layer. The ground surface material is similar to mineral thicket swamps, with more abundant sphagnum species. Vernal pooling and standing water are also common. Similar shrub species may be present with the addition of Dwarf Birch. Organic thicket swamps are typically more open than mineral thicket swamps, with more sphagnum cover. Substrates are organic, mostly deep, with a moisture regime of 7 – 9 (i.e., wet) or s (i.e., saturated) (Banton et al. 2009)

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 31** through **34**).

3.3.3.2.3 Mineral Conifer Swamps (B222 / B222TI / B222Tt; B223 / B223TI / B223Tt; B224Tt)

Mineral Poor Conifer Swamp (B222 / B222TI / B222Tt) and Mineral Intermediate Conifer Swamp (B223TI / B223Tt), together represent 9.9% of the Local Study Area.

These two communities differ primarily in their nutrient availability which influences vegetation composition. Mineral poor conifer swamps (B222Tl / B222Tt) consist of a canopy of Black Spruce with small amounts of other trees species (<10%), primarily conifer species. Understory trees species include Black Spruce and Balsam Fir. Ericaceous shrub species are abundant. The ground surface is mostly moss, woody debris, conifer littler, and broadleaf litter. Common understory species include Velvet-leaf Blueberry, Bunchberry, Feathermoss, and sphagnum, with other swamp indicators also present. Substrates are mineral, moderately deep to deep, with a moisture regime of 6 (i.e., very moist) or s (i.e., saturated) (Banton et al., 2009).

Mineral intermediate conifer swamps (B223Tl / B223Tt) also consist of a canopy of Black Spruce with Tamarack, and Speckled Alder. Understory tree species include Black Spruce and Balsam Fir, with abundant alder. The ground surface is mostly moss with woody debris, conifer litter, and broadleaf litter. Common understory species include Velvet-leaf Blueberry, Labrador-tea, Creeping Snowberry, Bunchberry, Wood Horsetail, Wild Lily-of-the-valley, Feathermoss, and sphagnum. Substrates are mineral, mostly deep to deep, with a moisture regime of 6 (i.e., very moist) or s (i.e., saturated) (Banton et al., 2009).

Mineral Rich Conifer Swamps (B224) consist of a canopy of Eastern White Cedar mixed with Black Spruce, Balsam Fir, White Spruce, Trembling Aspen, Black Ash (Oji-Cree translation *agimagwatik*), or Balsam Poplar (Oji-Cree translation *maan azaadii*). Understory tree species include Balsam Fir, Black Spruce, and White Birch. Ground surface is composed of moss, woody debris, conifer litter, and broadleaf litter. Rich swamp indicators are present. Substrates are mineral or peaty phase, moderately deep to deep and hydric with a moisture regime of 6 (i.e., very moist) or s (i.e., saturated) (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 35** through **38**).

3.3.3.3 Marsh Ecosites

3.3.3.3.1 Mineral Marshes (B142 / B142N, B148N, B151N)

Mineral Meadow Marsh (B142 / B142N), Mineral Shallow Marsh (B148N), and Mineral Open Water Marsh (B151N), together represent 0.8% of the Local Study Area, however the vast majority of the mineral marsh polygons are mapped as Mineral Meadow Marsh (B142N). A combined total of only five Mineral Shallow Marsh (B148N) and Mineral Open Water Marsh (B151N) polygons were mapped within the Local Study Area. These communities are often narrow or part of larger wetland complexes and may therefore be under-represented due to being lumped with a larger, more dominant adjacent community.

Mineral Meadow Marsh (B142 / B142N) is most often a graminoid dominated community, typically dominated by sedges and grasses (Oji-Cree translation *wabakamik*), with moderately high to high nutrient availability and often situated adjacent to a lake or stream. Tall shrub cover is ≤ 25% and tree cover is ≤ 10%. The ground surface is mostly sedge litter. The ecosite may be dominated by one species or have a more variable composition. Common shrubs include willows and Sweet Gale, and herbaceous plants include Canada

Blue-joint, Marsh Cinquefoil, sedges, and wool-grass. Substrates are mineral, mostly deep, and with a moisture regime of 6 (i.e., very moist) or s (i.e., saturated) (Banton et al., 2009).

Mineral Shallow Marsh (B148N) and Mineral Open Water Marsh (B151N) are composed of emergent or floating-leaved herbaceous species including grasses, rushes, sedges, and occasionally forbs and horsetails. Open water marshes are typically composed of submergent aquatic species. Water is normally above the substrate surface. Substrates are usually deep, saturated, mineral substrates (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 39** and **40**).

3.3.3.3.2 Organic Marshes (B144 / B144N, B149N)

Organic Meadow Marsh (B144 / B144N) and Organic Shallow Marsh (B149N), together represent 0.2% of the Local Study Area. Only 18 organic meadow marshes are mapped within the Local Study Area, ten of which were changed to this ecosite based on aerial or ground-based field surveys. Six of these ten polygons were desktop-typed as mineral meadow marsh (B142N), suggesting that there may be an under-representation of organic meadow marsh communities in the mapping. Likewise, only two organic shallow marsh (B149N) polygons are mapped within the Local Study Area, and both are polygons that were field verified via ground surveys. Both communities were changed from polygons that were desktop-typed as mineral meadow marsh (B142 / B142N) communities. This suggests that there may be an under-representation of organic shallow marsh communities in the mapping.

Organic meadow marsh (B144 / B144N) is most often a graminoid-dominated community, typically dominated by sedges and grasses, with high nutrient availability, and often situated adjacent to a lake or stream. Tall shrub cover is ≤ 25% and tree cover is ≤ 10%. The ground surface is mostly sedge litter. The ecosite may be dominated by one species or have a more variable composition. Shrub species may include willows, Speckled Alder, or Sweet Gale, with herbaceous species such as Canada Blue-joint, Marsh Cinquefoil, Broad-leaved Cattail (Oji-Cree translation *paskakannoog*), Wool-grass, and sedges. Substrates are organic, mostly deep, and with a moisture regime of 7 – 9 (i.e., wet) or saturated (Banton et al., 2009).

Organic shallow marsh (B149N) communities are composed of emergent or floating-leaved herbaceous species, typically dominated by grasses, rushes, sedges, and occasionally forbs and horsetails. Water is normally above the substrate surface. Substrates are organic, mostly deep, and saturated.

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 41** through **44**).

3.3.3.4 Bog Ecosites

3.3.3.4.1 Treed Bog (B126 / B126Tl / B126Tt, B137Tl / B137Tt)

Together, treed bog (B126 / B126Tl / B126Tt) and sparse treed bog (B137Tl / B137Tt) represent 1.0% of the Local Study Area.

Treed and sparse treed bogs are dominated by Black Spruce, with ≤ 10% other tree species, and are often pure conifer. Tree bogs have abundant ericaceous shrubs, are herb poor, and have a ground surface of mostly moss with conifer litter. Common understory species include Leatherleaf, Labrador-tea, Creeping Snowberry, Small Cranberry, Large Cranberry, Bog Laurel (Oji-Cree translation, *wiisakibag*), Sheathed Cotton-grass, sedges, Three-leaved Solomon's Seal, and sphagnum. Plant growth is limited by excess moisture and lack of nutrient availability. Bogs are hydrologically isolated, nourished only by rain. Substrates are organic, mostly deep, and with a moisture regime of 7-9 (i.e., wet) or saturated (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 45** through **52**).

3.3.3.4.2 Open Bog (B138 / B138N)

Open bog (B138 / B138N) represents 0.1% of the Local Study Area, with only two polygons mapped as this ecosite, one of which was mapped during the initial desktop-typing and a second identified through ground-based field verification. This ecosite is typically widespread and common across the boreal but may be under-represented in the Local Study Area mapping due to their sometimes-small size (e.g., found within small, filled in kettles), or association with larger peatland systems (e.g., raised dome or openings in trees, bogs, or fens) (Banton et al., 2009). Therefore, these ecosites may often be lumped within the dominant surrounding ecosite.

Open bogs are characterized by low shrub, bryophyte, or graminoid dominated systems with ≤ 10% tree cover. When present, shrubs are ericaceous. The ground surface is mostly sphagnum and deciduous litter. Fen indicators are mostly absent. Common shrubs include Leatherleaf, Bog Laurel, Bog Rosemary, and Labrador-tea. Herbaceous plants include Pitcher Plant, Round-leaved Sundew, Dense Cotton-grasses, and Few-seeded Sedge. Open bogs are hydrologically isolated, extremely low in nutrients, with acidic conditions that limit plant growth. Substrates are organic, mostly deep, and with a moisture regime of 7-9 (i.e., wet) (Banton et al., 2009).

Representative aerial images and site photos of these ecosites is presented in **Annex C** (**Photos 53** and **54**).

Table 3-6: Wetland Ecosystems in the Local and Regional Study Areas

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Wetland Community	Area (ha)	% Wetlands	% Local Study Area	% Regional Study Area
B126	Treed bog	39.4	<0.1	0	Bog	2,277.6	1.6	1.2	13.0
B126TI	Treed bog	342.9	0.2	5					
B126Tt	Treed bog	94.7	<0.1	3					
B137TI	Sparse treed bog	1,520.1	0.8	9					
B137Tt	Sparse treed bog	49.4	<0.1	4					
B138	Open bog	81.0	<0.1	0					
B138N	Open bog	150.0	0.1	2					
B136	Sparse treed fen	25.6	<0.1	2	Fen	73,917.2	50.9	37.3	24.8
B136TI	Sparse treed fen	63,103.3	31.9	20					
B136Tt	Sparse treed fen	4,348.1	2.2	8					
B139	Poor fen	50.5	<0.1	1					
B139N	Poor fen	159.7	0.1	6					
B139S	Poor fen	105.2	0.1	4					
B140N	Open moderately rich fen	2,490.1	1.3	4					
B140S	Open moderately rich fen	430.5	0.2	3					
B140TI	Open moderately rich fen	34.9	<0.1	0					
B141	Open extremely rich fen	17.8	<0.1	0					
B141N	Open extremely rich fen	2,763.8	1.4	4					
B141S	Open extremely rich fen	14.2	<0.1	1					
B146N	Open shore fen	319.0	0.2	12					
B146S	Open shore fen	23.6	<0.1	2					
B147S	Shrub shore fen	30.9	<0.1	2					
B142	Mineral meadow marsh	21.3	<0.1	3	Marsh	3,927.5	2.7	2.0	0.7
B142N	Mineral meadow marsh	1,484.2	0.7	7					

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Wetland Community	Area (ha)	% Wetlands	% Local Study Area	% Regional Study Area
B144	Organic meadow marsh	334.8	0.2	0					
B144N	Organic meadow marsh	1,952.9	1.0	13					
B148N	Mineral shallow marsh	13.5	<0.1	0					
B149N	Organic shallow marsh	119.4	0.1	4					
B151N	Open water marsh: mineral	1.3	<0.1	0					
B127	Organic poor conifer swamp	479.5	0.2	2	Swamp	65,084.6	44.8	32.9	29.1
B127TI	Organic poor conifer swamp	377.2	0.2	7					
B127Tt	Organic poor conifer swamp	2,674.4	1.4	25					
B128	Organic intermediate conifer swamp	7,854.0	4.0	3					
B128TI	Organic intermediate conifer swamp	3,410.5	1.7	7					
B128Tt	Organic intermediate conifer swamp	24,182.0	12.2	65					
B129	Organic rich conifer swamp	49.7	<0.1	0					
B129TI	Organic rich conifer swamp	192.1	0.1	5					
B129Tt	Organic rich conifer swamp	653.8	0.3	10					
B134	Mineral thicket swamp	22.0	<0.1	0					
B134S	Mineral thicket swamp	28.8	<0.1	2					
B135	Organic thicket swamp	38.7	<0.1	2					
B135S	Organic thicket swamp	325.5	0.2	14					
B222	Mineral poor conifer swamp	12,510.2	6.3	1					

Ecosite	Ecosite Name	Area (ha)	% Local Study Area	# of Survey Plots (field)	Wetland Community	Area (ha)	% Wetlands	% Local Study Area	% Regional Study Area
B222TI	Mineral poor conifer swamp	562.4	0.3	1					
B222Tt	Mineral poor conifer swamp	6,338.0	3.2	4					
B223	Mineral intermediate conifer swamp	64.3	<0.1	4					
B223Tt	Mineral intermediate conifer swamp	115.5	0.1	2					
B224	Mineral rich conifer swamp	13.4	<0.1	1					
B224Tt	Mineral rich conifer swamp	43.3	<0.1	0					
UNK	Unknown	5,149.4	2.6	0					
Wetland Community Summary		**145,206.9**	**73.4**	**274**		**145,206.9**	**100.0**	**73.4**	**67.6**

% = percentage; ha = hectare; < = less than

3.3.3.5 Field Verification of Wetland Ecosites

Wetland ecosystems mapped within the Local Study Area and summarized in the preceding sections is based on a combination of desktop pre-typed polygons and field-verified polygons. Wetland ecosite classifications that were changed based on visual and ground investigations were updated in the digital mapping. Although the field-verified ecosites represent a very small proportion of the polygons in the Local Study Area, these corrections helped to ensure that revised mapping and analysis would be based on the best available information.

Annex D, Table D-1 contains a list of the ecosites that were field-verified, including the desktop pre-typed ecosite and the field verified ecosite. Based on an assessment of the field verification process (**Annex A**), the following was determined:

- 94% of polygons that were pre-typed as wetland were confirmed to be wetland;
- 35% of polygons that were pre-typed as wetland ecosites were correct based on field verification (i.e., exact match);and
- For incorrect ecosite matches that were still field verified as wetland communities:
  - 32% had the correct wetland type (i.e., communities mapped as bog, fen, or marsh at desktop were field verified as same communities)

As noted previously, given the scale of the Project and the limitations identified in the desktop mapping exercise, for mapping and analyses purposes, ecosites were rolled up into four wetland vegetation community groupings, including swamp, marsh, bog, and fen. The results of the field-verification process summarized above, further support the decision to roll up the ecosites to broader vegetation community groupings.

Ecosites were further refined in 2024 through a combination of field and desktop investigations further detailed in the Peatlands Existing Conditions & Effects Assessment Report (AECOM/WSP 2024), which resulted in an additional 2052 changes in ecosite for wetland ecosystems. The majority of these changes resulted specifically from swamp ecosites being reclassified based on their soils (from organic to mineral, or vice versa).

3.3.4 Riparian Ecosystems

According to the *Vegetation Study Plan*, for the purposes of this study, Riparian Ecosystems include the vegetation assemblage (i.e., both wetland and upland communities) that are located within 30 m of a watercourse or waterbody (e.g., stream or lake). Specific field data were collected in riparian ecosites, to inform the riparian functional assessment and effects assessment for the *Environmental Assessment / Impact Statement Report*. Since riparian communities overlap with the wetland and upland communities summarized above, a separate analysis has not been completed for the purposes of this *Vegetation Technical Support Document*. However, riparian communities are discussed in the *Vegetation Existing Conditions and Effects Assessment Report*.

4. Summary

This *Vegetation Technical Support Document* summarizes the methods and results of the desktop assessment and field program undertaken to map and characterize the vegetation existing conditions within the Marten Falls Community Access Road vegetation study areas. This document has been prepared as an attachment to the *Vegetation Existing Conditions and Effects Assessment Report* as part of Environmental Assessment / Impact Statement Report.

Vegetation field investigations were carried out in the study area in four separate field programs from 2021 through 2023. These investigations included ecosite verification at ground inspection sites, visual checks completed during aerial (helicopter) surveys and visual checks completed through photo interpretation from site photos taken during wildlife surveys. A total of 481 survey sites were assessed including:

- 90 ground inspections;
- 316 visual checks (aerial surveys); and
- 75 visual checks (photo interpretation).

The results of the desktop mapping and field verification process determined that the Local Study Area is dominated by wetland ecosystems, with 73.4% of the Local Study Area (145,206.9 ha) mapped as wetland communities. Upland ecosystems represent 22.8% (45,279.1 ha) of the Local Study Area, with water representing a further 3.8% (7,506.9 ha), and anthropogenic (human-altered) lands representing <0.1% (53.0 ha). The highest concentration of wetlands is in the northern portion of the Local Study Area, north of Dusey Lake, with a greater prominence of upland ecosystems towards the southern limits of the Local Study Area.

Data are presented to the ecosite level in this *Vegetation Technical Support Document*. However, for the *Vegetation Existing Conditions and Effects Assessment Report*, the ecosite information has been rolled up into five upland and four wetland community groupings to inform the vegetation Valued Components effects assessment.

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Annex A – Confusion Matrix Analysis

Annex A – Confusion Matrix Analysis

Version #3

February 2026

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This limitations statement is considered an integral part of this report.

Authors

Revision	Name	Title	Company
Original	Michael Simpson	Senior Vegetation Ecologist	WSP

Date	Revised By	Revision Description
Rev1		

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1. Introduction

This section describes how the accuracy of desktop vegetation community mapping for the Local Study Area was quantified and the findings from that analysis. A detailed description of the process used to map the Local Study Area is provided in Appendix A and only summarized below.

1.1 Summary of Desktop Mapping Process

Desktop mapping of vegetation communities in the Local Study Area was carried out by KBM Resources Group (KBM) and involved an iterative process of terrain mapping, delineation of polygons, and assigning ecological communities to those polygons based on *Ontario Forest Resources Inventory Photo Interpretation Specifications* (OMNR, 2012a). Communities were assigned to polygons based on the interpretation of the following imagery sources using software called Summit Evolution (Audet, S. pers comm., 2023).

- 1:60,000 scale black and white aerial photographs from 1973, 1975, and 1976 sourced from the National Air Photo Library in Ottawa, Ontario, and covering the Local Study Area; and
- 1:33,000 scale 20-centimetre resolution colour aerial photographs acquired in 2019 by the aerial survey division of KBM and covering the area within 1 km on either side of the Project centreline (i.e., the Construction Disturbance Area).

Per OMNR (2012a), each polygon was assigned a primary ecosite code based on the ecosite keys in *Ecosites of Ontario* (Banton et al., 2009). An ecosite is defined in OMNR (2012a) as "*an ecological unit comprised of relatively uniform geology, parent material, soils, topography, and hydrology, and consists of related vegetation conditions*." A secondary ecosite was assigned to a polygon if that ecosite occupied at least 20% of the area and was not equal to or greater than 8 ha.

Forested polygons were typed based on standard forestry inventory metrics including species composition, stocking, stand height, site class, year of origin, depletion type and development stage. Species composition was inferred from the above-noted imagery by Ontario Boreal Certified photo interpreters (Audet, S. pers comm., 2023). Some default ecosite selections were made based on interpreter experience and expected conditions within the Local Study Area.

1.2 Rationale for the Analysis

A typical forest resource inventory desktop mapping approach involves a process of ground-truthing / calibration as per *Calibration Plot Specifications* (OMNR, 2012b). However, no field verification occurred during the desktop mapping process to validate its accuracy. Some polygons within the Construction Disturbance Area were subsequently verified and, if necessary, revised in 2023 using data collected by vegetation and soils field crews or using LiDAR imagery. Potentially, therefore, mapping within the Construction

Disturbance Area might be more accurate than that within the Local Study Area but outside the Construction Disturbance Area.

As only limited ground-truthing of polygons could be carried out during the desktop mapping process, the post-hoc analysis described in this document was undertaken to support any conclusions of the Environmental Assessment / Impact Assessment that rely on mapping data. Mapping data, especially the extent and spatial distribution of vegetation communities within the Local Study Area, are used by various disciplines to describe baseline conditions and extrapolate Project effects on VCs, such as those listed below:

- Upland and wetland community diversity and relative abundance;
- Vegetation communities of conservation concern;
- Habitats with high potential for rare plants;
- Habitats for culturally important plants; and
- Habitats with features that are important for wildlife (e.g., lichen for woodland caribou).

In each of these cases, the accuracy of mapping has implications for the description of baseline conditions and, by extension, the Environmental Assessment / Impact Assessment since the latter relies on estimates of the area removed from different ecosite phases during construction. If baseline mapping data are inaccurate, it could reduce the level of confidence that can be attributed to the residual effects ratings for mapping-dependent VCs.

2. Methods

2.1 Confusion Matrix Analysis

Mapping accuracy for the Project was assessed post hoc using a confusion matrix approach. Confusion matrix analysis is a simple method for quantifying the accuracy of data obtained from aerial photo interpretation or remote sensing by comparing them against reference data (Knudby, 2021). The latter in this case are vegetation community classifications recorded during field surveys. Such data cannot, themselves, be 100% accurate as they rely on the professional judgment of field staff. Nonetheless, as that judgement is based on direct observation of factors such as the species present, soil moisture, and landscape position, field-based vegetation classifications are assumed to be the most accurate possible.

For this analysis, each field survey location was paired with a mapped polygon that encompassed that location. Each pairing was then checked to determine if the vegetation community in each data set was the same (i.e., in agreement). The total number of agreements as a percentage of occurrences of that vegetation community in the mapping data is the indicator of mapping accuracy for that community.

Table 2-1 is an example of a confusion matrix analysis where each row represents a different vegetation community (Veg1, Veg2, and Veg3). For each mapped community, there is a corresponding column representing the community recorded in the field data. The Total column shows the total frequency of polygons of each community (n) that are in the mapping data (e.g., out of 66 polygons in the mapping data, 37 are polygons classified in mapping data as Veg1).

The cell at the intersection of each row and column (shaded in the example) shows how many agreements there are between mapping and field data for each community (e.g., out of a total of 37 mapped polygons of Veg1, 25 were also identified as Veg1 in the field). The other cells in each row show the frequency of disagreements (e.g., 12 polygons that were mapped as Veg1 were identified as Veg2 in the field).

The absolute values in the top matrix in **Table 2-1** are converted to percentages in the bottom matrix so it is possible to see what percentage of desktop-mapped polygons are in agreement (e.g., 68% of polygons were identified as Veg1 both in mapping and in the field). As it is assumed that communities are accurately identified in the field, this value is a measure of the accuracy with which each community has been mapped and can be used to determine a level of confidence in the mapping of different landscape units in the Local Study Area and any predicted residual effects related to them.

Table 2-1: Example Confusion Matrices

	FIELD-VERIFIED (Frequency)			
MAPPED	**Veg1**	**Veg2**	**Veg3**	**TOTAL (n)**
Veg1	25	12	0	**37**
Veg2	6	19	0	**25**
Veg3	0	0	4	**4**
TOTAL	**31**	**31**	**4**	**66**

	FIELD-VERIFIED (%)			
MAPPED	**Veg1**	**Veg2**	**Veg3**	**TOTAL**
Veg1	68	32	0	**100**
Veg2	24	76	0	**100**
Veg3	0	0	100	**100**

Shaded cells show the frequency or percentage of agreements between mapped polygons and field surveys.

A measure of the overall accuracy of mapping can be estimated from these data by summing the agreement frequencies for each community (∑(AF) below) and calculating what percentage that sum is of the total number of polygons. In the example above, the following calculation provides the estimate of overall mapping accuracy:

$$\sum(AF) = 25+19+4 = 48$$

$$\sum(AF) \div \sum(n) \text{ or } 48 \div 66 = 0.73 \text{ or } 73\%.$$

Although this is not shown in the example, columns representing ecosites that were recorded in the field but not in the mapping data can be included to maximize sample size. However, as these columns have no corresponding row or intersecting cells, their values do not contribute to ∑(AF).

2.2 Source Data

The data set used in the analysis comprised 393 mapped polygons that had a corresponding field data (**Annex B, Table B-1**). Field data were collected in field investigations carried out between 2021 and 2023 to assess the subset of pre-typed polygons. Sites were divided between upland, wetland, and riparian ecosystems, although sites were only mapped as uplands or wetlands. They included 203 locations in the Construction Disturbance Area and 190 outside the Construction Disturbance Area but within the Local Study Area. Of these, 82 were ground inspection sites and 311 were visual checks (i.e., surveys from a helicopter). More information on the field survey protocols is provided in the *Vegetation Technical Support Document: Existing Conditions & Effects Assessment* and Appendix A of that document.

The vegetation community at each location had been mapped to ecosite according to Banton et al. (2009). In most cases, ecosites were further differentiated using a vegetation cover code modifier (e.g., B136TI: Sparse Treed Fen, where B136 is the ecosite number and TI is the cover code for Low Treed). The mapping data included 43 ecosites of which 1, represented by a single polygon, did not have a modifier. The field data included 55 ecosites based on soil and botanical data that were collected in field surveys to characterize plant community composition. Eleven ecosites across 21 polygons lacked a cover code and 3 field locations were labelled “Unknown”. The combined mapping and field data included 63 different ecosites, 7 of which only occurred in the desktop mapping data and 32 of which only occurred in the field data.

2.3 Mapping Precision

Mapping accuracy was assessed for the Project at three scales of precision based on a hierarchical subdivision of landscape units that are ecologically relevant to the Environmental Assessment / Impact Assessment:

- Ontario ecosites as described in Banton et al. (2009);
- Upland communities as defined by canopy cover (i.e., coniferous, deciduous or mixedwood forests, or shrub-dominated) and a subset of widely used wetland formations based on vegetation composition and physiognomy (i.e., bogs, fens, swamps, marshes) (Riley, 2011). This scale is referred to as “upland and wetland classes”; and
- Uplands and wetlands as otherwise undifferentiated but functionally distinct ecosystems at the landscape scale (“landscape-scale ecosystems”).

Mapping data were analyzed at multiple scales to identify at which scale the data provide the best balance of precision and confidence in the Environmental Assessment / Impact Assessment and determine whether mapping accuracy varied between different ecosites, classes or landscape-scale ecosystems. The ability to accurately distinguish between different plant communities in aerial photographs can be affected by factors that include the species present, the resolution of the image, the time of day and year, and what year the image was captured. For instance, in low-resolution black-and-white images, it might be difficult to differentiate between black spruce (Oji-Cree translation, *shikobaatik*) (*Picea mariana*) and tamarack (Oji-Cree translation, *maaskigwatik* / *wakinagan*) (*Larix laracina*) in treed wetlands. The same could apply to different species of Sphagnum moss in open peatlands, making it challenging to differentiate poor fens from rich fens or bogs. Accuracy can therefore be higher for some wetland classes than for others or wetlands in general compared with uplands.

Recognizing that mapping confidence might vary between communities is also important to the Environmental Assessment / Impact Assessment because the degree to which mapping accuracy influences the assessment also depends on the effect itself. For example, if the Project will remove a relatively large area of vegetation or disproportionately affect some vegetation communities or ecosystems, accurate mapping will be critical for confidently evaluating what plant communities and associated species

will be affected. In contrast, if the Project will have a small footprint, mapping accuracy will be less important to the conclusions of the Environmental Assessment / Impact Assessment as the effect might not be area-related (although mapping accuracy will be of higher importance if there is a high potential for a project to have effects an ecosite that is critical for wildlife, rare plants, traditional use plants or community diversity).

3. Analysis of Project Data

3.1 Ecosites

To assess ecosite mapping accuracy, a confusion matrix analysis was conducted that included all ecosites that were mapped in five or more polygons (i.e., n>4). Five was considered to be the minimum number of occurrences to balance the competing considerations of having meaningful sample sizes while avoiding estimates that might be exaggerated by small sample sizes (e.g., if n=3 and 2 are in agreement, it would suggest that mapping accuracy is 75%, but that estimate will have a wide margin of error because of the very small sample size). Vegetation cover code was not considered as this added a layer of complexity to the data that did not provide additional useful information.

Sixteen ecosites across 23 polygons were excluded from the analysis because each occurred in fewer than 5 polygons in the mapping data. The final matrices included 15 mapped and 43 field-identified ecosites spread across 370 polygons. Given the size of the matrices, only a summary of the results is provided here (**Table 3-1**).

Agreement was highest for B129: Organic Rich Conifer Swamp (80%; n=5) and comparatively high for B127: Organic Poor Conifer Swamp (67%; n=9). The third most accurately mapped ecosite was also a swamp (B128: Organic Intermediate Conifer Swamp: 53%; n=75). Almost half the polygons of this ecosite (47%) were classified as a different ecosite in the field but 20% of the total were classified as another swamp ecosite (data not presented here). Agreement was lowest for B142: Mineral Meadow Marsh, with only 9% of polygons being identified as the same ecosite in the field (n=53). Of the remainder, 19% were classified as B144: Organic Meadow Marsh, 21% as B146: Open Shore Fen and 21% as B135: Organic Thicket Swamp (data not shown).

The total number of polygons with agreement across the 15 common ecosites was 122, resulting in an overall ecosite mapping accuracy of 33% (122 ÷ 370). Because ecosites with low frequencies were excluded, this calculation is based on only 47% of all ecosites in the mapping data (15 out of 32). However, 94% of polygons (370 ÷ 392) were included so the estimated overall mapping accuracy of 33% is representative of the entire data set at the ecosite scale.

Table 3-1: Summary of the Ecosites Confusion Matrix Analysis

Ecosite	Agreement Frequency	No. of Polygons in Mapping Data (n)	Accuracy
B129: Organic Rich Conifer Swamp	4	5	80%
B127: Organic Poor Conifer Swamp	6	9	67%
B128: Organic Intermediate Conifer Swamp	40	75	53%
B055: Dry to Fresh, Coarse: Aspen - Birch Hardwood	7	14	50%
B141: Open Extremely Rich Fen	4	8	50%
B065: Moist, Coarse: Black Spruce - Pine Conifer	3	7	43%
B126: Low Treed Bog	3	9	33%
B137: Sparse Treed Bog	2	6	33%
B139: Poor Fen	2	6	33%
B136: Sparse Treed Fen	18	59	31%
B050: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	14	53	26%
B049: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated Conifer	11	45	24%
B076: Moist, Coarse: Mixedwood	1	5	20%
B140: Open Moderately Rich Fen	2	16	13%
B142: Mineral Meadow Marsh	5	53	9%
TOTAL	**122**	**370**	**N/A**

3.2 Upland and Wetland Classes

Given the scale of the Project and the low level of mapping accuracy at the ecosite scale, ecosites were rolled up into the upland, wetland and other landscape unit classes shown in **Table 3-2** to evaluate the confidence level in mapping at this scale of intermediate precision.

Table 3-2: Polygon Frequency of Upland and Wetland Classes in the Mapping Data

Class	No. of Polygons in Mapping Data (n)
UPLAND	
Conifer-dominated	111
Hardwood-dominated	15
Mixedwood	7
WETLAND	
Bog	15
Fen	92
Marsh	55
Swamp	94
OTHER	
Rock Barren	1
Shoreline	1
Other / Unknown*	2
TOTAL	**393**

* Includes polygons classified as B159N Open Cliff (n=1) and B199X Other Materials (n=1)

As there were fewer than 5 polygons classified as Rock Barren, Shoreline or Other/Unknown, these were excluded from the mapping data used in the analysis, leaving the total number of included polygons at 389 (including one polygon classified as Shrubby in the field data that had no equivalent in the mapping data).

As expected from the ecosite-scale analysis, swamps (n=94) were the most accurately mapped class (81% agreement) (**Table 3-3**). Agreement was also comparatively high for the upland Hardwood class (75%; n=15). Conifer-dominated was the only other class to have a percentage agreement greater than 50% (58%; n=111). Agreement was particularly low for Mixedwood (29%; n=7). Most polygons that were mapped as a a mixedwood plant community were classified as a conifer-dominated community in field surveys although the sample size was small (57%).

Mapping accuracy was also low for the Bog and Marsh classes at 33% (n=15) and 35% (n=92), respectively. Field crews classified the former as swamps more often than they did as bogs, and 29% of polygons mapped as marshes were also recorded as swamps in the field. In total, field surveyors recorded 154 polygons, or 40% of all surveyed sites, as swamps, including 40% of polygons that were mapped as bogs, 30% that were mapped as fens, and 29% that were mapped as marshes (Table 3-3). Possibly field surveyors were more likely to choose a swamp ecosite than other wetland ecosites when one of the latter was not explicitly indicated by conditions on the ground.

Almost a third of polygons classified as marshes (31%) were called fens by field crews. A review of the ecosite data showed that 13 of the 53 polygons mapped as the ecosite B142: Mineral Meadow Marsh were identified as shore fen ecosites in the field, suggesting these polygons might be near watercourses or pools in fen complexes.

Table 3-3: Confusion Matrices of Upland and Wetland Classes

	FIELD-VERIFIED (Frequency)									
MAPPED	**Bog**	**Conifer**	**Fen**	**Hardwood**	**Marsh**	**Mixedwood**	**O/U[1,2]**	**Shrub[2]**	**Swamp**	**TOTAL (n)**
Bog	5	0	4	0	0	0	0	0	6	**15**
Conifer	2	64	1	16	1	0	1	0	26	**111**
Fen	14	2	43	0	4	0	1	0	28	**92**
Hardwood	0	1	0	11	0	0	0	1	2	**15**
Marsh	1	1	17	0	19	0	1	0	16	**55**
Mixedwood	0	4	0	1	0	2	0	0	0	**7**
Swamp	1	8	4	2	3	0	0	0	76	**94**
TOTAL	**23**	**80**	**69**	**30**	**27**	**2**	**3**	**1**	**154**	**389**

	FIELD-VERIFIED (%)									
MAPPED	**Bog**	**Conifer**	**Fen**	**Hardwood**	**Marsh**	**Mixedwood**	**O/U[1,2]**	**Shrub[2]**	**Swamp**	**TOTAL**
Bog	33	0	27	0	0	0	0	0	40	**100**
Conifer	2	58	1	14	1	0	1	0	23	**100**
Fen	15	2	47	0	4	0	1	0	30	**100**
Hardwood	-	7	0	73	0	0	0	7	13	**100**
Marsh	2	2	31	0	35	0	2	0	29	**100**
Mixedwood	-	57	0	14	0	29	0	0	0	**100**
Swamp	1	9	4	2	3	0	0	0	81	**100**

1 - O/U = Other / Unknown

2 – These classes were excluded from mapping data as they were either not present or occurred in fewer than five polygons.

Shaded cells show the frequency or percentage of agreements between mapped polygons and field surveys.

Overall mapping accuracy for upland and wetland classes was almost twice that for ecosite mapping at 57%.

$$\sum(AF) = 5+64+43+11+19+2+76 = 220$$

$$\sum(AF) \div \sum(n) \text{ or } 220 \div 389 = 0.57 \text{ or } 57\%.$$

Comparison Between Construction Disturbance Area and Local Study Area

In addition to the analysis of mapping accuracy across the entire Local Study Area described above, separate confusion matrices were generated for the Construction Disturbance Area and the area inside the Local Study Area but outside the Construction Disturbance Area. This was to assess whether the use of higher-quality imagery for the Construction Disturbance Area resulted in higher mapping accuracy.

Of the 389 polygons included in the upland and wetland class analysis, 200 were in the Construction Disturbance Area and 189 were in the Local Study Area but outside the Construction Disturbance Area. The results of the confusion matrices are summarized in **Table 3-4**.

Table 3-4: Confusion Matrices of Mapping Accuracy for Upland and Wetland Classes in the Construction Disturbance Area and Local Study Area

Vegetation Class	Construction Disturbance Area			Local Study Area Outside the Construction Disturbance Area		
	Agreement Frequency	No. of Polygons in Mapping Data (n)	Accuracy (%)	Agreement Frequency	No. of Polygons in Mapping Data (n)	Accuracy (%)
UPLANDS						
Conifer-dom.	40	71	56	24	40	60
Hardwood-dom.	6	8	75	5	7	71
Mixedwood	2	5	40	0*	2	N/A
WETLANDS						
Bog	2	4	50	3	11	27
Fen	9	34	26	34	58	59
Marsh	13	28	46	6	27	22
Swamp	42	50	84	34	44	77
TOTAL	**8**	**200**	**N/A**	**15**	**189**	**N/A**

* No polygons were classified as Mixedwood by field crews in the Local Study Area outside the Construction Disturbance Area.

Mapping accuracy was similar for the Construction Disturbance Area and the rest of the Local Study Area. However, mapping of fens in the Local Study Area outside the Construction Disturbance Area (59%; n=58) was more than twice as accurate as that within the Construction Disturbance Area (26%; n=34), whereas the opposite was found for bogs (Construction Disturbance Area: 50%; n=4; Local Study Area outside the Construction Disturbance Area: 27%; n=11). The confusion matrices (not presented here) showed that in the Construction Disturbance Area 50% of the polygons mapped as fens were classified in the field as swamps, whereas in the Local Study Area 45% of all polygons mapped as bogs were classified as swamps and 27% were classified as fens by field crews.

The differences between the areas described above cancelled each other out in the calculation of overall mapping accuracy, which was 57% for the Construction Disturbance Area and 56% for the rest of the Local Study Area. These analyses indicate there is no difference in the accuracy of mapping between the two areas.

3.3 Landscape Scale Ecosystems

Further rolling up landscape units into the categories of uplands and wetlands was considered useful as an overall indicator of how effectively mapping differentiated these distinctive landscape units because they fulfill a range of ecological functions and each can have different implications for the Project (e.g., wildlife habitat, wildfire potential, carbon sequestration and storage). Impacts on wetlands can also get greater scrutiny in environmental assessments.

For this analysis, any landscape units that were not in one of the upland or wetland classes in **Section 3.2** were classified as Other or Unknown (O/U). The analysis included all 389 polygons, of which 133 were classified as uplands and 256 as wetlands in the mapping data. Field crews classified 112 sites as uplands, 273 sites as wetlands, and 4 as features that didn't fit in either of these categories (**Table 3-5**). The mapping of wetlands was 94% accurate. Mapping of uplands was lower at 74% with 24% of sites mapped as uplands being classified as wetlands in the field (**Table 3-5**). In most cases these were conifer-dominated or mixedwood sites that field crews classified as swamps (**Section 3.2**; **Table 3-3**).

Overall mapping accuracy for landscape-scale ecosystems was 87% indicating that the mapping process had effectively differentiated wetlands (especially bogs, fens, and marshes) from uplands.

$$\sum(AF) = 99+241 = 340$$

$$\sum(AF) \div \sum(n) \text{ or } 340 \div 389 = 0.87 \text{ or } 87\%.$$

Table 3-5: Mapping Accuracy Confusion Matrices for Landscape-scale Ecosystems

	FIELD-VERIFIED (Frequency)			
MAPPED	**Upland**	**Wetland**	**O/U1,2**	**TOTAL (n)**
Upland	99	32	2	**133**
Wetland	13	241	2	**256**
TOTAL	**112**	**273**	**4**	**389**

	FIELD-VERIFIED (%)			
MAPPED	**Upland**	**Wetland**	**O/U[1,2]**	**Total**
Upland	74	24	2	**100**
Wetland	5	94	1	**100**

1 - O/U = Other / Unknown
2 – These classes either were either not present in mapping data or occurred in fewer than five polygons and were therefore excluded.
Shaded cells show the frequency or percentage of agreements between mapped polygons and field surveys.

4. Summary and Conclusions

This document summarizes the analyses used to verify the desktop vegetation community mapping for the Project. It includes a description of the confusion matrix analysis method that was used to calculate estimates of mapping accuracy at various classification scales by comparing the landscape units as classified in a subset of mapped polygons with classifications that were recorded in field data at corresponding sites during vegetation surveys.

Analyses were performed at three different classification scales: ecosites, upland, and wetland classes (conifer-dominated, mixedwood, and hardwood-dominated uplands, bogs, fens, marshes, and swamps), and landscape-scale ecosystems (uplands and wetlands).

Overall mapping accuracy was low at the ecosite scale at 33% but varied between ecosites. Accuracy was 80% for the Organic Rich Conifer Swamp ecosite and relatively high for other swamp ecosites but only 9% for the Mineral Meadow Marsh ecosite and under 50% for 9 of the 15 mapped ecosites included in the analysis.

At the scale of upland and wetland classes, mapping accuracy was higher at 57%, with swamps and hardwoods being the most accurately mapped classes (81% and 73%, respectively). Polygons mapped as bogs were classified as bogs in only 33% of sites by field crews but classified as swamps in 40% of sites, while 30% of sites mapped as fens were classified as swamps in field surveys. In total, 154 out of 389 polygons included in the analysis were classified as swamps in the field, of which 78 (51%) had not been mapped as swamps. Based on these findings, confidence that mapping has accurately distinguished between different ecosites is low, although mapping of swamp ecosites was highly accurate and disagreements between mapping and field data were often the result of field crews classifying sites as swamp ecosites that were not mapped as such. This could have been because defining characteristics of swamps were not evident in aerial photos or because field crews tended to default to swamp ecosite classifications at sites that lacked distinct indicators of other wetland ecosites.

Mapping accuracy was also compared between the Construction Disturbance Area and Local Study Area outside the Construction Disturbance Area. Even though the former was mapped with higher resolution colour photography and had been updated based on limited field verification, overall mapping accuracy was only marginally higher than for the rest of the Local Study Area (57% compared with 56%). Given these and the other findings described above, confidence in the accuracy with which mapping differentiates between different upland and wetland classes is moderate overall but varies between classes (i.e., high for swamps and hardwood-dominated uplands, moderate for conifer-dominated uplands and fens, but low for marshes and bogs).

Overall mapping accuracy was very high for landscape-scale ecosystems (87%) and particularly for polygons mapped as wetlands (94%). Mapping accuracy for uplands was lower (74%) possibly because some polygons that were mapped as conifer-dominated or hardwood-dominated uplands were classified as swamps by field crews. In general, confidence is high in the accuracy with which the mapping distinguishes between uplands and wetlands as undifferentiated but functionally distinct ecosystems at the landscape scale.

Due to the low overall accuracy of mapping at the ecosite scale, vegetation data in the Environmental Assessment / Impact Assessment are presented at the scale of upland and wetland classes unless ecosites are specifically relevant. Although this entails a loss of information in the presentation of data, it provides the best balance of accuracy and precision, and should not significantly undermine the objectives of the Environmental Assessment / Impact Assessment as it still captures vegetation communities at a scale that distinguishes functional and compositional differences (albeit without dominant species as a defining factor). Information at the more precise scale of ecosites is referenced in the Environmental Assessment / Impact Assessment where applicable with appropriate acknowledgment of any implications these mapping accuracy analyses have for the residual effects and confidence ratings.

5. References

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Annex B – Species List

Scientific Name	Common Name	G-rank[1]	S-rank[2]	ESA Status[3]	SARA Status	Coefficient of Wetness[5]
Abies balsamea	Balsam Fir	G5	S5			-3
Acer pensylvanicum	Striped Maple	G5	S4			3
Acer spicatum	Mountain Maple	G5	S5			3
Actaea rubra	Red Baneberry	G5	S5			3
Actaea sp.	Baneberry species					
Alnus alnobetula	Green Alder	G5	S5			0
Alnus incana	Speckled Alder	G5	S5			-3
Alnus sp.	Alder species					
Amelanchier bartramiana	Bartram's Serviceberry	G5	S5			0
Amelanchier laevis	Smooth Serviceberry	G5	S5			5
Amelanchier sp.	Serviceberry species					
Anaphalis margaritacea	Pearly Everlasting	G5	S5			3
Andromeda polifolia	Bog Rosemary	G5	S5			-5
Anemonastrum canadense	Canada Anemone	G5	S5			-3
Aralia nudicaulis	Wild Sarsaparilla	G5	S5			3
Arethusa bulbosa	Dragon's-mouth	G5	S4S5			-5
Arctostaphylos uva-ursi	Common Bear Berry	G5	S5			5
Aulacomnium palustre	Ribbed Groove Moss	G5	S5			
Betula papyrifera	Paper Birch	G5	S5			3
Betula pumila	Bog Birch	G5	S5			-5
Bidens sp.	Beggars-ticks species					
Botrypus virginianus	Rattlesnake Fern	G5	S5			3
Brasenia schreberi	Watershield	G5	S5			-5
Bromus ciliatus	Fringed Brome	G5	S5			-3
Calamagrostis canadensis	Bluejoint Reedgrass	G5	S5			-5
Calla palustris	Vernal Water-starwort	G5	S5			-5
Callitriche hermaphroditica	Autumnal Water-starwort	G5	S4?			-5
Caltha palustris	Yellow Marsh Marigold	G5	S5			-5
Capnoides sempervirens	Pale Corydalis	G5	S5			5
Carex aquatilis	Water Sedge	G5T5	S5			-5
Carex aurea	Golden Sedge	G5	S5			-3
Carex disperma	Two-seeded Sedge	G5	S5			-5
Carex flava	Yellow Sedge	G5	S5			-5
Carex intumescens	Bladder Sedge	G5	S5			-3
Carex lacustris	Lake Sedge	G5	S5			-5
Carex lasiocarpa	Woolly-fruited Sedge	G5	S5			-5
Carex limosa	Mud Sedge	G5	S5			-5
Carex magellanica	Boreal Bog Sedge	G5	S5			-5
Carex oligosperma	Few-seeded Sedge	G5	S5			-5
Carex pauciflora	Few-flowered Sedge	G5	S5			-5
Carex projecta	Necklace Sedge	G5	S5			-3
Carex rostrata	Swollen Beaked Sedge	G5	S4?			-5
Carex sp.	Sedge species					
Carex stricta	Tussock Sedge	G5	S5			-5
Carex tenuiflora	Sparse-flowered Sedge	G5	S5			-5
Carex trichocarpa	Hairy-fruited Sedge	G4	S3			-5
Carex trisperma	Three-seeded Sedge	G5	S5			-5
Carex utriculata	Northern Beaked Sedge	G5	S5			-5
Carex vaginata	Sheathed Sedge	G5	S5			-5
Carex viridula	Greenish Sedge	G5	S5			-5
Chamaedaphne calyculata	Leatherleaf	G5	S5			-5
Chamaenerion angustifolium	Fireweed	G5	S5			0
Cicuta bulbifera	Bulbous Water-hemlock	G5	S5			-5
Cirsium sp.	Thistle species					
Cladina sp.	Cladina species					
Cladonia chlorophaea	Mealy Pixie-cup Lichen	G5	S5			
Cladonia cristatella	British Soldiers	G5	S5			
Cladonia rangiferina	Reindeer Lichen	G5	S5			
Cladonia sp.	Cladonia species					
Cladonia stellaris	Star-tipped Reindeer Lichen	G5	S5			
Cladonia verticillata	Ladder Lichen	G5	S4S5			
Clintonia borealis	Blue Bead-lily	G5	S5			0
Comandra livida	Northern Comandra	G5	S5			0
Comandra umbellata	Bastard Toadflax	G5	S5			3
Comarum palustre	Marsh Cinquefoil	G5	S5			-5
Coptidium lapponicum	Lapland Buttercup	G5	S5			-5
Coptis trifolia	Goldthread	G5	S5			-3
Cornus canadensis	Bunchberry	G5	S5			0
Cornus sericea	Red-osier Dogwood	G5	S5			-3
Corylus cornuta	Beaked Hazel	G5	S5			3
Dasiphora fruticosa	Shrubby Cinquefoil	G5	S5			-3
Dendrolycopodium dendroideum	Round-branched Tree-clubmoss	G5	S5			3
Dicranum sp.	Dicranum species					
Diervilla lonicera	Northern Bush-honeysuckle	G5	S5			5
Diphasiastrum digitatum	Southern Ground-cedar	G5	S5			5
Drosera intermedia	Spoon-leaved Sundew	G5	S5			-5
Drosera rotundifolia	Round-leaved sundew	G5	S5			-5
Dulichium arundinaceum	Three-way Sedge	G5	S5			-5
Eleocharis palustris	Creeping Spikerush	G5	S5			-5
Eleocharis sp.	Spikerush species					-5
Equisetum arvense	Field Horsetail	G5	S5			0
Equisetum fluviatile	Water Horsetail	G5	S5			-5
Equisetum pratense	Meadow Horsetail	G5	S5			-3
Equisetum sp.	Horsetail species					
Equisetum sylvaticum	Woodland Horsetail	G5	S5			-3
Eriophorum angustifolium	Narrow-leaved Cottongrass	G5	S5			-5
Eriophorum sp.	Cottongrass species					
Eriophorum vaginatum	Tussock Cottongrass	G5	S5			-5
Eriophorum viridicarinatum	Green-keeled Cottongrass	G5	S5			-5

Scientific Name	Common Name	G-rank[1]	S-rank[2]	ESA Status[3]	SARA Status	Coefficient of Wetness[5]
Eurybia macrophylla	Large-leaved Aster	G5	S5			5
Euthamia graminifolia	Grass-leaved Goldenrod	G5	S5			0
Eutrochium maculatum	Spotted joe-pyeweed	G5	S5			-5
Fragaria sp.	Strawberry species					
Fragaria vesca	Woodland Strawberry	G5	S5			3
Fragaria virginiana	Wild Strawberry	G5	S5			3
Fraxinus nigra	Black Ash	G5	S3	END		-3
Galium asprellum	Rough Bedstraw	G5	S5			-5
Galium boreale	Northern Bedstraw	G5	S5			0
Galium trifidum	Three-petal Bedstraw	G5	S5			-3
Galium triflorum	Three-flowered Bedstraw	G5	S5			-3
Gaultheria hispidula	Creeping Snowberry	G5	S5			-3
Gaultheria procumbens	Eastern Teaberry	G5	S5			3
Gentiana sp.	Gentian species					
Geocaulon lividum	Northern Comandra	G5	S5			0
Geum sp.	Avens species					
Geum aleppicum	Yellow Avens	G5	S5			0
Geum rivale	Purple Avens	G5	S5			-5
Glyceria borealis	Boreal Mannagrass	G5	S5			-5
Glyceria canadensis	Canada Mannagrass	G5	S5			-5
Glyceria sp.	Mannagrass species					
Goodyera repens	Dwarf Rattlesnake-plantain	G5	S5			0
Gymnocarpium dryopteris	Common Oak Fern	G5	S5			-5
Huperzia lucidula	Shining Firmoss	G5	S5			-5
Hylocomium splendens	Splendid feather moss	G5	S5			
Icmadophila ericetorum	Fairypuke Lichen	G5	S5			
Iris versicolor	Harlequin Blue Flag	G5	S5			-5
Juncus sp.	Rush species					
Juniperus communis	Common Juniper	G5	S5			3
Juniperus horizontalis	Creeping Juniper	G5	S5			3
Kalmia angustifolia	Sheep Laurel	G5	S5			0
Kalmia polifolia	Pale Bog Laurel	G5	S5			-5
Kalmia sp.	Laurel species					
Larix laricina	Tamarack	G5	S5			-3
Lilium sp.	Lily species					
Linnaea borealis	Twinflower	G5	S5			0
Lonicera canadensis	Canada Fly Honeysuckle	G5	S5			3
Lonicera involucrata	Bracted Honeysuckle	G5	S5			3
Lonicera oblongifolia	Swamp Fly-honeysuckle	G5	S5			-5
Lonicera sp.	Honeysuckle species					
Lonicera villosa	Mountain Fly-honeysuckle	G5	S5			-3
Lycopodium clavatum	Running Clubmoss	G5	S5			0
Lycopus uniflorus	Northern Water-horehound	G5	S5			-5
Lycopus virginicus	Birginia Water-horehound	G5	S3			-5
Lysimachia borealis	Northern Starflower	G5	S5			0
Maianthemum canadense	Wild Lily-of-the-valley	G5	S5			3
Maianthemum trifolium	Three-leaved False Solomon's Seal	G5	S5			-5
Mentha arvensis	Wild Mint	G5	S5			-3
Menyanthes trifoliata	Bog Buckbean	G5	S5			-5
Mertensia paniculata	Tall Bluebells	G5	S5			0
Mertensia virginica	Virginia Bluebells	G5	S3			0
Mimulus ringens	Square-stemmed Monkeyflower	G5	S5			-5
Mitella nuda	Naked Mitrewort	G5	S5			-3
Mnium sp.	Mnium species					
Monotropa uniflora	Indian-pipe	G5	S5			3
Myrica gale	Sweet Gale	G5	S5			-5
Neottia cordata	Heart-leaved Twayblade	G5	S5			-3
Nuphar variegata	Variegated Pond-lily	G5	S5			-5
Onoclea sensibilis	Sensitive Fern	G5	S5			-3
Orthilia secunda	One-sided Wintergreen	G5	S5			0
Packera sp.	Packera species					
Peltigera aphthosa	Common Freckle Pelt Lichen	G5	S5			
Peltigera canina	Dog Lichen	G5	S5			
Persicaria amphibia	Water Smartweed	G5	S5			-5
Petasites frigidus	Arctic Sweet Coltsfoot	G5	S5			-3
Phalaris arundinacea	Reed Canary Grass	G5	S5			-3
Physocarpus opulifolius	Eastern Ninebark	G5	S5			-3
Physocarpus sp.	Ninebark species					
Picea glauca	White Spruce	G5	S5			3
Picea mariana	Black Spruce	G5	S5			-3
Pinus banksiana	Jack Pine	G5	S5			3
Plantago major	Common Plantain	G5	SNA			-1
Platanthera orbiculata	Lesser Round-leaved Orchid	G5TNR	S4			0
Pleurozium schreberi	Red-stemmed Feather Moss	G5	S5			
Poaceae	Grass species					
Pohlia nutans	Common Nodding Moss	G5	S5			
Polypodiopsida	Fern species					
Polytrichum sp.	Haircap Moss species					
Populus balsamifera	Balsam Poplar	G5	S5			-3
Populus tremuloides	Trembling Aspen	G5	S5			0
Potentilla fructicosa	Shrubby Cinquefoil	G5	S5			-3
Potentilla norvegica	Rough Cinquefoil	G5	S5			
Potentilla sp.	Cinquefoil species					
Prunus pensylvanica	Pin Cherry	G5	S5			3
Ptilium crista-castrensis	Knight's Plume Moss	G5	S5			
Pyrola sp.	Pyrola species					
Ranunculus pensylvanicus	Macoun's Buttercup	G5	S4			-5
Rhamnus alnifolia	Alder-leaved buckthorn	G5	S5			-5

Scientific Name	Common Name	G-rank[1]	S-rank[2]	ESA Status[3]	SARA Status	Coefficient of Wetness[5]
Rhododendron groenlandicum	Common Labrador Tea	G5	S5			-5
Rhododendron sp.	Rhododendron species					
Rhynchospora alba	White Beakrush	G5	S5			-5
Rhytidiadelphus triquetrus	Shaggy Gooseneck Moss	G5	S5			
Ribes glandulosum	Skunk Currant	G5	S5			-3
Ribes hirtellum	Swamp Gooseberry	G5	S5			-3
Ribes sp.	Current species					
Ribes triste	Swamp Red Currant	G5	S5			-5
Rosa acicularis	Prickly Rose	G5	S5			3
Rubus arcticus	Arctic raspberry	G5	S5			-3
Rubus chamaemorus	Cloudberry	G5	S5			-3
Rubus flagellaris	Northern Dewberry	G5	S4			3
Rubus idaeus ssp. *strigosus*	North American Red Raspberry	G5	S5			3
Rubus pubescens	Dewberry	G5	S5			-3
Rumex britannica	Greater Water Dock	G5	S5			-5
Sagittaria latifolia	Broad-leaved Arrowhead	G5	S5			-5
Salix bebbiana	Bebb's Willow	G5	S5			-3
Salix candida	Hoary Willow	G5	S5			-5
Salix discolor	Pussy Willow	G5	S5			-3
Salix lucida	Shining willow	G5T5	S5			-3
Salix pedicellaris	Bog Willow	G5	S5			-5
Salix petiolaris	Meadow Willow	G5	S5			-3
Salix planifolia	Tea-leaved Willow	G5T5	S5			-5
Salix pyrifolia	Balsam Willow	G5	S5			-5
Salix serissima	Autumn Willow	G5	S5			-5
Salix sp.	Willow species					
Sarracenia purpurea	Pitcher Plant	G5	S5			-5
Scheuchzeria palustris	Marsh Scheuchzeria	G5	S5			-5
Scirpus atrocinctus	Black-girdled Bulrush	G5	S5			-5
Scirpus cyperinus	Cottongrass Bulrush	G5	S5			-5
Scirpus fluviatilis	River Bulrush	G5	S5			-5
Scirpus microcarpus	Red-tinged Bulrush	G5	S5			-5
Scirpus sp.	Bulrush species					
Scutellaria galericulata	Marsh Skullcap	G5	S5			-5
Sium suave	Hemlock Water-parsnip	G5	S5			-5
Solidago sp.	Goldenrod species					
Solidago uliginosa	Bog Goldenrod	G5	S5			-5
Sorbus decora	Showy Mountain-ash	G5	S5			3
Sorbus sp.	Mountain-ash species					
Sphagnum angustifolium	Fine Bogmoss	G5	S5			
Sphagnum capillifolium	Northern Peat Moss	G5	S5			
Sphagnum centrale	Central Peat Moss	G5	S4			
Sphagnum fuscum	Rusty Bogmoss	G5	S5			
Sphagnum girgensohnii	Girgensohn's Peat Moss	G5	S5			
Sphagnum magellanicum	Magellan's Peat Moss	G5	S5			
Sphagnum sp.	Peat Moss species					
Sphagnum squarrosum	Shaggy Peat Moss	G5	S5			
Sphagnum teres	Rigid Peat Moss	G5	S4			
Sphagnum warnstorfii	Warnstorf's Peat Moss	G5	S5			
Sphagnum wulfianum	Wulf's Peat Moss	G5	S5			
Spinulum annotinum	Interrupted Clubmoss	G5	S5			0
Spiranthes romanzoffiana	Hooded Ladies'-tresses	G5	S5			-5
Symphyotricum sp.	Aster species					
Taxus canadensis	Canada Yew	G5	S4			3
Thalictrum pubescens	Tall Meadow-rue	G5	S5			-3
Thalictrum sp.	Meadow-rue species					
Thuja occidentalis	Eastern White Cedar	G5	S5			-3
Tomentypnum nitens	Shiny Golden Fuzzy Moss	G5	S4			
Triadenum fraseri	Fraser's St. John's-wort	G5	S5			-5
Typha latifolia	Broad-leaved Cattail	G5	S5			-5
Usnea sp.	Old Man's Beard species					
Utricularia sp.	Bladderwort species					
Vaccinium macrocarpon	Large Cranberry	G5	S4			-5
Vaccinium myrtilloides	Velvet-leaved Blueberry	G5	S5			-3
Vaccinium oxycoccos	Small Cranberry	G5	S4			-5
Vaccinium uliginosum	Alpine Bilberry / Bog Bilberry	G5	S5			0
Viburnum edule	Squashberry	G5	S5			-3
Viburnum trilobum	Highbush Cranberry	G5T5	S5			-3
Vicia americana	American Vetch	G5	S5			3
Viola renifolia	Kidney-leaved Violet	G5	S5			-3
Viola sp.	Violet species					

Notes:

1 Global Ranks (GRANK) are Rarity Ranks assigned to a species based on their range-wide status. GRANKS are assigned by a group of consensus of Conservation Data Centres (CDCs), scientific experts and the Nature Conservancy. These ranks are not legal designations. G1 (Extreemly Rare), G2 (Very Rare), G3 (Rare to uncommon), G4 (Common), G5 (Very Common), GH (Historic, no record in last 20yrs), GU (Status uncertain), GX (Globally extinct), ? (Inexact number rank), G? (Unranked), Q (Questionable), T (rank applies to subspecies or variety).

2 Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated).

3 Endangered Species Act (ESA), 2007. Species at Risk in Ontario List (O.Reg 230/08 last amended 29 January 2024 as O. Reg. 11/24); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

4 Species at Risk Act (SARA), 2002. Schedule 1 (Last amended 17 June 2024); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

5 Coefficient of Wetness. Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

Annex C – Representative Photographs

Annex C - Representative Photographs

Version #1

February 2026

Coniferous Forest Ecosites

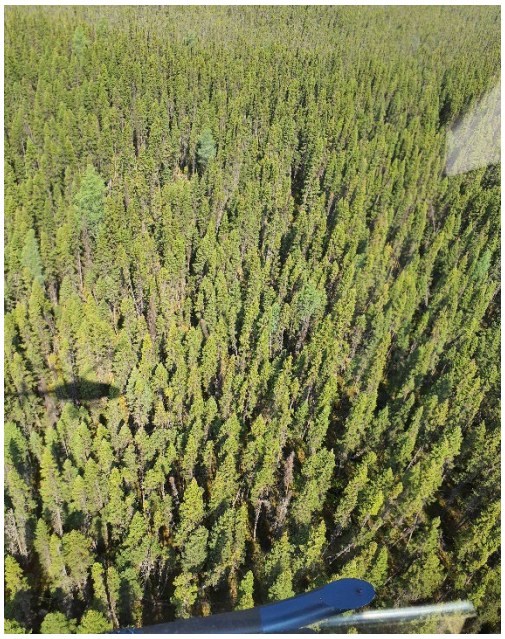

Photo 1: Aerial photo of Ecosite B049Tt (Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated – Tall Treed), Site Veg384, 15 June 2023.

Photo 2: Ground photo of Ecosite B049Tl (Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated – Low Treed), Site ARU149, 10 August 2022.

Photo 3: Aerial photo of Ecosite B50Tt (Dry to Fresh: Pine - Black Spruce Conifer – Tall Treed), Veg062, 29 September 2021.

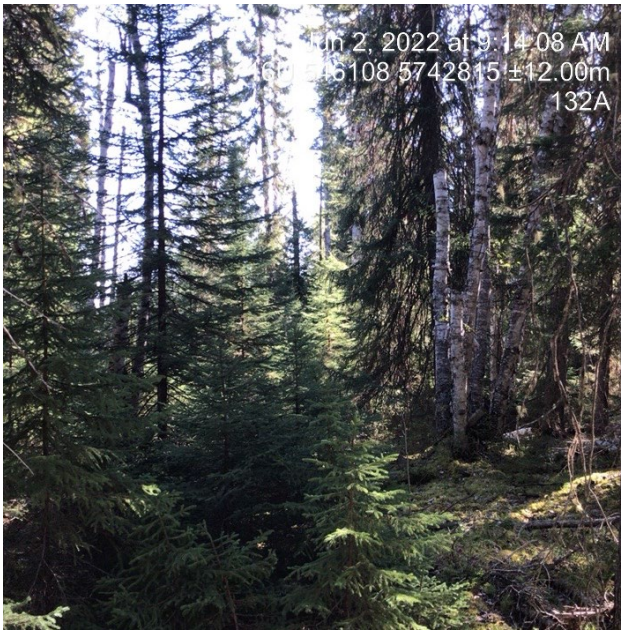

Photo 4: Ground photo of Ecosite B50Tt (Dry to Fresh: Pine - Black Spruce Conifer – Tall Treed), BBS132A, 2 June 2022.

Photo 5: Aerial photo of Ecosite B65Tl (Moist, Coarse: Black Spruce - Pine Conifer – Low Treed), Veg438, 15 June 2023

Photo 6: Ground photo of Ecosite B65Tt (Moist, Coarse: Black Spruce - Pine Conifer – Tall Treed), BBS301, 5 June 2023

Deciduous Forest Ecosites

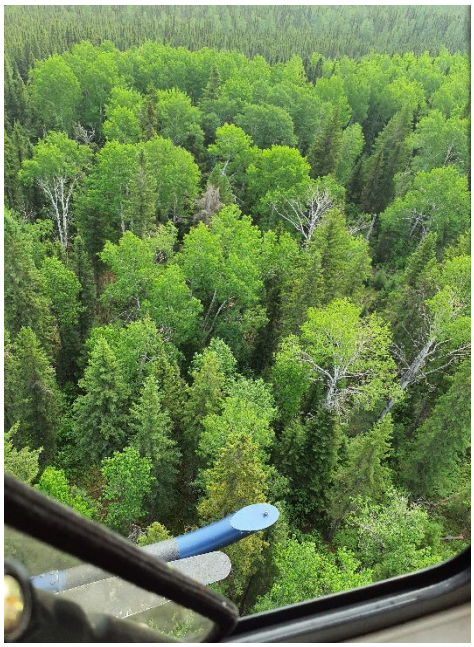

Photo 7: Aerial photo of Ecosite B55Tt (Dry to Fresh, Coarse: Aspen - Birch Hardwood – Tall Treed), Site Veg426, 18 June 2023.

Photo 8: Ground photo of Ecosite B55Tt (Dry to Fresh, Coarse: Aspen - Birch Hardwood – Tall Treed), Site ARU017, 13 August 2022.

Fen Ecosites

Photo 9: Aerial photo of Ecosite B136Tl (Sparse Treed Fen – Low Treed), Site Veg363, 17 June 2023.

Photo 10: Ground photo of Ecosite B136Tl (Sparse Treed Fen – Low Treed), Site Veg450, 4 August 2023.

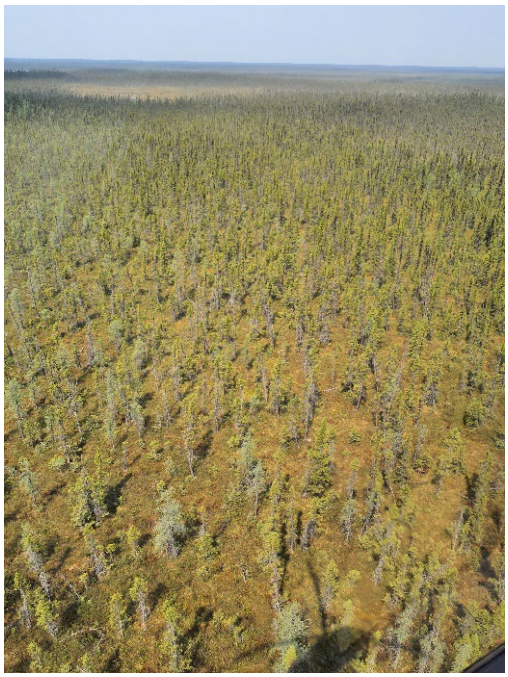

Photo 11: Aerial photo of Ecosite B136Tt (Sparse Treed Fen – Tall Treed), Site Veg420, 17 June 2023.

Photo 12: Ground photo of Ecosite B136Tt (Sparse Treed Fen – Tall Treed), Site Veg097, 23 September 2021.

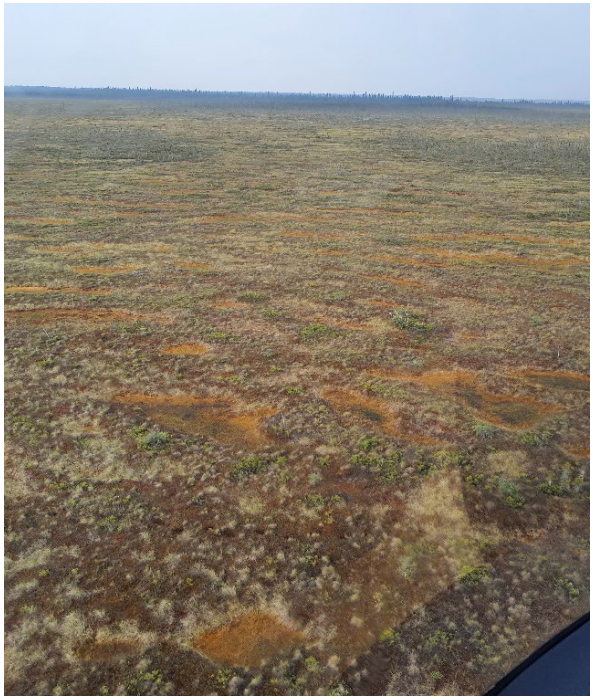

Photo 13: Aerial photo of Ecosite B139N (Poor Fen – Non-woody), Site Veg500A, 17 June 2023.

Photo 14: Ground photo of Ecosite B139N (Poor Fen – Non-woody), Site ARU076, 13 August 2022.

Photo 15: Aerial photo of Ecosite B139S (Poor Fen – Shrub), Site Veg386, 15 June 2023.

Photo 16: Ground photo of Ecosite B139S (Poor Fen – Shrub), Site Veg456, 4 August 2023.

Photo 17: Aerial photo of Ecosite B140N (Open Moderately Rich Fen – Non-woody), Site Veg415, 17 June 2023.

Photo 18: Ground photo of Ecosite B140S (Open Moderately Rich Fen – Shrub), Site Veg457, 4 August 2023.

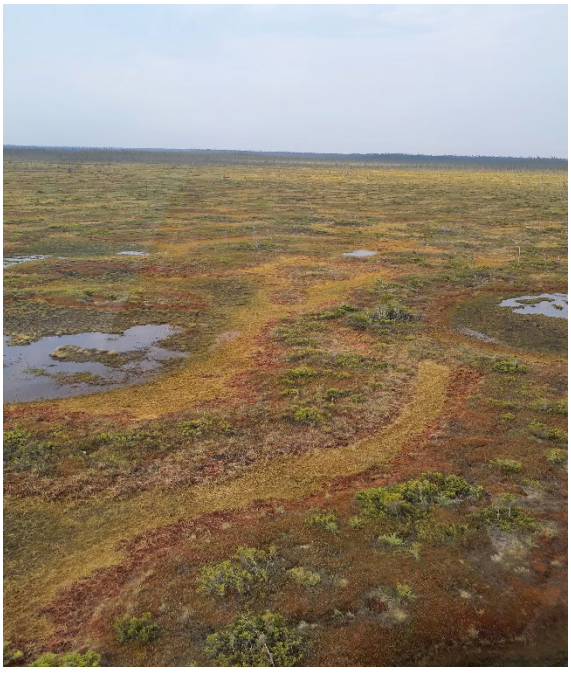

Photo 19: Aerial photo of Ecosite B141N (Open Extremely Rich Fen – Non-woody), Site Veg364, 17 June 2023.

Photo 20: Ground photo of Ecosite B141N (Open Extremely Rich Fen – Non-woody), Site Veg 443, 4 August 2023.

Photo 21: Aerial photo of Ecosite B146N (Open Shore Fen – Non-woody), Site Veg078, 27 September 2021.

Photo 22: Ground photo of Ecosite B146N (Open Shore Fen – Non-woody), Site Veg389, 18 June 2023.

Photo 23: Aerial photo of Ecosite B146N (Open Shore Fen – Non-woody), Site Veg411, 18 June 2023

Photo 24: Ground photo of Ecosite B146S (Open Shore Fen – Shrub), Site Veg355, 17 June 2023.

Photo 25: Aerial photo of Ecosite B147S (Shore Fen - Shrub), Site Veg284, 24 September 2021.

Photo 26: Ground photo of Ecosite B147S (Shore Fen - Shrub), Site Veg149, 26 September 2021.

Organic Conifer Swamp Ecosites

Photo 27: Aerial photo of Ecosite B128TI (Organic Intermediate Conifer Swamp – Low Treed), Site Veg262, 29 September 2021.

Photo 28: Ground photo of Ecosite B128TI (Organic Intermediate Conifer Swamp – Low Treed), Site Veg449, 4 August 2023.

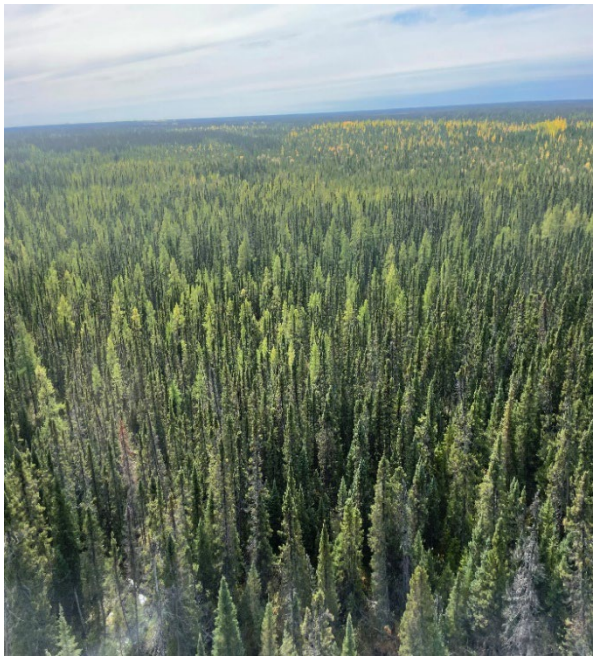

Photo 29: Aerial photo of Ecosite B128Tt (Organic Intermediate Conifer Swamp – Tall Treed), Site Veg271, 24 September 2021.

Photo 30: Ground photo of Ecosite B128Tt (Organic Intermediate Conifer Swamp – Tall Treed), Site Veg352A, 18 June 2023.

Thicket Swamp Ecosites

Photo 31: Aerial photo of Ecosite B134S (Mineral Thicket Swamp), Site Veg427, 18 June 2023.

Photo 32: Ground photo of Ecosite B134S (Mineral Thicket Swamp), Site Veg508, 4 August 2023.

Photo 33: Aerial photo of Ecosite B135S (Organic Thicket Swamp), Site Veg502A, 17 June 2023.

Photo 34: Ground photo of Ecosite B135S (Organic Thicket Swamp), Site Veg601A, 17 June 2023.

Mineral Conifer Swamp Ecosites

Photo 35: Aerial photo of Ecosite B222Tt (Mineral Poor Conifer Swamp – Tall Treed), Site Veg419, 17 June 2023.

Photo 36: Ground photo of Ecosite B222Tl (Mineral Poor Conifer Swamp – Low Treed), Site Veg042, 22 September 2021.

Photo 37: Aerial photo of Ecosite B223Tt (Mineral Intermediate Conifer Swamp – Tall Treed), Site Veg507A, 18 June 2023.

Photo 38: Ground photo of Ecosite B223Tt (Mineral Intermediate Conifer Swamp – Tall Treed), Site Veg012, 24 September 2021.

Mineral Marsh Ecosites

Photo 39: Aerial photo of Ecosite B142N (Mineral Meadow Marsh – Non-woody), Site Veg395, 15 June 2023.

Photo 40: Ground photo of Ecosite B142N (Mineral Meadow Marsh – Non-woody), Site Veg011, 24 September 2021.

Organic Marsh Ecosites

Photo 41: Aerial photo of Ecosite B144N (Organic Meadow Marsh – Non-woody), Site Veg069, 26 September 2021.

Photo 42: Ground photo of Ecosite B144N (Organic Meadow Marsh – Non-woody), Site Veg461, 3 August 2023.

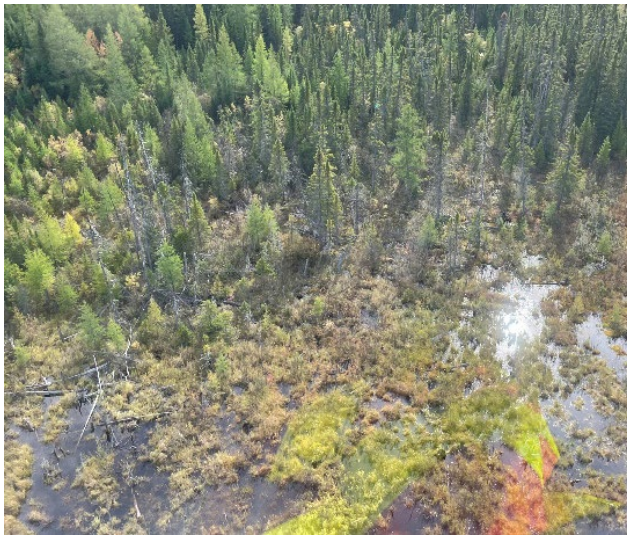

Photo 43: Aerial photo of Ecosite B149N (Organic Shallow Marsh - Non-woody) in the foreground, Site Veg094, 24 September 2021.

Photo 44: Ground photo of Ecosite B149N (Organic Shallow Marsh – Non-woody), Site Veg035, 27 September 2021.

Bog Ecosites

Photo 45: Aerial photo of Ecosite B126Tl (Treed Bog – Low Treed), Site Veg383, 15 June 2023.

Photo 46: Ground photo of Ecosite B126Tl (Treed Bog – Low Treed), Site Veg442, 4 August 2023.

Photo 47: Ground photo of Ecosite B126Tt (Treed Bog – Tall Treed), Site Veg250A, 23 September 2021.

Photo 48: Ground photo of Ecosite B126Tt (Treed Bog – Tall Treed), Site Veg250A, 23 September 2021.

Photo 49: Ground photo of Ecosite B137Tl (Sparse Treed Bog – Low Treed), Site Veg451, 3 August 2023.

Photo 50: Aerial photo of Ecosite B137Tl (Sparse Treed Bog – Low Treed), Site Veg084, 27 September 2021.

Photo 51: Aerial photo of Ecosite B137Tt (Sparse Treed Bog – Tall Treed), Site Veg150, 26 September 2021.

Photo 52: Aerial photo of Ecosite B137Tt (Sparse Treed Bog – Tall Treed), Site Veg331, 24 September 2021.

Photo 53: Ground photo of Ecosite B138N (Open Bog – Non-woody), Site Veg516, 4 August 2023.

Photo 54: Ground photo of Ecosite B138N (Open Bog – Non-woody), Site Veg516, 4 August 2023.

Annex D – Table D-1: Field Verified Ecosites

Table D-11: Field Verified Ecosites within the Local Study Area

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
M22SAD1	B040Tt: Dry, Sandy: Aspen - Birch Hardwood	B040Tt: Dry, Sandy: Aspen - Birch Hardwood	Ground	LSA
M22SAD3	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
M22SAD6	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	CDA
M22SAD7	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B012Tl: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	CDA
M22SAD8a	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	LSA
M22SAD8b	B128Tt: Organic Intermediate Conifer Swamp	B012Tl: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	LSA
M22SAD9	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg002A	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B040Tt: Dry, Sandy: Aspen - Birch Hardwood	Ground	CDA
Veg004	B128Tt: Organic Intermediate Conifer Swamp	B136Tt: Sparse Treed Fen	Ground	CDA
Veg005A	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Ground	CDA
Veg011	B140N: Open Moderately Rich Fen	B142N: Mineral Meadow Marsh	Ground	CDA
Veg012	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B223: Mineral Intermediate Conifer Swamp	Ground	CDA
Veg014	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg016	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg018	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg019	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg020	B144N: Organic Meadow Marsh	B142N: Mineral Meadow Marsh	Ground	LSA
Veg021A	B005X: Active Mineral Shoreline	B005X: Active Mineral Shoreline	Ground	CDA
Veg022	B128Tl: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg025	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B127Tt: Organic Poor Conifer Swamp	Ground	CDA
Veg026	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Ground	LSA
Veg027	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Ground	LSA
Veg028	B129Tt: Organic Rich Conifer Swamp	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Ground	LSA
Veg029	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	LSA
Veg030	B139N: Poor Fen	B135: Organic Thicket Swamp	Ground	CDA
Veg031	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B063S: Moist, Coarse, Shrub	Ground	LSA
Veg033	B128Tt: Organic Intermediate Conifer Swamp	B127Tl: Organic Poor Conifer Swamp	Visual	CDA
Veg034	B128Tt: Organic Intermediate Conifer Swamp	B129Tl: Organic Rich Conifer Swamp	Ground	LSA
Veg035	B142N: Mineral Meadow Marsh	B149N: Organic Shallow Marsh	Ground	CDA
Veg036	B142N: Mineral Meadow Marsh	B149N: Organic Shallow Marsh	Ground	CDA
Veg037	B142N: Mineral Meadow Marsh	B139S: Poor Fen	Ground	CDA
Veg038	B127Tt: Organic Poor Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg039	B136Tl: Sparse Treed Fen	B138N: Open Bog	Ground	LSA
Veg041	B142N: Mineral Meadow Marsh	B142: Mineral Meadow Marsh	Ground	CDA
Veg042	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B222Tl: Mineral Poor Conifer Swamp	Ground	CDA
Veg043	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg044	B142N: Mineral Meadow Marsh	B223: Mineral Intermediate Conifer Swamp	Ground	CDA
Veg045	B128Tt: Organic Intermediate Conifer Swamp	B222Tt: Mineral Poor Conifer Swamp	Ground	CDA
Veg046	B136Tl: Sparse Treed Fen	B126Tt: Low Treed Bog	Ground	CDA
Veg047	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Ground	CDA
Veg048	B127Tt: Organic Poor Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Ground	CDA
Veg053	B136Tl: Sparse Treed Fen	B135S: Organic Thicket Swamp	Visual	CDA
Veg054	B128Tl: Organic Intermediate Conifer Swamp	B223: Mineral Intermediate Conifer Swamp	Ground	CDA
Veg055	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B088Tt: Fresh, Clayey: Aspen - Birch Hardwood	Ground	LSA
Veg057	B142N: Mineral Meadow Marsh	B134S: Mineral Thicket Swamp	Visual	CDA
Veg058	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128: Organic Intermediate Conifer Swamp	Visual	CDA
Veg059	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA

[1] Ecosites from Ecosites of Ontario (Banton et al 2009).
Ecosite modifiers: Tt = tall treed; Tl = low treed; X = not vegetated; N = not woody; S = shrub.

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg060	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg061	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg062	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg063	B127Tt: Organic Poor Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Ground	CDA
Veg064	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg065	B142N: Mineral Meadow Marsh	B142N: Mineral Meadow Marsh	Visual	CDA
Veg066	B142N: Mineral Meadow Marsh	B142N: Mineral Meadow Marsh	Visual	CDA
Veg069	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Visual	CDA
Veg070	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B222Tt: Mineral Poor Conifer Swamp	Visual	CDA
Veg071	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Visual	CDA
Veg072	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tl: Organic Intermediate Conifer Swamp	Visual	CDA
Veg073	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg075	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	CDA
Veg076	B142N: Mineral Meadow Marsh	B142N: Mineral Meadow Marsh	Visual	CDA
Veg077	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	CDA
Veg078	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	CDA
Veg079	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	CDA
Veg082	B142N: Mineral Meadow Marsh	B136Tt: Sparse Treed Fen	Visual	CDA
Veg083	B128Tt: Organic Intermediate Conifer Swamp	B144N: Organic Meadow Marsh	Visual	CDA
Veg084	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B137Tl: Sparse Teed Bog	Visual	LSA
Veg085	B128Tl: Organic Intermediate Conifer Swamp	B135: Organic Thicket Swamp	Visual	CDA
Veg086	B142N: Mineral Meadow Marsh / B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg088	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	CDA
Veg089	B128Tt: Organic Intermediate Conifer Swamp	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg090	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	LSA
Veg091	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Visual	CDA
Veg092	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg096	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B126Tt: Low Treed Bog	Ground	CDA
Veg097	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Ground	LSA
Veg098A	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Ground	CDA
Veg100A	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Ground	CDA
Veg101	B136Tl: Sparse Treed Fen	B137Tt: Sparse Teed Bog	Visual	LSA
Veg108	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg109	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B085Tt: Fresh, Clayey: Spruce - Fir Conifer	Ground	CDA
Veg112	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Ground	CDA
Veg113	B129Tt: Organic Rich Conifer Swamp	B129Tl: Organic Rich Conifer Swamp	Ground	LSA
Veg114	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg119	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B066Tt: Moist, Coarse: Cedar (Hemlock) Conifer	Visual	LSA
Veg121	B142N: Mineral Meadow Marsh	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg122	B128Tt: Organic Intermediate Conifer Swamp	B129Tt: Organic Rich Conifer Swamp	Ground	CDA
Veg126	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg127	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg128	B128Tt: Organic Intermediate Conifer Swamp	B136: Sparse Treed Fen	Visual	LSA
Veg129	B136Tl: Sparse Treed Fen	B136: Sparse Treed Fen	Ground	LSA
Veg132	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tl: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg133	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg136	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg138	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg139	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg141	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	LSA
Veg142	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg143	B136Tl: Sparse Treed Fen	B222: Mineral Poor Conifer Swamp	Visual	CDA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg145	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B224: Mineral Rich Conifer Swamp	Visual	LSA
Veg146	B136Tl: Sparse Treed Fen	B068Tt: Moist, Coarse: Conifer	Visual	CDA
Veg147	B136Tl: Sparse Treed Fen	Unknown	Visual	CDA
Veg148	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B068Tt: Moist, Coarse: Conifer	Visual	LSA
Veg149	B142N: Mineral Meadow Marsh	B147S: Shrub Shore Fen	Visual	LSA
Veg150	B136Tl: Sparse Treed Fen	B137Tt: Sparse Teed Bog	Visual	CDA
Veg151	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg152	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg153	B128Tl: Organic Intermediate Conifer Swamp	B137Tt: Sparse Teed Bog	Visual	LSA
Veg154	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg155	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg156	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Ground	LSA
Veg157	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg158	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg160	B128Tl: Organic Intermediate Conifer Swamp	B146N: Open Shore Fen	Visual	LSA
Veg161	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg162	B140N: Open Moderately Rich Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg163	B065Tl: Moist, Coarse: Black Spruce - Pine Conifer	B065Tl: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg164	B140N: Open Moderately Rich Fen	B136Tl: Sparse Treed Fen	Visual	LSA
Veg166	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg167	B136Tl: Sparse Treed Fen	B128: Organic Intermediate Conifer Swamp	Visual	CDA
Veg168	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	CDA
Veg169	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg170	B142N: Mineral Meadow Marsh	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg171	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B068Tt: Moist, Coarse: Conifer	Visual	LSA
Veg172	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg173	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	LSA
Veg174	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	LSA
Veg175	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg176	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	LSA
Veg177	B136Tl: Sparse Treed Fen	B129Tt: Organic Rich Conifer Swamp	Visual	LSA
Veg178	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B053Tt: Dry to Fresh, Coarse: Conifer	Visual	LSA
Veg179	B164Tt: Rock Barren	B164Tt: Rock Barren	Visual	CDA
Veg180	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg181	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B129Tt: Organic Rich Conifer Swamp	Visual	CDA
Veg182	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg183	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg184	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg185	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg186	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg187	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg188	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg189	B128Tt: Organic Intermediate Conifer Swamp	B135S: Organic Thicket Swamp	Visual	CDA
Veg190	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg191	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B040Tt: Dry, Sandy: Aspen - Birch Hardwood	Visual	CDA
Veg192	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	LSA
Veg193	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg194	B128Tt: Organic Intermediate Conifer Swamp	B129Tt: Organic Rich Conifer Swamp	Visual	LSA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg195	B136Tl: Sparse Treed Fen	B129Tt: Organic Rich Conifer Swamp	Visual	LSA
Veg196	B136Tl: Sparse Treed Fen	B140S: Open Moderately Rich Fen	Visual	LSA
Veg197	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	LSA
Veg198	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	LSA
Veg199	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg200	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	CDA
Veg201	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg202	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg203	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg204	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg205	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg206	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg207	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg208	B128Tl: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg209	B142N: Mineral Meadow Marsh	B142N: Mineral Meadow Marsh	Visual	LSA
Veg210	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg211	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg215	B142N: Mineral Meadow Marsh	Unknown	Visual	CDA
Veg216	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg217	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg222	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg223	B128Tt: Organic Intermediate Conifer Swamp	B128Tl: Organic Intermediate Conifer Swamp	Visual	CDA
Veg224	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg225	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg226	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	LSA
Veg230	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg231	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg232	B136Tl: Sparse Treed Fen	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg233	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	LSA
Veg234	B136Tl: Sparse Treed Fen	B127Tl: Organic Poor Conifer Swamp	Visual	LSA
Veg235	B142N: Mineral Meadow Marsh	B140S: Open Moderately Rich Fen	Visual	LSA
Veg236	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg237	B140S: Open Moderately Rich Fen	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg238	B140N: Open Moderately Rich Fen	B139N: Poor Fen	Visual	LSA
Veg239	B140N: Open Moderately Rich Fen	B139: Poor Fen	Visual	LSA
Veg240	B137Tl: Sparse Teed Bog	B136Tl: Sparse Treed Fen	Visual	LSA
Veg241	B141N: Open Extremely Rich Fen	B140N: Open Moderately Rich Fen	Visual	LSA
Veg242	B140N: Open Moderately Rich Fen	B136Tl: Sparse Treed Fen	Visual	LSA
Veg244	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg245	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	LSA
Veg250A	B126Tl: Low Treed Bog	B126Tt: Low Treed Bog	Visual	CDA
Veg252	B135S: Organic Thicket Swamp	B142: Mineral Meadow Marsh	Visual	LSA
Veg253	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B142: Mineral Meadow Marsh	Ground	LSA
Veg255	B129Tl: Organic Rich Conifer Swamp	B129Tl: Organic Rich Conifer Swamp	Visual	LSA
Veg256A	B136Tl: Sparse Treed Fen	B136Tt: Sparse Treed Fen	Ground	LSA
Veg257	B136Tl: Sparse Treed Fen	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg258A	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B088Tt: Fresh, Clayey: Aspen - Birch Hardwood	Ground	LSA
Veg259	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg260	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	LSA
Veg261	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	LSA
Veg262	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B128Tl: Organic Intermediate Conifer Swamp	Visual	LSA
Veg264	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	LSA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg265	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	LSA
Veg266	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B136Tt: Sparse Treed Fen	Visual	CDA
Veg267	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg268	B128Tt: Organic Intermediate Conifer Swamp	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg269	B128Tl: Organic Intermediate Conifer Swamp	B068Tt: Moist, Coarse: Conifer	Visual	LSA
Veg270	B142N: Mineral Meadow Marsh	B137Tl: Sparse Teed Bog	Visual	LSA
Veg271	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg272	B136Tl: Sparse Treed Fen	B136Tt: Sparse Treed Fen	Visual	LSA
Veg273	B136Tl: Sparse Treed Fen	B136Tt: Sparse Treed Fen	Visual	CDA
Veg274	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg275	B128Tt: Organic Intermediate Conifer Swamp	B223: Mineral Intermediate Conifer Swamp	Visual	LSA
Veg276	B142N: Mineral Meadow Marsh	B149N: Organic Shallow Marsh	Visual	LSA
Veg277	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	LSA
Veg278	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B127: Organic Poor Conifer Swamp	Visual	LSA
Veg279	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg280	B128Tt: Organic Intermediate Conifer Swamp	B128Tl: Organic Intermediate Conifer Swamp	Visual	LSA
Veg283	B142N: Mineral Meadow Marsh	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg284	B142N: Mineral Meadow Marsh	B147S: Shrub Shore Fen	Visual	LSA
Veg285	B127Tt: Organic Poor Conifer Swamp	B053Tt: Dry to Fresh, Coarse: Conifer	Visual	LSA
Veg286	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg287	B142N: Mineral Meadow Marsh	B140N: Open Moderately Rich Fen	Visual	LSA
Veg288	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	LSA
Veg289	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg298	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg303	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Ground	LSA
Veg304A	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Ground	LSA
Veg305	B140N: Open Moderately Rich Fen / B128Tl: Organic Intermediate Conifer Swamp	B136Tl: Sparse Treed Fen	Visual	CDA
Veg306	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	CDA
Veg307	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg308	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	CDA
Veg309	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg310	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg311	B137Tl: Sparse Teed Bog	B137Tt: Sparse Teed Bog	Visual	CDA
Veg315	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Ground	CDA
Veg317A	B129Tt: Organic Rich Conifer Swamp	B129Tt: Organic Rich Conifer Swamp	Ground	CDA
Veg321A	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Ground	CDA
Veg323	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B083Tt: Fresh, Clayey: Black Spruce - Pine Conifer	Ground	CDA
Veg325	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B086Tl: Fresh, Clayey: Conifer	Ground	CDA
Veg327	B142N: Mineral Meadow Marsh	B146S: Open Shore Fen	Ground	LSA
Veg328	B146N: Open Shore Fen	B139S: Poor Fen	Ground	LSA
Veg329	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Ground	LSA
Veg331	B127Tt: Organic Poor Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg332	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	CDA
Veg334	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg337	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg338	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B222Tt: Mineral Poor Conifer Swamp	Visual	CDA
Veg339	B053Tt: Dry to Fresh, Coarse: Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg340	B128Tl: Organic Intermediate Conifer Swamp	B129Tl: Organic Rich Conifer Swamp	Visual	CDA
Veg341	B128Tt: Organic Intermediate Conifer Swamp	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg342	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg343	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg344	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg347	B136Tl: Sparse Treed Fen	B129Tt: Organic Rich Conifer Swamp	Ground	CDA
Veg351	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg352A	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Ground	CDA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg353	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg354	B159N: Open Cliff	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg355	B142N: Mineral Meadow Marsh	B146S: Open Shore Fen	Ground	LSA
Veg356	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg357	B053Tt: Dry to Fresh, Coarse: Conifer	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	Visual	CDA
Veg358	B136Tt: Sparse Treed Fen	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg359	B140S: Open Moderately Rich Fen	B136Tl: Sparse Treed Fen	Ground	LSA
Veg361	B137Tl: Sparse Teed Bog	B136Tl: Sparse Treed Fen	Ground	CDA
Veg363	B137Tl: Sparse Teed Bog	B136Tl: Sparse Treed Fen	Visual	LSA
Veg364	B141N: Open Extremely Rich Fen	B141N: Open Extremely Rich Fen	Visual	LSA
Veg365	B141N: Open Extremely Rich Fen	B139N: Poor Fen	Visual	LSA
Veg366	B136Tl: Sparse Treed Fen	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg367	B141N: Open Extremely Rich Fen	B141N: Open Extremely Rich Fen	Visual	LSA
Veg368	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg369	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg370	B126Tl: Low Treed Bog	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg371	B126Tl: Low Treed Bog	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg372	B126Tl: Low Treed Bog	B127Tl: Organic Poor Conifer Swamp	Visual	LSA
Veg373	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg374	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg375	B141N: Open Extremely Rich Fen	B141S: Open Extremely Rich Fen	Ground	LSA
Veg376	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg377	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	CDA
Veg378	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg379	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg380	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	LSA
Veg381	B076Tt: Moist, Coarse: Mixedwood	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg382	B076Tt: Moist, Coarse: Mixedwood	B101Tt:Fresh, Silty to Fine Loamy: Spruce - Fir Conifer	Ground	CDA
Veg382A	B076Tt: Moist, Coarse: Mixedwood	B101Tt: Fresh, Silty to Fine Loamy: Spruce - Fir Conifer	Ground	CDA
Veg383	B136Tl: Sparse Treed Fen	B126Tl: Low Treed Bog	Visual	CDA
Veg384	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg385	B141N: Open Extremely Rich Fen	B141N: Open Extremely Rich Fen	Visual	LSA
Veg386	B137Tt: Sparse Teed Bog	B139S: Poor Fen	Visual	LSA
Veg387	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Visual	CDA
Veg389	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Ground	LSA
Veg390	B136Tl: Sparse Treed Fen	B126Tl: Low Treed Bog	Visual	LSA
Veg391	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg392	B146N: Open Shore Fen	B146N: Open Shore Fen	Visual	CDA
Veg393	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg394	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg395	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Visual	CDA
Veg396	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg397	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tl: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg398	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg399	B128Tt: Organic Intermediate Conifer Swamp	B127Tl: Organic Poor Conifer Swamp	Visual	CDA
Veg400	B128Tt: Organic Intermediate Conifer Swamp	B149N: Organic Shallow Marsh	Visual	CDA
Veg401	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg402	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg403	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	LSA
Veg404	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg405	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B065Tt: Moist, Coarse: Black Spruce - Pine Conifer	Visual	CDA
Veg406	B139N: Poor Fen	B139N: Poor Fen	Visual	LSA
Veg407	B139: Poor Fen	B139N: Poor Fen	Visual	LSA
Veg408	B136Tl: Sparse Treed Fen	B126Tl: Low Treed Bog	Visual	LSA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg409	B127Tt: Organic Poor Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg410	B140N: Open Moderately Rich Fen	B146N: Open Shore Fen	Visual	LSA
Veg411	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	LSA
Veg412	B126Tl: Low Treed Bog	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg413	B136Tt: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg414	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Visual	LSA
Veg415	B140N: Open Moderately Rich Fen	B140N: Open Moderately Rich Fen	Visual	LSA
Veg416	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Visual	CDA
Veg417	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	CDA
Veg418	B126Tl: Low Treed Bog	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg419	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B222Tt: Mineral Poor Conifer Swamp	Visual	CDA
Veg420	B136Tl: Sparse Treed Fen	B136Tt: Sparse Treed Fen	Visual	LSA
Veg424	B223Tl: Mineral Intermediate Conifer Swamp	B223Tt: Mineral Intermediate Conifer Swamp	Visual	CDA
Veg425	B140S: Open Moderately Rich Fen	B142N: Mineral Meadow Marsh	Visual	LSA
Veg426	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg427	B135S: Organic Thicket Swamp	B135S: Organic Thicket Swamp	Visual	LSA
Veg428	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B052Tt: Dry to Fresh, Coarse: Spruce - Fir Conifer	Visual	CDA
Veg429	B136Tl: Sparse Treed Fen	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg430	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg431	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg432	B128Tt: Organic Intermediate Conifer Swamp	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg433	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg434	B128Tt: Organic Intermediate Conifer Swamp	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg435	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg438	B049Tl: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Unknown	Visual	LSA
Veg439	B126Tl: Low Treed Bog	B126Tl: Low Treed Bog	Visual	LSA
Veg440	B126Tl: Low Treed Bog	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg442	B126Tl: Low Treed Bog	B126Tl: Low Treed Bog	Ground	LSA
Veg443	B140N: Open Moderately Rich Fen	B141N: Open Extremely Rich Fen	Ground	LSA
Veg446	B127Tl: Organic Poor Conifer Swamp	B127Tl: Organic Poor Conifer Swamp	Ground	LSA
Veg449	B127Tl: Organic Poor Conifer Swamp	B128Tl: Organic Intermediate Conifer Swamp	Ground	LSA
Veg450	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Ground	LSA
Veg451	B137Tl: Sparse Teed Bog	B137Tl: Sparse Teed Bog	Ground	LSA
Veg455	B141N: Open Extremely Rich Fen	B140: Open Moderately Rich Fen	Ground	LSA
Veg456	B140S: Open Moderately Rich Fen	B139S: Poor Fen	Ground	LSA
Veg457	B140S: Open Moderately Rich Fen	B140S: Open Moderately Rich Fen	Ground	LSA
Veg459	B128Tl: Organic Intermediate Conifer Swamp	B129Tl: Organic Rich Conifer Swamp	Visual	LSA
Veg460	B059Tt: Dry to Fresh, Coarse: Mixedwood	B059Tt: Dry to Fresh, Coarse: Mixedwood	Visual	CDA
Veg461	B139N: Poor Fen	B144N: Organic Meadow Marsh	Ground	LSA
Veg462	B139N: Poor Fen	B144N: Organic Meadow Marsh	Ground	LSA
Veg463	B139S: Poor Fen	B129Tt: Organic Rich Conifer Swamp	Visual	CDA
Veg464	B076Tt: Moist, Coarse: Mixedwood	B067Tt: Moist, Coarse: Spruce - Fir Conifer	Visual	LSA
Veg465	B076Tt: Moist, Coarse: Mixedwood	B076Tt: Moist, Coarse: Mixedwood	Visual	CDA
Veg466	B136Tl: Sparse Treed Fen	B129Tt: Organic Rich Conifer Swamp	Visual	LSA
Veg467	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg468	B129Tt: Organic Rich Conifer Swamp	B129Tt: Organic Rich Conifer Swamp	Visual	LSA
Veg469	B142N: Mineral Meadow Marsh	B146N: Open Shore Fen	Ground	LSA
Veg471	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg473	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg474	B128Tt: Organic Intermediate Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg475	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	B127Tl: Organic Poor Conifer Swamp	Ground	CDA
Veg476	B012Tt: Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	B127Tl: Organic Poor Conifer Swamp	Ground	CDA
Veg477	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg478	B049Tt: Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg479	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg480	B065Tt: Moist Coarse: Black Spruce - Pine Conifer	B128Tt: Organic Intermediate Conifer Swamp	Ground	CDA
Veg481	B142N: Mineral Meadow Marsh	B144N: Organic Meadow Marsh	Visual	CDA
Veg482	B128Tl: Organic Intermediate Conifer Swamp	B128Tl: Organic Intermediate Conifer Swamp	Visual	CDA

Station Name	Desktop Assessment Ecosite[1]	Field-verification Ecosite	Type	Location
Veg483	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tt: Organic Intermediate Conifer Swamp	Visual	CDA
Veg484	B050Tl: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B128Tl: Organic Intermediate Conifer Swamp	Visual	LSA
Veg485	B199X: Other Materials	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg486	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	B055: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	CDA
Veg487	B136Tl: Sparse Treed Fen	B136Tt: Sparse Treed Fen	Visual	CDA
Veg488	B136Tl: Sparse Treed Fen	B127: Organic Poor Conifer Swamp	Visual	CDA
Veg490	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg491	B128Tt: Organic Intermediate Conifer Swamp	B085Tt: Fresh, Clayey: Spruce - Fir Conifer	Visual	CDA
Veg492	B128Tt: Organic Intermediate Conifer Swamp	B128: Organic Intermediate Conifer Swamp	Visual	CDA
Veg493	B136Tl: Sparse Treed Fen	B127Tt: Organic Poor Conifer Swamp	Visual	LSA
Veg500A	B141N: Open Extremely Rich Fen	B139N: Poor Fen	Visual	LSA
Veg501A	B127Tt: Organic Poor Conifer Swamp	B127Tt: Organic Poor Conifer Swamp	Visual	CDA
Veg502A	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	LSA
Veg503A	B140N: Open Moderately Rich Fen	B139N: Poor Fen	Visual	LSA
Veg504A	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Visual	LSA
Veg505A	B136Tl: Sparse Treed Fen	B137Tl: Sparse Teed Bog	Visual	LSA
Veg506A	B059Tt: Dry to Fresh, Coarse: Mixedwood	B055Tt: Dry to Fresh, Coarse: Aspen - Birch Hardwood	Visual	LSA
Veg507A	B223Tt: Mineral Intermediate Conifer Swamp	B223Tt: Mineral Intermediate Conifer Swamp	Visual	LSA
Veg508	B135S: Organic Thicket Swamp	B134S: Mineral Thicket Swamp	Ground	LSA
Veg509	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Visual	LSA
Veg512	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Visual	LSA
Veg514	B128Tl: Organic Intermediate Conifer Swamp	B136Tl: Sparse Treed Fen	Visual	LSA
Veg515	B136Tl: Sparse Treed Fen	B136Tl: Sparse Treed Fen	Ground	LSA
Veg516	B140N: Open Moderately Rich Fen	B138N: Open Bog	Ground	LSA
Veg600A	B128Tt: Organic Intermediate Conifer Swamp	B128Tt: Organic Intermediate Conifer Swamp	Ground	LSA
Veg601A	B142N: Mineral Meadow Marsh	B135S: Organic Thicket Swamp	Ground	LSA
Veg602A	B050Tt: Dry to Fresh, Coarse: Pine - Black Spruce Conifer	B127Tt: Organic Poor Conifer Swamp	Ground	LSA
Ecosite modifiers: Tt = tall treed; Tl = low treed; X = not vegetated; N = not woody; S = shrub.				

Attachment C – Ecosites with Habitat Suitability for Traditional Use Plant Species in the Existing Conditions Local Study Area

Table C-1. Ecosites with Habitat Suitability for Traditional Use Plant Species in the Existing Conditions Local Study Area

| Ecosite[1] | Traditional Use Plant Species[2] | | |

Ecosite[1]		Traditional Use Plant Species[2]																																								
	Blue Flag	American Sweetflag	Bog Goldenrod	Broad-leaved Cattail	Labrador Tea	Northern Black Currant	Northern Wild Rice	Small Cranberry	Sphagnum moss	Willow	Yellow Pond-lily	Balsam Fir	Black Spruce	Cloudberry	Creeping Snowberry	Eastern White Cedar	Highbush Cranberry	Red-osier Dogwood	Tamarack	Velvet-leaved Blueberry	Alpine Bilberry / Bog	Bunchberry	Fireweed	Sweetgrass	Common Yarrow	Indian-pipe	Jack Pine	Northern Mountain-ash	Paper Birch	Prickly Rose	Red Raspberry	Red Willow - (Green	Saskatoon berry[3]	Wild Strawberry	Common Bearberry	Balsam Poplar	Black Crowberry	Caribou / Reindeer	Dwarf birch	Narrow-leaved	Trembling Aspen	White Spruce	Common Labrador Tea	Northern Labrador Tea
B053Tt: Dry to Fresh, Coarse: Conifer					*							**X***	**X***			**X**			**X***	**X**		**X**				X	**X**	**X**	**X**	**X**			X		X			X*			**X***	**X***	*	
B053Tl: Dry to Fresh, Coarse: Conifer												**X**	**X**			**X**			**X**	**X**		**X**				X	**X**	**X**	**X**	**X**			X		X			X			**X**	**X**		
B055Tl: Dry to Fresh, Coarse: Aspen – Birch Hardwood																													*						*								
B055Tt: Dry to Fresh, Coarse: Aspen – Birch Hardwood					*					*		**X***	**X***			*		*	*	X		**X***				X	**X***	**X**	**X***	*	*	*	X		X	X*		*			**X***	X*	*	
B057Tt: Dry to Fresh, Coarse: Oak Hardwood												**X**				X				X		**X**					X	**X**	**X**						X						**X**	X		
B059Tl: Dry to Fresh, Coarse: Mixedwood												**X**	**X**			X				X		**X**				X	**X**	**X**	**X**						X						**X**	**X**		
B059Tt: Dry to Fresh, Coarse: Mixedwood												**X**	**X***			X				X		**X**				X	**X**	**X**	**X***						X						**X***	**X**		
B063S: Moist, Coarse, Shrub									**X**	**X***							**X**	**X***		X									**X***	*			**X**		**X**						X*	**X**		
B065Tl: Moist, Coarse: Black Spruce – Pine Conifer					**X***				**X**	X*		**X**	**X***		**X**	X	X		**X**	**X**		**X**					**X***		**X***	X	X				X		**X**			**X***		**X***	
B065Tt: Moist, Coarse: Black Spruce – Pine Conifer					**X***				**X**	X*		**X***	**X***		**X**	X	X		**X***	**X***		**X***				X	**X***		**X***			*			X*		**X***			**X***	*	**X***	
B066Tt: Moist, Coarse: Cedar (Hemlock) Conifer												*	*			*																										**X**	
B067Tt: Moist, Coarse: Spruce – Fir Conifer					X*					X*		**X***	**X***		X	X	X		*	**X**		**X**				X	**X***	**X**	**X***			*			**X**			X*			**X***	*	X*	

Ecosite[1]	Traditional Use Plant Species[2]																																												
	Blue Flag	American Sweetflag	Bog Goldenrod	Broad-leaved Cattail	Labrador Tea	Northern Black Currant	Northern Wild Rice	Small Cranberry	Sphagnum moss	Willow	Yellow Pond-lily	Balsam Fir	Black Spruce	Cloudberry	Creeping Snowberry	Eastern White Cedar	Highbush Cranberry	Red-osier Dogwood	Tamarack	Velvet-leaved Blueberry	Alpine Bilberry / Bog	Bunchberry	Fireweed	Sweetgrass	Common Yarrow	Indian-pipe	Jack Pine	Northern Mountain-ash	Paper Birch	Prickly Rose	Red Raspberry	Red Willow - (Green	Saskatoon berry[3]	Wild Strawberry	Common Bearberry	Balsam Poplar	Black Crowberry	Caribou / Reindeer	Dwarf birch	Narrow-leaved	Trembling Aspen	White Spruce	Common Labrador Tea	Northern Labrador Tea
B068Tl: Moist, Coarse: Conifer					X				X	X		X	X		X	X	X		X	X		X				X	X	X	X	X						X		X			X	X	X	
B068Tt: Moist, Coarse: Conifer					X				X	X		X*	X*		X	X	X		X*	X		X				X	X*	X	X	X						X*		X	*		X*	X	X	
B070Tl: Moist, Coarse: Aspen – Birch Hardwood												X	X			X				X		X				X	X		X							X		X			X	X		
B070Tt: : Moist, Coarse: Aspen – Birch Hardwood												X	X			X				X		X				X	X		X							X		X			X	X		
B076Tt: Moist, Coarse: Mixedwood												X*	X*			X				X		X				X	X		X							X		X			X*			
B079Tt: Fresh clayey: sparse shrub										X		X					X	X		X			X						X	X	X	X				X					X	X		
B083Tt: Fresh, Clayey: Black Spruce – Pine Conifer									*			X	X*		*	X				X*		X*				X	X		X	X						X		*			X*	X		
B085Tt: Fresh, Clayey: Spruce – Fir Conifer												X*	X*			X				X		X*	*			X	X	X	X*	X*		*				X					X*	X*		
B086Tl: Fresh, Clayey: Conifer										*		X	X*			X			X*	X*		*	X*			X	X		X	X	X			X*		X*		*			X*	X		
B088Tt: Fresh, Clayey: Aspen – Birch Hardwood					*							X	X*		*					X*		X*	*			X	X*	X	X*	X*	*	*		X*		X		*			X*	X*		
B101Tt: Fresh, Silty to Fine Loamy: Spruce – Fir Conifer												*	*			*						*								*		*									*	*		
B117Tt: Moist, Fine: Conifer					*			*	X*	X*		X*	X*		X*	X	X		*	X*		*				X	X		X	X					*	X*		*			*	X	*	
B120Tt: Moist, Fine: Elm – Ash Hardwood						X						X	X			X	X	X		X								X	X							X					X			

Ecosite[1]	Traditional Use Plant Species[2]																																								
	Blue Flag	American Sweetflag	Bog Goldenrod	Broad-leaved Cattail	Labrador Tea	Northern Black Currant	Northern Wild Rice	Small Cranberry	Sphagnum moss	Willow	Yellow Pond-lily	Balsam Fir	Black Spruce	Cloudberry	Creeping Snowberry	Eastern White Cedar	Highbush Cranberry	Red-osier Dogwood	Tamarack	Velvet-leaved Blueberry	Alpine Bilberry / Bog	Bunchberry	Fireweed	Sweetgrass	Common Yarrow	Indian-pipe	Jack Pine	Northern Mountain-ash	Paper Birch	Prickly Rose	Red Raspberry	Red Willow - (Green	Saskatoon berry[3]	Wild Strawberry	Common Bearberry	Balsam Poplar	Black Crowberry	Caribou / Reindeer	Dwarf birch	Narrow-leaved	Trembling Aspen	White Spruce	Common Labrador Tea	Northern Labrador Tea
B126Tl: Low Treed Bog			X		**X***			**X***	**X***	X		X	X*	X*	X				X*		X		*															*	X			**X***	X
B126Tt: Low Treed Bog			X		**X***			**X***	**X***	X		X*	X*	X*	X*				X	*	X													*				*	X		*	**X***	X
B127Tl: Organic Poor Conifer Swamp			X	X	**X***	X		X*	**X***	X*		X	**X***	*	**X**	X	X	X	**X***	**X***		*	*				**X***			X					X	X	**X***	*	X	X		**X***	X
B127Tt: Organic Poor Conifer Swamp	*		X	X	**X***	X		X*	**X***	X*		X*	**X***	*	**X***	X	X	X	**X***	**X***		*	*				**X**		*	X*				*	*	X*	X	**X***	*	X	X*		**X***	X
B128Tl: Organic Intermediate Conifer Swamp				X	**X***	X		X*	**X***	X*		**X***	**X***	*	**X***	X	X	X	**X***	**X***		**X***					*			X						X	X	**X***	*	X	X*		**X***	X
B128Tt: Organic Intermediate Conifer Swamp				X	**X***	X		X*	**X***	X*		**X***	**X***	*	**X***	X*	X	X	**X***	**X***		**X***					*		*	X*		*		*	*	X*	X	**X***	*	X	X*	*	**X***	X
B129Tl: Organic Rich Conifer Swamp			*	X	**X***	X		X*	**X***	X*		**X***	**X***	*	**X***	**X***	X	X*	**X***	**X***	*	**X***	*					*	**X**	X*				*	X	X	**X***	*	X	X		**X***	X
B129Tt: Organic Rich Conifer Swamp				X	**X***	X		X*	**X***	X*		**X**	**X***	*	**X***	**X***	X	X*	**X***	**X***		**X***	*						**X***	X*				*	X	X	**X***	*	X*	X		**X***	X
B134S: Mineral Thicket Swamp	**X***			X		X		X	**X**	**X***		*	**X**		X		X	**X**	X	X									**X**	**X**	**X***				**X**				X		**X**		
B135S: Organic Thicket Swamp	**X***			**X**	**X***	X		X*	**X***	**X***		*	**X***	*	X*	**X***	X	**X***	**X***	X											*					**X**			*	X			**X***	X
B136Tl: Sparse Treed Fen	X*		X	X	**X***			X*	**X***	X*		X	**X***	*	**X***	*	X	*	**X***		X	**X***	*				*		*						*			**X***	*	X			**X***	X
B136Tt: Sparse Treed Fen			X	X	**X***			X*	**X***	X*		X*	**X***	*	**X***		X		**X***	*	X	**X***	*				*							*	*	*		**X***	*	X	*		**X***	X
B137Tl: Sparse Treed Bog			X		**X***			X*	**X***	X		**X**	**X***	X*	**X***				**X***		X	**X**																**X***		X*			**X***	X
B137Tt: Sparse Treed Bog			X		**X***			X*	**X***	X		**X**	**X***	X	**X**				**X***		X	**X**					*											**X***	*	X			**X***	X

Ecosite[1]	Traditional Use Plant Species[2]																																										
	Blue Flag	American Sweetflag	Bog Goldenrod	Broad-leaved Cattail	Labrador Tea	Northern Black Currant	Northern Wild Rice	Small Cranberry	Sphagnum moss	Willow	Yellow Pond-lily	Balsam Fir	Black Spruce	Cloudberry	Creeping Snowberry	Eastern White Cedar	Highbush Cranberry	Red-osier Dogwood	Tamarack	Velvet-leaved Blueberry	Alpine Bilberry / Bog	Bunchberry	Fireweed	Sweetgrass	Common Yarrow	Indian-pipe	Jack Pine	Northern Mountain-ash	Paper Birch	Prickly Rose	Red Raspberry	Red Willow - (Green	Saskatoon berry[3]	Wild Strawberry	Common Bearberry	Balsam Poplar	Black Crowberry	Caribou / Reindeer	Dwarf birch	Narrow-leaved	Trembling Aspen	White Spruce	Common Labrador Tea	Northern Labrador Tea
B138N: Open Bog			X		**X**			**X***	**X***	**X**			**X***	**X***	**X**				*		X																		X			**X**	X
B139N: Poor Fen			X	X	**X***			**X**	**X***	**X**		X	**X***		X		X		**X***		X						*												X*			**X***	X
B139S: Sparse Treed Bog	*		X	X	**X***			**X***	**X***	**X***		X	**X***	*	X		X		**X***		X						*											*	*	X*			**X***	X
B140N: Open Moderately Rich Fen			**X**	X				X	**X***	**X**		X	**X***		X		X		**X***		X																	*	X			X
B140S: Open Moderately Rich Fen			X	X				X	**X***	**X***			**X***		X		X		**X***		X*																		*	X			X
B141N: Open Extremely Rich Fen					**X***			X	**X***	X			**X***			**X**	X		**X***		X		*															*	X			**X***	X
B141S: Open Extremely Rich Fen					**X***			X	**X***	X			**X***			**X***	X		**X***		X																*		X			**X***	X
B142N: Mineral Meadow Marsh	X*		X	X	*					**X***			**X**	X	X			X*	**X***				*						X	*									X				
B144N: Organic Meadow Marsh	**X***		X	**X**				*	*	**X***			**X***	X	X	**X**		X	**X***							*			X	*			*			*	*	X				X
B146N: Open Shore Fen	**X***		X	**X***				**X***	**X***	**X***			*		X		X		*		X								*									*	X				X
B146S: Open Shore Fen	**X**		X	**X**				**X**	**X***	**X***			*		X		X		*		X*								*									*	X				X
B147S: Shrub Shore Fen	X		X	**X**	**X**			**X**	**X**	**X**			**X**		X		X		**X***		X																	*	X			**X**	X
B148N: Mineral Shallow Marsh	X	X	X	**X**			X				**X**																																	
B149N: Organic Shallow Marsh	X	**X**	X	**X**			**X**	*	*	X*	**X**		*	X				X	*										*										X				X

Ecosite[1]	Traditional Use Plant Species[2]																																										
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B151N: Open Water Marsh: Mineral				X							**X**																																
B153Tt: Constructed Water Collections	X	X		**X**					*	**X**																																	
B158Tt: Cliff																				**X**			X		X		X	X	**X**		X		X	X	**X**		X	**X**	X		X			
B159Tt: Open Cliff																				**X**			X		X			X	**X**		X		X	X	**X**		X	**X**	X		X			
B164Tl: Rock Barren										**X**		X	**X**			X				**X**	X		**X**		X		X		**X**			**X**	**X**	X	**X**		X	**X**	X					
B164Tt: Rock Barren										**X**		X	**X***			X				**X**	X		**X**		X		X*		**X**			**X**	**X**	X	**X**		X	**X**	X		*			
B168Tt: Open Talus or Historic/Raised Beach																							X		X			X	**X**		**X**		X	X	X		X	**X**	X					
B197X: Constructed: Water Shedding, Impervious and Compact																																											
B199X: Constructed: Coarse and Compact																																											
B222Tl: Mineral Poor Conifer Swamp				X	**X***	X		X*	**X***	X*		X*	**X***		**X***	X	X	X	X*	**X***		**X***					**X**			X*					*	X	X	**X***		X	**X**		**X***	
B222Tt: Mineral Poor Conifer Swamp				X	**X***	X		X	**X***	X		X	**X***		**X**	X	X	X	X*	**X**		**X**					**X**			X						X	X	**X**		X	**X**		**X***	
B223Tl: Mineral Intermediate Conifer Swamp				X	**X**	X		X	**X**	X		**X***	**X***		**X**	X	X	X	**X**	**X**		**X**							**X**	X					X	X	**X**		X	**X**		**X**	
B223Tt: Mineral Intermediate Conifer Swamp				X	**X***	X		X*	**X***	X*		**X***	**X***		**X***	X	X*	X*	**X***	**X***		**X***					*		**X**	X*	*	*		*	*	X*	X	**X***		X	**X***	*	**X***	

Ecosite[1]	Traditional Use Plant Species[2]																																										
	Blue Flag	American Sweetflag	Bog Goldenrod	Broad-leaved Cattail	Labrador Tea	Northern Black Currant	Northern Wild Rice	Small Cranberry	Sphagnum moss	Willow	Yellow Pond-lily	Balsam Fir	Black Spruce	Cloudberry	Creeping Snowberry	Eastern White Cedar	Highbush Cranberry	Red-osier Dogwood	Tamarack	Velvet-leaved Blueberry	Alpine Bilberry / Bog	Bunchberry	Fireweed	Sweetgrass	Common Yarrow	Indian-pipe	Jack Pine	Northern Mountain-ash	Paper Birch	Prickly Rose	Red Raspberry	Red Willow - (Green	Saskatoon berry[3]	Wild Strawberry	Common Bearberry	Balsam Poplar	Black Crowberry	Caribou / Reindeer	Dwarf birch	Narrow-leaved	Trembling Aspen	White Spruce	Common Labrador Tea	Northern Labrador Tea
Riparian habitats	X	X	X	X			X			X	X			X							X											X												

[1] Ecosite modifiers: Tt = tall treed; Tl = low treed; X = not vegetated; N = not woody; S = shrub.

[2] Plant species values: X = suitable based on habitat detail; reasonably likely that species would be present; bolded **X** = Key component of ecosite (included in vegetation description table), based on Boreal Ecosites (Uhlig 2015), * = observed in ecosite during field surveys.

[3] While *Amelanchier alnifolia* was not encountered during field surveys, several other *Amelanchier* species (A. *bartramiana, A. laevis*) were encountered [B012Tt, B050Tt, B055Tt, B063S, B088Tt, B127Tt, B128Tt, B129Tt, B223Tt] and may be harvested for traditional plant use.

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Phone: 1-800-764-9114 **Email:** info@martenfallsaccessroad.ca **Web:** http://www.martenfallsaccessroad.ca