# 6 Existing Environmental Conditions

This section describes the existing environmental conditions in the project area (refer to **Figure 1.1**) and the proposed approach to data collection to develop a fulsome understanding of the existing (or baseline) natural, socio-economic and cultural conditions for the Project. The EA will adopt a multi-scale approach for describing existing environmental conditions and predicting effects from the Project. As such, study areas will be used to define the geographic extent within which to capture the potential direct and indirect effects of the Project. The preliminary study area definitions for the purposes of the EA are provided in Section 8.1.

## 6.1 General Environmental Setting

The Project is located in Northwestern Ontario, with the northern end of the road approximately 525 km northeast of Thunder Bay (refer to **Figure 1.1)**. The Project is located on provincial Crown land, Webequie First Nation Reserve land under federal jurisdiction, and the traditional territories of Indigenous communities (refer also to Section 6.4.6 Land and Resource Use). **Figure 6.1** illustrates the location of the alternative routes in relation to project area features and sensitivities. Due to confidentiality constraints (including those imposed by Webequie First Nation and Government of Ontario ministries), and the need to respect the wishes of potentially affected Indigenous communities with respect to divulging certain information on the use of lands in the project area, it is not possible to illustrate the location or bounds of a number of features and sensitivities, including First Nations' traditional territories, individual camps/cabins, species at risk observations and government-regulated hunting areas (e.g., trapline licences).

The project area lies within the Ontario Shield Ecozone Region of Northern Ontario. This ecozone is known for the Precambrian bedrock, as well as many wetlands and large rivers and streams, which flow to Hudson Bay (Crins et al, 2009) and James Bay (Charron et al, 2014). Bogs and fens also dominate the region, with forest stands on higher ground formed on glacial materials, such as eskers or next to rivers. The project area is within the Big Trout Lake Ecoregion.

Hydrologically, the project area is situated within the primary Southwestern Hudson Bay watershed (refer to **Figure 6.2** information extracted from the 2017 All-Season Community Road Study). The area includes parts of the Winisk-Coast, Ekwan-Coast and Attawapiskat-Coast secondary watersheds, and falls within the following three (3) tertiary watersheds:

- Attawapiskat – Pineimuta River, Muketei River, Attawapiskat River;
- Winisk – Fishbasket River, Wapitotem River; and
- Ekwan – Ekwan River.

The Attawapiskat River flows in a generally easterly direction to James Bay, and the Winisk and Ekwan River systems flow north to Hudson Bay.

Portions of the preferred corridor for the all-season road traverse intact boreal forest (including bogs and fens). The terrain is generally low gradient with large wetland areas, several lakes and ponds, and slow flowing, often meandering streams and rivers. Upland areas are common along river banks and associated with glacial till deposits. These areas, with contrasting vegetation due to much better drained soils, constitute a relatively low percentage of the landscape in the area. Poplar trees dominate upland glacial till deposits, while dense spruce trees typically dominate the stream and river banks.

470000 480000 490000 500000 510000 520000 530000 540000 550000

5890000 5880000 5870000 5860000 5850000 5840000

Winisk Lake
Eastwood Island
Winisk Lake Crossing
Webequie Settlement
Bender Lake
Webequie Airport
Winiskisis Channel Crossing
Prime Lake
Muketei River
McFaulds Lake
Noront Resources Exploration Camp
Muketei River Crossing

**Legend**

- Proposed Major Water Crossings
- Optimal Geotechnical Route
- Route Preferred by Webequie Community
- Existing Winter Roads
- Spring Water Source Location (Approximate)
- Potential Aggregate Sources
- Webequie First Nation Reserve Limits
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

# Webequie Supply Road

*Project Area Features and Sensitivities*

| Date: 2020-03-13 | File Number: 649920 | Sub Code: 0000 |
|---|---|---|
| Figure Number: 6.1 | | Rev. 0 |

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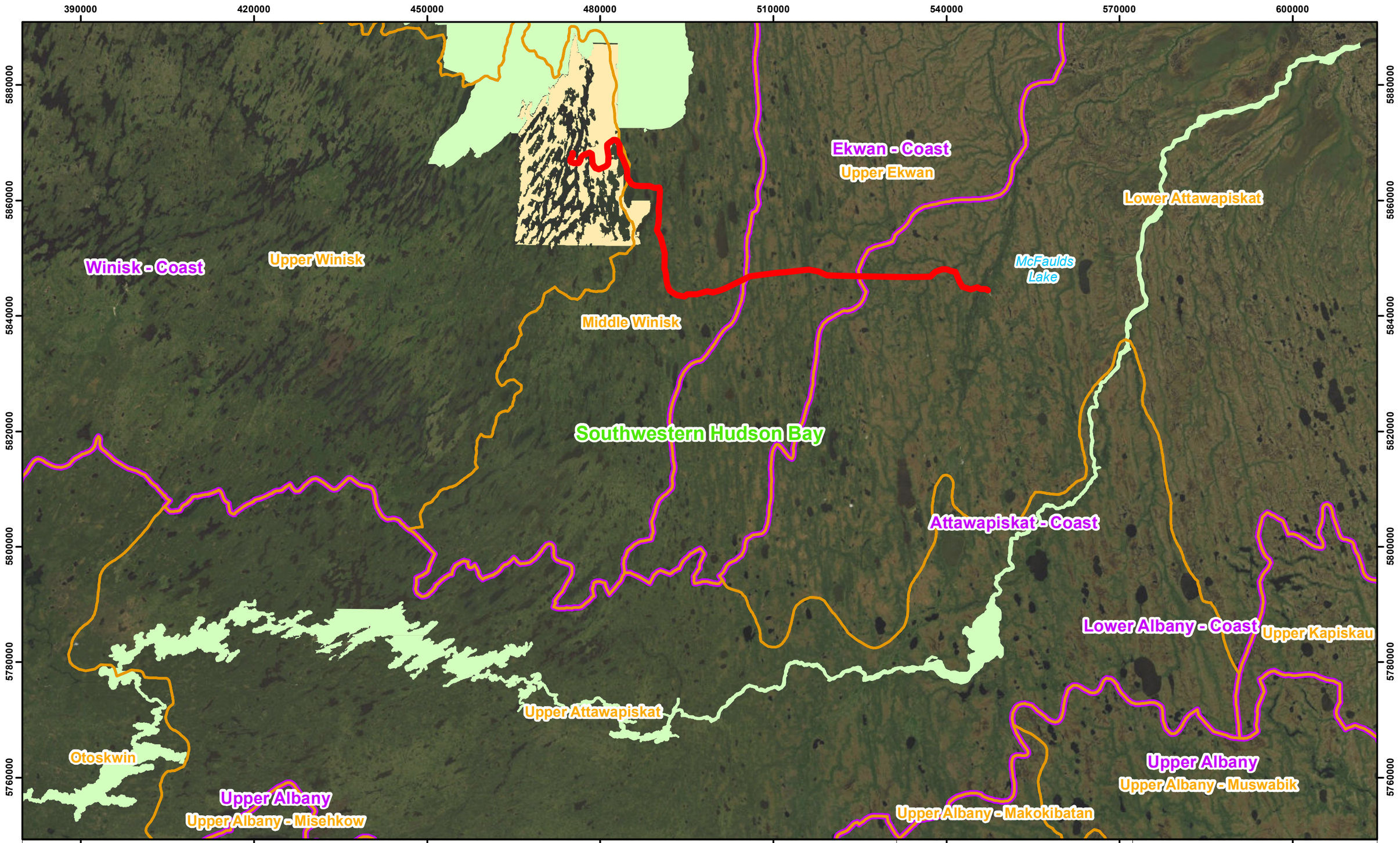


**Legend**

- Proposed Community Preferred Webequie Supply Road Route
- Primary Watersheds
- Secondary Watersheds
- Tertiary Watersheds
- Webequie First Nation Reserve
- Provincial Parks

WSR WEBEQUIE SUPPLY ROAD

0 5 10 20 Km

N

NAD 83
UTM Zone 16N

# Webequie Supply Road

*Project Area Watersheds and Subwatersheds*

| Date: 2020-03-13 | File Number: 649920 | Sub Code: 0000 |
|---|---|---|
| Figure Number: 6.2 | | Rev. 0 |

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## 6.2 Natural Environment

The following sections document the existing natural environment (biological and physical components) conditions for the Project. All information collected as part of the natural environment field program and obtained through Indigenous Knowledge transfer from WFN and other Indigenous communities will be used in the EA to determine the preferred corridor and to identify potential effects and proposed mitigation measures for the Project. Information collected for the EA may also be used by WFN to obtain other permits, approvals and/or licences that may be required to proceed to construction.

The description of the existing natural environment conditions in this section includes the preliminary results from the 2017 baseline studies conducted for the Webequie Supply Road as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). This baseline data is considered preliminary and the full details of these studies and other supplemental studies, including field collection methodologies and results, will be available for review during the EA phase of the Project.

### 6.2.1 Geology, Terrain and Soils

Surficial geology consists of exposed bedrock, as well as large moraines. Much of the surficial deposit is dominated by silt and silt clay deposits as a result of glaciolacustrine deposition from post-glacial Lake Agassiz. The landscape is weakly broken, with low lying ridges of clay and sand, and extensive peatlands in low lying areas (Crins et al, 2009).

Terrain and topography are generally flat, with some localized relief. Large stretches of the preferred corridor pass through water logged areas/marshes exhibiting poor ground condition, with deeper peat and organics and poor drainage.

The project area is characterized by predominantly flat, poorly drained soils with slow rates of plant decay. As a result, the development of organic soils and peat is common throughout much of the area. The organic surface layer typically ranges from 1 to 2 metres in thickness. It is underlain by a clay/silt till layer up to 2 m thick, and a Quaternary till layer up to 5 m thick. Depth to bedrock ranges from 5 to 12 m below the surface.

Surficial material in the region consists of unstratified post-glacial till interspersed with bedrock outcrops and stratified till. The surficial material in the project area is predominantly silty clay to silt matrix, commonly clast poor with high carbonate content. Soil development in the region varies depending on drainage. Low lying areas consist of organic soils, and soils (regosolic) with limited development (i.e., less than 5 centimetres thick) due to erosion of the landscape or hillslopes with higher water runoff or wind exposure.

Glaciofluvial esker deposits are common in the project area. Eskers are ridges that typically consist of a core of stratified sands and gravels. In esker deposits, the soils are much better drained, there is little surface organic material, and the groundwater table is further below the surface. Eskers are of particular interest for the caribou habitat values analysis at the sub-range and range scales. Being a small proportion of the landscape, eskers may have functions proportionally greater than their area alone might suggest.

The project area is situated within a band of sporadic permafrost that is part of the Discontinuous Permafrost Zone of Canada's permafrost region (National Atlas of Canada, 5th Edition (1995): Canada Permafrost). In the Discontinuous Zone, some areas beneath the land surface have permafrost and other areas are free of permafrost. In the sporadic permafrost band where the project area is located, permafrost occurs in

islands (10-50 % of the land area is underlain by permafrost), varies in thickness (estimated at a few metres in the project area), the active layer (surface layer of soil or rock above the permafrost) may not extend down to the permafrost, and ground ice content in the upper 10-20 m of the ground is categorized as Low (less than 10%). The thickness of the permafrost may be influenced by soil and rock type, snow cover and proximity to waterbodies.

### 6.2.2 Groundwater and Surface Water

From data available near McFaulds Lake area (Noront, 2013) groundwater is present in the saturated organic material and in unstratified and stratified glacial till (composed of sand, silt and clay). There is also groundwater present in the near-surface and deep bedrock layers. Hydraulic conductivities (K) are on the order of $10^{-4}$ m/s in the coarser overburden soils, $10^{-6}$ m/s for the organic soils, and as low as $10^{-7}$ m/s in the finer soils and bedrock. In general, the hydraulic conductivity of bedrock generally decreases with depth. The groundwater levels in region are thought to range from 0 to 4.9 m below ground surface, with seasonal fluctuations between 0.5 and 1.5 m.

Stream systems are cut minimally into the landscape, and have low slope and slow flows. Due to low relief and low permeability soils, the streams are connected to the overburden aquifer and are not typically connected to deeper bedrock aquifers. The groundwater table in the overburden is typically at or near the surface due to the flat terrain and underlying low permeability silts and clays. Where the low permeability overburden material exists, the shallow overburden aquifer is isolated from groundwater in the deeper bedrock. The permeability of the bedrock is expected to decrease with depth so, in general, the most permeable bedrock aquifer will occur along the bedrock/overburden interface.

The project area has many different types of waterbodies, including streams, rivers, lakes, ponds and wetlands (over 50% of the ecoregion is covered by wetlands). There are several larger rivers in the area, including the Winisk, Ekwan, Attawapiskat, Fishbasket and the Pineimuta Rivers. There are also some very large lakes, such as Winisk Lake in the northeast part of the project area. There is also a vast network of smaller connected headwater streams, ponds and lakes. Many of these smaller streams are part of open fens. Streams in the region are low gradient and have low velocity flow throughout most of the year. The stream banks are typical of low gradient streams and are well defined by earth, boulders, bedrock outcrops and natural levees. Beaver dams are common features on small to medium sized streams. Stream flow peaks in the spring as a result of snowmelt runoff and rainfall runoff from saturated soils. Flows recede through the summer and increase in the fall due to an increase in rainfall and a decrease in evaporation. Flows are normally lowest in winter, and some small streams freeze completely to the stream channel bed. Snowfall is an important component of the hydrologic cycle in the region, as accumulated snow represents a significant stored water component.

### 6.2.3 Wildlife and Wildlife Habitat

#### MAMMALS

A background data review for mammal occurrence in the project area indicated that 41 mammal species may occur in the region. This total is largely based on data presented in the *Atlas of the Mammals of Ontario* (AMO) (Dobbyn, 1994).

During the preparation of the Noront Eagle's Nest Mine EA, in advance of an approved ToR, winter tracking surveys were conducted in 2011 and 2012 at three general locations along the proposed all-season road and one location around the Eagle's Nest Mine site. The EA surveys detected a total of 16 mammal

species, the most abundant of which included American Marten, Snowshoe Hare, Fisher, Moose, Gray Wolf, and Red Fox (Noront, 2013). Wolverine was also recorded during the surveys. Three of the four tracking study areas occurred along the preferred corridor for the WSR, and between 11 and 13 species were recorded at each area.

Wildlife surveys were conducted in 2017, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). The results of these surveys produced records of 10 mammal species, of which 4 were seen or heard, and 6 were recorded based only on the presence of sign, such as tracks, scat, gnaw marks and houses. A list of these recorded species is presented in **Table 6-1.** A total of 9 mammal species were recorded across the TPA1A route, while 3 species were recorded across the TPA1B route. All recorded species recorded have been reported by the AMO and, with the exception of Caribou (Boreal population), were accounted for through winter tracking surveys.

A group of 7 caribou and a single caribou were recorded. Caribou (Boreal population) is a Species at Risk (SAR), listed as *Threatened,* and is protected under the *Species at Risk Act, 2002* (SARA). The forest-dwelling population of Caribou (Boreal population) is also listed as *Threatened* and is protected under Ontario's *Endangered Species Act, 2007* (ESA). An estimated maximum of 5,000 mature forest-dwelling Caribou (Boreal population) remain in Ontario (COSEWIC, 2014). Within the project area, the highest Caribou (Boreal population) occupancy forms a broad band, averaging 110 km wide, straddling the ecotone between the boreal shield and the Hudson Bay lowlands. The project area for the WSR is situated within this high-occupancy band. Further discussion of SAR and the likelihood of occurrence in the project area is presented in Section 6.3.6.

**Table 6-1: Mammals Recorded During Wildlife Surveys (2017)**

| Common Name | Latin Name | SARA (federal) | ESA (provincial) | Route Observed |
|---|---|---|---|---|
| **American Marten** | *Martes americana* | - | - | TPA1A |
| **American Mink** | *Mustela vison* | - | - | TPA1A/TPA1B |
| **Beaver** | *Castor canadensis* | - | - | TPA1A |
| **Moose** | *Alces americanus* | - | - | TPA1A |
| **Gray Wolf** | *Canis lupus occidentalis* | - | - | TPA1A |
| **Red Fox** | *Vulpes* | - | - | TPA1A |
| **Red Squirrel** | *Tamiasciurus hudsonicus* | - | - | TPA1A/TPA1B |
| **Snowshoe Hare** | *Lepus americanus* | - | - | TPA1A |
| **Weasel Sp.** | *Mustela sp.* | - | - | TPA1A |
| **Caribou (Boreal population)** | *Rangifer tarandus caribou* | Threatened | Threatened | TPA1B |

## BATS AND BAT HABITAT

A review of range maps from Bat Conservation International (2017) indicate that five bat species may occur along the preferred corridor for the Project. These species include Big Brown Bat (*Eptesicus fuscus*) Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Aeorestes cinereus*), Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*). Of these species, Little Brown Myotis, Northern Myotis, Big Brown Bat and Silver-haired Bat are cavity roosting bats, while Hoary Bat is a foliage-roosting bat.

Two bat Significant Wildlife Habitat (SWH) types are recognized for Ecoregion 3W, which include maternity colonies or maternity roosting habitat and hibernacula (MNR, 2017b). During the spring and early summer, most Ontario bat species rely on forest habitat that supports a healthy density of large-diameter cavity trees. Females form maternity colonies in tree cavities that provide a warm, humid microclimate that optimizes gestation and postnatal growth of offspring (Kunz and Anthony, 1982). Trembling Aspen is a tree species commonly found within the project area and may provide suitable maternity roosting habitat by way of woodpecker holes in old trees suffering from heart-rot (Parsons et al, 2003; Psyllakis and Brigham, 2006).

In northern Ontario, bats typically hibernate in caves or abandoned mine shafts or adits, as well as underground foundations. Caves and mine shafts are the important features. Hibernacula are often associated as components of either cliff or rock barren ecosites.

Suitable hibernacula maintain winter temperatures slightly above freezing, have little air circulation and relative humidity is high. From the 2017 surveys conducted, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018), no habitat features indicative of bat hibernacula, such as caves, karst, old mine shafts, or otherwise were observed during field surveys – either by air, or on foot. Mid-age aspen-dominated deciduous forest was present at one waterbody crossing; however, no cavity trees or snags were observed in this forest patch.

## BIRDS

A review of secondary sources indicates that at least 130 bird species occur in proximity to the preferred corridor for the Project. In 2009, AECOM (2010) conducted a baseline bird survey in the area of the proposed Eagle's Nest mine site, recording 31 species. As a result of field studies conducted in 2010, MNRF (Phoenix, 2010; 2013) also compiled a list of 96 breeding bird species for the Ring of Fire region. In 2011 and 2012 field studies, point count surveys were conducted at 176 sample plots, distributed among five infrastructure locations and six major habitat types in proximity to the proposed all-season road corridor (Noront, 2013). This study resulted in the detection of 82 bird species (Noront, 2013).

A total of 42 bird species were observed during the 2017 survey, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). Of these, six had never been previously recorded in the aforementioned studies, including Great Gray Owl, Rough-legged Hawk, Snow Bunting, Lesser Scaup, Tundra Swan, and American Tree Sparrow. With the exception of Great Gray Owl and Lesser Scaup, it is expected that these species were non-breeding migrants that were passing through the area on route to their wintering grounds.

The six most frequently occurring breeding bird species for the project area, in decreasing order, were Swainson's Thrush, White-throated Sparrow, Yellow-rumped Warbler, Ruby-crowned Kinglet, Hermit Thrush and White-winged Crossbill (Noront, 2013).

### Waterfowl Stopover and Staging (Aquatic)

Waterfowl stopover and staging SWH consists of water bodies used for migration, including ponds, marshes, lakes, bays, and coastal inlets (MNRF, 2017). This includes reservoirs managed as large wetlands, or a pond/lake, but excludes sewage treatment ponds and stormwater ponds used by waterfowl. Areas that host annual staging of Ruddy Ducks, Canvasbacks, Trumpeter Swans or Tundra Swans are considered significant.

A total of over 1,000 waterfowl species are known to occur in the project area; however, only 11 species were recorded during the 2017 survey for the Project, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). Many lakes and wetlands surveyed in 2017 did not have any waterfowl present. Species recorded included Canada Goose, Tundra Swan, Mallard, Green-winged Teal, Lesser Scaup, Ring-necked Duck, Bufflehead, Common Goldeneye, Common Merganser, Red-breasted Merganser, and Hooded Merganser. Bufflehead was the most widely observed and numerous waterfowl species along the preferred corridor.

### Eagle and Osprey Concentration Area and Nesting Habitat

Eagle and Osprey concentration area SWH consists of large river systems and merging lakes that are used by these species as hunting locations in spring, fall, or winter for several years (MNRF, 2017). Trees regularly used for perching, and areas that are used for feeding or as winter/nocturnal roosting sites, are considered SWH.

Eagle and Osprey nesting habitat SWH are associated with lakes, ponds, rivers or wetlands along treed shorelines, islands, or on structures over water (MNRF, 2017). Osprey nests are usually at the top of a tree, whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.

Bald Eagle was recorded at two locations along the preliminary preferred corridor for the WSR from the 2017 bird surveys, as documented in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). No habitat features were observed that might provide suitable nesting habitat. However, it is expected that suitable perching and foraging habitat for Bald Eagles is not limiting in proximity to the corridor, due to the abundance of lakes and watercourses in the area.

No Osprey or Osprey nests were observed along the preferred corridor during the 2017 survey.

### Woodland Raptor Nesting Habitat

A review of existing information revealed that 11 woodland-nesting raptor species have been recorded in project area, including Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Broad-winged Hawk, Red-tailed Hawk, Merlin, Barred Owl, Boreal Owl, Great Horned Owl, Long-eared Owl, and Northern Hawk-Owl. Based on the Noront *Baseline Terrestrial Studies: Birds* report (Noront, 2013), coniferous forest, mixed forest, and deciduous forest covered a combined 33% (542,791 ha) of their regional study area.

Deciduous and mixed forests most likely to provide large diameter trees (typically *Populus sp.*) suitable for supporting stick-nests or large cavities for cavity-nesting species comprised 8% (126,937ha).

From the 2017 field surveys for the Project, as documented in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018), at least three hawk species, including Red-tailed Hawk, Rough-legged Hawk and Northern Harrier, were recorded, as well as a single Great Gray Owl. Of these, only Red-tailed Hawk and Great Gray Owl use woodland raptor nesting habitat. Common Raven was also recorded. Two stick nests that were likely used by either hawk or large owl species or Common Raven were observed from the helicopter.

#### REPTILES AND AMPHIBIANS

A review of background information available, including the Ontario Reptile and Amphibians Atlas, indicates that five amphibians and two reptiles may occur within the project area. Baseline studies conducted in support of the proposed Noront Eagle's Nest Mine recorded five frog species, including American Toad, Boreal Chorus Frog, Northern Leopard Frog, a Spring Peeper, and Wood Frog (Noront, 2013). Eastern Garter Snake was also recorded along each study section across of the transportation corridor (Noront, 2013).

According to the Ontario Reptile and Amphibian Atlas, Ontario's most northerly turtle species, Western Painted Turtle and Snapping Turtle (*Chelydra serpentine*), do not occur further north than Woodland Caribou Provincial Park, which has a similar latitude to Pickle Lake. The Midland Painted Turtle does not occur further north than Pukaskwa National Park, on the eastern shoreline of Lake Superior. As a result, it is unlikely that turtles and turtle SWH, such as Turtle Wintering Areas and Turtle Nesting Areas, occur within the project area.

### 6.2.4 Vegetation

The project area is located within the Big Trout Lake Ecoregion (Ecoregion 2W), a large ecoregion stretching from the Manitoba border to the Hudson Bay Lowlands.

Forest dominates the ecoregion's landscape, covering approximately 50% of the ecoregion. The majority of this is coniferous forest, with a smaller component of mixed forest, and deciduous forest pockets growing along river valleys (Crins et al, 2009). Wetland (30%), open water (12%) and burns occupy the rest of the ecoregion. The burn area in this ecoregion is the highest percentage of any in Ontario. Black Spruce dominates both upland and lowland sites, with Jack Pine and White Birch and Poplar species as associates. The shrub layers tend to be dominated by ericaceous shrubs, willow, and alder. The ground cover primarily consists of mosses and lichens, low ericaceous shrubs, and some herbs. Bedrock exposures have fewer trees and greater lichen cover. Closed to open stands of stunted black spruce, with ericaceous shrubs and a ground cover of sphagnum moss, dominate poorly drained peat-filled depressions.

#### VEGETATION COMMUNITIES

From the review of available information sources and the 2017 field surveys, as documented in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018), the following is a description of the vegetation communities in the project area. Further vegetation assessments in accordance with established regional and provincial protocols along the preliminary preferred corridor for the WSR will be undertaken as part of

the EA, including conducting additional seasonal (spring/fall) surveys to capture early and late flowering species and develop a comprehensive three-season species list for the Project.

In summary, from the 2017 baseline vegetation survey, the majority of the forest sites (68%) were dominated by coniferous trees, usually either Black Spruce (*Picea mariana*), or Jack Pine (*Pinus banksiana*). As well, approximately16% of the sites surveyed were classified as mixed treed and 16% as deciduous treed. Deciduous trees were typically Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*Populus tremuloides*), and White Birch (*Betula papyrifera*). Wetland sites were mainly coniferous swamps, with the majority falling into this Land Cover type (68%), typically dominated by Black Spruce. The remainder of the sites surveyed were classified as Sparse Treed Fen, Open Fen and Thicket Swamp.

Vegetation has been grouped according the Far North Land Cover Classification system and is briefly described as follows.

### *Coniferous Treed*

The coniferous treed Land Cover type was the most commonly found community type in the project area and one which contains the most variability. Eight different boreal ecosites were recorded in this community type. Canopy height varied, but was typically greater than 10 m, with tree cover of greater than 60%. The dominant canopy species was Black Spruce or Jack Pine. Jack Pine dominated sites often had strong regeneration of Black Spruce in the understorey, likely reflective of previous fire events. Balsam Poplar and Trembling Aspen were also present at some sites as smaller components of the canopy. Tall shrub growth was typically sparse, consisting of Alder species when present. Low shrub growth was variable, dominated commonly by Labrador Tea (*Ledum groenlandicum*), with other common species including Leatherleaf (*Chamaedaphne calyculata*) and Bunchberry (*Cornus canadensis*). Moss cover was variable, though generally more prevalent at Black Spruce sites. Feathermoss species were the most common component, frequently dominating sites. Sphagnum species were occasionally found in depressions at wetter sites. Lichens were present at most sites, principally Reindeer Lichen (*Cladina rangiferina*) and Coral Lichen (*Cladina stellaris*).

### *Mixed Treed*

The mixed treed Land Cover category found in the project area displayed three different boreal ecosites. Canopy height was greater than 10 m, with tree cover of more than 60%. Tree species were Black Spruce, Jack Pine, Trembling Aspen, Balsam Poplar, White Birch and Tamarack (*Larix laricina*). Tall shrubs were present, usually mixed with sub-canopy trees, and consisted mainly of Green Alder (*Alnus viridis*) and Speckled Alder (*Alnus incana*), with occasional willow species (*Salix sp.*). Low shrub growth was fairly sparse, with Labrador Tea, Prickly Rose (*Rosa acicularis*), Bunchberry, and Velvet Leaf Blueberry (*Vaccinum myrtilloides*) being the most common species. Moss cover was sparse at most sites, with Feathermosses the most consistently present; other moss species, including Ground Cedar (*Lycopodium complanatum*) and Ground Pine (*Lycopodium obscurum*), were present in lower abundances.

### *Deciduous Treed*

This Land Cover category contained 4 sites consisting of three boreal ecosites. Canopy height was greater than 10 m, and greater than 20 m at most sites. Dominant canopy species were Balsam Poplar and Trembling Aspen, with Jack Pine also present at some sites. Subcanopy growth was variable, consisting mainly of poplar species, along with White Birch. Black Spruce was also present in subcanopy. Tall shrub growth was variable, consisting of mostly alder with some willow. Common low shrubs included Prickly

Rose, Velvet Leaf Blueberry and Bunchberry, with Labrador Tea also present. Moss cover was sparse at most sites, although one site had significant feathermoss coverage. Other moss species included Ground Pine and Ground Cedar, as well as Club Moss species.

### *Coniferous Swamp*

The coniferous swamp Land Cover type was the most common wetland type. Three boreal ecosites were associated with this category, two of which are differentiated by organic versus mineral soils. Canopy height was variable, with some sites under 10 m and some over 20 m, but the majority of sites had canopies between 10 m and 20 m in height. Black Spruce was the dominant canopy species at all sites, and usually dominated subcanopy layers as well. Tamarack was present as a canopy species at some sites. Tall shrub growth was sparse and typically restricted to Speckled Alder. Low shrub growth was variable, but quite dense at some sites. Labrador Tea was the most common species, occurring at almost all sites and often dominant. Leatherleaf and Dwarf Birch (*Betula nana*) were also present at wetter sites. Moss coverage was near complete at all sites. Sphagnum species were generally dominant, with Feathermosses also present and, in some cases, codominant.

### *Sparse Treed Fen*

The sparse treed fen Land Cover type surveyed had one boreal ecosite associated with this category. Canopy height was generally less than 10 m and sparse. Tamarack was the primary tree species, with Black Spruce also present. Tall shrubs were also sparse, typically consisting of willow species where present. Low shrubs included Dwarf Birch, Leatherleaf, Bog Rosemary (*Andromeda polifolia*), and occasionally Red Osier Dogwood (*Cornus stolonifera*). Ground cover was a combination of Sphagnum mosses and herbaceous growth consisting of grass and sedge species, with most sites having primarily herbaceous cover.

### *Open Fen*

Two of the sites from the 2017 baseline surveys were open fen, with two boreal ecosites included in this Land Cover type. Trees were rare, consisting of Tamarack or, more rarely, Black Spruce, usually less than 2 m tall. Tall shrubs, where present, consisted of Speckled Alder and willow species. Low shrubs present included Leatherleaf, Dwarf Birch, and Bog Rosemary. Ground cover was dominated by grass and sedge species.

### *Rare Plant Species and Communities*

Based on previous work conducted by Noront (2013), a list of rare plant species and plant communities was generated for the region from their contact with the MNRF. During the 2017 field surveys in support of the Project, none of the plants identified in the list were observed. However, based on the timing of the surveys, the presence of these species will be reassessed as part of the additional field surveys to be completed to support the EA.

Known plant species of cultural value or significance to Indigenous communities include: wild berries or nuts (Blueberry, Wild Strawberry, Gooseberry/Currant, Raspberry), wild plants (Labrador Tea Leaves, Muskrat Root, Wild Rice, Mint Leaves, and Dandelions), and Tree Foods (Cedar Tea, Maple Syrup, and Poplar Inner Bark).

### 6.2.5 Fish and Fish Habitat

The project area has many different waterbodies, including streams, rivers, lakes, ponds and wetlands that provide direct habitat and support many different fish species. There are several larger rivers in the area, including the Winisk, Ekwan, Attawapiskat, Fishbasket and the Pineimutei Rivers. There are also some very large lakes, such as Winisk Lake in the northeast part of the project area. There is also a vast network of smaller connected headwater streams, ponds and lakes. Many of these smaller streams are part of open fens. The larger lakes and watercourses provide year-round fish habitat; the smaller, shallower lakes and wetlands often do not, as oxygen levels can drop to hypoxic conditions. The smaller watercourses and lakes can also provide suitable habitat for rearing and feeding for some parts of the year, usually early spring.

There are a vast number of streams in region that connect to many shallow lakes and wetlands in the area. In general, waterbodies in the project area are considered to support a variety of cool and cold-water fish. Large rivers, including the Ekwan, Muketei, Attawapiskat and Ogoki, support populations of Walleye (*Sander vitreus*), Lake Sturgeon (*Acipenser fulvescens*), Brook Trout (*Salvelinus fontinalis*), Lake Whitefish (*Coregonus clupeaformis*) and other fish species. A number of lower energy watercourses connected to these rivers provide habitat for Walleye and Northern Pike (*Esox lucius*). Typically, Yellow Perch (*Perca flavescens*), White Sucker (*Catostomus commersonii*) and other small foraging fish species are present with these larger bodied fish. Smaller streams and lakes in the area also support a variety of smaller-bodied fish including cyprinid species, Brook Stickleback (*Culaea inconstans*) and Mottled Sculpin (*Cottus bairdii*).

There are 39 fish species that have been identified as potentially present within the project area, through the review of various sources, and are presented in **Table 6-2.**

**Table 6-2: Fish Species Potentially Within Project Area**

| Family | Scientific Name | Common Name |
|---|---|---|
| **Acipenseridae** | *Acipenser fulvescens* | Lake Sturgeon |
| **Cyprinidae** | *Couesius plumbeus* | Lake Chub |
| | *Margariscus margarita* | Pearl Dace |
| | *Luxilus cornutus* | Common Shiner |
| | *Notropis atherinoides* | Emerald Shiner |
| | *N. heterolepis* | Blacknose Shiner |
| | *N. hudsonius* | Spottail Shiner |
| | *N. volucellus* | Mimic Shiner |
| | *Notemigonus crysoleucas* | Golden Shiner |
| | *Margariscus nachtriebi* | Northern Pearl Dace |
| | *Chrosomus eos* | Northern Redbelly Dace |
| | *Chrosomus neogaeus* | Finescale Dace |
| | *Pimephales notatus* | Bluntnose Minnow |
| | *Pimephales promelas* | Fathead Minnow |
| | *Rhinichthys cataractae* | Longnose Dace |
| **Catostomidae** | *Catostomus catostomus* | Longnose Sucker |
| | *Catostomus commersonii* | White Sucker |

| Family | Scientific Name | Common Name |
|---|---|---|
| | *Moxostoma anisurum* | Silver Redhorse |
| | *Maxostoma macrolepidotum* | Shorthead Redhorse |
| **Esocidae** | *Esox lucius* | Northern Pike |
| **Salmonidae** | *Coregonus artedi* | Cisco |
| | *Coregonus clupeaformis* | Lake Whitefish |
| | *Salvelinus fontinalis* | Brook Trout |
| | *Salvelinus namaycush* | Lake Trout |
| | *Prosopium cylindraceum* | Round Whitefish |
| **Percopsidae** | *Percopsis omiscomaycus* | Trout-Perch |
| **Gadidae** | *Lota lota* | Burbot |
| **Gasterosteidae** | *Culaea inconstans* | Brook Stickleback |
| | *Pungitius pungitius* | Ninespine Stickleback |
| **Cottidae** | *Cottus bairdi* | Mottled Sculpin |
| | *Cottus cognatus* | Slimy Sculpin |
| | *Cottus ricei* | Spoonhead Sculpin |
| **Percidae** | *Etheostoma exile* | Iowa Darter |
| | *Etheostoma nigrum* | Johnny Darter |
| | *Perca flavescens* | Yellow Perch |
| | *Percina caprodes* | Logperch |
| | *Percina shumardi* | River Darter |
| | *Sander canadensis* | Sauger |
| | *Sander vitreus* | Walleye |
| **Sciaenidae** | *Percina caprodes* | Logperch |

Note: List of fish species present in the area was generated using MNR and Royal Ontario Museum (ROM) species distribution data (Holm et al, 2010).

## FISH HABITAT

From the review of background information sources and 2017 aquatic surveys in the project area, as documented in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018), surface waters generally flow in a west-to-east direction, towards James Bay, and also a northerly direction to Hudson Bay. Through much of the area, surface waters move as diffuse flow through broad, densely vegetated fens, with occasional consolidation in defined channels. Many of these channels appear as pools of open water (usually created by beaver dams) that are connected to larger watercourses by narrow, poorly defined channels, or by fens without recognizable channels. Frequent ponding, flooding of treed areas and diversion of flows occur due to beaver activity, and many of the pools of open water visible on topographic maps and satellite imagery are the result of old, stable beaver dams. An abundance of fen and beaver-pond habitats are present in project area. The abundant beaver dams pose barriers to fish passage and potential for stranding. The poor water quality (specifically, low dissolved oxygen) in these small watercourses can also pose a severe limitation to their overall productivity and suitability to most species.

Due to a lack of coarse substrate in the smaller streams, during the spring period spawning, fish that require rapids or riffle habitats likely spawn in the larger rivers (e.g., Pineimuta River and Fishbasket River), possibly on bedrock and boulder shoals, due to a lack of gravel substrate.

Burbot is the only winter-spawning fish in the project area, and it is generally found in lake and large-river habitats. Burbot spawn in a fairly broad range of habitats, and specific spawning habitats in the project area have not been identified to date based on the preliminary field surveys conducted in 2017.

The fall-spawning species in project area include Lake Whitefish and Cisco, which are predominantly lake dwelling species. These species occasionally ascend rivers and the lower reaches of large streams (Scott and Crossman, 1973). Of the watercourses within the project area, the potential for presence of these species is likely limited to the larger rivers and lakes (e.g., the Pineimuta and Fishbasket Rivers, Winisk Lake). Lake Whitefish and Cisco are likely absent in the many smaller streams within the project area.

As part of the EA for the Project, aquatic investigations will be conducted to collect data on biophysical habitat conditions and sensitivity, spawning habitat, species at risk, surface water quality and fish community present.

### 6.2.6 Species at Risk

From the review of background information sources and field surveys conducted in 2017 (B*aseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018), there are several species listed as Threatened, Endangered or Special Concern under the provincial *Endangered Species Act* (ESA) or the Federal *Species at Risk Act* (SARA) that have the potential to occur within the project area. A full list of potential Species at Risk, habitat characteristics and preliminary presence/absence determination within the project area is presented in **Table 6-3**.

From the preliminary presence/absence determination the following provincially and/or federally listed Species at Risk could potentially be found in the project area:

- Bald Eagle (*Haliaeetus leucocephalus*) (Special Concern under ESA);
- Barn Swallow (*Hirundo rustica*) (Threatened under both ESA and SARA);
- Bank Swallow (*Riparia riparia*) (Threatened under both ESA and SARA);
- Canada Warbler (*Cardellina canadensis*) (Special Concern under ESA, Threatened under SARA);
- Common Nighthawk (*Chordeiles minor*) (Special Concern under ESA, Threatened under SARA);
- Evening Grosbeak (*Coccothraustes vespertinus*) (Special Concern under both ESA and SARA);
- Rusty Blackbird (*Euphagus carolinus*) (Special Concern under both ESA and SARA);
- Olive-sided Flycatcher (*Contopus cooperi*) (Special Concern under ESA, Threatened under SARA);
- Yellow Rail (*Coturnicops noveboracensis)* (Special Concern under both ESA and SARA);
- Wolverine (*Gulo gulo*) (Threatened under ESA, Special Concern under SARA);
- Caribou (Boreal population) (*Rangifer tarandus*) (Threatened under both ESA and SARA);
- Caribou (Eastern Migratory population) (*Rangifer tarandus*) (Special Concern under ESA, Endangered under SARA);
- Little Brown Myotis (*Myotis lucifugus)* (Endangered under both ESA and SARA); and
- Lake Sturgeon (*Acipenser fulvescens*) (Special Concern under both ESA and SARA).

The EA will assess and document the general locations of known incidences of Species at Risk, endangered and threatened species, and species of special concern for the Project. This assessment will

be based on review of secondary sources and conducting targeted species-specific field surveys and personal communications, published and unpublished information, such as Indigenous Knowledge gathered through consultation.

Consultation with the MECP and Environment and Climate Change Canada (ECCC) is currently being undertaken to determine the scope and extent of field studies to be completed during the EA specific to Species at Risk and species of conservation concern.

**Table 6-3: Species at Risk Status, Habitat Characteristics, and Preliminary Presence/Absence Determination**

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| **MAMMALS** | | | | | | | | |
| *Puma concolor* | Mountain lion (Cougar) | No Status | Endangered | SU | Atlas of the Mammals of Ontario | No | The Cougar or Mountain Lion lives in northern remote undisturbed forests where there is little human activity. However, few cougar sightings have been confirmed in recent decades. Forested habitats must support plenty of White-tailed Deer (*Odocoileus virginianus*) and other prey species for cougars. | No |
| *Myotis lucifugus* | Little Brown Myotis | Endangered | Endangered | S3 | Layng et al, 2019 | | Caves, quarries, tunnels, hollow trees, buildings, attics, barns, wetlands, forest edges | Yes |
| *Myotis septentrionalis* | Northern Myotis | Endangered | Endangered | S3 | Atlas of the Mammals of Ontario, Bat Conservation International Maps | No | Forest areas that have hollow trees or loose bark. Such habitat is available in the project area; however, review of Atlas of the Mammals of Ontario and Bat Conservation International Maps indicate that project area is outside the known documented range of species in Canada. | No |

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| *Gulo gulo* | Wolverine | Special Concern | Threatened | S2S3 | Atlas of the Mammals of Ontario | Yes | Wolverine occupy many habitat types in the far north of Ontario. Individuals can have ranges of up to 3,500 km$^2$ and dens are built in snow drifts, under logs and boulders (Ontario Wolverine Recovery Team, 2013). | Yes |
| *Rangifer tarandus* | Caribou (Boreal population) | Threatened | Threatened | S4 | Atlas of the Mammals of Ontario | Yes | Caribou require large undisturbed areas of old and mature conifer upland forest and lowlands dominated by jack pine and/or black spruce. They are also found in bogs and fens. Only the boreal population of caribou is listed as a species at risk in Ontario. | Yes |
| *Rangifer tarandus* | Caribou (Eastern Migratory population) | Endangered | Special Concern | S4 | Atlas of the Mammals of Ontario | No | Population exists as four subpopulations from coastal western Hudson Bay to Labrador. Migratory corridor for species and its movement south to boreal forest habitat within project area is possible. | Yes |
| | | | | **BIRDS** | | | | |
| *Haliaeetus leucocephalus* | Bald Eagle | No Status | Special Concern | S2N, S4B | OBBA | Yes | Prefer to nest in large trees, almost always near a major lake or river where they do most of their hunting. | Yes |

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| *Hirundo rustica* | Barn Swallow | Threatened | Threatened | S4B | iNaturalist, eBird | Yes | Prefer open habitat for foraging: grassy fields, pastures, ROWs, agriculture crops and wetlands. Post-European settlement: Nest in human structures, including barns, garages, houses, bridges, and culverts.<br><br>Barn swallows generally reuse nests from year to year and are, therefore, sensitive to the removal of nesting structures. | Yes |
| *Riparia riparia* | Bank Swallow | Threatened | Threatened | S4B | OBBA | No | Habitat includes nest sites, foraging areas, and nocturnal roost sites. Build nest burrows in eroding vertical banks, such as lakeshore bluffs, riverbanks, and banks or stockpiles created in aggregate pits and construction sites. | Yes |
| *Chaetura pelagica* | Chimney Swift | Threatened | Threatened | S4B, S4N | OBBA | No | Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys. | No |
| | | | | | | | | |
| *Chliodonias niger* | Black Tern | No Status | Special Concern | S3B | Noront | No | Shallow freshwater marshes (> 20 ha.) with cattails and emergent vegetation interspersed with open water. Smaller | No |

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| | | | | | | | wetlands with the same features are also used. | |
| *Chordeiles minor* | Common Nighthawk | Threatened | Special Concern | S4B | OBBA | No | Open ground; clearings in dense forests; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. | Yes |
| *Antrostomus vociferus* | Eastern Whip-poor-will | Threatened | Threatened | S4B | OBBA | No | Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaf-litter, wooded edges; pine plantations. | No |
| *Contopus virens* | Eastern Wood-pewee | Special Concern | Special Concern | S4B | Noront | No | Mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests; preferred habitats are intermediate-age forest stands and mature stands with little understory vegetation. | No |
| *Coccothraustes vespertinus* | Evening Grosbeak | Special Concern | Special Concern | S4B | OBBA | Yes | This breeds in secondary growth and mature mixed forests; however, habitat selection is likely influenced by food availability, rather than habitat structure. Presence is most likely base | Yes |

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| | | | | | | | on the presence of Spruce Budworm, a primary food source for this species. | |
| *Contopus cooperi* | Olive-sided Flycatcher | Threatened | Special Concern | S4B | OBBA | Yes | Semi-open, conifer forest; prefers Spruce, Jack Pine, and Balsam Fir; near pond, lake, or river; treed wetlands for nesting; burns with dead trees for perching. | Yes |
| *Falco peregrinus anatum/ tundrius* | Peregrine Falcon | Special Concern | Special Concern | S3B | OBBA | No | Nests on cliff ledges or crevices, preferably 50 to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas. | No |
| *Euphagus carolinus* | Rusty Blackbird | Special Concern | Special Concern | S4B | OBBA | Yes | Nests in the boreal forest; prefers shores of wetlands, peat bogs, swamps, and beaver ponds. | Yes |
| *Asio flammeus* | Short-eared Owl | Special Concern | Special Concern | S2N, S4B | OBBA | No | Resides in open habitats, including arctic tundra, grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. Preferred nesting sites are dense grasslands, as well as tundra with areas of small willows. | No |
| *Coturnicops noveboracensis* | Yellow Rail | Special Concern | Special Concern | S4B | OBBA | No | Large, freshwater or brackish grass and sedge marshes with dense vegetation, | Yes |

| Species | | SARA[1] | ESA[2] | S-RANK[3] | Information Source[4] | Observed During Field Studies | Habitat Requirements[5] | Potential Habitat in Project Area |
|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | | | | | | | |
| | | | | | | | including bullrushes, horsetails, grasses. | |
| | | | | **FISH** | | | | |
| *Acipenser fulvescens* | Lake Sturgeon (Southern Hudson Bay - James Bay population) | Special Concern | Special Concern | S3 | DFO Species at Risk Mapping, NHIC | No | Resides almost exclusively in lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of 5 to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. | Yes |

[1] Federal *Species at Risk Act*

[2] Species at Risk in Ontario List. (2014, August 11). Ministry of Natural Resources and Forestry. Retrieved September 12, 2014, from http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

[3] Conservation Ranking

[4] Various sources

[5] MNRF Significant Wildlife Habitat Technical Guide Appendix G (MNRF, 2000) Ontario Ministry of Natural Resources. Significant Wildlife Habitat Technical Guide. 151 p.

Status

**No Status**: Species has not been assessed under the *Species at Risk Act*.

**Special Concern**: Species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.

**Threatened**: Species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

**Endangered**: Species that is facing imminent extirpation or extinction.

### 6.2.7 Climate

Being located within the James Bay Lowlands, the project area is subject to cold, extended winters and cool summers of short duration. This humid continental climate is strongly influenced by proximity to James Bay and Hudson Bay. Fog is common, with extended periods typically expected in the transition months of ice 'freeze-up' in the Fall months and ice 'break-up' in the Spring. It is also not unusual to have fog occurring during the summer months. Summer temperatures typically range between 10 and 20 degrees Celsius, with winter temperatures usually between -10 and -30 degrees Celsius. Winter winds are typically from the west to northwest, with the summer winds usually from the west to southwest. Lakes typically begin to freeze in mid-October, with spring thaws typically initiating in mid-April. Annual precipitation levels in the area tend to exceed 700 mm, of which over 200 mm is typically snow.

### 6.2.8 Air Quality

The Project is located in a remote region of Ontario away from any significant sources of human induced air emissions. Air quality data from several monitoring stations in northern Ontario (e.g., Thunder Bay) and other remote locations in Canada will be used to estimate concentrations of background air quality parameters for the Project. All of the regional background air quality values reviewed are well within acceptable applicable Ontario Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS). The EA will assess trends from existing air quality data and studies; and incorporate Indigenous Knowledge and information from stakeholders to identify potential project emission sources and assess project effects. Potential project emission sources will be evaluated against regulatory standards in the EA.

### 6.2.9 Acoustic Environment

Background noise levels are consistent with rural and remote areas dominated by natural sounds (Ministry of the Environment Class 3 Area). In the absence of the sounds of wind and local animals, such areas would typically have a background noise level of 20 to 30 dBA. Noise surveys conducted by Noront for the Eagle's Nest Mine confirmed ambient noise levels of 25 to 37 dBA, which are expected to be indicative of the noise levels in the project area.

## 6.3 Socio-Economic Environment

The following sections document the existing socio-economic environment in the project area.

### 6.3.1 Regional Planning/Policy Initiatives

The Project is subject to both federal and provincial planning policy initiatives that dictate how projects will be undertaken. The principal planning and policy documents related to the rationale for the Project are cited in Section 1.4.2 and summarized in **Appendix A**. Two other important provincial regional planning/policy initiatives that will influence how the ToR and the EA are undertaken are the *Far North Act*, and the *Planning Act*.

- The *Far North Act* facilitates land use planning decisions in the Far North by governing how the Province will work with First Nation communities to identify areas where development can occur, and areas that should be protected. The main purpose of the Act is to establish land use planning that:
  - Is based on a joint planning process between First Nation communities and the Government of Ontario;
  - Supports environmental, social and economic objectives for land use planning in Ontario; and

- Is conducted in a manner consistent with the recognition and affirmation of existing Aboriginal and treat rights enshrined in Section 35 of the Constitution Act, 1982, including the duty to consult.

The Far North is defined in the Act as:

(a) the portion of Ontario that lies north of the land consisting of,
  (i) Woodland Caribou Provincial Park,
  (ii) the following management units designated under Section 7 of the *Crown Forest Sustainability Act*, 1994 as of May 1, 2009: Red Lake Forest, Trout Lake Forest, Lac Seul Forest and Caribou Forest,
  (iii) Wabakimi Provincial Park, and
  (iv) the following management units designated under Section 7 of the *Crown Forest Sustainability Act*, 1994 as of May 1, 2009: Ogoki Forest, Kenogami Forest, Hearst Forest, Gordon Cosens Forest and Cochrane-Moose River, or

(b) the area, if any, that is set out in the regulations made under this Act and that describes the area described in clause (a) more specifically ("Grand Nord").

Section 12(1) of the *Far North Act* stipulates that constructing or expanding all-weather transportation infrastructure and any other infrastructure that is associated with it cannot occur without a community based land use plan (CBLUP) in place. However, Section 12.(2) of the Act includes provisions for exemption from this stipulation through the issuance of an exception order by the Minister of Natural Resources and Forestry. The exemption provisions involve concurrent planning, and applicants must meet additional conditions prior to issuance of the exception order. Alternatively, Section 12.(4) of the Act allows the activity granted an exception to occur if the Lieutenant Governor in Council determines that the development is in the social and economic interests of Ontario. The issuance and approval of an Order permitting development under the aforementioned sections of the Act cannot occur until after the EA is approved, and must occur before the issuance of other permits and approvals (such as work permits under the *Public Lands Act*). Preparation of the Webequie CBLUP is in progress, and WFN applied to MNRF for an exception order for the Supply Road Project on January 29, 2018. The application was accepted by the Minister on March 2, 2018. In addition to this application, other requirements under Section 12.(2) must be met before the Minister could consider making an Order.

The *Planning Act* establishes guidelines for land use planning decisions in Ontario. The purpose of the Act is to:

- Promote sustainable economic development in a healthy natural environment within a provincial policy framework;
- Provide for a land use planning system led by provincial policy;
- Integrate matters of provincial interest into provincial and municipal planning decisions by requiring that all decisions be consistent with the Provincial Policy Statement and conform/not conflict with provincial plans;
- Provide for planning processes that are fair, by making them open, accessible, timely and efficient;
- Encourage co-operation and coordination among various interests; and
- Recognize the decision-making authority and accountability of municipal councils in planning.

Under the Act, the Minister of Municipal Affairs and Housing may issue Provincial Policy Statements (PPS), which are province wide policy directions related to land use planning and development. Any PPS that are relevant to this project will be incorporated into the planning and design for this project.

Of particular importance for this project is the 'Places to Grow, Growth Plan for Northern Ontario" published by the Ministry of Municipal Affairs and Housing, which documents the growth plan for Northern Ontario for the next 25 years. The plan has a goal of strengthening Northern Ontario's economy through the following (MMA, 2011):

- Diversifying the region's traditional resource-based industries;
- Stimulating new investment and entrepreneurship; and
- Nurturing new and emerging sectors with high growth potential.

These two pieces of regional planning/policy initiatives will influence the planning process for the Webequie Supply Road Project.

### 6.3.2 Economy, Resources, Commercial and Industrial Activities

The economy of Northern Ontario relies heavily on resource extraction, with the forestry and mining industries acting as large industrial employers.

Northern Ontario communities and outfitters also provide recreation and tourism opportunities for hunting, fishing and camping, constituting an important aspect of the Northern Ontario experience.

The EA document will fully describe and assess existing commercial, recreational and industrial activities that contribute to the economic vitality of the region. The EA will also describe and characterize economic development and economic sectors, businesses, governmental finances, and housing characteristics in the project area.

### 6.3.3 Population, Demographics and Community Profile

The Webequie First Nation has experienced increases in both their employment rates and their population rates since 2006. This has not been the same for much of Northern Ontario, or other Indigenous communities who may have an interest in the Project. The population of Northern Ontario has, in general, declined in recent years, with many resource-based industries shutting down production or relocating. However, the Indigenous population is growing at a faster rate than that of Northern Ontario or Canada. According to the 2016 Census, the Indigenous population comprised 2.8% of Ontario's population, (accounting for 374,395 out of Ontario's 13,242,160 population), an increase from 2.4% in 2011. The Indigenous population is a younger demographic than the non-Indigenous population. This is due to a higher fertility rate and increased life expectancy.

The 2016 Census shows that the employment rate of Webequie First Nation was 40%, with an average annual income of $20,680, compared to Ontario's employment rate of 64.7%, with an average annual income of $33,539. Remote Indigenous communities experience challenges due to their lower employment rates and average incomes when compared to averages in Ontario as a whole. This trend is not uncommon for many Northern Indigenous communities. This is due, in part, to communities transitioning away from traditional economic activities (i.e., trapping) in response to market pressures. In addition, many youth are out-migrating or living off-reserve to find other employment opportunities. This has led to impacts to employment prospects in the area. Mineral exploration and development activities and infrastructure

projects, such as the Webequie Supply Road, may provide both skilled and unskilled workers with the opportunity to access employment opportunities.

### 6.3.4 Human Health

Northern and remote Indigenous communities face many health and well-being issues due to their isolation. Mental health, substance abuse, suicide, food insecurity, and other health stressors are more prevalent among remote Indigenous communities. In addressing potential health issues, the Webequie Supply Road Project will examine human health and well-being by assessing potential changes in surface water, air quality, noise, and public safety (including social issues, such as drugs and alcohol abuse in the community) likely to result from project activities. These changes can act as pathways to potential effects on human health. These criteria will be drawn upon to inform human health and well-being assessments in the EA.

### 6.3.5 Infrastructure and Services

With the exception of the area at the west limits of the proposed WSR corridor (east side of Webequie community), there is no established transportation infrastructure or access to typical community services in the project area. Infrastructure services in the community include a water treatment facility and distribution pipes, sanitary sewers and sewage treatment plant, diesel fuel electricity generator and power distribution lines. The drinking water source for the community is Winisk Lake. There is regular air access to the community via a licensed carrier (North Star Air currently provides passenger air service three times daily to and from Webequie). Formal land access to the community is via the winter road from the west, connecting Webequie with Pickle Lake (refer to **Figure 6.1**); land travel corridors east of Webequie are limited to a sparse, informal network of trails.

The proposed all-season road corridor will cross the traditional territories of communities that may be able to provide supportive services such as waste management and other ancillary services. The construction phase of the Project will generate waste materials and access to disposal areas will be required.

In 2016, there were a total of 155 dwellings in Webequie First Nation. Remote Indigenous communities in Northern Ontario face challenges with their housing. Census data has shown that Indigenous people were much more likely to live in dwellings that were in need of major repairs. Families are also living in crowded conditions, with more than one person per room, compared to the average household in Ontario. Having safe and adequate housing is a major concern for Northern Indigenous communities, as the quality and housing stock worsen.

The EA document will describe available housing, infrastructure and services, such as nearby road connections and the Webequie Airport, which have the potential to interact with or connect to the proposed project. In addition, the Project may also have the potential to interact with other community infrastructure and services, such as policing, fire rescue, health clinics/nursing stations, schools, churches and other religious buildings, as well as local businesses and residential areas.

### 6.3.6 Land and Resource Use

The project area is located on unsurveyed Ontario Crown lands and Webequie First Nation Reserve lands. Although Webequie First Nation holds the position that provincially registered traplines do not represent spatial limits of traditional use by their members, for reference purposes, it can be stated that the project area intersects traplines registered to Webequie First Nation and Marten Falls First Nation community members. A total of

17 km of the project corridor sits on federal land comprising the Webequie First Nation Reserve, as shown in **Figures 1.1 and 6.1**.

### *Webequie Community Based Land Use Plan and Comprehensive Community Plan*

As introduced in Section 5.1.2.3, Webequie First Nation is in the process of preparing a Community Based Land Use Plan (CBLUP) in accordance with the Ontario Far North Act, which provides the authority, purpose, and process for community based land use planning. Webequie First Nation started the CBLUP process in 2011 and expects to complete the process by December 2020. The community based land use planning follows a stepwise process for decision making that is consultative in nature based on a consensus building approach. Key steps in the process are: Phase 1 – Preparing for Planning; Phase 2 – Terms of Reference; Phase 3 – Draft Plan; and Phase 4 – Final Plan. Webequie First Nation is currently in Phase 3 that involves jointly preparing the Draft CBLUP with MNRF. After the completed Draft Plan is shared with the community, with adjacent First Nation communities and all interested people and organizations, the joint planning team will consider all input and continue work to prepare the Final Plan. The Final Plan will be jointly approved by the Chief of Webequie First Nation and the Minister of Natural Resources and Forestry. As set out in the Far North Act, once a community based land use plan is approved, it is required that land use planning decisions be consistent with the land use designations and permitted uses specified in the plan.

The location of the proposed Webequie Supply Road corridor is consistent with the recommended land use areas and designations in the Webequie Draft CBLUP. Specifically, the alternative concepts are located primarily in the designated areas of "General Use Area" (GUA) and "Other Areas", with a minor segment located within an "Enhanced Management Area" (EMA). The intent and permitted uses in these designated areas are described below.

General Use Area – The intent of the General Use Area is to protect cultural values and respect traditional use, while enabling resource development that promotes sustainability for communities and future generations. Cultural and traditional practices by Indigenous people are ongoing in this designated area, where Aboriginal and Treaty Rights are respected. Economic development opportunities include mineral exploration and development, with an emphasis on benefits for First Nations communities, including infrastructure (e.g., roads, transmission lines and other linear corridors) for community access and resource development, small-scale community-led commercial forestry, renewable energy and tourism.

Other Areas - The Other Areas designation captures the east-west section of the alternative concepts and is considered a shared area with Marten Falls and Neskantaga First Nations and where Webequie and the MNRF/Ontario have determined not to advance planning direction at the Draft Plan stage, pending further additional dialogue with these communities to confirm direction prior to finalizing the Plan.

Enhanced Management Areas - The intent of EMAs is to support a range of resource development opportunities while providing for protection of sensitive First Nation cultural sites, historical travel routes, cultural waterways and harvesting areas, as well as fish and wildlife habitat, muskeg, peatlands, wetlands and remote tourism and recreation values.

The "Corridor EMA", within which a short segment of the WSR is situated, is a 129,000 ha area located to the south of the community. It is a shared area with Neskantaga First Nation and Nibinamik First Nation and contains historic travel routes from Webequie to these two communities. The intent of the Corridor EMA is to enable major access corridors to Webequie First Nation and the Ring of Fire, while also protecting cultural and ecological values in the area. The area supports all-season road, hydro transmission and communications corridors to Webequie First Nation. It also supports options for all-season access to adjacent mineral potential

areas. Aggregate extraction in the area is supported, while recognizing the need to respect sensitive cultural values. Mineral sector activities are also supported.

The "Prime Lake EMA" is located immediately east of the community and encompasses almost 34,000 ha. The area is a focus for Webequie-led opportunities to connect the community with the Ring of Fire through all-season road planning and associated environmental assessment processes. The intent of this designation is to enable resource development activities and support associated access and infrastructure, including Webequie community supply road interests, in a way that respects First Nation use of the land, and cultural, recreation and tourism values. Mineral exploration and development is a supported activity and aggregate extraction may be pursued. Road use restrictions may be considered on some tourism and resource access roads (e.g., forest access roads) to preserve remoteness in the area. For new roads, there is an emphasis on minimizing the footprint around waterways and water crossings to protect cultural and natural values.

The project area sits on Ontario Crown lands and federal lands (Webequie First Nation Reserve). The Project will require access to, and the use, occupation, exploration, and development of lands and resources currently used for traditional purposes by Webequie and other Indigenous communities. Traditional activities of these First Nations include hunting, gathering and fishing, as well as cultural and spiritual activities. As part of the input received through consultation activities conducted to date for this project, Marten Falls First Nation and Neskantaga First Nation have both indicated direct impacts to their traditional territories by the Project; and Attawapiskat First Nation, Weenusk (Peawanuck) First Nation and Kasabonika Lake First Nation have asserted that they have shared traditional territory with Webequie First Nation, but have not specified as to whether these areas coincide with the project area. Weenusk First Nation has stated that they have overlapping traditional territory in and around the Winisk River downstream (north) of WFN's reserve lands. Kasabonika Lake First Nation has asserted that they share traditional territory with WFN and actively use these lands for hunting and fishing. Attawapiskat First Nation traditional territory is deemed by Attawapiskat to extend into the project area by virtue of the community's use of the Attawapiskat River and its subwatershed areas, and Attawapiskat has expressed concerns over potential effects to the "western portion" of its territory.

The current Webequie First Nation Draft CBLUP (March 2019) recognizes that there is shared territory with other First Nations within the lands that Webequie has identified as its proposed planning area, including areas shared with Neskantaga and Marten Falls that would be occupied by the Webequie Supply Road corridor (refer also to extracts below from the Webequie Draft Community Based Land Use Plan outlining the current status of discussions with Neskantaga and Marten Falls).

### *Neskantaga First Nation*

Dialogue has been ongoing between Webequie and Neskantaga regarding shared uses and planning interests between the two communities. Community members of Webequie and Neskantaga share close family connections and common history of movement and traditional use in the area between the two communities. Neskantaga First Nation has an ongoing traditional use connection to the southern portion of the proposed Webequie planning area; in the Chipai, Fishbasket and Wapitodem River areas, south and east of Winisk Lake, the upper Winiskisis Channel, and the upper portions of the Ekwan and Attawapiskat River drainage areas that fall within the proposed planning area. Webequie First Nation honors and respects Neskantaga First Nation Indigenous use connections in the proposed planning area.

At the Draft Plan stage, in order to respect the ongoing Three-Nation discussions between Webequie, Marten Falls and Neskantaga, Webequie First Nation has chosen not to advance planning direction for a portion of the proposed planning area. Dialogue regarding the area will be ongoing between the Draft and Final Plan.

*Marten Falls First Nation*

Webequie and Marten Falls have engaged in regular dialogue regarding shared uses and interests, including in the context of Marten Falls' own CBLUP process. At the Draft Plan stage, in order to respect the ongoing Three-Nation discussions, Webequie First Nation has chosen not to advance planning direction in the shared area. Dialogue will be ongoing between the Draft and Final Plan to confirm a respectful planning arrangement for the shared area. Webequie and Marten Falls are currently advancing their interests in access between the communities, Ring of Fire and the region by way of proposals and environmental assessment processes for community and supply access road projects.

Due to the draft status of the CBLUP, and the fact that Plan development discussions between Webequie, Neskantaga and Marten Falls are ongoing, the shared areas cannot be shown at this time. No mapping of traditional territory can be provided for confidentiality reasons.

Webequie is also preparing a Comprehensive Community Plan (CCP) under the auspices of Crown-Indigenous Relations and Northern Affairs Canada, with the support of the Nishnawbe Aski Development Fund. This has been a four-year process, culminating in the current Draft CCP (August 2019). The CCP is complementary to the CBLUP and other community plans, and is another community-led process, rooted in Webequie's Three-Tier governance model (refer to **Section 10.1.1.2** of this Terms of Reference), that supports reconciliation, rebuilding and healing. The CCP sets out community values and visions; establishes realistic goals, objectives and measurable targets; and provides direction and guiding principles for achieving and monitoring positive change, based on sustainability and self-reliance in the context of ancestral relationships with each other and the community's land base. The land areas around the community that are inherent in the Three-Tier model include: the 34,279 ha of community land base (Tier 1 - Tawin); the protected traditional area within a 1-day walk (roughly 40-50 km radius) from the community (Tier 2 - Tashiikawiin/Tashiiwiitoo); and the area of mutual benefit with neighbouring communities, an additional 1-day walk from the community (Tier 3 - Bimachiiowiin Akkii). The CCP's goals and action strategies are laid out in relation to the following eight (8) components:

- Education and training;
- Cultural vibrancy and traditional life;
- Housing and infrastructure;
- Environmental quality and relationship with the land;
- Community health and wellness;
- Family and social conditions;
- Economic development; and
- Community leadership and governance.

### *Other Land and Resource Use*

Notable land uses in the region include Winisk River Provincial Park, which sits north of the proposed corridor and borders the approximate northern half of the Webequie First Nation Reserve lands, the Victor Diamond Mine, located 150 km east of the project's east terminus, east of the proposed Eagle's Nest Mine site, and the Musselwhite gold mine located approximately 210 km to the west. Other uses of lands and waters in the region include tourist lodges, fly-in hunting and fishing camps and other tourist-related activities, which are not located in proximity to the WSR corridor.

According to the Ontario Ministry of Energy, Northern Development and Mines' Strategic, Network and Policy Division (J. Paetz correspondence to SLI dated April 1, 2019), there are also 56 active, unpatented mining claims and one mining lease near, or overlapping, the proposed WSR corridor. The crown land tenure and

claim holders within the mineralized zone in the McFaulds Lake area includes the following entities, as identified by ENDM:

- Noront Resources Ltd.
- Macdonald Mines Exploration Ltd.
- Canada Chrome Corporation
- Abitibi Royalties Inc.
- Metalex Ventures Ltd.
- Aurcrest Gold Inc.
- De Beers Canada Inc.
- Fancamp Exploration Ltd.
- Superior Exploration Ltd.
- Debut Diamonds Inc.
- Platinex Inc.
- Perry Vern English
- Michael Albert Haveman
- Clark Exploration and Consulting Inc.

Other information regarding land and resource use along the proposed road corridor will be collected through engagement and consultation activities, and review of various published and unpublished sources and Indigenous Knowledge information made available by First Nation communities, and will be documented in the EA.

## 6.4 Cultural Environment

From the perspective of the WFN and other Indigenous communities, the cultural environment encompasses a broad series of aspects for consideration and evaluation in the EA. Specifically, this includes, but is not limited to:

- Aboriginal and Treaty rights;
- Current land resource uses, such as hunting, gathering, fishing and trapping, within their traditional territories for cultural and socio-economic purposes;
- Socio-cultural character of remote communities (i.e., language, traditions, etc.) and potential for outside influences of non-indigenous peoples;
- Built heritage resources (e.g., hunting or trapping camps/cabins) and/or cultural heritage landscapes (e.g., natural features – rivers or hills) that may have spiritual and symbolic meaning to Indigenous communities; and
- Known burial or sacred sites of cultural importance to communities.

A description of the existing cultural environment from an Indigenous perspective will be gathered from Indigenous Knowledge information received from communities and will be documented in the EAR/IS.

### 6.4.1 Cultural Heritage Resources

A Stage 1 Archaeological Assessment will be conducted to identify and confirm areas of archaeological potential. The findings from this assessment will be documented in the EA and all archaeological assessment report(s) will be submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries, in accordance with the *Ontario Heritage Act* and the *Standards and Guidelines for Consultant Archaeologists* (Ontario). To assess potential effects to archaeological resources, the Stage 1

Archaeological Assessment will involve consultation with Indigenous communities, review of existing published data sources and information obtained from other stakeholders and agencies.

Archaeological research to date for the region suggests that the area was occupied by humans as early as 7,000 years before present. These early humans, known as the Shield Archaic Culture, tended to locate themselves near caribou river crossings. Previous archaeological research has also shown that ungulates and fish were exploited by Aboriginal peoples from circa 1000 A.D. to contact with Europeans (Noront, 2013).

Evidence also suggests that the region was intensively used during the historic fur trade. Previous research has indicated that the area is located within a region that was explored by the mid-to-late 18th century. Additionally, there is a history of mining in the region spanning from the early 20th century until the present (Noront, 2013).

The preliminary preferred corridor is also situated approximately 15 km south of Winisk River Provincial Park, which is a cultural heritage landscape feature of interest. Landforms in the park include a large moraine and drumlin field. Geological features include the Sachigo Subprovince, Big Beaverhouse Moraine, Winisk Drumlin Field, and Cochrane Advance.

## 6.5 Data Collection Methods and Baseline Studies

This section describes the general data collection methods and baseline studies that will be conducted to characterize and describe the existing (or baseline) natural, socio-economic and cultural conditions for the Project.

Initially, desktop studies will be utilized to collect data and pertinent knowledge for the environmental factors to be considered in the EA. This knowledge will serve to inform preliminary project design and direct efforts for further assessment of the effects to the environment. Information used for the purpose of documenting existing natural, socio-economic and cultural conditions will be gathered from background information provided by government agencies and other stakeholders, as well as published and unpublished data sources, and will be updated as required. An important information source will be Indigenous Knowledge from WFN and other Indigenous communities that will be incorporated into aspects of the EA, subject to consultation with and willingness of traditional knowledge holders and communities.

Information to characterize existing environmental conditions and features for the Project will draw upon the following secondary sources:

- Previously conducted environmental studies, including Indigenous Knowledge information obtained through consultation with Indigenous communities, will be reviewed and dated information updated as required;
- Regulatory databases;
- Aerial photography;
- Geographic Information System (GIS) databases;
- Academic literature; and
- Information obtained from regulatory agencies and other stakeholders.

In addition to the review of background data sources, field investigations and first-hand consultation with Indigenous communities and stakeholders will be used to characterize and describe existing environmental conditions for the project area. Field work studies will focus on the identified preliminary preferred corridor

(2 km wide corridor) as identified in Section 5.3, which includes the two (2) supply road alternative routes (i.e., Webequie community route and optimal geotechnical route, each 35 m in width) that are proposed to be carried forward in the EA for further examination and analysis. Field investigations will also focus on the areas where project related temporary or permanent supportive infrastructure such as aggregate pits/quarries, construction camps and access roads are proposed.

The scope and intensity of the field studies and the associated data collection and effects assessment methodologies will be defined during the EA process through consultation with Indigenous communities, the public, federal/provincial authorities and stakeholders. This will include the development of work plans at the outset of the EA phase for valued environmental components, including the opportunity for federal and provincial agencies to review the plans and provide guidance. The contents of the work plans will also be presented to Indigenous communities to seek their input. The anticipated work plans, including the data collection methodologies, that will be developed early in the EA process include:

- Aquatic
- Species at Risk
- Vegetation
- Wildlife
- Breeding Birds
- Groundwater and Surface Water
- Geology,Terrain and Soils
- Climate Change and Air Quality
- Noise and Vibration
- Human Health
- Socio-Economic
- Visual Environment
- Cumulative Effects

### 6.5.1 Published Sources of Information

**Table 6-3** presents a list of the preliminary published sources of information to be used to determine the existing environmental conditions.

**Table 6-4: Published Sources of Information for Existing Conditions**

| Source of Information | Document |
|---|---|
| **Banton et al** | Ecosites of Ontario: Boreal Range (2009) |
| **Birds Ontario (Bird Studies Canada, OFO, ECCC, Ontario Nature, MNRF)** | Ontario Breeding Bird Atlas (OBBA) (2007) |
| **Committee on the Status of Endangered Wildlife in Canada (COSEWIC)** | Wildlife Species Assessments |
| **Committee on the Status of Species at Risk in Ontario (COSSARO)** | Ontario Species at Risk (May 2000) |
| **Committee on the Status of Species at Risk in Ontario (COSSARO)** | Species at Risk in Ontario (SARO) List |

| Source of Information | Document |
|---|---|
| **Environment and Climate Change Canada** | Species at Risk in Canada (SARA) List |
| **Ministry of Natural Resources, 2009** | The Ecosystems of Ontario, Part 1, Ecozones and Ecoregions |
| **Ministry of Natural Resources and Forestry, 2018** | Ecosystems of Ontario, Part 2: Ecodistricts |
| **Nature Conservancy of Canada, 2011** | Wetlands of the Hudson Bay Lowland: An Ontario Overview |
| **Ontario Ministry of Natural Resources, 2011** | Aquatic ecosystems of the Far North of Ontario state of knowledge |
| **Ministry of Natural Resources, 2013** | Aquatic Ecosystem Assessments for Rivers |
| **Federation of Ontario Naturalists** | Ontario Mammal Atlas (1994) |
| **the Cornell Lab of Ornithology** | ebird |
| **Bird Studies Canada** | Breeding Bird Atlas |
| **California Academy of Sciences and the National Geographic Society** | iNaturalist |
| **Ontario Nature** | The Ontario Reptile and Amphibian Atlas |
| **Ministry of Energy, Northern Development and Mines** | Abandoned Mines Information System (AMIS) database |
| **Ministry of the Environment Conservation and Parks** | Ontario Lake Partner: https://www.ontario.ca/data/ontario-lake-partner |
| **Ministry of Environment, Conservation and Parks** | Permit to Take Water and water taking map: https://www.ontario.ca/ data/permit-take-water |
| **Ministry of the Environment, Conservation and Parks** | Provincial (Stream) Water Quality Monitoring Network: https://www.ontario.ca/data/provincial-stream- |
| **Ministry of the Environment, Conservation and Parks** | Ontario Benthos Biomonitoring Network: https://www.ontario.ca/data/ontario-benthos- |
| **Noront Resources Ltd.** | Eagle's Nest Project - Federal/Provincial Environmental Impact Statement/Environmental Assessment Report (2013) – Preliminary Draft |

| Source of Information | Document |
|---|---|
| **Webequie and Nibinamik First Nations** | Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A) (2018) |
| **Eabametoong, Webequie, Neskantaga and Nibinamik First Nations** | All-season Community Road Study (2016) |
| **Ministry of the Environment, Conservation and Parks** | Environmental assessments, registry and approvals database |
| **Ministry of the Environment, Conservation and Parks** | General Habitat Description Mapping Product (spatial database) |
| **Ministry of the Environment, Conservation and Parks** | Policy Guidance on Harm and Harass under the Endangered Species Act (2014) |
| **Ministry of the Environment, Conservation and Parks** | Categorizing and Protecting Habitat under the Endangered Species Act (2012) |
| **Ministry of the Environment, Conservation and Parks** | Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits (2010) |
| **Ministry of the Environment, Conservation and Parks** | Model Municipal Noise Control By-Law Noise Pollution Control Guideline (NPC) Construction Equipment, Publication NPC-115 (NPC-115) (1978) |
| **Ministry of the Environment, Conservation and Parks** | Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (NPC-300) (2013) |
| **Ministry of the Environment, Conservation and Parks** | Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (NPC-300) (2013) |
| **Ministry of the Environment, Conservation and Parks** | General Habitat Description Mapping Product (spatial database) |
| **Ministry of the Environment, Conservation and Park** | Policy Guideline on Harm and Harass under the Endangered Species Act (2014) |
| **Ministry of the Environment, Conservation and Parks** | Categorizing and Protecting Habitat under the Endangered Species Act (2012) |

| Source of Information | Document |
|---|---|
| **Ministry of the Environment, Conservation and Parks** | Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits (2012) |
| **Ministry of Transportation (MTO), Fisheries and Oceans Canada (DFO), MNRF** | Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (2013) |
| **Ministry of Natural Resources and Forestry** | Significant Wildlife Habitat Technical Guide (2000) |
| **Ministry of Natural Resources and Forestry** | Significant Wildlife Habitat Ecoregion Criteria Schedules (2012) |
| **Ministry of Natural Resources and Forestry** | Ontario's Woodland Caribou Conservation Plan (2009) |
| **Ministry of Natural Resources and Forestry** | Bat Survey Protocol for Treed Habitats (2017) |
| **Ministry of Natural Resources and Forestry** | Wildlife Monitoring Programs and Inventory Techniques for Ontario (1997) |
| **Ministry of Natural Resources and Forestry** | Land Information Ontario (LIO) (2016) |
| **Ministry of Natural Resources and Forestry** | Survey Protocol for Eastern Whip-poor-will in Ontario (2014) |
| **Ministry of Natural Resources and Forestry** | Natural Heritage Reference Manual (NHRM) (2014) |
| **Ministry of Natural Resources and Forestry** | Range Management Policy in Support of Woodland Caribou Conservation and Recovery (2014) |
| **Ministry of Natural Resources and Forestry** | General Habitat Description for the Forest-dwelling Woodland Caribou (*Rangifer tarandus caribou*) (2013) |
| **Ministry of Natural Resources and Forestry** | Integrated Range Assessment for Woodland Caribou and their Habitat: The Far North of Ontario 2013 (2014) |
| **Ministry of Natural Resources and Forestry** | Best Management Practices for Aggregate Activities and Woodland Caribou in Ontario |
| **Ministry of Natural Resources and Forestry** | State of the Woodland Caribou Resource Report (2014) |
| **Ministry of Natural Resources and Forestry** | Woodland Caribou (*Rangifer tarandus caribou*) in the Far North of Ontario: Background information in support of land use planning (2014) |

| Source of Information | Document |
|---|---|
| **Ministry of Natural Resources and Forestry** | Wolverine Government Response Statement (2016) |
| **Ministry of Natural Resources and Forestry** | Wolverine Recovery Strategy (2013) |
| **Natural Heritage Information Centre** | Biodiversity Explorer Database |
| **Natural Heritage Information Centre (NHIC)** | Rare Vascular Plants (1999) |
| **NHIC, MNRF** | Ontario Herpetofaunal Summary Atlas (2000) |
| **Ontario Nature** | Ontario Nature Reptile and Amphibian Atlas |
| **Phair, C., Henson, B.L., and Brodribb, K.E.** | Great Lakes Conservation Blueprint for Aquatic Biodiversity. Volume 2: Tertiary Watershed Summaries (2005) |
| **Royal Ontario Museum (ROM)** | Field Guide to Freshwater Fishes of Ontario (2008) |
| **Statistics Canada** | Census Profile and National Household Survey (2016) |
| **The Cornell Lab of Ornithology** | eBird |
| **California Academy of Sciences, and the National Geographic Society** | iNaturalist |
| **Carbon Storage and Potential Methane Projection in Hudson Bay Lowlands** | Ontario Forest Research Institute |
| **Hydrological functions of mine-impacted and natural peatland- dominated watershed, James Bay Lowlands** | Journal of Hydrology (2015) |
| **Mercury Studies** | Cree of Eeyou Istchee – March 2005. |
| **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 |

### 6.5.2 Baseline Studies

Baseline studies will include the following to characterize the environment.

- Natural (Biophysical) Environment, including:
  - Terrestrial Environment (vegetation, wildlife and wildlife habitat)

  - Aquatic Environment (fish and fish habitat)
  - Species at Risk (terrestrial and aquatic)
  - Air quality
  - Climate Change
  - Acoustic Environment (Noise & Vibration)
  - Surface Water, including hydrology and water quality
  - Groundwater
  - Geology, Terrain and Soils, including geochemistry

- Socio-Economic Environment, including:
  - Profiles of Indigenous Communities - population, demographics, education, employment, household composition and infrastructure and social services, with specific focus on the Indigenous communities surrounding Webequie First Nation, including: Attawapiskat First Nation, Eabametoong First Nation; Kasabonika Lake First Nation; Marten Falls First Nation; Neskantaga First Nation; Nibinamik First Nation; Aroland First Nation and Weenusk (Peawanuck) First Nation
  - Human Health and Social Issues
  - Traditional Land and Resource Uses

- Cultural Environment, including:
  - Archaeological Resources
  - Built Heritage and Cultural Heritage Landscapes

The specific objectives of the baseline studies are to:

- Describe the existing natural, socio-economic and cultural environments for the project area;
- Facilitate the assessment of potential environmental effects for all phases of the Project;
- Provide the basis for the identification and development of appropriate impact management measures (i.e., mitigation) to avoid or reduce the identified potential adverse environmental effects and enhance potential benefits of the Project;
- Identify and evaluate project alternatives to minimize potential adverse environmental effects and optimize benefits; and
- Establish benchmarks for environmental effects and compliance monitoring that will be implemented during the construction, operation and maintenance of the Project, as required.

The Webequie Project Team will interact with potentially affected Indigenous communities and/or other interested groups during the baseline data collection period to facilitate the two-way exchange of information (i.e., Indigenous Knowledge) and opportunities to express their concerns and preferences with regard to the project development.

The description and characterization of the existing environmental conditions provided in the ToR (Sections 6.3, 6.4 and 6.5) will be presented in greater detail in the EAR/IS and will include the detailed methodologies and results of the baseline field programs that were completed to support the EA.

# 7 Potential Environmental Effects

The Project will likely result in a number of potential environmental effects, which will be identified and assessed as part of the EA. Potential environmental effects as result of the Project can be positive or negative, direct or indirect, short-term or long-term, and can occur throughout all of the project phases (construction, operation and maintenance, and retirement). The environmental effects will be evaluated on the basis of their direction (positive, negative or neutral), magnitude, geographic extent, duration, frequency and reversibility, using applicable criteria and indicators to be fully developed during the EA.

The assessment will incorporate input from potentially affected and/or interested Indigenous communities, government ministries and agencies, the public and stakeholders. It is expected that a broader and more detailed range of potential effects will be identified once the final baseline studies are completed and the results of the consultation and engagement program have been considered. It is possible that some of the potential effects, such as impacts to wildlife movement from the development of a linear road corridor, and increased human access to remote areas, may require more detailed field investigations or surveys to determine their full extent/scope. As part of the assessment, consideration will also be given to confirming whether environmental effects of the Project could combine with the effects of other present and reasonably foreseeable developments (cumulative effects).

Additionally, as part of the effects assessment process, WFN will document existing Aboriginal and Treaty rights, including traditional and current land uses and other socio-economic aspects. This process will include seeking Indigenous Knowledge information from Indigenous communities during the consultation/engagement program for the Project. Indigenous Knowledge information, where provided, will be integrated into all relevant aspects of the EA, but the data will remain proprietary property of the communities that provide it. The EAR/IS will describe Indigenous communities, their traditional uses of the land and their established and asserted claims, including accommodation as necessary to address potential effects to Aboriginal and Treaty rights. Section 10 of the ToR details the consultation process in greater detail. Design considerations and mitigation/remedial measures recommended to reduce or eliminate potential environmental effects will be described in the EAR/IS. Mitigation measures will be developed in consultation with Indigenous communities, government ministries and agencies, stakeholders and other interested parties.

The EA will also include an Environmental Protection Plan (EPP) specific to the construction and operations phases of the Project. The EPP will specify procedures and mitigation measures to be implemented to reduce or eliminate potential negative effects of the Project and will utilize standard industry guidelines and BMPs, with input from Indigenous communities. It is also anticipated that the EPP will include a series of contingency plans and management plans, such as a spill prevention and response plan, a waste management plan, an environmental contingency and emergency preparedness plan, and a blast management plan, should blasting be required.

The following sections provide a description of the preliminary potential environmental effects of the Project. The identification of potential environmental effects is initially based on the project components and activities described in Section 4.0 – Description of the Undertaking (“the Project”).

# 7.1 Natural Environment

## 7.1.1 Geology, Terrain and Soils

Potential effects of the road construction will involve site clearing and re-contouring of topography (cut and fill grading) that will change the local terrain (topography and surficial geology) from existing conditions. Removal of overburden will also be required to construct structure foundations at waterbody crossings. Locally sourced aggregate extraction and processing areas have the potential to change topography and terrain, which may directly cause adverse effects to surface drainage patterns or catchment areas. Changes to terrain are not anticipated during the operations phase for the Project as grading, site clearing and preparation are not required following construction, and permanent access roads established during construction will be used during operation of the road. Effects of using locally sourced gravel (e.g., eskers) as construction material for the road could also release naturally abundant metals to waterbodies.

Soil compaction, rutting, and admixing from road construction activities have the potential to change soil quality by altering physical, chemical, and biological characteristics that encompass overall soil health. Changes in soil quality and quantity may also occur during construction due to a potential increase in erosion and sedimentation rates related to such activities as vegetation clearing, excavation, grading and stockpiling of excess earth material.

Spills from chemical or hazardous material (e.g., petroleum products,) could contaminate soils and cause adverse effects on aquatic organisms, soil organisms, and vegetation. Changes to soil quality from chemical or hazardous material spills is possible during the construction and operations (maintenance) phases of the Project.

Piled snow along the roadside can affect ground temperature and thawing of permafrost, where it is located close to ground surface. However, in the sporadic permafrost band where the project area is located, permafrost occurs in islands and ground ice content in the active layer is not significant. Therefore, given the general lack of permafrost in the area and the limited width of road surface to be cleared of snow (~11 m), the insulating effects of snow on warming of permafrost are not expected to be problematic. Similarly, any permafrost that exists in the project area is not anticipated to have a measurable destabilizing effect on the road infrastructure.

## 7.1.2 Groundwater

Temporary construction dewatering of excavations for structure foundations can cause the groundwater levels to be temporarily lowered, thereby reducing groundwater availability to nearby groundwater features (i.e., wetlands, streams, water wells, springs). If not mitigated properly, construction groundwater discharge from dewatering activities has the potential to result in erosion and mobilization of sediment at the discharge point and along the flow path, with elevated suspended solids and potential release of contaminants (i.e., sediment) to receiving waterbodies. Groundwater quality may also be adversely affected by an accidental spill of contaminants (e.g., petroleum or chemical products) during the construction and/or operations phases of the Project.

Vegetation clearing will take place for the road corridor, construction of temporary/permanent access roads, construction camps, laydown areas and aggregate extraction areas. Clearing of vegetation may increase recharge to the shallow groundwater table in higher permeability areas, thereby increasing local groundwater levels and increasing groundwater availability to nearby groundwater features (i.e., water wells, springs, wetlands and streams).

Portable water for construction camps is expected to be provided from new water wells. The temporary pumping of construction camp water supply wells can lower groundwater levels and has the potential to reduce groundwater availability to nearby groundwater features.

The hardening of surfaces to construct the supply road and supportive infrastructure, such as construction camps and laydown/storage yards, has the potential to reduce groundwater recharge and lower the groundwater levels resulting in changes to groundwater quantity or patterns of flow that provide base flow to watercourses or discharge to wetlands.

### 7.1.3 Hydrology and Surface Water

The construction, operation and maintenance of the WSR, as well as the construction of the structure foundations, access roads, and other supportive infrastructure (e.g., construction camps, aggregate pits) could result in changes to surface water quantity and quality. The construction and/or maintenance of these project components is expected to result in changes to land cover type, specifically in areas that are currently dominated by tree cover; lowland peatlands will be converted to a cover type of bare ground or gravel surfaces. The potential effects to surface water quantity as a result of the identified changes in land cover may include a local increase in runoff rates and runoff volumes at the various project components, and, in turn, an increase in stream flows, water levels, and erosion-sedimentation processes at nearby waterbodies (i.e., downstream receivers).

The installation and maintenance of waterbody crossing structures (temporary and permanent) during the construction and operations phases of the Project may result in changes to channel hydraulics at the affected portion of the waterbody, and, in turn, potential changes in surface water quantity (e.g., increased flooding) or erosion due to modifications in channel form and function.

Construction activities, such as vegetation clearing, grading, excavation, equipment and machinery use, and temporary/permanent watercourse crossings may temporarily increase erosion and result in sediment delivery to nearby waterbodies due to the creation of exposed soils. Potential sedimentation in surface waterbodies may result in adverse effects to water quality (e.g., elevated concentrations of sediment), or alter baseflow in waterbodies or water temperatures. Construction activities may also affect surface water quality through the introduction of contaminants (petroleum or chemical products) resulting from improper management and maintenance of equipment (e.g., leaks), construction water from dewatering activities, from road maintenance activities, such as salt and sand application, and accidental spills from vehicles and equipment used during the construction and operation of the WSR.

### 7.1.4 Wildlife

Based on the expected interaction between the project components and activities, potential project effects on wildlife (including species that are considered country foods) include:

- Clearing, grading and stockpiling of materials during construction of the Project and operation of the WSR could result in loss or alteration of vegetation that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution, as well as predation opportunities;
- Changes to hydrology may alter drainage patterns and increase/decrease drainage flows and surface water levels that can cause changes to soils and vegetation, which can affect wildlife habitat availability and distribution;

- Introduction and spread of noxious and invasive plant species (e.g., from external equipment/vehicles brought to site) can affect plant community composition, which can affect wildlife habitat availability and distribution;
- Collisions with vehicles during construction and operations may cause injury or mortality to individual animals;
- Attraction of wildlife to construction camps (e.g., food waste) or the road corridor itself during construction may increase human wildlife interactions and change predator prey relationships, which can affect wildlife survival and reproduction;
- Increase in public access (others outside of Webequie community) could affect wildlife survival and reproduction through vehicle strikes and/or legal and illegal hunting (poaching);
- Chemical, petroleum or other hazardous material spills along the WSR, or along access roads, could affect wildlife survival and reproduction;
- Dust and air emissions, and subsequent deposition of contaminants can change soil quality and vegetation, which can affect wildlife habitat availability and distribution; and
- Sensory disturbance related to proximity (noise) impacts from construction equipment, roadway traffic and increased air traffic can affect habitat availability, use and connectivity (movement and behaviour), leading to changes in abundance and distribution of terrestrial animals, caribou in particular.

The project activities also have the potential to adversely affect migratory birds, as defined under the *Migratory Birds Convention Act* (MBCA). The greatest potential impact on migratory birds would occur if vegetation clearing activities were conducted during the Primary Nesting Period for birds. This is the period when the percent of total nesting species is greater than 10%, and occurs between April 21 and August 14 for the project area, although nesting also infrequently occurs outside of this period. Potential effects to migratory birds, including mitigation measures, will be identified as part of the EA. A key mitigation and preliminary recommendation to prevent harm to migratory birds is to avoid any vegetation clearing between April 21 and August 14.

### 7.1.5 Vegetation

Potential effects on vegetation communities (e.g., riparian, wetland, upland, etc.) resulting from the construction phase of the Project include changes to community diversity, loss of vegetation, changes to wetland quantity and function, and changes to species diversity or composition.

Construction of road and supportive infrastructure, such as temporary access roads, laydown areas, construction camps and aggregate extraction areas, will result in direct removal of vegetation. Potential indirect effects could include changes to the characteristics and function of vegetation communities from uncontrolled erosion and sedimentation, or accidental release of contaminants during the construction and operations phases of the Project. Fragmentation of vegetation communities, and the habitat this provides to wildlife, may also occur as a result of the project components and activities.

In summary, based on the interaction between the project components and activities, potential project effects on vegetation include:

- Reduced soil quantity during earth moving activities may affect revegetation/restoration;
- Soil disturbance and stockpiling can change physical, chemical, or biological properties of soil, increase erosion potential, and affect revegetation/restoration;
- Changes to hydrology may alter drainage patterns and increase/decrease drainage flows and surface water levels, which could cause changes to soils and upland, wetland and riparian ecosystems;

- Chemical, petroleum or other hazardous material spills along the WSR, or along access roads, could affect soil quality and upland, wetland and riparian ecosystems;
- Dust and air emissions, and subsequent deposition, can affect upland, wetland and riparian ecosystems through changes in soil quality and direct contact with plants;
- Introduction and spread of noxious and invasive plant species (e.g., European Common Read) from external equipment/vehicles brought to site could affect upland, wetland and riparian ecosystems. Use of herbicides to control vegetation along the road corridor, if elected to be used during operations, could adversely affect vegetation; and
- Removal of wetland (e.g., bogs, peatland) could reduce the capacity of these areas to store carbon and thereby regulate climate.

### 7.1.6 Fish and Fish Habitat

Effects on fish and fish habitat, as defined under the *Fisheries Act* and including species identified as country food, may occur due to potential changes to the quantity and quality of habitat. Project related effects and/or activities with the potential to harm fish, or alter fish habitat, include:

- Physical alteration to fish habitat during construction of temporary and/or permanent waterbody crossings, related to such activities as:
  - operation of equipment in a waterbody (i.e., below the high-water mark; or in-water work)
  - installation of work area isolation structures during construction
  - bank treatments, site preparation, and restoration
  - placement of structures, fill, or other materials in a waterbody
  - removal of temporary structures from a waterbody at access road crossings
  - dewatering or removal of beaver dams
- Changes to channel morphology, hydrology and use of habitat features (riffles, pools, etc.) through alteration in the shape of the streambed and bank composition/stability from construction of waterbody crossings, including temporary access roads;
- Changes in fish accessibility to habitat, where the crossing structure (e.g., perched culvert) forms a barrier to fish passage (e.g., migration or access to spawning/reproduction area), which can cause habitat fragmentation and changes to genetics of fish populations;
- Increased rates of erosion from land disturbance activities or from removal of riparian vegetation, causing deposition of sediment in waterbodies that can result in loss of habitat, degraded water quality, alteration to baseflows or water temperatures, disruption of fish life processes or fish and egg mortality;
- Chemical, petroleum or other hazardous material spills along the WSR, or along access roads, could affect fish or fish habitat through adverse changes to surface water quality;
- Effects on fish community dynamics due to increased angling pressure and related activities, including selective removal of some species, or local reductions of species numbers (inclusive of species that are considered country foods); and
- Effects on fish from invasive aquatic life introduced through angling activities of those outside of the community of Webequie.

Potential project effects to fish and fish habitat are higher during the construction phase, but remain during the operations and maintenance period. To mitigate potential adverse effects to fish and fish habitat, waterbody crossings, such as culverts, will be designed and installed in accordance with applicable federal and provincial guidelines and standards to avoid or minimize harm to fish and fish habitat.

### 7.1.7 Species at Risk

As noted in Section 6.2.6, from the preliminary presence/absence determination conducted to date based on the review of background information sources and select field studies, there are a number of provincially and/or federally listed Species at Risk that could potentially be affected by the Project.

Potential effects to Species at Risk at the current early planning stage of the Project are broadly identified to include: increased mortality; harm and/or disturbance; displacement, alteration, fragmentation or removal of habitat; population stress; and increased predation and poaching opportunities.

### 7.1.8 Air Quality

Construction activities have the potential to temporarily affect local air quality in the immediate vicinity of the Project. Emissions from construction are primarily comprised of fugitive dust (i.e., particulate matter that is suspended in air by wind action and human activity) and tailpipe emissions (e.g., nitrogen oxides and carbon monoxide) from the movement and operation of construction equipment and vehicles. Potential effects associated with construction are anticipated to be minimal due to their short duration in any one location and intermittent frequency. The emission sources associated with construction of the Project include the following:

- Land clearing and material handling, including establishing and maintaining stockpiled erodible materials;
- Vehicular and equipment emissions;
- Fugitive dust from vehicles travelling on gravel roadways and other (exposed) earth surfaces; and
- Diesel generators (power source) at the construction camps and maintenance yards during operation of the road.

Where it is in close proximity to construction and operations activities, vegetation serving as country (traditional) food or medicinal plant sources for Indigenous communities (e.g., berries, wild rice, juniper) may also be affected through deposition of particulate matter.

The operation of the WSR would contribute to changes in the local air quality as a result of vehicular traffic volume (expected to be less than 500 vehicles per day) and equipment and vehicles used for operation and maintenance activities. Vehicular exhaust emissions will consist primarily of nitrogen oxide, carbon monoxide, sulphur dioxide, suspended particulates, and volatile organic compounds, as well as greenhouse gases (GHG).

### 7.1.9 Climate Change

Historic climate data from the Big Trout Lake weather station, about 200 km northwest of Webequie, show that, since 1980, average annual winter daytime temperatures have increased by 1.5°C; fall daytime temperatures have increased by 1.5°C to 2°C; and summer daytime temperatures have also increased over the same period. Trend analysis of temperatures at Big Trout Lake suggests average annual winter daytime warming of about 2°C by the 2050s compared to this decade. Climate modelling indicates that the increase could be nearly double that figure[5]. Winter freeze-up in regional watercourses used by Webequie community members (e.g., Fishbasket River) is reportedly now in November, compared to October or

[5] Webequie First Nation: Adapting to Climate Change (Part 2 of "Climate Change Impacts in Far North Communities"). Peterson, David, Laurentian University; Wabasse, Harry, 2012. P. 3.

September a generation ago; ice is thinner; and spring break-up can be as early as February[6], resulting in reduced and less safe winter road/trail operation periods.

The Project is expected to produce greenhouse gases that may contribute to the aforementioned trending changes in climatological parameters. These emissions will be primarily in the form of exhaust from construction equipment and vehicles during the construction phase; during the operations phase, emissions will be from vehicles travelling on the road and from vehicles and equipment engaged in maintenance activities.

The Project will also create changes to the landscape (permanent removal of peatland and forested areas), potentially resulting in reductions in the ability of these terrestrial carbon sinks to capture and store carbon, which, in turn, may contribute to climate change. In addition, the Project in combination with climate changes may increase the risk and vulnerability of immediately adjacent and downstream ecosystems to the effects of climate change (e.g., erosion in watercourse channels as a result of increased impervious surfaces combined with higher water levels in flood seasons; lower contributions to downstream riparian flows/water levels due to barrier effects).

Examples of other potential climatic and related environmental changes, including those related to food security, comprise:

- Less average annual rainfall;
- Lower water levels in watercourses and drying wetlands in non-winter seasons, resulting in challenges for hunting and gathering activities (more difficult travel/reduced access to some country food and medicinal plant harvesting areas; fewer sightings of some small mammals; earlier fish spawning and changes in fish taste/texture; additional travel to access some fish species);
- Increased incidence of heavy rain and thunderstorms in winter (increased risk of localized flooding as runoff from frozen ground overwhelms roadside ditches and culverts);
- Increased variability in winter daytime temperatures (benefit of reduced heating costs with increased temperatures);
- Hotter summer days, with short severe heat spells (declines in some upland tree and riparian shrub species; increased risk of wildfires; hot weather health alerts); and
- Changes in staging areas for migrating waterfowl and mating areas for moose (less predictability for goose and moose hunts).

The environmental assessment will include the following three principal considerations of climate change addressed in the MECP guide entitled *Considering Climate Change in Environmental Assessment in Ontario*, which is a companion to the MECP Codes of Practice for preparing and reviewing Terms of Reference and Environmental Assessments:

1) The impacts of the Project on climate change;
2) The impacts of climate change on the Project; and
3) Identifying and minimizing negative climate change impacts during implementation of the Project.

The assessment will respond to MECP's expectation that the proponent takes into account:

- The project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
- Vulnerability and resilience of the Project and adjacent ecosystems to changing climatic conditions (climate change adaptation).

[6] Ibid. P. 3.

### Project Impacts on Climate Change

Greenhouse Gases - The Project Team recognizes that carbon dioxide is only one of many greenhouse gases in the earth's atmosphere (others include methane, nitrous oxide and halogenated carbon compounds). However, the WSR assessment will focus on carbon dioxide, principally in relation to direct contributions of emissions from equipment/machinery and vehicles during both the construction and operations phases. The project team's preliminary estimate of GHG emissions will be updated for both the construction and operations phases.

Landscape Changes - Recognizing the key role that forested areas and the Hudson Bay and James Bay Lowlands play in sequestering carbon, the assessment will address the effects of deforestation and the removal of peatlands in reducing the capacity of carbon sinks in the region to remove and store carbon dioxide from the atmosphere. The peatland analysis will include, as applicable, the effects of peat removal, covering, dewatering, storage, restoration and other disturbances associated with the Project on carbon storage and greenhouse gas responses.

### Impacts of Climate Change on the Project

The assessment of climate change effects on the Project will assist in identifying unintended potential risks and impacts to adjacent ecosystems and human health. These will be related principally in terms of risk and vulnerability levels to the road infrastructure during the construction and operations phases, in the context of trending severe weather events. It will also include consideration of the degree to which the cumulative effects of climate change on the Project (and the Project itself) contribute directly or indirectly to the vulnerability or resilience of adjacent ecosystems, such as watercourses and peatlands.

The considerations above will be based on both quantitative and qualitative assessments. For example, it is expected that the assessment of greenhouse gases will be quantitative, entailing an estimation of the generation of carbon equivalents based on a determination of the type, number and duration of equipment operation, and with the use of manufacturers' information on equipment and machinery exhaust emission rates/content. Methods and calculations based on the Ontario and International Panel on Climate Change *Guidelines for National Greenhouse Gas Inventories* will be documented. The degree of calculation and estimation effort will be aligned with the level of significance the Project Team attaches to climate change effects associated with the Project.

The assessment of means to reduce or mitigate potential climate change effects will be more qualitative in nature, including consideration of other measures that may have been used on similar projects. Examples include: the use of different construction materials and methods; optimization of transportation of materials and equipment; means to achieve energy efficiencies; waste reduction measures; construction schedule changes; and site restoration measures (e.g., tree planting to offset generated emissions).

The climate change assessment will be conducted primarily in the context of potential impacts to Indigenous peoples. In addition to placing some reliance on historical recorded meteorological data to establish climatic trends, the Project Team will seek input from First Nation communities with respect to their observations and perceptions of changes and trends in climatic parameters and dependent resources and amenities, including:

- Seasonal precipitation, temperature and wind, including effects on infrastructure (e.g., winter roads);
- Trees, birds, animals and medicinal/edible plants in the bush;
- Lakes, rivers, wetlands and soils (hydrology, permafrost, water quality/levels, fish, birds, animals, insects);
- Severe weather and other major related events/emergencies (thunderstorms, water funnels, tornados, fire and flooding); and
- Related changes in community health and well-being.

The EA will also include a discrete concluding statement detailing how climate change was considered in the overall assessment of effects and the development of mitigation measures.

### 7.1.10 Noise

Project construction activities, such as the operation of equipment and machinery used for clearing, grading and earth moving, have the potential to cause temporary noise and vibration effects at sensitive receptors. These effects are not anticipated to be long-term, due to the temporary nature of construction activities. However, once constructed, the WSR will accommodate heavy and light vehicles that will allow for the movement of materials, supplies and people between the Webequie Airport and the McFaulds Lake area. Based on the types of vehicles that will use the WSR, there is a low potential for producing groundborne vibration effects. However, due to the remote nature of the project area, with low ambient noise levels, there is potential for traffic along the WSR to generate a perceptible change in the noise levels at nearby human noise receptor areas, which include the community of Webequie and the mine exploration camp at the McFaulds Lake area operated by Noront. Similarly, these sensitive receptors may experience increased noise from airplane and helicopter traffic during both the construction and operations phase of the Project.

These same noise impacts may also result in sensory disturbance to wildlife. Sensory disturbance can impact habitat availability, use and connectivity (movement and behaviour), leading to changes in abundance and distribution of terrestrial animals, caribou in particular. Sensory disturbance is most detrimental during key periods, such as late winter when animals tend to be in poor condition, and during reproductive season (spring/early summer).

Potential environmental impacts related to the acoustic environment will be further assessed in the EA, including potential effects to human health and wildlife sensory disturbance.

## 7.2 Socio-Economic Environment

Socio-economic impacts can be positive or negative; and can occur at various units of social order: individuals, families/clans, businesses, communities and economic sectors. Both potential positive and negative socio-economic effects of all phases of the Project will be assessed as part of the EA process, including identifying appropriate impact management measures to reduce or eliminate any significant negative effects and identifying means of enhancing potential benefits.

Effects assessment linkages with other environmental disciplines will be determined, if applicable (e.g., links between socio-economic environment and visual aesthetics, noise, terrestrial and aquatic environments, and human health).

A preliminary list of potential socio-economic effects is presented in **Table 7-1.**

**Table 7-1: Potential Effects to Socio-economic Environment**

| Potential Effects |
|---|
| **Positive Effects/Benefits** |
| **Economic**<br>• Employment and economic benefits to community members and businesses of neighbouring Indigenous communities during construction and operation/maintenance<br>• Emergence of economic opportunities along the road |

| Potential Effects |
|---|
| • Opportunity for WFN and other First Nations to own and/or construct and operate the road, including opportunity for revenue generation and potential for subsequent investment in economic development opportunities<br><br>**Education/Training**<br><br>• Opportunities for capacity building and business training<br>• Opportunities for youth-employment and training<br>• Possible higher overall educational levels and capacity<br><br>**Social**<br><br>• Higher household incomes from increased economic activity, allowing for Improved standard of living |
| **Negative Effects** |
| **Social/Health**<br><br>• May result in easier access to undesirable substances, possibly causing more health and social issues in community<br>• More outsiders coming into area, causing possible social issues (i.e., community safety)<br><br>**Socio-economic**<br><br>• Although not proposed as part of the Project, should the supply road be connected to the existing provincial road network in the future, there may be a reduction in the amount government transfer payments currently paid to the community/its members due to changes in remote status, with this reduction likely phased in gradually<br>• May facilitate more outsiders coming into community, such as resource users, that put a strain on traditional territories for hunting, fishing, mineral resource exploration, as well as pressure on wildlife populations and movements |

### 7.2.1 Effects on Traditional/Indigenous Land Use

The EA will specifically and directly consider potential project effects on Aboriginal or Treaty rights. Through WFN discussions and engagement/consultation with other Indigenous communities, the assessment will evaluate and take into account potential changes in the traditional availability of, access to and use of resources, and the ability of communities to exercise their Aboriginal or Treaty rights.

In coordination with other provincial government ministries and agencies, Ontario (MECP) has provided a list of twenty-two (22) Indigenous communities where WFN should undertake consultation and engagement activities. The list is Ontario's (MECP) current understanding of those communities whose Aboriginal and Treaty rights may be potentially affected by the Project, and/or that may have interests in the Project. At present, sixteen (16) of these Indigenous communities may have Aboriginal or treaty rights that may be adversely affected by the Project, whereas the other six (6) Indigenous communities are considered to have potential interests in the Project. A Consultation Plan to engage communities during the EA, including WFN's overall approach to engagement and consultation, is detailed in Section 10 of the ToR. The

Consultation Plan outlines the degree and manner in which the identified Indigenous communities will be engaged and consulted.

## 7.3 Cultural Environment

The Project may have the potential to affect the cultural environment, including, but not limited to, the following areas of interest and value to Indigenous communities:

- Aboriginal and Treaty rights, which are the collective rights of Indigenous communities flowing from their status as the original peoples of Canada. These rights are recognized and affirmed by Section 35 of the *Constitution Act* (refer to Section 7.2.1 above);
- Effects to land resource uses, such as hunting, gathering, fishing and trapping, within their traditional territories;
- Effects to the socio-cultural character of remote Indigenous communities (e.g., language, traditions, etc.) from potential outside influences of non-indigenous peoples;
- Loss of, or adverse effects to known archaeological sites and areas of archaeological potential;
- Effects to known burial sites (to address the possibility that the Ontario *Funeral, Burial and Cremation Services Act* may apply); and
- Effects to known and potential built heritage resources (e.g., old hunting or trapping camps) and/or cultural heritage landscapes, including historic, spiritual and symbolic sites of interest or value to Indigenous communities.

Consultation and engagement with Indigenous communities, including receiving Indigenous Knowledge information where available, will be used to characterize and describe the existing cultural environment and assess potential impacts.

To assess the potential effects of the Project on cultural heritage resources, as defined under the *Ontario Heritage Act*, a Stage 1 Archaeological Assessment will be undertaken by a licensed archaeologist in accordance with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) *Standards and Guidelines for Consultant Archaeologists* (2011). The assessment will involve review and research of geographic and historical features and land use history of the preferred corridor and its surroundings. The purpose of the Stage 1 Archaeological Assessment will be to evaluate in appropriate detail the preferred corridor's archaeological potential (i.e., the likelihood that the area contains archaeological resources).

The MHSTCI requirements for Stage 1 Archaeological Assessment include Aboriginal consultation and engagement, and establishing protocols to be implemented in the event that unexpected archaeological finds are encountered during construction of the Project.

With respect to encountering unknown archaeological resources during construction, typical contingency or mitigation measures to be implemented by the construction contractor in such an event would include:

- Notifying MHSTCI if any archaeological resources are impacted by the EA work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the *Ontario Heritage Act* and the *Standards and Guidelines for Consultant Archaeologists*.
- If human remains are encountered, all activities must cease immediately and the local police and the Registrar, Burials of the Ministry of Government and Consumer Services (416-326-8800) must be contacted. In situations where human remains are associated with archaeological resources,

MHSTCI should also be notified to ensure that the site is not subject to unlicensed alterations, which would be a contravention of the *Ontario Heritage Act*.

The assessment of effects to built heritage resources and cultural heritage landscapes, including historical and cultural components (e.g., sacred or spiritual sites to Indigenous communities) will be documented in a Cultural Heritage Existing Conditions and Preliminary Impact Assessment Report prepared by a qualified person with recent and relevant experience in consultation with Indigenous communities.

The archaeological, built heritage and cultural heritage landscape assessments will identify potential impacts and recommend measures to avoid or mitigate potential negative impacts (e.g., refinement of road alignment, fencing of sensitive sites during construction, monitoring by qualified heritage conservation/archaeological professionals during construction), where appropriate. Should potential effects to cultural heritage resources be identified during the EA process, WFN will engage with potentially affected Indigenous communities and the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries to review avoidance and other mitigation options.

# 8 Approach to Assessment and Evaluation of Effects

This section describes the proposed approach to carrying out the assessment and evaluation of environmental effects for the Webequie Supply Road Project. The effects assessment and evaluation will be completed on the proposed preliminary corridor, alternative routing alignments and supporting infrastructure elements (e.g., aggregate source sites) to accommodate the all-season road and potential future power/telecommunication lines. The Ontario *Environmental Assessment Act* requires an assessment of the potential environmental effects, evaluation of alternatives, description of impacts, identification of mitigation measures and description of the net effects of the Project on the environment.

The assessment approach for the Project will be guided by the Webequie First Nation Three-Tier approach to consultation, whereby neighbouring First Nations are engaged/consulted in a respectful manner that acknowledges and reflects the culture, traditions and beliefs of their people and ancestors, and the shared history and aspirations of its neighbouring communities. The Three-Tier approach has been passed on through generations by Indigenous Knowledge Keepers and forms part of the Elders' Guiding Principles. The Three-Tier approach consists of a: Core Tier – Webequie First Nation; a Regional Tier – First Nation Neighbours and Government Agencies; and a Foundational Tier - Social and Economic Benefits from the Land. Details on the Three-Tier framework with respect to the approach to engagement and consultation are presented in Section 10 – Consultation.

The Webequie Project Team's approach to the assessment of effects is intended to satisfy the regulatory requirements of the Ontario *Environmental Assessment Act* and the federal *Impact Assessment Act*. The assessment will be based on the approved Terms of Reference, the Ministry of the Environment and Climate Change (now MECP) *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario* (MOECC, 2014a) and the Impact Assessment Agency of Canada's Tailored Impact Statement Guidelines developed specifically for this project.

An overview of the effects assessment and evaluation approach is shown in **Figure 8.1** and involves the following steps:

- Describe the purpose of the Project;
- Identify natural, socio-economic and cultural environmental factors/criteria of value or interest that could be potentially directly or indirectly affected by the project activities, including related assessment indicators (e.g., changes to harvesting, wildlife populations and their movement, etc.) for the effects assessment. A list of preliminary criteria and indicators for the environmental effects evaluation are discussed below and presented in **Appendix B**;
- Determine the assessment boundaries/study areas for each factor/criterion;
- Compile information on and characterize existing environmental baseline conditions based on Indigenous Knowledge from WFN and other Indigenous communities, as well as a combination of existing data/information sources and field programs;
- Identify and evaluate potential environmental effects, advantages and disadvantages of alternative methods of carrying out the Project, including measures to mitigate potential adverse effects; net effects; and identification of the preferred alternative method(s) (the Project);
- Assess net effects (positive and negative) from implementation of the Project, which involves:
  - Identify potential impacts and associated positive and negative environmental effects;
  - identify mitigation measures to address negative effects;

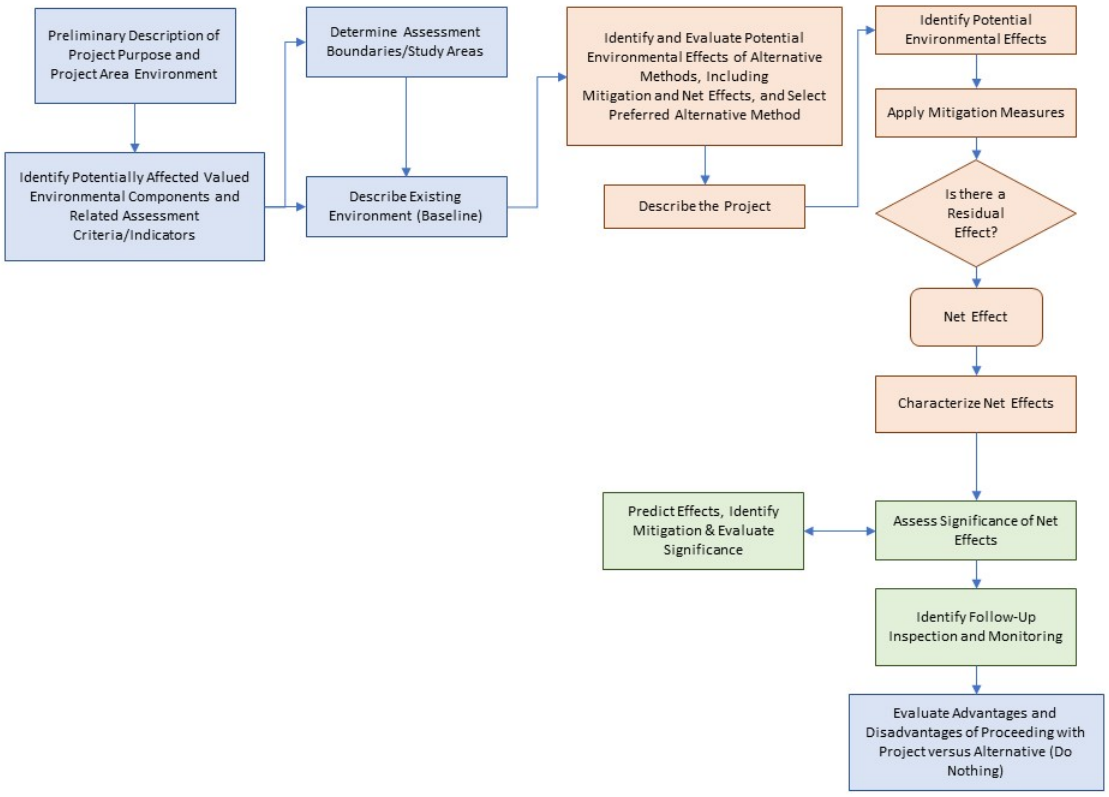
- predict the net effects;
- characterize the net effects (i.e., after mitigation measures) of the Project on environmental criteria;
- Assess the significance of the net effects (positive and negative);
- Conduct a cumulative effects assessment of the net effects of the Project in combination with other present, or reasonably foreseeable developments in the local and regional area and assess the significance of those effects;

› Identify follow-up, inspection, and monitoring programs that will be completed during and after construction to verify prediction of the projects effects and the effectiveness of mitigation measures. This would also include a compliance monitoring program to evaluate and demonstrate that the Project has been constructed and operated in accordance with commitments made in the EAR/IS; and

› Evaluate the overall advantages and disadvantages of proceeding with the Project against the Do Nothing Alternative.

A more detailed assessment method, including discipline-specific criteria and indicators, will be developed during the EA and presented in the EAR/IS.

**Figure 8.1: Environmental Effects Assessment Approach**



## 8.1 Cumulative Effects

The EA will examine the incremental net environmental effects of the Project. The assessment will also evaluate and assess the significance of net effects from the Project that overlap temporally and spatially with effects from present and reasonably foreseeable developments and activities. In addition, the assessment will evaluate and assess the significance of net effects from the Project that overlap temporally and spatially with effects from all present and reasonably foreseeable developments and activities. The Impact Assessment Agency of Canada describes cumulative effects as the sum of net effects from all past, current and reasonably foreseeable projects or activities on the physical, biological, cultural and socio-economic valued components of the environment. In general, a cumulative effects assessment for a project should include the following five (5) key steps: scoping, analysis, mitigation, significance, and follow-up.

As part of the EA, Webequie First Nation will identify and assess the project's cumulative effects using the approaches described in provincial and federal guidance documents, such as the *Operational Policy Statement: Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* (CEA Agency, 2015b)*;* and *Interim Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* (CEA Agency, 2018b). Based on these guidance documents, the cumulative effects assessment will generally include the following tasks:

- Identify and characterize net effects of the Project;
- Define spatial (i.e., Regional Study Area) and temporal boundaries (i.e., construction, operations) for each criterion where net effects have been identified;
- Identify current and reasonably foreseeable projects with effects likely to overlap both spatially and temporally with the predicted net effects of the Project;
- Predict likely cumulative effects and develop appropriate additional mitigation measures, if warranted; and
- Evaluate and determine the significance of the likely cumulative effects.

A technical work plan for the cumulative effects assessment will be prepared at the outset of the EA, including identification of which other developments will be assessed and the methodology for assessing effects. The work plan will be provided to MECP and IAAC for review and guidance, and will be summarized and presented to the public, Indigenous communities and stakeholders as part of the consultation and engagement activities for the Project.

## 8.2 Study Area Definitions

The EA will describe the spatial and temporal boundaries for each valued component of the environment. The geographic boundaries for the Project will indicate the areas within which potential effects are reasonably anticipated, including cumulative effects. The temporal boundaries for the Project will be generally based on the planned phases that include the construction phase: the period from the start of construction to the start of operation; and the operations phase: the operation and maintenance activities throughout the life of the Project. As such, the EA will adopt a multi-scale approach for describing existing environmental conditions and predicting effects from the Project. Specifically, the following study areas will be used to define the geographic extent within which to capture the potential direct and indirect effects of the Project.

**Project Footprint:** established to identify areas of direct disturbance (i.e., the physical area required for construction and operation of the Project). The project footprint is the preferred corridor (35 m right-of-way

width) and temporary or permanent areas needed to support the Project that include laydown yards, storage yards, construction camps, access roads and aggregate extraction sites.

**Local Study Area (LSA):** established to assess the potential, largely direct, and immediate indirect effects of the Project on the local environment. The boundaries of each LSA will extend a specified distance from the project footprint boundary to capture the direct and nearby indirect effects on an environmental component/criterion.

**Regional Study Area (RSA):** established to assess the potential, largely indirect and cumulative effects of the Project in the broader, regional context. The RSA extends beyond the LSA to include the maximum geographical extent to which impacts from the Project may be expected.

The EA will further define the LSA and RSA boundaries for each environmental factor/criterion (e.g., surface water, fish, wildlife, air, socio-economic, etc.) depending on the nature of likely effects and the geographic extent and characteristics of each factor. The selection of study areas will also consider comments and input received from Indigenous communities, regulatory agencies, the public and stakeholders. Study areas will also be designed to capture the maximum spatial extent of potential effects from the Project, including other existing developments and proposed reasonably foreseeable developments as in the case of the cumulative effects assessment. In general, each environmental factor/criterion or valued component will be assessed within the context of the project footprint, LSA and RSA. For example, in some cases, larger or separate study areas will be developed to address select potential natural heritage and socio-economic features, including but not limited to Caribou (Boreal population), archaeology, air/noise and socio-economic elements, to allow for greater accuracy in the prediction of project effects and development of mitigation measures.

## 8.3 Identification and Evaluation of Alternatives

Section 6.1(2) of the *Environmental Assessment Act* (EA Act) requires proponents to conduct an alternatives assessment to demonstrate the advantages and disadvantages of the preferred alternative in comparison to other alternatives considered. As discussed in Section 5 of the ToR – Description of and Rationale for Alternatives, the Ontario EA process requires that two types of project alternatives be considered: “alternatives to” the Undertaking (i.e., functionally different ways of addressing an identified problem or opportunity to arrive at the preferred planning solution) and “alternative methods” of carrying out the Undertaking (options for implementing the preferred planning solution).

An assessment of alternatives to the Undertaking to meet the project purpose as defined by WFN has been completed and is presented in Section 5.1 of the ToR. Alternatives to the Undertaking (the Project) that were examined included: do nothing; upgrade the existing trail system to a seasonal winter road; alternative modes of transportation (hoverbarge, airship, rail); manage travel demand; and a new all-season road. Based on the evaluation, and having considered the balance of advantages and disadvantages of each alternative, the preferred alternative is the construction of a new all-season road between Webequie First Nation and the mineral exploration and proposed mine activities in the McFaulds Lake area, as described in Section 4 – Description of the Undertaking. A new all-season road is the most reasonable planning alternative, as it best meets the objectives of Webequie First Nation by providing new and enhanced opportunities to improve Webequie’s economic and social well-being; and, given the current and projected available resources (people and financing), it is the likeliest alternative to be within Webequie’s technical and economic abilities to implement. In addition, the preferred planning alternative is consistent with provincial government plans and policies for development of the region, including the Ring of Fire area.

Based on the conclusion from the assessment of alternatives to the Undertaking, this ToR proposes that a focused EA be prepared in accordance with subsections 6(2)(c) and 6.1(3) of the EA Act. As such, the opportunities and goals of the Project have been clearly identified and the EA will not contain any further assessment of alternatives to the Undertaking, but instead will focus on alternative methods of carrying out the Project.

With respect to determining alternative methods of carrying out the Project, it is relevant to understand the background of the various road/transportation studies that have been conducted in the Webequie First Nation/McFaulds Lake region over recent years, and Webequie First Nation's community based land use planning process, to provide the context for the identification and screening of the alternative concept corridors for the WSR.

In addition to the previous transportation studies and Community Based Land Use Plan that is currently being prepared by Webequie, in 2017, WFN conducted an initial screening of supply road corridor alternatives of approximately 2 km in width between Webequie and mineral deposit area near McFaulds Lake. The screening and analysis of corridors was guided by a Local Working Group made up of community members of land users, harvesters, elders, and youth representatives. The corridor screening process included the identification of the advantages and disadvantages of corridor concept alternatives against the broad range of assessment factors (caribou habitat, culturally significant features, areas used for traditional activities, etc.), which were identified based on discussions with community members as to features and sensitivities that may be affected by the Project and what constituted valued environmental components for the community. In addition to the community based traditional land and resource use evaluation criteria, the alternative concepts were screened against criteria inherent in the broader definition of the environment that included natural, socio-economic, cultural and built environment factors and technical considerations. The result of this community based planning exercise was the identification of a preliminary preferred corridor for the supply road (35 m right-of-way width) along the centreline of the apporximately 2 km wide corridor. As further described in Section 5 of the ToR, the community's preliminary preferred route has been overlain with terrain mapping and assessment to identify a geotechnical optimal route within the 2 km wide preliminary proposed corridor. This yielded the proposed initial alternatives to be carried forward for assessment in the EA, as shown in **Figure 5.8**.

Therefore, it is proposed that, in addition to the initial alternatives and with the benefit of additional engagement and consultation, the EA may further identify and evaluate additional routing alignment alternatives within the preliminary preferred corridor, as appropriate. The 2 km corridor width will be retained to provide flexibility for refining/developing other route options for evaluation, if identified during the EA process. As indicated in Section 5.5, alternative supportive temporary and/or permanent infrastructure elements for the Project (e.g., aggregate sites, sites for temporary laydown and storage areas, sites for construction camps, and access road locations) will be evaluated during the EA. The assessment of alternative designs and/or locations will involve a comparative evaluation of the advantages and disadvantages against a set of natural environment, socio-economic environment and cultural environment and technical considerations (e.g., cost, constructability) to provide a clear rationale for the selection of a preferred alternative.

The principles for evaluating alternative methods are intended to yield a balanced design solution that maximizes the degree to which potential project benefits and opportunities can be realized, while minimizing significant adverse environmental effects. Significance of environmental net effects, including their characterization, will be determined during the EA process. It is anticipated that modifications to the project design will occur throughout the project planning process in conjunction with discussions with Indigenous

communities, government ministries and agencies, the public and stakeholders. Evaluation methodologies will be fully documented within the EA.

### 8.3.1 Evaluation Criteria and Indicators

In order to evaluate alternative methods for carrying out the Project and effects of the Undertaking, it will be necessary to establish criteria and indicators. Sufficient information about the criteria and indicators and how they will be developed is presented in the ToR to ensure the approach is understood by interested persons and communities, who are then able to provide informed comments. Each criterion will have one or more indicators that will identify how the potential environmental effects will be measured. A preliminary list of criteria and indicators is presented in **Appendix B** of the ToR. The preliminary list details the rationale for the selection of each of the proposed criteria and indicators, data sources, and an explanation about how each criterion and indicator will be further developed during the EA process. The preliminary list of criteria and indicators has been developed by the Webequie Project Team and includes input received during the engagement and consultation activities undertaken to date. The criteria, indicators and evaluation methods will be further developed, refined and finalized during the EA process in consultation with Indigenous communities, government ministries and agencies, the public and any other interested persons or groups. Some examples of the criteria and indicators proposed to be used for the EA are presented in **Table 8-1**.

**Table 8-1: Select Preliminary Criteria and Indicators for Evaluation**

| Environment Factor | Criterion | Indicators |
|---|---|---|
| **Natural Environment** | Upland Ecosystems, Riparian Ecosystems and Wetlands | Change (hectares - ha) to upland ecosystems, riparian ecosystems and wetlands (not designated as Provincially Significant Wetland (PSW)<br>Ecosystem availability<br>Ecosystem distribution, including fragmentation<br>Ecosystem composition |
| | Fish and Aquatic Habitat<br>- Brook Trout<br>- Northern Pike<br>- Walleye<br>- Lake Sturgeon | Change to fish and Fish habitat<br>• Number or area (ha) of waterbodies crossed<br>• Fish spawning, nursery or rearing areas (ha)<br>• Habitat quantity<br>• Habitat quality<br>• Abundance and distribution |
| | Federal or Provincial Species at Risk (SAR)<br>- Caribou (Boreal population)<br>- Wolverine<br>- Little brown myotis<br>- Barn swallow<br>- Bank swallow | Change to:<br>• Habitat availability (i.e., quantity and quality)<br>• Habitat distribution (i.e., configuration and connectivity) |

| Environment Factor | Criterion | Indicators |
|---|---|---|
| | - Common nighthawk<br>- Canada Warbler<br>- Olive-sided flycatcher<br>- Rusty Blackbird<br>- Bald eagle<br>- Lake sturgeon | • Survival and reproduction |
| | Wildlife and Wildlife Habitat | Changes to wildlife and wildlife habitat<br>• Area (ha) of wildlife habitat crossed<br>• Habitat availability (i.e., quantity and quality)<br>• Habitat distribution (i.e., arrangement, connectivity, fragmentation)<br>• Survival and reproduction |
| | Significant Ecological Area (defined as an area of interest to MNRF that is ecologically significant, and warrants special consideration, excluding Area of Natural and Scientific Interest (ANSI), parks or Reserves) | Number and/or area (ha) of Significant Ecological Areas affected |
| | Migratory Birds | Areas (ha) of migratory bird flyways, feeding habitat and resting areas |
| **Socio-Economic Environment** | Traditional Land and Resource Uses (hunting, gathering, fishing, trapping) | Changes, disruption to (number of sites) or loss of (ha) intensively used areas for traditional land use activities by community members<br>Number of fish spawning areas affected<br>Number of seasonal hunting areas affected<br>Number of moose mating areas affected<br>Area (ha) used for harvesting of plants for medicinal or human consumption affected<br>Number of traplines affected |
| | Commercial Activities and Labour Market | Change to employment and/or business-related activities<br>Training opportunities |

| Environment Factor | Criterion | Indicators |
|---|---|---|
| | Community Health and Well-being | Nuisance effects |
| | | Changes in levels of public safety |
| | | Changes in human health |
| | | Changes to the volume and type of waste in the community landfill, including hazardous waste materials, such as fuel cans, batteries, tires, vehicles |
| | | Level of methylmercury in fish in downstream rivers |
| | Mineral and/or Aggregate Resources | Area (ha) of significant aggregate deposits affected |
| | | Area (ha) of mines within the study area affected |
| | | Number of mining claims within the study area affected |
| | | Area of pits/quarries (ha) within the study area affected |
| | Recreational Activities (camps, trails, outfitters, movement of small watercraft) | Number/types of activities affected |
| | Provincial Parks, Areas of Natural and Scientific Interest (ANSI) or Conservation Reserves | Number and area (ha) of Provincial Parks, Areas of Natural and Scientific Interest (ANSI) or Conservation Reserves affected |
| **Cultural Environment** | Aboriginal and Treaty Rights and Interests | Changes in preferred harvested species |
| | | Changes to, or restrictions on, preferred harvesting methods |
| | | Changes to quantity and quality of cultural use locations and access routes |
| | | Changes in the experience of lands and resources for cultural purposes |
| | Archaeological Resources | Number and/or area (ha) of Indigenous archaeological sites affected, as identified by communities |
| | | Number or area (ha) of Euro-Canadian archaeological sites effected |
| | Burial Sites (in relation to Ontario *Funeral, Burial and Cremation Services Act*) | Number of burial sites affected |

| Environment Factor | Criterion | Indicators |
|---|---|---|
| | Built Heritage and Cultural Heritage Landscapes | Number and type of Indigenous or non-Indigenous built heritage features/sites (e.g., old trapping or hunting camp, etc.) and/or cultural heritage landscapes that may be effected (e.g., spiritual or symbolic sites of value or interest to Indigenous communities) |
| **Technical Considerations** | Safety and Reliability | Conformance of road alignment to provincial road safety standards and ability to provide reliability for users |
| | Constructability | Terrain and soil stability |
| | Cost | Construction capital cost<br>Operations and maintenance cost<br>Length (km) of all-season road |
| | Location of Supportive Infrastructure (aggregate supply areas, camps, laydown/storage yards, access roads) | Proximity/distance to corridor of aggregate source sites, including quality of deposits<br>Constraints to haulage/movement of materials and equipment<br>Length (km) of temporary and permanent access roads |