



**CANADA NICKEL**  
COMPANY



**Stantec**

# **Crawford Nickel Project Impact Statement**

Chapter 18 Assessment of Potential Effects on Birds and  
Bird Habitat



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**Prepared for:**  
Canada Nickel Company

**Prepared by:**  
Stantec Consulting Ltd.

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## Table of Contents

<b>18</b>	<b>Assessment of Potential Effects on Birds and Bird Habitat.....</b>	<b>18.1</b>
18.1	Scope of Assessment .....	18.2
18.1.1	Regulatory and Policy Setting .....	18.2
18.1.2	The Influence of Consultation and Engagement on the Assessment .....	18.4
18.1.3	Potential Effects, Pathways and Measurable Parameters .....	18.8
18.1.4	Boundaries .....	18.10
18.1.5	Residual Effects Characterization .....	18.11
18.1.6	Significance Definition .....	18.12
18.2	Existing Conditions for Birds and Bird Habitat .....	18.13
18.2.1	Methods.....	18.13
18.2.2	Overview.....	18.16
18.3	Project Interactions with Birds and Bird Habitats .....	18.32
18.4	Assessment of Residual Effects on Birds and Bird Habitats .....	18.35
18.4.1	Analytical Assessment Techniques.....	18.35
18.4.2	Change in Bird Habitat .....	18.40
18.4.3	Change in Mortality Risk .....	18.66
18.4.4	Summary of Project Residual Effects.....	18.78
18.4.5	Significance of Adverse Federal Effects .....	18.79
18.5	Potential Effects on Federal Lands .....	18.81
18.6	Prediction Confidence .....	18.81
18.7	Assumptions.....	18.82
18.8	Follow-up and Monitoring.....	18.82
18.9	References.....	18.83
18.10	Figures .....	18.97

### List of Tables

Table 18.1	Summary of Key Information, Indigenous Knowledge, and Concerns for the Project Related to Birds and Bird Habitat.....	18.5
Table 18.2	Potential Effects, Effect Pathways and Measurable Parameters for Birds and Bird Habitat.....	18.8
Table 18.3	Characterization of Residual Effects on Birds and Bird Habitat .....	18.11
Table 18.4	Bird Field Surveys Completed During Baseline Studies .....	18.14
Table 18.5	Bird Significant Wildlife Habitat Features Included in the Assessment .....	18.16
Table 18.6	Bird Species at Risk Observed or Potentially Present in the Local Study Area .....	18.22
Table 18.7	Bird Species of Conservation Concern Observed or Potentially Present in the Local Study Area .....	18.25
Table 18.8	Summary of Land Cover in the Regional Study Area.....	18.29
Table 18.9	Summary of Habitat Categories within the Project Area and Local Study Area .....	18.30
Table 18.10	Area of Each Bird Significant Wildlife Habitat Feature in the Project Area and Local Study Area .....	18.31
Table 18.11	Project Interactions with Birds and Bird Habitat .....	18.32
Table 18.12	Land Cover Classes used to Quantify Breeding Habitat for Bird Species Groups, Species at Risk and Species of Conservation Concern.....	18.38
Table 18.13	Estimated Change in Land Cover Compensation in the Local Study Area .....	18.45
Table 18.14	Estimated Change in Bird Significant Wildlife Habitat in the Local Study Area .....	18.45
Table 18.15	Estimated Bird Habitat Remaining in the Regional Study Area after Construction ....	18.46
Table 18.16	Predicted Noise Effects (> 50 dBA) on Bird Habitat During Construction Within the Local Study Area .....	18.47

Table 18.17	Predicted Noise Effects (> 50 dBA) on Bird Habitat during Operations within the Local Study Area .....	18.59
Table 18.18	Project Residual Effects on Birds and Bird Habitat .....	18.78

### List of Figures

Figure 18.1	Local and Regional Study Areas .....	18.98
Figure 18.2.1	Bird Habitat Mapping Candidate Waterfowl Nesting Area.....	18.99
Figure 18.2.2	Bird Habitat Mapping Confirmed Bald Eagle Nesting Habitat.....	18.100
Figure 18.2.3	Bird Habitat Mapping Candidate Woodland Raptor Nesting Habitat .....	18.101
Figure 18.2.4	Bird Habitat Mapping Candidate Sharp-tailed Grouse Lek Habitat.....	18.102
Figure 18.2.5	Bird Habitat Mapping Candidate Marsh Bird Breeding Habitat .....	18.103
Figure 18.2.6	Bird Habitat Mapping Shrub/Early Successional Bird Breeding Habitat .....	18.104
Figure 18.2.7	Bird Habitat Mapping Confirmed Habitat for Special Concern and Rare Species ...	18.105
Figure 18.3	Species at Risk and Species of Concern Observations within the RSA .....	18.106
Figure 18.4.1	Species Groups: Forest Birds .....	18.116
Figure 18.4.2	Species Groups: Other Landbirds .....	18.117
Figure 18.4.3	Species Groups: Marshbirds .....	18.118
Figure 18.4.4	Species Groups: Raptors .....	18.119
Figure 18.4.5	Species Groups: Waterfowl.....	18.120
Figure 18.4.6	Species Groups: Waterbirds.....	18.121
Figure 18.4.7	Species Groups: Shorebirds .....	18.122
Figure 18.4.8	Species Groups: Upland Gamebirds.....	18.123
Figure 18.4.9	Species Groups: Common Nighthawk .....	18.124
Figure 18.4.10	Species Groups: Evening Grosbeak .....	18.125
Figure 18.4.11	Species Groups: Olive-sided Flycatcher .....	18.126
Figure 18.4.12	Species Groups: Rusty Blackbird.....	18.127
Figure 18.4.13	Species Groups: Yellow Rail .....	18.128
Figure 18.4.14	Species Groups: Canada Warbler.....	18.129
Figure 18.4.15	Species Groups: Lesser Yellowlegs .....	18.130
Figure 18.4.16	Species Groups: Short-eared Owl.....	18.131

## Acronyms and Abbreviations

ARU	Autonomous Recording Unit
BCR	Bird Conservation Region
CBC	Christmas Bird Count
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
dBA	A-weighted decibels
EC	Environment Canada
ECCC	Environment and Climate Change Canada
ESA	<i>Endangered Species Act, 2007</i>
ESC	Erosion and Sediment Control
FRI	Forest Resources Inventory
FWCA	<i>Fish and Wildlife Conservation Act, 1997</i>
GIS	Geographical Information System
GOC	Government of Canada
LIO	Land Information Ontario
LSA	Local Study Area
MBCA	<i>Migratory Birds Convention Act</i>
MBR	Migratory Birds Regulations, 2022
MECP	Ministry of the Environment, Conservation and Parks
MNR	Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
PA	Project Area
RSA	Regional Study Area

SAR	Species at Risk
SARA	Species at Risk Act
SOCC	Species of Conservation Concern
S-rank	Provincial sub-national rank
SWH	Significant Wildlife Habitat
VC	Valued Component

## Glossary of Technical Terms

Autonomous Recording Unit (ARU)	A stationary audio recording device that records sound continuously during a set time period.
Crepuscular	Birds that are most active during twilight periods – dawn and dusk.
Forest Birds	Birds that live and nest primarily in forests and wooded habitat, such as warblers, vireos and thrushes.
Marsh Birds	Birds that live primarily in marshes or wetlands, such as grebes, rails, herons, and cranes.
Migratory Birds	A migratory bird is a species that is protected by the MBCA. Some bird species are not protected by the MBCA such as raptors, owls, grouse and some blackbird species.
Other Landbird	Includes birds that primarily live and forage on land and are not covered under the other bird species groups or habitat guilds (group of species that share similar habitat).
Passerine	Birds that belong to the order <i>Passeriformes</i> , also known as perching birds or songbirds.
Raptors	Birds of prey that hunt for food with sharp talons and beaks, such as hawks, eagles, falcons and owls.
Shorebirds	Bird species found along shorelines, such as sandpipers, plovers and snipes.
Significant Adverse Residual Effect	A significant adverse residual effect on migratory birds and SAR is one that that, following the application of avoidance and mitigation measures, causes or further contributes to the exceedance of a conservation-based threshold that leads to changes in bird habitat and bird mortality.
Species at Risk (SAR)	Species listed on Schedule 1 of SARA as extirpated, endangered or threatened or listed as extirpated, endangered or threatened under Ontario ESA.
Species of Conservation Concern (SOCC)	Species assessed as extirpated, endangered, threatened, or special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but have not yet been added to Schedule 1 of SARA; listed as special concern on the Species at Risk in Ontario or as Special Concern on Schedule 1 of SARA; ranked as provincially rare in Ontario including species with provincial status (S-ranks) of S1 (Critically Imperiled), S2 (Imperiled) or combinations thereof (e.g., S1S2).
Species of Indigenous Importance	Bird species identified as important by Indigenous nations listed in the Indigenous Engagement and Partnership Plan (IAAC 2023).

Upland Gamebird	Includes species that are hunted and recorded within the local study area, such as Ruffed Grouse ( <i>Bonasa umbellus</i> ), Sharp-tailed Grouse ( <i>Tympanuchus phasianellus</i> ) and Spruce Grouse ( <i>Canachites canadensis</i> ).
Waterbirds	Birds that rely on aquatic habitats likes lakes and rivers, such as loons, gulls, and terns.
Waterfowl	Birds that are commonly found around water, such as lakes, rivers, ponds, and wetlands, such as ducks, geese, and swans.

## 18 Assessment of Potential Effects on Birds and Bird Habitat

Birds and Bird Habitats was selected as a Valued Component (VC) because it provides important ecological, social, cultural, aesthetic, recreational, and economic value to the public, Indigenous nations, governments, and other affected parties, and because of the potential interactions with Project activities and regulatory considerations. Some waterfowl and upland game bird species are ecologically important; however, they also have economic, cultural, and traditional value to the public. Raptors, including owls, represent top bird predators and use both terrestrial and freshwater habitats. Some raptor species also have important cultural and traditional value to the public and Indigenous nations.

This VC includes consideration of waterbirds, shorebirds, waterfowl, raptors, marsh birds, and other land birds protected under the *Migratory Birds Convention Act* (MBCA) and the *Ontario Fish and Wildlife Conservation Act*. It also includes species of Indigenous importance, species of conservation concern (SOCC), and species at risk (SAR).

The Tailored Impact Statement Guidelines (TIS Guidelines, Appendix A.1 of the Impact Statement) require an assessment of the effects of the Project on birds and bird habitat. The Crawford Nickel Project ('the Project') may affect birds and bird habitat because of changes to habitat quantity and quality. These changes could affect bird habitat directly through loss of habitat or indirectly through displacement due to sensory disturbance and could affect the abundance and diversity of bird populations. Changes in habitat quality could affect the health of individual birds directly or indirectly through effects to lower trophic communities, which are a source of prey for certain bird groups.

Birds and Bird Habitat are linked to other VCs in the Impact Statement, including:

- Atmospheric Environment (Chapter 12 of the Impact Statement), whereby atmospheric deposition of fugitive dust and/or potentially acidifying or eutrophying emissions may result in changes in terrestrial and aquatic bird habitat quality.
- Acoustic Environment (Chapter 13 of the Impact Statement), whereby changes in noise may affect quality of bird habitat and bird health.
- Surface Water (Chapter 15 of the Impact Statement), whereby changes in surface water may impact the availability and quality of aquatic habitats that are used by birds.
- Vegetation, Riparian and Wetland Environments (Chapter 16 of the Impact Statement), whereby changes in vegetation and wetlands may impact bird habitat quality and availability.
- Fish and Fish Habitat (Chapter 17 of the Impact Statement), whereby changes in fish communities, abundance, and health have the potential to affect mortality risk bird for species that consume fish (e.g., Bald Eagle).

- Social Conditions (Chapter 22 of the Impact Statement), whereby changes in the bird community and bird habitat may impact the distribution and abundance of bird species that are hunted and/or species of cultural importance.
- Indigenous Interests (Chapters 25 to 28 of the Impact Statement), whereby changes in the abundance and distribution of birds may affect harvesting by Indigenous nations for subsistence and cultural purposes or species of spiritual importance.

## 18.1 Scope of Assessment

### 18.1.1 Regulatory and Policy Setting

This Section identifies the primary regulatory requirements and policies of the federal and provincial authorities that influence the scope of the assessment on birds and bird habitat.

#### 18.1.1.1 Federal

##### 18.1.1.1.1 Migratory Birds Convention Act

The MBCA affords protection and conservation to migratory bird populations, individuals, and their nests within all of Canada. Most bird species in Canada are afforded protection, except for a few families (e.g., cormorants, pelicans, grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, kingfishers, and corvids). The MBCA is the enabling statute for the Migratory Birds Regulations, which were updated in May 2022 (Migratory Birds Regulations 2022; MBR). Section 6 of this regulation states that without the authorization of a permit, the disturbance, destruction, or taking of a nest, egg, nest shelter, eider duck shelter, or duck box of a migratory bird, or possession of a migratory bird, carcass, skin, nest, or egg of a migratory bird are prohibited. Under the 2022 MBR, nests for 18 bird species (7 of which occur in Ontario) receive year-round protection for a prescribed length of time ranging from 24-36 months (Schedule 1), and all other nests of migratory birds are protected when they contain a live bird or viable egg (S. 5(2)(b)). If a nest of a species identified on Schedule 1 of the MBR is determined to be empty of live birds or viable eggs, then the nest can be registered under Environment and Climate Change Canada's (ECCC) Abandoned Nest Registry, at which point the prescribed period of inactivity begins.

##### 18.1.1.1.2 Species at Risk Act

The *Species at Risk Act* (SARA) provides a framework across Canada to prevent the extinction of wildlife species and to support actions for their recovery. Federal departments are responsible for preventing the disappearance of endangered or threatened species on their properties and to implement management plans to comply with the SARA.

General SARA prohibitions include section 32(1), which states that “no person shall kill, harm, harass, capture, or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species”, and section 33, which states that “no person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the

reintroduction of the species into the wild in Canada.” In addition, critical habitat, defined as the habitat that is necessary for the survival or recovery of a listed wildlife species, may be defined and protected under section 58. Only those species currently listed in Schedule 1 of SARA (i.e., those listed as extirpated, endangered, or threatened) are protected by the prohibitions of sections 32 to 36 and 58 of SARA, and then only on federal lands, except for aquatic species and migratory birds which are protected throughout Canada. SARA-listed species designated as special concern are not protected by the prohibitions of sections 32 to 36 or 58 of SARA; however, these species are protected under section 79, which states that federal authorities must “identify adverse effects of the project on the listed wildlife species [including special concern species] and its critical habitat...and ensure that measures are taken to avoid or lessen adverse effects.” Furthermore, special concern species require that provincial or regional management plans, including conservation measures, be developed to protect the species.

Under SARA, a Recovery Strategy must be developed by ECCC for terrestrial species listed as threatened or endangered under Schedule 1 and a Management Plan must be developed for species listed as special concern under Schedule 1. The Recovery Strategy should include the identification of critical habitat and list examples of activities that are likely to result in its destruction.

### **18.1.1.2 Provincial**

#### **18.1.1.2.1 Endangered Species Act**

The Ontario *Endangered Species Act, 2007* (ESA) was created to protect SAR and their habitats in Ontario. Endangered, threatened, and extirpated species listed on the Species at Risk in Ontario (SARO) list receive legal protection from harm or harassment under the ESA. In addition to species protection, the ESA prohibits damage or destruction of habitat for endangered or threatened species. Habitat of a given species is classified as either general habitat protection or regulated habitat protection (i.e., defined under regulation).

#### **18.1.1.2.2 Fish and Wildlife Conservation Act, 1997**

The Ontario *Fish and Wildlife Conservation Act, 1997* (FWCA) provides protection to many birds, mammals, reptiles, amphibians, fish, and invertebrates. FWCA legislation prohibits hunting (killing, capturing, injuring, and harassing) and trapping of ‘specially protected wildlife’ as defined in Ontario Regulation 699/98 of the Act. Birds that are not protected by the MBCA (e.g., raptors) are protected under the FWCA. The FWCA protects individuals and their habitat (e.g., nests, roosts).

### **18.1.1.3 Species at Risk and Species of Conservation Concern**

For this Project, SAR are defined as species that are:

- listed on Schedule 1 of SARA as extirpated, endangered or threatened
- listed as extirpated, endangered or threatened under Ontario ESA

SOCC are defined as species that are:

- assessed as extirpated, endangered, threatened, or special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but have not yet been added to Schedule 1 of SARA
- listed as special concern on the Species at Risk in Ontario or as Special Concern on Schedule 1 of SARA
- ranked as provincially rare in Ontario including species with provincial status (S-ranks) of S1 (Critically Imperiled), S2 (Imperiled) or combinations thereof (e.g., S1S2)

Provincial ranks (S-ranks) are defined as follows:

- S1 - critically imperiled; usually fewer than 5 occurrences
- S2 - imperiled; usually fewer than 20 occurrences
- S3 - vulnerable; usually fewer than 100 occurrences
- S4 - apparently secure; uncommon but not rare, usually more than 100 occurrences
- S5 - secure; common, widespread, and abundant
- ? - S-rank followed by a “?” indicates the rank is uncertain

### **18.1.2 The Influence of Consultation and Engagement on the Assessment**

Canada Nickel has engaged with potentially affected Indigenous nations, regulators, the public, and stakeholders. Table 18.1 provides a summary of the topics, key information including Indigenous knowledge, and concerns that Canada Nickel identified as part of their engagement efforts that relate to birds and bird habitats, as well as a summary of the influence that the outcomes of this engagement had on the assessment.

This information was considered when evaluating whether Canada Nickel’s planned mitigation will effectively manage the identified potential interactions, or whether additional or refined mitigation is warranted. Specific concerns regarding birds and bird habitats raised during engagement for the Project and any additional and specific mitigation measures added to address one or more of the concerns, are described in Table 18.1.

**Table 18.1 Summary of Key Information, Indigenous Knowledge, and Concerns for the Project Related to Birds and Bird Habitat**

Topic	Key Information, Indigenous Knowledge, and Concerns	Influence on the Assessment	Where Information is Addressed in the Impact Statement
Birds and Bird Habitat	<ul style="list-style-type: none"> <li>• Members of the public and other stakeholders expressed concerns regarding:                             <ul style="list-style-type: none"> <li>- potential effects on migratory birds and their habitat, including habitat loss, habitat alteration or fragmentation, or disturbance due to site alteration, vegetation clearing, vehicle operation, accidents and spills, and increased noise levels and light pollution, during all Project phases</li> <li>- potential effects to the existing northern flyway for geese and ducks</li> <li>- potential effects on Bald Eagle (including stick nests), Canada Warbler, Common Nighthawk, Olive-Sided Flycatcher, Yellow Rail, Whip-poor-will, Evening Grosbeak, Barn Swallow, Bobolink, Red-headed Woodpecker, Peregrine Falcon and Bank Swallow</li> </ul> </li> <li>• Flying Post First Nation, Matachewan First Nation and Mattagami First Nation expressed concerns regarding impacts to waterfowl, eagle, and osprey nesting habitat.</li> <li>• Flying Post First Nation, Matachewan First Nation, Mattagami First Nation, Métis Nation of Ontario – Region 3, and Taykwa Tagamou Nation expressed concern relating to impacts to migratory birds and their habitat from noise, blasting, and timing of activities.</li> <li>• Matachewan First Nation expressed concern that development of the Project area will result in habitat loss and affect the diversity of migratory birds. Community members note that the clearing of undeveloped land and noise disturbance from the Project will affect the behaviours of migratory birds in the surrounding area.</li> </ul>	<ul style="list-style-type: none"> <li>• Contributed to an understanding of existing conditions for birds and bird habitat.</li> <li>• The potential change in bird habitat was considered and assessed.</li> <li>• The potential effects to birds from sensory disturbance, such as noise and light, were considered in the effects assessment.</li> <li>• Considered in the development of mitigation and management measures and supported scope of issues assessed.</li> <li>• Informed the assessment on Indigenous interests in Chapters 25-28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> <li>• Canada Nickel's response to mitigation recommendations made by Indigenous nations are provided in Chapters 25-28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 18 (Assessment of Potential Effects on Birds and Bird Habitats), Sections 18.2, 18.4.2</li> <li>• Chapters 25-28 (Assessment of Potential Effects on Indigenous Interests)</li> </ul>

Topic	Key Information, Indigenous Knowledge, and Concerns	Influence on the Assessment	Where Information is Addressed in the Impact Statement
Bird Health and Mortality	<ul style="list-style-type: none"> <li>• Members of the public and other stakeholders expressed concerns regarding potential for increased bird mortality.</li> <li>• Matachewan First Nation and Mattagami First Nation expressed concern regarding birds encountering tailings and becoming contaminated.</li> <li>• Taykwa Tagamou Nation expressed concern regarding contamination of local waterways and water sources and resulting effects to geese and ducks.</li> <li>• Flying Post First Nation, Matachewan First Nation, Mattagami First Nation and Métis Nation of Ontario – Region 3 expressed concern regarding the use of light fixtures that could disturb nocturnal species such as the common nighthawk.</li> <li>• Flying Post First Nation, Matachewan First Nation, Mattagami First Nation, and Taykwa Tagamou Nation recommend mitigation measures regarding birds, migratory birds, and their habitat from accidents, ambient light, interactions with tailings, and disturbance activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Contributed to an understanding of existing conditions for bird health.</li> <li>• The potential effects to birds from sensory disturbance, including light, were considered in the effects assessment.</li> <li>• Potential effects to birds and bird habitat as a result of accidents or malfunctions was considered in Chapter 31 (Assessment of Potential Effects of Accidents and Malfunctions).</li> <li>• The potential change in bird mortality was considered and assessed.</li> <li>• Considered in the development of mitigation and management measures and supported scope of issues assessed.</li> <li>• Informed the assessment on Indigenous interests in Chapters 25-28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> <li>• Canada Nickel's response to mitigation recommendations made by Indigenous nations are provided in Chapters 25- 28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 18 (Assessment of Potential Effects on Birds and Bird Habitats), Sections 18.2, 18.4.2, 18.4.3</li> <li>• Chapters 25-28 (Assessment of Potential Effects on Indigenous Interests)</li> <li>• Chapter 31 (Assessment of Potential Effects of Accidents and Malfunctions)</li> </ul>

Topic	Key Information, Indigenous Knowledge, and Concerns	Influence on the Assessment	Where Information is Addressed in the Impact Statement
Species of Indigenous Importance	<ul style="list-style-type: none"> <li>• Matachewan First Nation continue to rely on an abundance and diversity of species to exercise hunting and trapping rights including partridge and ducks. Traditional species of importance also include geese, eagle (bald eagle), duck, crane and osprey.</li> <li>• Taykwa Tagamou Nation and Mattagami First Nation expressed that passing on land-based knowledge, including where and how to hunt and trap has been integral to members' continual practice of these activities. The Nation noted that members harvest wild foods throughout their territory. Grouse and goose were identified as significant, followed by duck. Traditional species of importance also include osprey, partridge and crane. Taykwa Tagamou Nation and Mattagami First Nation reported that waterfowl are hunted in both the spring and the fall, as the birds followed their annual north-south migration routes.</li> <li>• Taykwa Tagamou Nation recommends Canada Nickel plan for potential interactions between geese and reclamation efforts post decommissioning.</li> </ul>	<ul style="list-style-type: none"> <li>• Contributed to an understanding of Species of Importance for Indigenous nations.</li> <li>• Species of Indigenous importance were assessed within their respective bird groups.</li> <li>• Considered in the development of mitigation and management measures and supported scope of issues assessed.</li> <li>• Informed the assessment on Indigenous interests in Chapters 25-28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> <li>• Canada Nickel's response to mitigation recommendations made by Indigenous nations are provided in Chapters 25- 28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).</li> </ul>	<ul style="list-style-type: none"> <li>• Chapters 18 (Assessment of Potential Effects on Birds and Bird Habitats), Sections 0, 18.4</li> <li>• Chapters 25-28 (Assessment of Potential Effects on Indigenous Interests)</li> </ul>

Where made available by Indigenous nations through engagement, information gathering, and voluntary information sharing, Indigenous knowledge has been considered and incorporated into the Impact Statement, as applicable. Refer to Description of Engagement with Indigenous Peoples (Chapter 7 of the Impact Statement) for detailed methods regarding the incorporation of Indigenous knowledge to the Impact Statement.

### 18.1.3 Potential Effects, Pathways and Measurable Parameters

The potential effects of the Project on birds and bird habitat are identified in Table 18.2. For each effect in Table 18.2, effect pathways and indicators/measurable parameters have been identified to characterize the quantitative or qualitative measurement of change in Project-specific effects.

The assessment of change in habitat uses measurable parameters that are quantifiable where possible (e.g., area of direct habitat loss). However, in some cases, habitat loss was predicted qualitatively (e.g., indirect loss). Change in mortality was also predicted qualitatively through literature review, professional judgement, and project experience.

**Table 18.2 Potential Effects, Effect Pathways and Measurable Parameters for Birds and Bird Habitat**

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in bird habitat	<p>Direct loss or alteration of bird habitat (e.g., vegetation clearing).</p> <p>Indirect loss or alteration of bird habitat (e.g., sensory disturbance, edge effects).</p>	<p>Amount (ha) of bird habitat (or measured qualitatively for species where habitat loss cannot be quantified) directly or indirectly lost or altered for:</p> <ul style="list-style-type: none"> <li>• general bird habitat</li> <li>• forest birds</li> <li>• other landbirds</li> <li>• marsh birds</li> <li>• raptors</li> <li>• waterfowl</li> <li>• waterbirds</li> <li>• shorebirds</li> <li>• upland gamebirds</li> </ul> <p><b>SAR including:</b></p> <ul style="list-style-type: none"> <li>• Bank Swallow</li> <li>• Barn Swallow</li> <li>• Canada Warbler</li> <li>• Eastern Whip-poor-will</li> <li>• Lesser Yellowlegs</li> <li>• Short-eared Owl</li> </ul> <p><b>SOCC including:</b></p> <ul style="list-style-type: none"> <li>• Common Nighthawk</li> <li>• Evening Grosbeak</li> <li>• Olive-sided Flycatcher</li> <li>• Rusty Blackbird</li> </ul>

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
		<ul style="list-style-type: none"> <li>• Yellow Rail</li> </ul> <p>Qualitative evaluation of the amount of indirect habitat loss or altered for the bird groups and species listed above.</p> <p>Qualitative assessment of changes in diversity and abundance of the bird community from changes in habitat.</p> <p>Area (ha) of formally defined SAR critical habitat directly or indirectly affected, if present.</p> <p>Number of SARA-defined bird SAR residences that may be adversely affected by the Project.</p> <p>Area (ha) of bird habitat features that may be adversely affected by the Project for:</p> <ul style="list-style-type: none"> <li>• Waterfowl Nesting Area</li> <li>• Bald Eagle and Osprey Nesting Habitat</li> <li>• Woodland Raptor Nesting Habitat</li> <li>• Sharp-tailed Grouse Lek Habitat</li> <li>• Marsh Breeding Bird Habitat</li> <li>• Shrub/Early Successional Breeding Bird Habitat</li> </ul>
Change in mortality risk	<p>Activities associated with construction, operations, and/or decommissioning of the proposed Project could result in increased mortality risk for birds and bird nests through vegetation clearing activities and collisions with vehicles, equipment and other Project infrastructure.</p> <p>Indirect increase in mortality risk or number of bird fatalities (e.g., altered predator-prey dynamics, behavioural changes, increase in hunting and/or poaching because of improved access).</p>	<p>Estimated (qualitative) change in mortality risk for:</p> <ul style="list-style-type: none"> <li>• forest birds</li> <li>• other landbirds</li> <li>• marsh birds</li> <li>• raptors</li> <li>• waterfowl</li> <li>• waterbirds</li> <li>• shorebirds</li> <li>• upland gamebirds</li> </ul> <p><b>SAR including:</b></p> <ul style="list-style-type: none"> <li>• Bank Swallow</li> <li>• Barn Swallow</li> <li>• Canada Warbler</li> <li>• Eastern Whip-poor-will</li> <li>• Lesser Yellowlegs</li> <li>• Short-eared Owl</li> </ul> <p><b>SOCC including:</b></p> <ul style="list-style-type: none"> <li>• Common Nighthawk</li> <li>• Evening Grosbeak</li> <li>• Olive-sided Flycatcher</li> <li>• Rusty Blackbird</li> <li>• Yellow Rail</li> </ul>

## 18.1.4 Boundaries

### 18.1.4.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on birds and bird habitat in areas surrounding the Project components

The **Project Area (PA)** encompasses the Project footprint and is the anticipated area of physical disturbance associated with the construction, operations and decommissioning and closure of the Project. The PA covers an area of 11,785 hectare (ha) (118 square kilometres [km<sup>2</sup>]) and includes the following key Project components: the relocated 500 kV transmission line, future Highway 655 Right-of-Way, rail line, site roads, Ore Stockpiles (West and East), Open Pit (Main and East Zones), Collection Ponds (for collection and storage), Tailings Management Facility (TMF), and Impoundment Facility. The extent of the PA for the Project is shown on Figure 18.1.

The **Local Study Area (LSA)** includes the area in which Project-related effects (direct or indirect) can be predicted or measured with a reasonable level of accuracy and confidence. The LSA encompasses the PA and is VC-specific, as it is based on the reasonable geographic extent by which Project-related effects can be predicted. The LSA is identical to the Vegetation, Riparian, and Wetland Environments LSA because changes in vegetation, riparian and wetlands may result in changes to birds and bird habitat. The LSA includes the sub-watersheds on the west side of the West Buskegau River main channel, several catchments within the Jocko Creek watershed, and headwater subwatersheds of the North Driftwood River. The LSA continues downstream on the West Buskegau River and North Driftwood River, away from the PA. The LSA for the Birds and Bird Habitat VC is shown on Figure 18.1.

The **Regional Study Area (RSA)** includes the area within which cumulative effects on birds and bird habitat are likely to occur, depending on the location of other past, present or reasonably foreseeable future projects or activities. The RSA for birds and bird habitat encompasses the PA and the LSA and was defined primarily based on major road networks, which fragment habitat and may impede movement for some bird species. Gaps in forested habitat can impede movements of adult and juvenile birds during the breeding and non-breeding season (e.g., Bailey et al. 2018, MacIntosh et al. 2011, Desrochers and Hanon 1997) because they may be perceived as inhospitable habitat due to increased predation risk (Rodriguez et al. 2003). The extent of the RSA for the Birds and Bird Habitat VC is shown on Figure 18.1.

### 18.1.4.2 Temporal Boundaries

The temporal boundary of the assessment includes all Project phases from the start of construction through to the end of closure. Based on the current Project schedule, the Project phases include:

- Construction (Year -3 to Year -1)
- Operations
  - Operations phase 1 (Year 1 to Year 5): 60 kilotonnes per day (kt/d) milling capacity with ore extraction
  - Operations phase 2 (Year 5 to Year 30): 120 kt/d milling capacity with ore extraction

- Operations phase 3 (Year 30 to Year 41): 120 kt/d milling capacity with no ore extraction
- Decommissioning and closure
  - Active closure (Year 41 to Year 46)
  - Passive closure (Year 46+)

Refer to Chapter 3 of the Impact Statement (Project Description) for a detailed description of the activities anticipated to occur during each phase.

### 18.1.5 Residual Effects Characterization

The characterizations used to assess residual effects on birds and bird habitat are provided in Table 18.3.

**Table 18.3 Characterization of Residual Effects on Birds and Bird Habitat**

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p><b>Positive</b> – a residual effect that moves measurable parameters in a direction beneficial to birds and bird habitat relative to baseline</p> <p><b>Adverse</b> – a residual effect that moves measurable parameters in a direction detrimental to birds and bird habitat relative to baseline</p> <p><b>Neutral</b> – no net change in measurable parameters for the birds and bird habitat relative to baseline</p>
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	<p><b>Negligible</b> – no measurable change in the effect can be noted</p> <p><b>Low:</b></p> <p><u>Change in habitat:</u> disturbance/habitat loss results in measurable change in breeding bird density, but no change in breeding bird diversity (i.e., no loss of sensitive species)</p> <p><u>Change in mortality:</u> observed mortality to migratory birds or bird nests, but at levels not anticipated to have a measurable effect on breeding density or diversity of local species</p> <p><b>Moderate:</b></p> <p><u>Change in habitat:</u> disturbance/habitat loss results in measurable change in breeding bird density with change in breeding bird diversity (i.e., displacement of sensitive species)</p> <p><u>Change in mortality:</u> observed mortality to migratory birds or bird nests at levels that reduce breeding density or nesting success, but not anticipated to affect sustainability of local species</p> <p><b>High:</b></p> <p><u>Change in habitat:</u> disturbance/loss of habitat results in measurable change in breeding bird density and results in displacement of multiple species</p> <p><u>Change in mortality:</u> observed mortality to migratory birds or bird nests at levels that reduce breeding density or success and may affect sustainability of some local species</p>
Geographic Extent	The geographic area in which a residual effect occurs	<p><b>PA</b> – residual effects are restricted to the PA</p> <p><b>LSA</b> – residual effects extend into the LSA</p> <p><b>RSA</b> – residual effects extend into the RSA</p>

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Timing <sup>1</sup>	Considers when the residual effect is expected to occur, where relevant to the VC	<p><b>No Sensitivity</b> – the residual effect does not occur during critical life stage (e.g., nesting period) or timing is not expected to affect birds and bird habitat</p> <p><b>Moderate Sensitivity</b> – the residual effect may occur during a lower sensitive period of a critical life stage, e.g., several days prior to bird nesting period or near the end (e.g., periods when birds have fledged but remain in proximity to their nest or near end of key staging period)</p> <p><b>High Sensitivity</b> – residual effect occurs during a critical life stage (e.g., during breeding season or during key staging period)</p>
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	<p><b>Short-term</b> – the residual effect is restricted to construction (&lt;3 years)</p> <p><b>Medium-term</b> – the residual effect extends through the operations phase (3 to 41 years)</p> <p><b>Long-term</b> – the residual effect extends beyond the life of the Project (&gt;41 years)</p>
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	<p><b>Single event</b></p> <p><b>Multiple irregular event</b> – occurs at no set schedule</p> <p><b>Multiple regular event</b> – occurs at regular intervals.</p> <p><b>Continuous</b> – occurs continuously</p>
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the Project activity ceases	<p><b>Reversible</b> – the residual effect is likely to be reversed after activity completion and reclamation</p> <p><b>Irreversible</b> – the residual effect is unlikely to be reversed</p>
<p>Note:</p> <p>1. In terms of <b>Timing</b>, the critical life stages include episodes (such as, for the birds and bird habitat VC, species nesting/breeding) which will vary both by VC and annually depending on seasonal conditions. For example, it is clear that winter is outside of bird nesting and breeding periods and that spring is fully within this critical time period, whereas early spring and late fall is a transitional period that, depending on the seasonal conditions, may affect the life stage. Timing is also relevant to activities such as trapping, hunting and harvesting.</p>		

### 18.1.6 Significance Definition

The Impact Statement must characterize the extent of significance of any residual adverse federal effect, which includes residual adverse effects within federal jurisdiction and any adverse direct or incidental effects as defined in section 2 of the *Impact Assessment Act*. A change to migratory birds, as defined in subsection 2(1) of the MBCA, is identified as an effect within federal jurisdiction for which a determination of the extent of significance is required. Further, a change in habitat for any migratory bird protected under the SARA is identified as an effect within federal jurisdiction for which a determination of the extent of significance is required. As such, the extent to which residual adverse effects on migratory birds,

including migratory birds protected under the SARA, are considered significant is presented in Section 18.4.5.

A residual adverse effect of high significance on migratory birds and bird habitat is one that, following the application of avoidance and mitigation measures, causes or further contributes to the exceedance of a conservation-based threshold or threatens the long-term persistence or viability of SAR, SOCC, or species of cultural or traditional importance.

A residual adverse effect of moderate significance on migratory birds and bird habitat is one that, following the application of avoidance and mitigation measures, may cause or further contribute to the exceedance of a conservation-based threshold, or may threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance; however, recovery from effects is anticipated to make unlikely these outcomes.

A residual adverse effect of negligible/low significance on migratory birds and bird habitat is one that, following the application of avoidance and mitigation measures, is unlikely to cause or further contribute to the exceedance of a conservation-based threshold or unlikely to threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

## **18.2 Existing Conditions for Birds and Bird Habitat**

This Section summarizes existing conditions for birds and bird habitat in the PA, LSA, and RSA, including information sources and methods.

### **18.2.1 Methods**

Existing conditions for birds and bird habitat were based on a review of background information from publicly available data sources, feedback and engagement with stakeholders, government and Indigenous nations, and site-specific field investigations. The methodology for data collection is provided in the following Sections.

#### **18.2.1.1 Background Review**

Background data sources from government agencies and non-governmental organizations and from background reports and published literature were reviewed to compile information on the occurrence, abundance, distribution, and habitat associations of birds in the LSA and RSA. This included a review of bird species of management concern that are known to occur or have potential to occur in the LSA and interact with the Project. Sensitive habitats and areas where birds may congregate during key time periods (i.e., nesting, migration, winter) were also identified. The following data sources were reviewed for birds:

- Christmas Bird Count (CBC; National Audubon Society 2023)
- eBird Canada (eBird 2024)
- Ontario Breeding Bird Atlas (BC et al. 2024)

- Ontario Nocturnal Owl Survey (BC and MNRF 2024)
- North American Breeding Bird Survey (Ziolkowski et al. 2023)
- Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre online database (MNRF 2024a)
- Natural Heritage Areas Make-a-Map Application (MNRF 2024b)
- Critical Habitat for Species at Risk National Dataset – Canada (Government of Canada [GOC] 2024a)
- *Species at Risk Act* (SARA), Schedule 1 (GOC 2024b)
- Species at Risk in Ontario List (Ministry of the Environment, Conservation and Parks [MECP] 2024a)
- Federal and provincial recovery strategies and management plans

### 18.2.1.2 Field Studies

Field surveys were completed for birds by Wood and WSP from 2021-2023 and are summarized in Table 18.4, below. Further details on survey methodology can be found in the 2023 Terrestrial Ecology Baseline Study in Appendix B.7.4 of the Impact Statement.

**Table 18.4 Bird Field Surveys Completed During Baseline Studies**

Survey Type	Date	Summary
Breeding Bird Point Count Surveys	June 7, 12-18; July 5-9, 2021	90 point count stations
	June 1-8; June 27-July 2, 2022	50 point count stations
	May 23-31; June 3-4, June 19-21; July 4-8 2023	42 point counts
Breeding Bird Surveys using Autonomous Recording Unit (ARUs)	June-August 2021	19 ARUs (6 between June 12-13 and moved to new locations June 17-18)
	May-August 2, 2022	10 ARUs deployed
	May-September, 2023	8 ARUs (2 removed/damaged)
Aerial Surveys	March 17-19, 2021; March 12-13, 2022	Aerial survey concurrent with ungulate survey.
Spring Migration Surveys for Waterfowl and Shorebirds	May 13-17, 2022	17 area searches
Fall Bird Migration Surveys	September 11-15, 2023	29 area searches
Marsh Bird Survey	June 14 and July 5, 2021	1 survey station using call playback
	May 16 and 18; June 1 and 3; June 27 and 29, 2022	8 survey stations using call playback
Nocturnal Owl Surveys	March 12, 2022; May 14-18, 2022	20 roadside survey stations using call broadcast

Survey Type	Date	Summary
Crepuscular Bird Surveys using ARUs	June-August 2021	19 ARUs were deployed to target crepuscular species
	May-August 2, 2022	9 ARUs were deployed to target crepuscular species
	May-September, 2023	10 ARUs were deployed to target crepuscular species
Lesser Yellowlegs Surveys	May 23-31, 2023	83 point counts
	May 23-31, 2023	10 ARUs were deployed to target Lesser Yellowlegs
Short-eared Owls	June 2-4, 2023	Three survey routes with total of 30 survey stations

### 18.2.1.3 Bird Habitat Assessment

Desktop mapping and land classification for areas of the RSA outside of the LSA was accomplished by using Ontario Land Cover Data Base, 2nd Edition (LIO 2002). Because wetlands were under-represented in the Ontario Land Cover Data Base, the Ontario Wetland Evaluation System was used where available (MNR 2023).

Vegetation communities within the LSA were delineated and described according to the Ontario Ecosite Classification system (Banton et al. 2009). Forest Resources Inventory (FRI) Versions 1 and 2 were used as a baseline for vegetation boundaries between wetlands, forests, and vegetation communities (LIO 2007, 2023). FRI from the Abitibi River Forest, Romeo Malette Forest, and Gordon Cosen’s Forest were used to update the baseline FRI. Some manual adjustments to polygon boundaries and classification were made based on visual aspects of the polygon and surrounding habitats. As FRI was not available for all areas of the RSA, land cover between the RSA and LSA is not comparable.

Significant Wildlife Habitat (SWH), as defined by provincial policy (MNR 2005), features that may be important to birds within the LSA were identified and mapped using results from 2021- 2023 field surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Bird SWH features were mapped following methodology used during baseline studies (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]) and following the SWH Criteria Schedule for Ecoregion 3E (MNR 2015). These criteria include ecosite codes for identifying candidate habitat, and criteria for confirming features with field studies (e.g., species presence and abundance criteria). The bird SWH that were identified during baseline studies (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]) were carried forward to this assessment and mapping was expanded to the extent of the LSA.

Each bird SWH was categorized as either candidate (meaning that the SWH may occur based on habitat presence, but the defining criteria have not been confirmed through field studies) or confirmed (meaning that the defining criteria have been met). The SWH features that were carried forward are listed below in Table 18.5.

**Table 18.5 Bird Significant Wildlife Habitat Features Included in the Assessment**

Bird Significant Wildlife Habitat Feature	Description
Waterfowl Nesting Area	Upland habitats adjacent to wetlands
Bald Eagle and Osprey Nesting Habitat	Bald Eagle or Bald Eagle nests, which are typically associated with lakes, ponds, rivers or wetlands along treed shorelines, islands or on structures over water
Woodland Raptor Nesting Habitat	Stick nests in forested Ecological Land Classification communities >30 ha with 10 ha of interior habitat
Sharp-tailed Grouse Lek Habitat	Fields, meadows or other grassy areas where Sharp-tailed Grouse engage in courtship activities
Marsh Breeding Bird Habitat	Wetlands with shallow water with emergent aquatic vegetation with American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan, Black Tern, and/or Yellow Rail
Shrub/Early Successional Breeding Bird Habitat	Large natural field areas succeeding to shrub and thicket habitats >30 ha in size that may support Clay-colored Sparrow, Field Sparrow, Ruffed Grouse, Eastern Kingbird, American Woodcock.

## 18.2.2 Overview

The Project falls within Bird Conservation Region 8 (BCR 8) – the Boreal Softwood Shield. BCR 8 is more than 1,470,000 km<sup>2</sup> and spans six provinces; 30% of BCR 8 is within Ontario (Environment Canada [EC] 2014). BCR 8 covers approximately 48% of the province (EC 2014). The Boreal Softwood Shield is dominated by coniferous forest interspersed with numerous lakes, rivers and wetlands. Tree species diversity in BCR 8 is low, and bird diversity is also lower compared to more southerly BCRs in Ontario (EC 2014). However, BCR 8 supports a high abundance of birds; more than 10% of the global population of at least 20 species are present in Ontario’s BCR 8 (BCR 8 ON) during the breeding season (EC 2014).

There are 71 bird species identified as priorities in Ontario’s BCR 8. Sixty-five percent of the priority species are landbirds, followed by waterfowl (17%), waterbirds (12%), and shorebirds (6%). Priority species in Ontario’s BCR 8 are associated with 10 habitat types. Forested habitat is associated with more than 60% of the priority species; 31% use coniferous, and 32% use mixed wood. Wetlands are also important and are used by 31% of priority species (EC 2014). Shrub and early successional habitats as well as riparian habitats are used by 14% and 13% of priority species respectively (EC 2014). The RSA and LSA support a variety of bird groups including forest birds, waterfowl, waterbirds, shorebirds, raptors, upland gamebirds, and other landbirds. Forest landbirds are the most common and abundant species group present within the RSA and LSA. A total of 128 bird species have been documented within the LSA incidentally or during bird surveys.

The number and diversity of bird species that are present in the LSA and RSA varies according to season. Species diversity and abundance is highest during the breeding season, followed by spring and fall migration seasons. Many species that winter in the southern US, Mexico, Central or South America return to boreal forests in Ontario to breed (EC 2014). Many of the bird species that breed in the LSA may

also be present during migration, while species that breed in areas further north (e.g., Long-tailed Duck [*Clangula hyemalis*], Semipalmated Plover [*Charadrius semipalmatus*]) may only be present during migration (Nol and Blanken 2020, Robertson and Savard 2020). During bird migration/waterfowl surveys, 66 bird species were observed, most of which were believed to be migrating through the area (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

The winter season has the lowest bird species abundance and diversity. Birds present in the RSA in winter includes year-round residents such as Black-capped Chickadee (*Poecile atricapillus*), Ruffed Grouse (*Bonasa umbellus*) and Evening Grosbeak (Foote et al. 2020; Rusch et al. 2020, eBird 2024). One species (Rough-legged Hawk [*Buteo lagopus*]) is only present in the LSA during the winter; this species breeds in the Arctic (Bechard et al. 2020).

Data from the Christmas Bird Count (CBC) were used to assess which bird species are present during winter. Between 2003 and 2023, a total of 51 species of birds have been observed in the Timmins CBC, and 52 species have been observed at the Iroquois Falls CBC (National Audubon Society 2023). The Timmins CBC circle is located approximately 7 km from the PA, and the Iroquois Falls CBC is approximately 34 km away. Some of the species that were most commonly recorded in both count circles include Common Raven, Black-capped Chickadee, Rock Pigeon, Evening Grosbeak, European Starling, Pine Grosbeak, Common Redpoll, Snow Bunting, American Crow and Blue Jay. Species observed during CBC surveys that only occur during winter include Snowy Owl, Snow Bunting, and Rough-legged Hawk.

#### **18.2.2.1 Bird Community**

#### **18.2.2.2 Forest Birds**

A total of 70 species of forest birds have been observed in the LSA (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]). This group includes a variety of species that inhabit forested habitats, including warblers, flycatchers, woodpeckers, sparrows, kinglets, thrushes, vireos, jays, nuthatches, finches, mockingbird and thrashers. Forest birds are abundant throughout the RSA in all forest types (hardwood, softwood and mixed wood) and ages.

Based on results of field surveys, the most common forest birds within the LSA were White-throated Sparrow, Ruby-crowned Kinglet (*Corthylio calendula*), Swainson's Thrush (*Catharus ustulatus*), Tennessee Warbler (*Leiothlypis peregrina*), Common Yellowthroat (*Geothlypis trichas*), Magnolia Warbler, Red-eyed Vireo (*Vireo olivaceus*), and American Robin (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Species that were not commonly observed included Rusty Blackbird, Brown Thrasher (*Toxostoma rufum*), Rose-breasted Grosbeak (*Pheucticus ludovicianus*) and Canada Jay.

Most forest birds present in the LSA and RSA are migrants and are only present during the breeding season. For example, all warblers, vireos, and flycatchers migrate to warmer, more southern locations during the winter, and are present in the LSA only from spring to late summer or fall. However, some forest birds are present in the LSA year-round, including Black-capped Chickadee, Black-backed Woodpecker (*Picoides arcticus*), Red-breasted Nuthatch (*Sitta canadensis*), Pine Siskin (*Spinus pinus*), Evening Grosbeak (*Coccothraustes vespertinus*), Blue Jay and Canada Jay.

The forest bird group includes three SOCC: Common Nighthawk, Evening Grosbeak, and Olive-sided Flycatcher and two SAR: Canada Warbler, Eastern Whip-poor-will. These birds are discussed in further detail in Sections 18.2.2.10 and 18.2.2.11. This group also contains 21 BCR 8 Priority Species.

### 18.2.2.3 Other Landbirds

Seventeen bird species reported within the LSA were classified as other landbirds (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]). This group is a diverse mix of landbirds that are mostly found outside of forested habitats. Some of these such as American Crow (*Corvus brachyrhynchos*), Common Grackle (*Quiscalus quiscula*), and Common Raven (*Corvus corax*) are habitat generalists that occupy a wide variety of habitat types (Boarman and Heinrich 2020, Peer and Bollinger 2020, Verbeek and Caffrey 2021). Many of the species in this group use shrub or early successional habitats, including Alder Flycatcher (*Empidonax alnorum*), American Goldfinch (*Spinus tristis*), and Lincoln's Sparrow (*Melospiza lincolnii*) (Lowther 2020a, McGraw and Middleton 2020, Pandolfino et al. 2023). Alder Flycatcher and Red-winged Blackbirds (*Agelaius phoeniceus*) are often found in wet thickets and riparian areas, or around wetland habitats (Lowther 2020a, Yasukawa and Searcy 2020). Belted Kingfisher (*Megaceryle alcyon*) and Tree Swallows (*Tachycineta bicolor*) are also found near water, including lakes, ponds, streams and rivers (Kelly et al. 2020, Winkler 2020). Tree Swallows can also be found in fields or marshes (Winkler 2020). Open habitats are important for many of the other landbird species, including Eastern Bluebird (*Sialia sialis*), LeConte's Sparrow (*Ammospiza leconteii*), Savannah Sparrow (*Passerculus sandwichensis*), Eastern Kingbird (*Tyrannus tyrannus*) and Mourning Dove (*Zenaidura macroura*). These species use grasslands, open pasture and in some cases, open woodland habitats (Gowaty and Plissner 2020, Lowther 2020b, Murphy and Pyle 2020, Otis et al. 2020, Wheelwright and Rising 2020).

During field surveys, American Goldfinch, Alder Flycatcher, Common Raven, Red-winged Blackbird, and American Crow were the most common bird species in the other landbird group (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). American Pipit (*Anthus rubescens*) was commonly observed during the migration surveys.

Most species in the other landbirds group are present only during the breeding season. However, American Pipit is only present during migration because it breeds in northern and western Canada, and overwinters in the southern US, Mexico and Central America. Common Raven is a year-round resident.

Two other landbird species are SAR - Barn Swallow and Chimney Swift. These species are discussed in Section 18.2.2.10. Five other landbird species are BCR 8 Priority Species: Alder Flycatcher, Barn Swallow, Chimney Swift, Eastern Kingbird, and Tree Swallow.

### 18.2.2.4 Raptors

Thirteen species of raptors have been observed in the LSA, including hawks, falcons, owls, Bald Eagle (*Haliaeetus leucocephalus*), Northern Harrier (*Circus hudsonius*) and Osprey (*Pandion haliaetus*) (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]). The habitat requirements for these raptors vary by species. American Goshawk (*Accipiter gentilis*), Barred Owl (*Strix varia*), Boreal Owl (*Aegolius funereus*), and Broad-winged Hawk (*Buteo platypterus*) are interior

forest species that prefer older forests with large trees (Goodrich et al. 2020, Hayward and Hayward 2020, Mazur and James 2021, Squires and Reynolds 2023). Sharp-shinned Hawk (*Accipiter striatus*) and Cooper's Hawk (*Accipiter cooperii*) also use forests but are also be found along forest edges or in suburban areas (Bildstein et al. 2020, Rosenfield et al. 2020). Merlin (*Falco columbarius*) prefers open and semi-open forest habitat (Warkentin et al. 2020). Northern Harrier, Rough-legged Hawk and American Kestrel (*Falco sparverius*) all prefer open habitats, including grasslands and farm fields (Bechard et al. 2020, Smallwood and Bird 2020, Smith et al. 2020). Northern Harrier often occurs in large open wetlands (Smith et al. 2020). Red-tailed Hawks (*Buteo jamaicensis*) occupy both open and forest habitats, including pastures and parks (Preston and Beane 2020). All the raptor species except for Northern Harrier, nest in trees. Northern Harrier is a ground nester and typically build nests in dense vegetation in a field or marsh (Smith et al. 2020).

Osprey and Bald Eagle are species of Indigenous importance, which are typically found near water, as they feed on fish (Bierregaard et al. 2020, Buehler 2022). Bald Eagle nests in forests relatively close (usually <2 km) to large waterbodies or rivers with suitable foraging resources. Osprey also nest near water, including lakes or coastlines. Large stick nests are built in the tops of trees, rocky cliffs, or on artificial structures such as utility lines and nesting platforms (Bierregaard et al. 2020).

Two Bald Eagle nests and two adult eagles were recorded during aerial surveys in 2021 and 2022, only one of which was in the LSA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figure 18.2). Osprey was only detected on ARUs; no evidence of nesting has been noted in the LSA.

Most species of raptors that occur in the LSA occur during the breeding season. The exception is Rough-legged Hawk, which occurs only in the winter, and breeds in the Arctic (Bechard et al. 2020). Four of the species observed in the LSA, are present year-round: American Goshawk, Bald Eagle, Barred Owl, and Boreal Owl (Buehler 2022, Hayward and Hayward 2020, Mazur and James 2021, Squires and Reynolds 2023).

Northern Harrier, Broad-winged hawk, American Kestrel and Boreal Owl are relatively common in the RSA and were each observed several times during field surveys. American Goshawk appear to be relatively uncommon and was only observed during the 2021 aerial surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Osprey and Barred Owl were only detected on ARUs (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

There is one raptor SAR (Short-eared Owl), which is discussed in Section 18.2.2.10. In addition, three raptor species are BCR 8 Priority Species: Bald Eagle, Boreal Owl and Sharp-shinned Hawk.

#### 18.2.2.5 Upland Gamebirds

Three upland gamebird species were recorded in the LSA - Ruffed Grouse (*Bonasa umbellus*), Sharp-tailed Grouse (*Tympanuchus phasianellus*) and Spruce Grouse (*Canachites canadensis*) (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]). These species are year-round residents that likely nest in the LSA. Ruffed Grouse and Spruce Grouse are both forest species, but

Spruce Grouse is only found in coniferous forests, whereas Ruffed Grouse prefers mixed-aged mixed wood forests (Rusch et al. 2020, Schroeder et al. 2021).

Sharp-tailed Grouse are typically found in grasslands or bogs with shrubby areas present to provide cover. In winter, Sharp-tailed Grouse use woodlands more, because they provide greater protection from the elements (Connelly et al. 2020). All three upland gamebird species are ground nesters (Connelly et al. 2020, Rusch et al. 2020, Schroeder et al. 2021). A total of 13,022 ha of candidate Sharp-tailed Grouse habitat was identified in the LSA following SWH criteria (Table 18.10, Figure 18.2.4). During aerial surveys, Sharp-tailed Grouse were observed in six locations within the LSA, including potential lek sites.

Ruffed Grouse was frequently observed during breeding bird and bird migration surveys and the most common of the three upland gamebird species (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Ruffed Grouse is a BCR 8 Priority Species; there are no upland gamebird species SAR or SOCC. Grouse species were identified as a species of Indigenous importance.

#### **18.2.2.6 Marsh Birds**

Six marsh bird species have been observed in the LSA (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]), all of which breed in freshwater marsh habitats. American Bittern (*Botaurus lentiginosus*), Sora (*Porzana carolina*), Yellow Rail (*Coturnicops noveboracensis*) and Virginia Rail (*Rallus limicola*) prefer marshes with cattails, bulrushes and sedges (Conway 2020, Leston and Bookhout 2020, Lowther et al. 2020c, Melvin and Gibbs 2020). Swamp Sparrow (*Melospiza georgiana*) and Sandhill Crane (*Antigone canadensis*) use cattail marshes but will also nest in fens and bogs with open water (Gerber et al. 2020, Herbert and Mowbray 2020).

Swamp Sparrow is very common throughout the LSA and Sandhill Cranes are also relatively common. Swamp Sparrow was frequently recorded during breeding and migration surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Sandhill Crane and American Bittern were both recorded numerous times during breeding bird surveys; American Bittern are present in low abundance where suitable habitat exists. Sora, Yellow Rail, and Virginia Rail are uncommon within the RSA. Sandhill Crane, American Bittern, Yellow Rail, and Virginia Rail are ground nesters, whereas Swamp Sparrow nests in shrubs (Conway 2020, Gerber et al. 2020, Herbert and Mowbray 2020, Leston and Bookhout 2020, Lowther et al. 2020c). Sora typically builds nests a few inches above water in dense vegetation or attached to plant stems (Melvin and Gibbs 2020).

All six marsh bird species are present in the LSA only during breeding season. These species migrate to warmer, more southern areas to over-winter. Yellow Rail is a SOCC and is discussed further in 18.2.2.11. Three marsh bird species are BCR 8 Priority Species: American Bittern, Yellow Rail, and Swamp Sparrow.

### 18.2.2.7 Shorebirds

Eight shorebird species were recorded during field surveys, seven of which breed in the LSA: American Woodcock (*Scolopax minor*), Killdeer (*Charadrius vociferus*), Solitary Sandpiper (*Tringa solitaria*), Spotted Sandpiper (*Actitis macularius*), Wilson's Snipe (*Gallinago delicata*), Greater Yellowlegs (*Tringa melanoleuca*) and Lesser Yellowlegs (*Tringa flavipes*). All these species are ground nesters but have different habitat requirements. American Woodcock nest in young forests, shrubby areas, or old fields (McAuley et al. 2020). Killdeer nest in open areas, such as grazed fields, lawns, parking lots, airports, or mudflats (Jackson and Jackson 2020). Spotted Sandpiper and Solitary Sandpiper typically nest along freshwater waterbodies or watercourses, and Solitary Sandpiper also nest in areas with bogs and spruce trees (Moskoff 2020, Reed et al. 2020). Wilson's Snipe, Lesser and Greater Yellowlegs typically nest in wetlands such as peatlands (bogs and fens), marshes or wet meadows, or near ponds (Elphick and Tibbitts 2020; Mueller 2020; Tibbitts and Moskoff 2020). Except for Lesser Yellowlegs, all these species are relatively common breeders in the LSA and occur where suitable habitat exists

One additional shorebird species (Semipalmated Plover) is only present during migration. Semipalmated Plovers breed in subarctic and arctic regions but may stopover in the LSA or RSA during the spring and fall migration (Nol and Blanken 2020).

Wilson's Snipe and Spotted Sandpiper were most common during field surveys. Greater Yellowlegs and Killdeer were all observed at multiple survey stations whereas Semipalmated Plover and Solitary Sandpiper were uncommon. Lesser Yellowlegs are also relatively uncommon, but were recorded during breeding bird surveys in 2021, and on ARU in 2023 (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

Lesser Yellowlegs is a SAR and is discussed in further detail in Section 18.2.2.10. Four species of shorebirds are BCR 8 Priority Species: Greater Yellowlegs, Lesser Yellowlegs, Solitary Sandpiper, and Wilson's Snipe.

### 18.2.2.8 Waterbirds

Five waterbird species were recorded in the LSA, including two gulls, one heron, one loon, and one grebe (Appendix B.7.2 of the Impact Statement [Birds and Bird Habitat Supplemental Baseline Report]). All species require open water habitat. Common Loon (*Gavia immer*) is the only waterbird that was confirmed as breeding during field surveys but all others except Herring Gull are likely nesting within the LSA.

Bonaparte's Gull (*Chroicocephalus philadelphia*) breeding habitat is found in the boreal forest near lakes, ponds or marshy areas, where they nest in conifer trees (Burger and Gochfeld 2020). Great Blue Heron (*Ardea herodias*) nest colonially, and typically make their nests in trees, although they sometimes nest in bushes or on the ground (Vennesland and Butler 2020). Common Loons nests are built on islands or along the shoreline adjacent to the water (Paruk et al. 2021). Pied-billed Grebe (*Podilymbus podiceps*) occur on lakes or ponds, where they construct floating nests among emergent vegetation (Muller and Storer 2020). Herring Gulls (*Larus argentatus*) are widespread through North America and occur in the LSA only during migration.

Of the waterbirds, Common Loon was most common during field surveys and was present during both breeding and migration surveys. Great Blue Heron was observed several times during the breeding season and the remaining species were all relatively uncommon (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

Two waterbird species (Common Loon and Herring Gull) are BCR 8 Priority Species; there are no waterbird SAR or SOCC.

### 18.2.2.9 Waterfowl

Thirteen waterfowl species have been observed in the LSA. All these species require open water habitats such as ponds and lakes. Three of the species are only present during migration, and do not breed in the LSA: Gadwall (*Mareca strepera*), Long-tailed Duck (*Clangula hyemalis*) and Redhead (*Aythya americana*) (Leschack et al. 2020, Robertson and Savard 2020, Woodin and Michot 2020). The remaining species are present during the breeding season, however not all have been confirmed breeding. For example, American Wigeon (*Mareca americana*) and Gadwall were observed during the breeding season, but no evidence of breeding was observed.

Most waterfowl are ground nesters and build their nests near water or in wetlands. However, there are some exceptions, including Hooded Merganser (*Lophodytes cucullatus*) and Wood Duck (*Aix sponsa*), which nest in tree cavities near water (Dugger et al. 2020, Hepp and Bellrose 2020).

Although there is some suitable habitat for aquatic or terrestrial waterfowl stopover and staging areas in the LSA, field surveys found only small numbers of waterfowl using these, and thus the habitats did not qualify as SWH (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

Six waterfowl species are BCR 8 Priority Species: American Black Duck, American Wigeon, Green-winged Teal, Long-tailed Duck, Mallard, and Ring-necked Duck; Redhead is a SOCC and is discussed in Section 18.2.2.11.

### 18.2.2.10 Species at Risk

Six bird SAR have the potential to occur, or have been confirmed as occurring, in the LSA and/or PA (Table 18.6; Figure 18.2.7; Figure 18.3.1 to 18.3.10).

**Table 18.6 Bird Species at Risk Observed or Potentially Present in the Local Study Area**

Species / Conservation Status	Habitat Description	Presence in LSA
Bank Swallow ( <i>Riparia riparia</i> ) SARA: THR ESA: THR COSEWIC: THR S-Rank: S4B Source: NHIC, eBird	An aerial insectivore that constructs nests in vertical banks, typically along watercourses and in coastal areas. Forages in open habitats including open water, wetlands, grasslands, agricultural areas, shrublands, and occasionally over wooded areas (COSEWIC 2013).	<b>Potential</b> – Bank Swallow was not confirmed in the PA or LSA during field surveys and no suitable habitat was documented during field surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). However, there are eBird records of the species within the LSA and RSA (eBird 2024) (Figure 18.3.1-18.3.10).

Species / Conservation Status	Habitat Description	Presence in LSA
<p>Barn Swallow  (<i>Hirundo rustica</i>)  SARA: THR  ESA: SC  COSEWIC: SC  S-Rank: S4B  Source: field observations</p>	<p>The Barn Swallow is an aerial insectivore that attaches its nests to structures such as barns, bridges and culverts. Before European colonization of North America, Barn Swallows nested on cliffs, rock overhangs, and caves (COSEWIC 2021a). They forage over open areas.</p>	<p><b>Confirmed</b> –There are numerous background records of Barn Swallow in the LSA (eBird 2024), and this species was documented during field surveys in the PA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figure 18.3.1-18.3.10).</p>
<p>Canada Warbler  (<i>Cardellina canadensis</i>)  SARA: THR  ESA: SC  COSEWIC: SC  S-Rank: S5B  Source: field observations</p>	<p>The Canada Warbler is usually found in moist mixed deciduous-coniferous forests with a well-developed understorey. It may also occur in shrub marshes, red maple stands, coniferous riparian woodlands, ravines and steep brushy slopes, and regenerating forests (COSEWIC 2008).</p>	<p><b>Confirmed</b> –Canada Warbler was observed during breeding bird surveys at two stations and was recorded on seven ARUs in the PA and LSA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figure 18.3.1-18.3.10).</p>
<p>Chimney Swift  (<i>Chaetura pelagica</i>)  SARA: THR  ESA: THR  COSEWIC: THR  S-Rank: S3B  Source: ARU field recordings</p>	<p>Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (MECP 2022).</p>	<p><b>Absent</b>– Chimney Swift was initially identified as present based on analysis of ARU recordings using artificial intelligence software BirdNET version 2.2 (BirdNET_GLOBAL_3K_V2.2_Model_FP32.tflite), but the species was not visually confirmed (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). In 2024, the recordings were run through a newer version of BirdNET (version 2.4, BirdNET_GLOBAL_6K_V2.4), and Chimney Swift was not detected (Appendix B.7.4 of the Impact Statement). Stantec biologists with experience identifying Chimney Swift also listened to a subset of recordings that were identified by BirdNET as Chimney Swifts and none of the calls that were examined further were confirmed as Chimney Swifts.</p> <p>The use of natural tree cavities by Chimney Swifts is rare unless large diameter trees are present (Zanchetta et al. 2014). For these reasons, Chimney Swift is unlikely to be present as a breeding bird in the LSA so is not discussed further in this assessment.</p> <p>This species is uncommon in this part of Ontario, there is one record of the species within the RSA at the Timmins Airport (eBird 2024).</p>

Species / Conservation Status	Habitat Description	Presence in LSA
<p>Eastern Whip-poor-will  (<i>Antrostomus vociferus</i>)  SARA: THR  ESA: THR  COSEWIC: SC  S-Rank: S4B  Source: background information</p>	<p>The Eastern Whip-poor-will is typically found in areas with a mixture of open and forested habitats such as savannahs, open woodlands or openings in mature forests (COSEWIC 2022). Semi-open and patchy forests are preferred, as are areas with little ground cover such as rock barrens (COSEWIC 2022)</p>	<p><b>Potential</b> – This species was not recorded during targeted surveys, but the LSA is within the species’ range and suitable habitat may be present (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).</p>
<p>Lesser Yellowlegs  (<i>Tringa flavipes</i>)  SARA: Not listed  ESA: THR  COSEWIC: THR  S-Rank: S3S4B, S5M  Source: field observations</p>	<p>Lesser Yellowlegs is a medium sized shorebird that breeds primarily in boreal and taiga wetlands. Its breeding range in Canada extends from northern Yukon to western Labrador and it winters in South America (COSEWIC 2020b).</p>	<p><b>Confirmed</b> - This species may be found in the PA and LSA during the breeding season and during migration. Four Lesser Yellowlegs were observed during breeding bird surveys in June 2021, and the species was recorded at three ARU stations (one in 2023, and three in 2022; 2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). The observations were within the PA and LSA. There are also eBird records of this species in the RSA (eBird 2024; Figure 18.3.1-18.3.10).</p>
<p>Short-eared Owl  (<i>Asio flammeus</i>)  SARA: SC  ESA: THR  COSEWIC: THR  S-Rank: S4?B,S2S3N  Source: eBird 2024</p>	<p>Short-eared Owls are medium sized owls that are most often active at dawn and dusk. They are found in open habitats including tundra, grasslands, wetlands and pastures (COSEWIC 2021b).</p>	<p><b>Potential</b> - Targeted surveys for Short-eared Owl were conducted in suitable habitat during the 2023 breeding season and the species was not observed (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). However, this species is nomadic, moving large distances between years in response to changing prey abundance (COSEWIC 2021b). There are eBird records for Short-eared Owl from within the RSA and suitable habitat is present within the LSA (eBird 2024; Figure 18.3.1-18.3.10).</p>
<p>Notes:  SC – Special Concern  THR – Threatened  END – Endangered  S-ranks:  S1 – Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.  S2 – Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.  S3 – Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.  S4 – Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.  S#S# Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).  Qualifiers:  B – Breeding – Conservation status refers to the breeding population of the species in the province.  SU – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.</p>		

Species / Conservation Status	Habitat Description	Presence in LSA
<p>N – Conservation status refers to the non-breeding population of the species in the province.</p> <p>M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.</p> <p>? – Denotes inexact or uncertain numeric rank (? Qualifies the character immediately preceding it in the S-rank).</p>		

### 18.2.2.11 Species of Conservation Concern

Six bird SOCC have the potential to occur or have been confirmed present in the LSA (Table 18.7; Figure 18.2.7; Figure 18.3.1 to Figure 18.3.10).

**Table 18.7 Bird Species of Conservation Concern Observed or Potentially Present in the Local Study Area**

Species / Conservation Status	Habitat Description	Presence in LSA
<p>Common Nighthawk  <i>(Chordeiles minor)</i>                      SARA: SC                      ESA: SC                      COSEWIC: SC                      S-Rank: S4B                      Source: eBird, Field observations</p>	<p>Common Nighthawk breeds in a wide range of open habitats, such as recently logged or burned-over areas, beaches, forest clearings, short-grass prairies, pastures, open forests, marshes, lakeshores, gravel roads, riverbanks, rocky outcrops or barrens, railways, and urban parks. Common Nighthawks may forage in most habitat types (COSEWIC 2018a).</p>	<p><b>Confirmed</b> – During field surveys, Common Nighthawk was recorded on 28 ARUs in the PA and LSA and was also recorded incidentally (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figures 18.3.1-18.3.10). There are also many eBird records of Common Nighthawk within the LSA and RSA (Figure 18.3.1-18.3.10).</p>
<p>Evening Grosbeak  <i>(Coccothraustes vespertinus)</i>                      SARA: SC                      ESA: SC                      COSEWIC: SC                      S-Rank: S4                      Source: field observations</p>	<p>Evening Grosbeak breeding habitat generally includes open, mature mixedwood forests, where fir species and/or white spruce are dominant, and Spruce Budworm is abundant. Outside the breeding season, the species depends on seed crops from trees such as firs and spruces in the boreal forest but is also attracted to ornamental trees that produce seeds or fruit, and bird feeders stocked with sunflower seeds (COSEWIC 2016).</p> <p>Evening Grosbeaks are found in a variety of forested areas, most typically mature mixed forests with an open canopy and high proportions of Balsam Fir, White Spruce and/or Trembling Aspen (COSEWIC 2016).</p>	<p><b>Confirmed</b> – Evening Grosbeaks were documented two times during breeding bird surveys, at one survey station in the LSA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). This species is a year-round resident; there are many eBird records of this species throughout the RSA (Figure 18.3.1-18.3.10).</p>

Species / Conservation Status	Habitat Description	Presence in LSA
<p>Olive-sided Flycatcher  <i>(Contopus cooperi)</i>                      SARA: SC                      ESA: SC                      COSEWIC: SC                      S-Rank: S4B                      Source: field observations, NHIC</p>	<p>Olive-sided Flycatcher is a medium sized migratory songbird that breeds throughout most of forested Canada (COSEWIC 2018b). Olive-sided Flycatchers breed in edge habitats, such as coniferous forests with open habitats, wetlands or disturbed forest (COSEWIC 2018b).</p>	<p><b>Confirmed</b> – Olive-sided Flycatcher was observed incidentally during field studies and was identified on nine (9) ARUs in the PA and LSA using automated identification software (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figure 18.3.1-18.3.10). There are also many eBird records of this species within the RSA and LSA (Figures 18.3.1-18.3.10)</p>
<p>Redhead  <i>(Aythya americana)</i>                      SARA: Not listed                      ESA: Not listed                      Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Not listed                      S-Rank: S2B,S4N                      Source: eBird, field observations</p>	<p>Redhead is a diving duck that feeds on marshy freshwater ponds and lakes and winters in flocks on any large body of water, often mixed with other diving ducks. Redheads mainly breed in seasonal ponds and other wetlands in the prairies.</p>	<p><b>Confirmed</b> – There are a small number of eBird records for this species within the LSA and a single individual was observed in the PA during field surveys (eBird 2024, 2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]; Figure 18.3.3). The LSA is located outside of the main breeding range and not within suitable habitat. Therefore, it is likely that the individual was using the area for resting or moulting. For these reasons, Redhead is not discussed further in this assessment.</p>
<p>Rusty Blackbird  <i>(Euphagus carolinus)</i>                      SARA: SC                      ESA: SC                      COSEWIC: SC                      S-Rank: S4B,S3N                      Source: field observations</p>	<p>The Rusty Blackbird breeds in habitats that are dominated by coniferous forests with wetlands nearby including bogs, marshes and beaver ponds. The Rusty Blackbird is only found in North America. It breeds in every province and territory in Canada and migrates to most of the central and eastern United States for winter. In Ontario, the breeding range is found in the Hudson Bay Lowlands and northern Boreal Shield ecosites (MECP 2021).</p>	<p><b>Confirmed</b> – During field surveys, Rusty Blackbird was confirmed at two ARU stations in 2023, one in 2022, and two in 2021. One Rusty Blackbird was also documented during breeding bird point count surveys and eight were observed during fall migration surveys. Observations were recorded in both the PA and LSA.</p>

Species / Conservation Status	Habitat Description	Presence in LSA
<p>Yellow Rail                      (<i>Coturnicops noveboracensis</i>)                      SARA: SC                      ESA: SC                      COSEWIC: SC                      S-Rank: S4                      Source: field observations</p>	<p>Nesting Yellow Rails are typically found in marshes dominated by sedges, true grasses, and rushes, where there is little or no standing water (generally 0-12 cm water depth), and where the substrate remains saturated throughout the summer. They can be found in damp fields and meadows, on the floodplains of rivers and streams, in the herbaceous vegetation of bogs, and at the upper levels (drier margins) of estuarine and salt marshes. Nesting habitats usually have a dry mat of dead vegetation from previous growing seasons. A greater diversity of habitat types is used during migration and winter than during the breeding season. In winter, the rails are known to use coastal wetlands and rice fields (COSEWIC 2009). In Ontario, it is mainly found in the Hudson Bay Lowlands. The breeding status of Yellow Rail in boreal regions south of the Hudson Bay Lowlands is uncertain (MECP 2024b).</p>	<p><b>Potential</b> – There is suitable Yellow Rail habitat in wetlands within the LSA. A possible Yellow Rail was heard in 2021 at one marsh bird station in the PA but could not be confirmed (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).</p>
<p>Notes:                      SC – Special Concern                      S-ranks:                      S2 – Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.                      S3 – Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.                      S4 – Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.                      Qualifiers:                      B – Breeding – Conservation status refers to the breeding population of the species in the province.                      N – Conservation status refers to the non-breeding population of the species in the province.</p>		

### 18.2.2.12 Species of Indigenous Importance

A preliminary list of bird species of importance to Indigenous nations considered are summarized as follows:

- Bald Eagle (raptor)
- Bank Swallow (SAR)
- Barn Swallow (SAR)
- Bobolink (other landbird)
- Canada Warbler (SAR)
- Common Nighthawk (SOCC)
- Eastern Whip-poor-will (SAR)
- Evening Grosbeak (SOCC)
- Olive-sided Flycatcher (SOCC)
- Osprey (raptor)
- Rusty Blackbird (SOCC)
- Sandhill Crane (marsh bird)
- Ducks and geese (waterfowl)
- Ruffed Grouse (referred to as partridge; Upland Gamebird)
- Spruce Grouse (Upland Gamebird)
- Wild Turkey (Upland Gamebird)
- Yellow Rail (marsh bird)

The results are based on information made available by Indigenous nations through engagement, information gathering, and voluntary information sharing about species of importance to the Indigenous nations; additional information regarding wildlife of importance to Indigenous nations is provided in Chapters 25 to 28 of the Impact Statement (Assessment of Potential Effects on Indigenous Interests).

Species of Indigenous importance will be assessed within their respective bird groups (shown in parentheses above). Wild Turkey and Bobolink however, will not be assessed because these species are not present within the LSA.

### 18.2.2.13 Bird Habitat

Within the RSA, upland treed habitat covers 39% (169,993 ha); mixed forests and coniferous treed forests are the most common upland forest types (Table 18.8). Wetlands are the largest ecosystem category in the RSA, covering 49% (217,459 ha) of the RSA. Swamps are the most common wetland class in the RSA (167,358 ha, 38%), followed by fens (21,978 ha, 5%). Open water, such as lakes, rivers, and ponds, covers a relatively small area of the RSA (12,427.8 ha, 3%). The RSA is in a relatively undisturbed state; anthropogenic and sparsely vegetated areas cover 9% (38,681 ha) of the RSA. Cuts (harvested areas) are the largest anthropogenic or sparsely vegetated areas, reflecting the history of logging in the RSA, followed closely by settlement and infrastructure areas.

**Table 18.8 Summary of Land Cover in the Regional Study Area**

Ecosystem Category	Land Cover Class	RSA	
		Area (ha)	Area <sup>1</sup> (%)
Upland - Treed	Coniferous Forest	49,883	11
	Deciduous Forest	10,485	2
	Mixed Forest	86,740	20
	Sparse Forest	22,885	5
	<b>Total Upland - Treed</b>	<b>169,993</b>	<b>38</b>
Wetland	Unclassified Bog	15,218	3
	Open Bog	500	0.1
	Treed Bog	2,906	1
	<b>Subtotal Bog</b>	<b>18,624</b>	<b>4</b>
	Unclassified Fen	21,037	5
	Open Fen	71	0.0
	Treed Fen	870	0.2
	<b>Subtotal Fen</b>	<b>21,978</b>	<b>5</b>
	Unclassified Marsh	4,760	1
	Swamp	167,358	38
	Other Wetland	4,739	1
<b>Total Wetland</b>	<b>217,459</b>	<b>49</b>	
Water	Water - Deep or Clear	12,428	3
Sparsely Vegetated or Anthropogenic	Bedrock	115	0.0
	Cropland	794	0.2
	Cuts	18,280	4
	Pasture	5,756	1
	Sand/Gravel/Mine Tailings	5,603	1
	Settlement, Infrastructure	8,133	2
	<b>Total Sparsely Vegetated or Anthropogenic</b>	<b>38,681</b>	<b>8</b>
<b>Grand Total</b>		<b>438,561</b>	<b>103</b>
Note: 1. Total exceeds 100% due to rounding.			

Most of the LSA and PA are in a relatively natural condition. Wetlands cover most of the LSA and PA, occupying 71% (39,175 ha) and 73% (8,667 ha), respectively (Table 18.9). Upland forests cover 24% (2,837 ha) of the PA and 26% (14,273 ha) of the LSA (Table 18.9). Conifer forests are the dominant upland forest type, covering 21% (2,521 ha) of the PA and 23% (12,386 ha) of the LSA (Table 18.9). Open water is relatively uncommon in the LSA (288 ha, <1%) and occurs as scattered ponds, small lakes, rivers and (Table 18.9).

Anthropogenic and other poorly vegetated areas cover 2% (254 ha) of the PA and 1% (576 ha) of the LSA (Table 18.9). Utility corridors account for the largest anthropogenic areas, covering 1% (167 ha) of the PA and 1% (360 ha) of the LSA (Table 18.9). A total of 50 ecosites and mapping units were identified in the LSA and 42 in the PA (see Chapter 16 of the Impact Statement [Assessment of Potential Effects on Vegetation, Riparian and Wetland Environments] for additional details).

The PA represents 22% of the LSA and 2.7% of the RSA.

**Table 18.9 Summary of Habitat Categories within the Project Area and Local Study Area**

Land Cover Class	PA		LSA	
	Area (ha)	Area <sup>1</sup> (%)	Area (ha)	Area <sup>1</sup> (%)
<b>Upland - Treed</b>				
Coniferous Forest	2,521	21	12,386	23
Deciduous Forest	316	3	1,887	3
<b>Total Upland - Treed</b>	<b>2,837</b>	<b>24</b>	<b>14,273</b>	<b>26</b>
<b>Wetland</b>				
Open Bog	5	0	32	0.1
Treed Bog	2,353	20	7,860	14
<b>Subtotal Bog</b>	<b>2,358.0</b>	<b>20.0</b>	<b>7,892</b>	<b>14</b>
Open Fen	7	0.1	233	0.4
Treed Fen	781	7	4,465	8
<b>Subtotal Fen</b>	<b>788</b>	<b>7</b>	<b>4,698</b>	<b>8</b>
Marsh	752	6	1,295	2
Swamp	4,768	40	25,290	47
<b>Total Wetland</b>	<b>8,666</b>	<b>73</b>	<b>39,175</b>	<b>71</b>
<b>Barren</b>				
Active Mineral Barren	0.4	0.0	12	0.0
<b>Water</b>				
Lakes, Rivers, Ponds	26	0.2	288	0.5
<b>Anthropogenic</b>				
Commercial/Residential	13	0.1	20	0.0
Utilities	167	1	360	1
Pavement/Concrete	74	1	196	0.4
<b>Total Anthropogenic</b>	<b>254</b>	<b>2</b>	<b>576</b>	<b>1</b>
<b>Grand Total</b>	<b>11,783</b>	<b>106</b>	<b>54,324</b>	<b>107<sup>1</sup></b>
Note:				
1. Total exceeds 100% due to rounding.				

The following bird habitat features of conservation interest were identified and mapped following Significant Wildlife Habitat Criteria for Ecoregion 3E (MNR 2015) during baseline studies (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]):

- Waterfowl Nesting Area
- Bald Eagle and Osprey Nesting Habitat
- Woodland Raptor Nesting Habitat
- Sharp-tailed Grouse Lek Habitat
- Marsh Breeding Bird Habitat
- Shrub/Early Successional Breeding Bird Habitat
- Habitat for Special Concern and Rare Species

A description of each bird SWH, including the ecosites included, can be found in the 2023 Terrestrial Ecology Baseline Study (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). The area of each SWH feature in the PA and LSA is presented in Table 18.10, and is shown on Figure 18.2 to Figure 18.2.7.

Bald Eagle nesting habitat was confirmed, and a Bald Eagle nest was observed in the southeast corner of the PA (Figure 18.2.3). Habitat for Special Concern and Rare Species were also confirmed, based on the presence of SAR and SOCC (including Barn Swallow, Canada Warbler, Common Nighthawk, Evening Grosbeak, Olive-sided Flycatcher and Rusty Blackbird). The remaining identified SWH are considered candidate, which means that suitable habitat is present, but field studies to determine whether the SWH ecoregion criteria have been met were not completed (MNR 2015).

**Table 18.10 Area of Each Bird Significant Wildlife Habitat Feature in the Project Area and Local Study Area**

Significant Wildlife Habitat Features	Area (ha)	
	Project Area	Local Study Area
Candidate Waterfowl Nesting Area	3,186	7,880
Candidate Woodland Raptor Nesting Habitat	2,837	14,273
Candidate Sharp-tailed Grouse Habitat	3,246	13,021
Candidate Marsh Breeding Bird Habitat	2,483	8,256
Candidate Shrub/Early Successional Bird Breeding Habitat	936	2,032
Confirmed Bald Eagle Nesting Habitat	149	201
Confirmed Habitat for Special Concern and Rare Species	350	937

### 18.3 Project Interactions with Birds and Bird Habitats

Table 18.11 identifies, for each potential effect, the physical activities that might interact with the VC and result in the identified effect. These interactions are indicated by a check mark (✓) and are discussed in detail in Section 18.4, in the context of effects pathways, standard and Project-specific mitigation/enhancement, and residual effects.

**Table 18.11 Project Interactions with Birds and Bird Habitat**

Physical Activities	Potential Effects	
	Change in habitat	Change in mortality risk
<b>Construction</b>		
Mobilization of construction equipment and materials on site.	✓	✓
Vegetation clearing, including the removal and disposal of trees, brush, shrubs, and other foliage.	✓	✓
Stripping, including the removal of topsoil and other foliage.	✓	✓
Grading of overburden to be used as fill.	✓	–
Handling and use of explosives, including blasting.	✓	✓
Excavating and pre-stripping of mine rock from the Open Pit and surrounding area.	✓	✓
Development of the Impoundment Facility for storage of rock, clay, sand, and till.	✓	–
Preparation of construction surfaces, including hauling reclaimed graded material and crushed mine rock to construction locations.	✓	✓
Construction of water management systems to collect, manage, treat and discharge contact water from mine components to the receiving waterbodies via collection ponds, ditches, and water treatment plants.	✓	–
Construction of minor water diversions around perimeter of the mine site to collect and divert flows.	✓	–
Dewatering of minor water bodies within the PA.	✓	–
Waste management, including collection and temporary storage.	–	–
Construction of mine infrastructure, including crusher facilities, process plant and TMF, as well as the potable water well, and ancillary infrastructure (e.g., offices, workshop, fuel farm, magazine storage and explosives pad).	✓	✓
Construction of internal haul roads and internal access roads, including water crossings.	✓	✓

**Crawford Nickel Project Impact Statement**  
**Chapter 18 Assessment of Potential Effects on Birds and Bird Habitat**  
September 30, 2024

Physical Activities	Potential Effects	
	Change in habitat	Change in mortality risk
Construction of power supply and distribution systems.	✓	✓
Construction of power supply and overpass.	✓	✓
Construction of temporary Highway 655 by-pass and overpass.	✓	✓
Construction of the rail spur.	✓	✓
Vehicle operation within the PA.	✓	✓
Employment and expenditures <sup>1</sup> .	–	✓
<b>Operations (Mining and Processing)</b>		
Construction of Project infrastructure including the expansion of ore processing components.	✓	✓
Relocation and decommissioning of Highway 655 and associated infrastructure.	✓	✓
Relocation of 500 kV transmission line.	✓	✓
Construction of the North Driftwood Diversion Channel.	✓	✓
Handling and use of explosives including blasting.	✓	✓
Ore extraction in the Main Zone and East Zone of the Open Pit, including drilling, loading and hauling of mine rock from the pits.	✓	✓
Maintenance and management of mine rock stockpiles, overburden, and TMF.	✓	✓
Ore processing, including conveyor, crushing and processing activities with and between the stockpiles, crusher facilities and process plant.	✓	✓
Operation of water management systems, including the collection, management, treatment and discharge of contact water from mine components to the receiving waterbodies via collection ponds, ditches and water treatment plants.	✓	✓
Transportation of Ore via the rail spur line.	✓	✓
Waste management, including collection and temporary storage.	–	–
Vehicle operation within the PA.	✓	✓
Progressive reclamation of disturbed areas.	✓	✓
Employment and expenditures <sup>1</sup> .	–	–
<b>Decommissioning and Closure</b>		
Pit flooding through the creation of channels from the collection ponds towards the Open Pit.	✓	–
Water management, including groundwater and surface water.	✓	–

Physical Activities	Potential Effects	
	Change in habitat	Change in mortality risk
Decommissioning, dismantling and/or disposal of buildings and mine infrastructure.	✓	✓
Removal of power lines and electrical equipment.	✓	✓
Vehicle operation within the PA.	✓	✓
Reclamation, including the placement of overburden, seeding and re-grading.	✓	✓
Monitoring and maintenance.	–	–
Employment and expenditures <sup>1</sup> .	–	✓
Notes: ✓ = Potential interaction – = No interaction 1. Project employment and expenditures are generated by most Project activities and are the main drivers of many potential socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, 'employment and expenditures' is listed as a separate item under each phase of the Project.		

Employment and expenditure activities are not expected to interact with change in bird habitat for the lifetime of the Project as there is no pathway for these activities to affect bird habitat.

### Construction

- Waste management, including collection and temporary storage is not expected to cause changes to bird habitat or bird mortality during construction. Any change in mortality related to waste hauling is discussed under the pathway of vehicle operation within the PA.
- Grading of overburden to be used as fill, development of the Impoundment Facility, construction of water management systems and construction of minor water diversions are not expected to cause changes in bird mortality because birds are unlikely to be present in the PA once vegetation is removed.
- Dewatering of natural water bodies and water management activities are not expected to interact with bird mortality risk because these activities do not involve heavy equipment or vegetation clearing.

### Operations

- Waste management, including collection and temporary storage is not expected to cause changes to bird habitat or bird mortality during construction. Any change in mortality related to waste hauling is discussed under the pathway of vehicle operation within the PA.

### Decommissioning and Closure

- Water management and pit flooding is not expected to cause changes in bird mortality as there are no pathways that would result in bird mortality.

- Monitoring and maintenance during decommissioning and closure is not expected to cause any changes to bird habitat or bird mortality.

## 18.4 Assessment of Residual Effects on Birds and Bird Habitats

The potential residual environmental effects of the Project on birds and bird habitat associated with the construction, operations, and decommissioning and closure phases of the Project are described in the Sections below. Each potential effect is characterized by change in habitat and change in mortality risk.

### 18.4.1 Analytical Assessment Techniques

To assess potential impacts to birds and bird habitat, bird species were divided into the following categories:

- Forest birds
- Other landbirds
- Marsh birds
- Raptors
- Waterfowl
- Waterbirds
- Shorebirds
- Upland Gamebirds

SOCC and SAR were assessed individually and included:

SAR:

- Bank Swallow
- Barn Swallow
- Canada Warbler
- Eastern Whip-poor-will
- Lesser Yellowlegs
- Short-eared Owl

SOCC:

- Common Nighthawk
- Evening Grosbeak
- Olive-sided Flycatcher
- Rusty Blackbird
- Yellow Rail

Species of Indigenous importance were assessed within the following categories: Upland Gamebirds, Waterfowl, and Raptors.

#### 18.4.1.1 Change in Bird Habitat

Change in bird habitat was assessed by comparing direct and indirect changes in habitat availability from baseline conditions to the residual condition in the LSA and RSA for each Project phase (i.e., construction, operations, decommissioning and closure), for bird groups, SOCC and SAR. Change in habitat for all bird groups was assessed quantitatively except for “other landbirds”, which was assessed qualitatively because this group includes bird species that are associated with a variety of habitat types.

Change in bird habitat was assessed qualitatively for the following SAR and SOCC either because they were not documented in the LSA or because their preferred habitat could not be accurately mapped with available land cover datasets:

- Bank Swallow
- Barn Swallow
- Eastern Whip-poor-will

Changes in the diversity and abundance of the bird community, which may result from changes in habitat was also assessed qualitatively.

Land cover classes (using Ontario Land Cover Data Base for the RSA) that were considered habitat for each bird SAR/SOCC or species group are summarized in Table 18.12 and shown on Figure 18.4.1- Figure 18.4.16. Habitat associations were established using relevant scientific literature, life history information, and professional judgement. Direct change in habitat (e.g., vegetation clearing) was calculated as the loss of habitat (using habitat associations) due to clearing in the PA. The amount of habitat remaining for each bird group, SAR and SOCC was also estimated by mapping available habitat within the RSA (Figure 18.4.1- Figure 18.4.16). In general, once vegetation clearing is completed during construction, the PA provide no suitable bird habitat, except for a few species that may take advantage of developed sites (e.g., Killdeer [*Charadrius vociferus*]).

Direct loss of bird SWH features was quantified by overlaying the PA on bird SWH mapping (Figure 18.4.1- Figure 18.4.16). Direct loss of the following features was assessed:

- Waterfowl Nesting Area
- Bald Eagle and Osprey Nesting Habitat
- Woodland Raptor Nesting Habitat
- Sharp-tailed Grouse Lek Habitat
- Marsh Breeding Bird Habitat
- Shrub/Early Successional Breeding Bird Habitat
- Habitat for Special Concern and Rare Species

Indirect effects on habitat were measured based on estimated areas of potential sensory disturbance, from noise. The sensory disturbance zone is the area over which the effects of a disturbance are assumed to reduce habitat quality, which will in turn result in avoidance or underutilization. To estimate the indirect effects of noise, the 50 A-weighted decibels (dBA) noise contour was overlain on bird habitat mapping to calculate the disturbance zone. The disturbance zone was calculated as the area located outside of the PA and did not overlap with areas of direct habitat loss. This was necessary to not double count both direct and indirect habitat loss.

Other types of indirect habitat loss (e.g., light, edge effects) were assessed qualitatively.

### **18.4.1.2 Change in Mortality Risk**

Change in mortality risk was assessed qualitatively through evaluating the relative change in direct sources of mortality (e.g., vehicle collisions, interactions with equipment and Project infrastructure) compared to the existing condition. The qualitative assessment included a combination of literature review and professional judgement to predict effects. Direct sources of mortality were mainly associated with construction and operations phases of the Project. Change in mortality risk was assessed for each bird species group, SAR and SOCC.

Indirect sources of mortality were assessed qualitatively and included predictions of changes in predator-prey interactions and harvest pressure. Indirect sources of mortality are associated with all phases of the Project.

**Table 18.12 Land Cover Classes used to Quantify Breeding Habitat for Bird Species Groups, Species at Risk and Species of Conservation Concern**

Landcover Class	All Birds	Forest Birds	Other Landbirds	Raptors	Upland Gamebirds	Marsh birds	Shorebirds	Waterbirds	Waterfowl	Canada Warbler	Lesser Yellowlegs	Short-eared Owl	Common Nighthawk	Evening Grosbeak	Olive-sided Flycatcher	Yellow Rail	Rusty Blackbird
<b>Upland Forest</b>																	
Coniferous Forest	✓	✓		✓	✓					✓			✓	✓	✓		✓
Deciduous Forest	✓	✓		✓	✓					✓			✓				
Mixed Forest	✓	✓		✓	✓					✓			✓	✓	✓		
Sparse Forest	✓	✓	✓	✓	✓		✓						✓				
<b>Wetland</b>																	
Open Bog	✓			✓	✓		✓				✓	✓				✓	
Treed Bog	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓		✓		✓
Open Fen	✓		✓	✓	✓		✓		✓		✓	✓				✓	
Treed Fen	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓		✓		✓
Marsh	✓			✓		✓	✓	✓	✓		✓	✓				✓	
Swamp	✓	✓	✓	✓			✓	✓	✓	✓					✓		✓
<b>Water</b>																	
Open Water	✓			✓			✓	✓	✓								
<b>Bedrock</b>																	
Bedrock	✓												✓				
<b>Cuts</b>																	
Cuts	✓		✓	✓	✓		✓						✓				

Crawford Nickel Project Impact Statement  
 Chapter 18 Assessment of Potential Effects on Birds and Bird Habitat  
 September 30, 2024

Landcover Class	All Birds	Forest Birds	Other Landbirds	Raptors	Upland Gamebirds	Marsh birds	Shorebirds	Waterbirds	Waterfowl	Canada Warbler	Lesser Yellowlegs	Short-eared Owl	Common Nighthawk	Evening Grosbeak	Olive-sided Flycatcher	Yellow Rail	Rusty Blackbird
<b>Agriculture</b>																	
Cropland	✓																
Pasture	✓		✓	✓					✓			✓	✓			✓	✓
<b>Anthropogenic</b>																	
Sand/Gravel/Mine Tailings	✓							✓					✓				
Settlement, Infrastructure	✓		✓													✓	

## 18.4.2 Change in Bird Habitat

This Section describes the pathways, mitigation measures, and predicted Project residual effects related to changes in bird habitat.

### 18.4.2.1 Project Pathways

#### 18.4.2.1.1 Construction

Most of the direct changes to bird habitat (i.e., habitat loss and/or alteration) will occur during Project construction, through vegetation removal, stripping and grading during site preparation. Site preparation activities will result in the removal of upland and wetland habitats in the PA. Dewatering will also result in a direct change in bird habitat through loss and alteration of aquatic habitats. During construction, the PA will provide very limited bird habitat, but some species (e.g., Barn Swallow, Killdeer) may use anthropogenic structures or cleared areas for nesting. For most species, habitat loss and alteration will result in localized changes in diversity and abundance as birds relocate to areas of suitable habitat outside of the PA.

Clearing of vegetation during construction also results in the creation of habitat edges and subsequent edge effects. Edge effects include changes in microclimate (e.g., Murcia 1995, Hofmeister et al. 2019), vegetation structure (e.g., Harper et al. 2005, Franklin et al. 2021), nest predation (e.g., Paton 1994), bird presence and abundance (e.g., Schmiegelow et al. 1997), or behavioral responses of birds (e.g., Machtans 2006). These edge effects can affect the productivity of nesting birds; birds nesting near edges may experience lower reproductive success compared to birds nesting in interior forest (Friesen et al. 1999, Suarez et al. 1997). Forest nesting songbirds are particularly vulnerable to edge effects, but impacts vary by species (Akresh et al. 2024). Edge effects are typically restricted to areas within 250 m of an edge (Fuentes-Montemayor et al. 2009).

Construction activities may also cause indirect habitat loss through sensory disturbance (e.g., noise, light pollution, fugitive dust and vibrations). Sensory disturbance from noise and vibration from blasting, infrastructure construction and heavy equipment use, site lighting, increased traffic volumes, presence of workers and fugitive dust deposition may trigger an avoidance response (Marques et al. 2021) or may cause stress or other physiological effects. As a result, there are likely to be changes to the diversity and abundance of the bird community in areas affected by sensory disturbance. The magnitude of indirect effects on habitat will vary by Project activity.

#### 18.4.2.1.2 Operations

Most vegetation clearing (and subsequent edge effects) will occur during construction activities. For this assessment, it has been assumed that bird habitat will not be restored during operations due to ongoing activity within the PA, including construction of Project infrastructure, realignment of Highway 655, relocation of 500 kV transmission line, ore extraction, ore processing, maintenance and management of mine rock stockpiles, waste and water management and road use. However, progressive reclamation will commence during the operations phase. For these reasons, there will be fewer direct effects on bird habitat during operations compared to construction.

Progressive reclamation activities that will occur during operations phase includes but is not limited to:

- Removal of construction-related buildings and rehabilitation of laydown areas and access roads used during construction but that no longer required for operations, if any
- Progressive reclamation of rock, clay and sand and till piles within the Impoundment Facility
- Rehabilitation of the TMF upon completion of deposition after year 18 of operations

For additional details on progressive reclamation during operations, see the Conceptual Closure Plan (Appendix F of the Impact Statement).

Water management activities have potential to cause fluctuating water levels in adjacent waterbodies, and a subsequent direct change in bird habitat. As the pit is excavated, the water balance in nearby lakes, rivers, and wetlands may be affected, which can directly affect the habitat available for bird species. An assessment of changes to groundwater discharge to waterbodies during operations found that water level changes will be minor (0.02 m-0.05 m), which is within the expected range of natural water level variability (see Appendix C.5 of the Impact Statement [Surface Water Resources Assessment] for further details). Therefore, changes in bird habitat, species diversity and abundance are not expected due to water management.

Project activities during operations may also cause indirect habitat loss through sensory disturbance (e.g., noise, light pollution, fugitive dust and vibrations). Sensory disturbance from noise, site lighting, increased traffic volumes, presence of workers and fugitive dust deposition may trigger an avoidance response (Marques et al. 2021) or may cause stress or other physiological effects. The magnitude of indirect effects on habitat will vary by Project activity. Similar to the construction phase, it is predicted that the diversity and abundance of the bird community will be reduced in areas affected by sensory disturbances.

#### 18.4.2.1.3 Decommissioning and Closure

The pathways that result in a direct change in bird habitat will vary over time as operational mining activities transition to site restoration and succession during progressive reclamation, decommissioning and closure activities.

Compared to the operations phase, reclamation and revegetation of the PA during decommissioning and closure may result in an increase in bird habitat availability and potential increases in diversity and abundance of the bird community. Some bird species may move back into areas that were abandoned during construction and operations. Following closure, habitat in the PA will change over time as vegetation becomes established in the disturbed areas, which will likely result in an increase in the diversity and abundance of birds. Following closure, low vegetation will establish within the PA and the area will be quite open. Mature forest habitat will take longer to re-establish. The Open Pit will eventually become a lake (which differs from baseline conditions) that may attract aquatic birds such as waterfowl and waterbirds. Some previously vegetated communities within the PA are not expected to return to existing conditions. The diversity and abundance of the bird community will gradually increase during the decommissioning and closure phase, but the species composition will likely differ from baseline conditions because of the changes in vegetation communities.

### 18.4.2.2 Mitigation Measures

The following mitigation measures have been incorporated into the design of the Project and/or are proposed to avoid or reduce Project-related effects on bird habitat:

- Canada Nickel will restrict clearing to the approved PA.
- Canada Nickel will mark clearing boundaries prior to site preparation to maintain clearing activities within the designated footprint. Where possible, vegetated buffers and natural vegetation will be maintained around sensitive features.
- Canada Nickel will implement appropriate vegetation clearing techniques to reduce impacts on features to be retained (e.g., trees to be felled away from adjacent lands where natural areas are to be retained/protected).
- Canada Nickel will install erosion and sediment control measures prior to construction activities in areas where offsite sedimentation may impact natural features, particularly wetlands, watercourses, and waterbodies.
- Canada Nickel will reduce the extent and duration of exposed soil and cover areas to suppress fugitive dust and prevent sedimentation due to wind and rainfall erosion, to the extent practical.
- Canada Nickel will maintain vegetation cover along the boundaries of high-activity areas (e.g., access roads) to reduce sensory (noise and visual) disturbance, where practical.
- When crossing wetlands with linear features such as roads that will be preserved over the Project duration, Canada Nickel will maintain hydrological connectivity using appropriate features such as properly placed and sized culverts.
- Canada Nickel will control activities associated with vehicles, including maintenance procedures to reduce the risk of petroleum products, debris, rubble, concrete or other deleterious substances entering the water.
- Canada Nickel will implement mitigation for lighting as described in Chapter 12 of the Impact Statement (Assessment of Potential Effects on the Atmospheric Environment).
- Canada Nickel will schedule vegetation clearing activities outside the migratory breeding bird period (Zone C5: April 30 to August 20) to reduce the likelihood of disturbing or harming nests of migratory birds, to the extent practical.
- If small scale, localized vegetation clearing is required during the migratory bird breeding season and the area can be effectively searched for presence of nests, Canada Nickel will have an experienced biologist/scientist survey for signs of nesting before vegetation removal.
- Canada Nickel will complete pre-disturbance surveys to identify any nests that are protected under the FWCA (e.g., Bald Eagle, other raptors) or nests that are protected year-round on

Schedule 1 of the MBR (e.g., Pileated Woodpecker, Great Blue Heron). Canada Nickel will not remove these nests unless appropriate permits are in place.

- Canada Nickel personnel or contractors will report the discovery of bird nests to appropriate Canada Nickel personnel (e.g., the Environmental Department) who will follow appropriate action or follow-up as per the Wildlife Management Plan for the Project.
- Canada Nickel will complete pre-disturbance surveys to identify Short-eared Owl nesting areas within or adjacent to the PA. If nests are present, appropriate timing windows and buffers will be implemented by Canada Nickel.
- Canada Nickel will provide training for environmental personnel responsible for site monitoring during construction to recognize SAR and SOCC that may be present in the PA, as well as nests protected under the FWCA, and Great Blue Heron and Pileated Woodpecker nests that are protected year-round on Schedule 1 of the Migratory Birds Regulations, 2022.
- Canada Nickel will construct soil Stockpiles to achieve flatter slopes to make the Stockpiles less attractive to Bank Swallows, which are known to construct nesting burrows in soil stockpiles that have steep faces and light soils amenable to burrowing. In addition, if soil has been removed from a Stockpile during the bird breeding season resulting in a vertical or near-vertical face, Canada Nickel will knock down the vertical face with an excavator to make it unattractive to swallows.
- Canada Nickel will progressively reclaim disturbed areas used during construction and operations.
- Canada Nickel will develop and implement a Mine Development Closure Plan (refer to Appendix F of the Impact Statement for Conceptual Closure Plan) which will describe the methods for restoration of the mine site, including opportunities for revegetation, restoration of natural corridors and habitat connectivity. The Mine Development Closure Plan will also:
  - Consider the needs of bird SAR, such as encouraging the development of a high, dense shrub layer to support Canada Warblers.
  - Layout timelines for revegetation/reclamation, as well as methods to federal and provincial permits will be obtained as necessary in relation to impacts to birds, bird nests and bird habitat (i.e., ESA, MBCA, FWCA).

### 18.4.2.3 Project Residual Effects

#### 18.4.2.3.1 Construction

Direct habitat loss for birds will occur during the construction phase as a result of vegetation clearing and stripping in preparation for excavation and construction of mine infrastructure, water management systems, access and haul roads, power supply and distribution systems, temporary Highway 655 by-pass and overpass and the new rail spur. The loss and alteration of bird habitat is predicted to result in a shift in the diversity and abundance of birds as individuals relocate to areas of suitable habitat outside of the PA.

Construction activities within the PA will result in a direct loss of 11,785 ha of habitat, a 22% decrease in habitat from existing conditions in the LSA (Table 18.13). Most of the habitat that will be lost is potential bird habitat except for about 255 ha of anthropogenic and poorly vegetated habitat, which may still provide habitat for some bird species but to a lesser extent.

The Project will remove 2,837 ha of upland forests and 8,667 ha of wetland habitats (Table 18.13). Species most likely to be affected by a direct loss of habitat are those that inhabit swamp, bog and coniferous forest habitats. There will also be a direct loss of bird habitat features (i.e., SWH) as shown in Table 18.14 and on Figures Figure 18.2.1 - Figure 18.2.7. Within the LSA, there will be a 40% loss of candidate waterfowl nesting features (Table 18.14). Upland nesting features including candidate woodland raptor nesting, Sharp-tailed Grouse lekking and shrub/early successional breeding bird habitat will also be lost in the PA during construction (-20%; -25%, -46% respectively; Table 18.14). A loss of around 30% for candidate marsh breeding bird habitat is also expected during construction (Table 18.14, Figure 18.2.5).

Loss of habitat during construction will primarily impact habitat for breeding migratory birds (e.g., songbirds, waterfowl) and habitat for birds that are year-round residents (e.g., woodpeckers, owls, grouse). There will also be a loss of habitat for birds that migrate through or stage within the LSA (e.g., waterfowl, shorebirds) although no unique habitat features that would concentrate migrants were identified. The amount of habitat remaining in the RSA following construction is shown in Table 18.15.

Clearing of vegetation for power supply and distribution systems will result in a change in bird habitat but will provide habitat for bird species that use forest edges or open habitats. Effects on species groups (i.e., waterbirds, shorebirds, waterfowl, raptors, landbirds, upland gamebirds) and SAR are described in greater detail below.

Effects of direct habitat loss during construction are anticipated to be long term, as removal of habitat from some areas of the PA (e.g., Open Pit) will be permanent and may not completely re-establish to pre-existing conditions upon closure. Other areas (e.g., access and haul roads) that will be rehabilitated will experience medium term effects.

**Table 18.13 Estimated Change in Land Cover Compensation in the Local Study Area**

Land Cover Category	Existing Condition (LSA)	Direct Change in Habitat (PA)	
	ha	ha	%
Upland Coniferous Forest	12,386	2,521	-20
Upland Deciduous Forest	1,887	316	-17
<b>Subtotal Upland Forest</b>	<b>14,273</b>	<b>2,837</b>	<b>-20</b>
Wetland – Bog	7,892	2,358	-30
Wetland – Fen	4,698	789	-17
Wetland – Marsh	1,295	752	-58
Wetland – Swamp	25,290	4,768	-19
<b>Subtotal Wetland</b>	<b>39,175</b>	<b>8,667</b>	<b>-22</b>
Water - Lakes, Rivers, Ponds	288	26	-9
Anthropogenic and Poorly Vegetated	576	255	-88
<b>GRAND TOTAL</b>	<b>54,313</b>	<b>11,785</b>	<b>-22</b>

**Table 18.14 Estimated Change in Bird Significant Wildlife Habitat in the Local Study Area**

Bird Habitat Feature	Existing Condition (LSA)	Direct Change in Habitat (LSA)	
	ha	ha	%
Candidate Waterfowl Nesting Area	7,879.7	3,186.5	-40
Candidate Woodland Raptor Nesting Habitat	14,272.9	2,837.1	-20
Candidate Sharp-tailed Grouse Habitat	13,021.6	3,245.7	-25
Candidate Marsh Breeding Bird Habitat	8,255.8	2,482.9	-30
Candidate Shrub/Early Successional Breeding Bird Habitat	2,032.2	936.5	-46

**Table 18.15 Estimated Bird Habitat Remaining in the Regional Study Area after Construction**

Bird Species Group	Habitat remaining in RSA after construction	
	(ha)	(%)
Forest Birds	327,686	97
Raptors	412,491	97
Upland Gamebirds	206,929	98
Marsh Birds	4,500	94
Shorebirds	261,663	97
Waterbirds	185,814	96
Waterfowl	206,708	96
Canada Warbler	308,372	97
Lesser Yellowlegs	43,686	96
Short-eared Owl	46,087	97
Common Nighthawk	200,751	99
Evening Grosbeak	134,686	99
Olive-sided Flycatcher	266,534	97
Rusty Blackbird	218,448	96
Yellow Rail	53,888	97

An indirect loss of change in bird habitat may occur through sensory disturbance (i.e., noise and light), fugitive dust deposition, edge effects and habitat fragmentation. In areas where vegetation is cleared for the Project, new edges may be created. Clearing of forest areas can result in changes to habitat that was previously forest interior with respect to abiotic factors. The effects of the creation of new edges varies by species - some bird species prefer edge habitat (e.g., American Robin, White-throated Sparrow) and may increase in abundance along edges. Habitat interior specialists (e.g., Swainson's Thrush, Black-throated Green Warbler [*Setophaga virens*]), on the other hand will avoid edge habitats and may decrease in abundance in these habitats (Whitaker and Montevecchi 1997). These indirect changes in habitat are predicted to affect the diversity and abundance of the bird community.

Sensory disturbance (e.g., noise, light pollution, fugitive dust and vibrations) can also result in indirect bird habitat loss during construction. Sensory disturbance from noise of blasting and heavy equipment, site lighting, increased traffic volumes, presence of workers and fugitive dust deposition may trigger an avoidance response (Marques et al. 2021) or could result in other physiological and behavioural effects (Amjad et al. 2024, Kight et al. 2012). Physiological and behavioural effects of noise on birds includes (Ortega 2012):

- stress responses
- fright-flight responses
- changes in foraging behaviour, reproductive success and communication
- interference with ability to hear predators

Decreased reproductive success from noise can occur by disrupting detection of potential mates (Habib et al. 2007), changes in parental behaviour or through lowered clutch size (Halfwerk et al. 2011) and/or hatching success (Kleist et al. 2018).

Impacts of noise on birds is influenced by a variety of factors including the type of noise produced, frequency, loudness and duration and varies by species and habitat types. For example, birds nesting in forested habitats tend to be more affected by anthropogenic noise compared to birds in open environments (Senzaki et al 2020). Noise impacts may result in changes in species composition, distribution, and abundance. Although noise effects are typically considered greatest during critical periods such as the breeding season, it has been demonstrated that migrating birds also avoid stopping over in noisy areas (McClure et al. 2013).

Sound pressure levels related to construction are predicted to be below 45 dBA approximately 500 m from the PA, except for areas east of the PA where the pits are located where sound levels of 45 dBA or less are not predicted until around 1,500 m from the PA. Sound pressure levels related to the existing highway alignment and the new highway realignment are not expected to exceed 38 dBA and 33 dBA respectively past 600 m from the highway. Acoustic modelling for this assessment assumed no vegetation between the source of the noise and the receptor, adding conservatism to the estimates. See Chapter 13 of the Impact Statement (Assessment of Potential Effects on the Acoustic Environment) for additional discussion on noise impacts and recommended mitigation to lessen the effects.

From the acoustic modelling, it is conservatively assumed that approximately 3,371 ha of bird habitat is predicted to be altered due to noise effects. Swamp and coniferous forest habitats will experience the highest indirect loss (1,511 ha and 897 ha respectively; Table 18.16). These habitats support a variety of bird species including forest birds, raptors, shorebirds, waterbirds and waterfowl.

**Table 18.16 Predicted Noise Effects (> 50 dBA) on Bird Habitat During Construction Within the Local Study Area**

Habitat Type	Amount (ha)
Coniferous Forest	897
Deciduous Forest	174
Swamp	1,511
Bog	478
Fen	118
Marsh	90
Water	102
<b>TOTAL</b>	<b>3,371</b>

The impact of noise on birds can be difficult to assess because it does not occur in isolation, but rather interacts with other Project effects such as habitat loss, fragmentation, edge effects and other types may also interact with other types of sensory disturbance, including light pollution (Wilson et al. 2021). A recent study investigated the effects of artificial light and anthropogenic noise, and the interactions of the two effects on bird abundance across North America (Wilson et al. 2021). The study found that for

species that responded negatively to the effects of noise, the additional presence of light exacerbated the negative effects (Wilson et al. 2021).

Site lighting may also cause adverse effects for local and migrating birds. The zone of influence varies with factors such as weather, intensity and position (height) of the light source, and ambient light conditions (Poot et al. 2008, Jones and Francis 2003, Montevecchi 2006). Down-lighting, a technique to direct night lighting downward to reduce light effects on birds adjacent to the mine site, as well as noise and light abatement measures for machinery and buildings, will be used to reduce sensory disturbance to birds within the LSA.

### **Forest Birds**

Construction of the Project will result in the direct loss of 7,605 ha (a 19% decrease) of forest bird habitat (total loss of coniferous forest, deciduous forest and swamp habitat) from the LSA (Table 18.13). Habitat for forest birds includes all upland forests (coniferous and deciduous) and swamps. Following construction of the Project, habitat for forest birds within the LSA and RSA will remain abundant because anthropogenic disturbance is low within the RSA and large tracts of habitat will remain intact (Figure 18.4.1). There will be approximately 327,685 ha of habitat available for forest birds (97% of forest bird habitat will remain) within the RSA after construction of the Project (Table 18.15).

Direct and indirect habitat loss or alteration are most likely to affect breeding forest birds that are common within the LSA (eBird 2024, 2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]), such as:

- American Goldfinch
- American Redstart
- American Robin
- Bay-breasted Warbler
- Black-and-white Warbler
- Blue-headed Vireo
- Cape May Warbler
- Cedar Waxwing
- Common Yellowthroat
- Dark-eyed Junco
- Golden-crowned Kinglet
- Hermit Thrush
- Least Flycatcher
- Magnolia Warbler
- Nashville Warbler
- Northern Parula
- Northern Waterthrush
- Ovenbird
- Red-eyed Vireo
- Ruby-crowned Kinglet
- Swainson's Thrush
- Tennessee Warbler
- White-throated Sparrow
- Winter Wren
- Yellow-rumped Warbler

An indirect loss of landbird habitat is expected through sensory disturbance during construction, particularly in coniferous forest and swamp habitats, where 1,511 ha and 897 ha respectively will be indirectly lost (Table 18.16). Anthropogenic noise can result in a variety of negative effects on forest birds. Effects of noise include declines in breeding success, behavioural changes such as altered song characteristics (Francis et al. 2011), to population or physiological consequences such as altered species abundance and/or richness and increased stress as discussed above (Bayne et al. 2008, Shannon et al., 2016, Rosa and Koper 2023).

Other effect pathways, including fugitive dust deposition, edge effects, and fragmentation may also reduce habitat quality in areas adjacent to the PA. Edge and fragmentation effects will vary by species. For example, forest-interior species are disproportionately affected compared to edge-tolerant (Laurance et al. 2004). Although birds are highly mobile, studies show that natural and anthropogenic (e.g., roads or utility corridors) forest gaps, may impede landscape-level movements of some bird species (Bélisle and St. Clair 2002).

The residual effects of the construction phase on forest bird habitat are expected to be adverse, moderate in magnitude, restricted to the LSA, occur during times of moderate (migration or wintering) to high (breeding) sensitivity, be short-term (indirect loss) to long-term (direct habitat loss) in duration and continuous. While habitats will be restored, the forest bird habitat will not be the same during and post closure, so loss of forest bird habitat is considered irreversible. Shifts in the distribution of forest birds are expected but the diversity and abundance of forest birds is expected to remain stable in the LSA during construction due to the availability of suitable habitat.

## Other Landbirds

Construction of the Project will result in loss of habitat for other landbirds, but the extent of loss could not be quantified based on the available land cover datasets. Birds in this category are generally habitat generalists (e.g., American Crow, Common Grackle) or birds that use open country (e.g., Tree Swallow, Savannah Sparrow) or early successional habitats (e.g., Alder Flycatcher, American Goldfinch). Most species are present only during the breeding season, but some are present year-round (e.g., Common Raven). Many of the species within this group are closely associated with anthropogenic habitats and human disturbance so may be less sensitive to indirect habitat loss due to sensory disturbance. Loss of habitat for other landbirds is considered reversible as early successional habitats will re-establish during active closure. Localized shifts in the distribution of other landbirds is expected but the diversity, and abundance of other landbird species is predicted to remain stable within the LSA during construction due to the amount of available habitat and this species group's tolerance to disturbance.

The residual effects of the construction phase on other landbird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of moderate (wintering or migration) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration, continuous and reversible.

## Raptors

Construction of the Project will result in the direct loss of 7,605 ha of forested habitat (upland and swamp), a 19% loss within the (Table 18.13). Forested habitat may support nine raptor species of hawks, including falcons, hawks, owls and eagles, but habitat preferences vary by species as discussed in Section 18.2.2.4. Using the SWH criteria, there will be a loss of 2,837 ha of candidate woodland raptor nesting habitat from the LSA, which is an approximate 20% loss. Habitat for raptors will remain abundant in the LSA and RSA following construction of the Project (Figure 18.4.4) and is not predicted to affect the diversity and abundance of raptors. There will be approximately 412,491 ha of habitat available for raptors within the RSA (97% of habitat in RSA will remain), following construction of the Project (Table 18.15).

There will be a direct loss of 26 ha (-9%) of open water habitat in the LSA, which may provide foraging habitat for Bald Eagle and Osprey and a direct loss of 765 ha of open wetlands, which may provide habitat for Northern Harrier (Table 18.13). There will be a direct loss of confirmed Bald Eagle nesting habitat (Figure 18.2.2) and a loss of potential Bald Eagle habitat (i.e., swamps, forests) from construction of the Project, but habitat will be available within the LSA and RSA. Habitat is not considered a limiting factor for the Bald Eagle population in Ontario (Armstrong 2014).

Raptors may also be affected by indirect change in habitat (sensory disturbance) resulting from Project construction, as their nest sites are sensitive to anthropogenic disturbance. Nesting Bald Eagles are vulnerable to disturbance from construction activities. Response to disturbance varies by timing, type and duration of disturbance and distance to disturbance (Armstrong 2014). Non-habituated Bald Eagles nesting in undisturbed areas are less tolerant of human disturbance and require greater protection (Armstrong 2014).

Other effect pathways, including fugitive dust deposition, edge effects, and fragmentation may also reduce habitat availability in areas where the PA is immediately adjacent to raptor nests. With the implementation of nest setbacks, timing windows and nest monitoring during construction, indirect habitat loss is expected to be low in magnitude.

During migration, adverse effects relating to the direct and indirect loss or alteration of habitat on raptors will be negligible. Given the northern location of the Project and no known bottlenecks that concentrate the migrating raptors, small numbers of raptors are expected to pass through the RSA or LSA. Wintering raptors may be adversely affected but the magnitude will be low.

The residual effects of the construction phase on raptor habitat are expected to be adverse, moderate in magnitude, restricted to the LSA, occur during times of moderate (migration or wintering) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. Habitat for some raptor species will be restored during and after closure, which may result in changes to species diversity and abundance. For example, open habitats will be available for species such as Northern Harrier and as ponds become naturalized and the Open Pit becomes a lake, habitat for Osprey and Bald Eagle will become available. Loss of habitat for forest raptors, however, is considered irreversible as the landscape will be altered compared to the existing condition (i.e., Open Pit will become a lake) and it will take many years for mature forest to re-establish. Diversity and abundance of raptor species is predicted to remain stable in the LSA during construction due to the availability of suitable habitat.

### **Upland Gamebirds**

There are two upland gamebird species that are found within forested areas in the LSA, Ruffed Grouse and Spruce Grouse. Ruffed Grouse will experience an 1,887 ha (-17%) loss of deciduous forest and Spruce Grouse will experience a 2,521 ha (-20%) loss of coniferous forest within the LSA from construction of the Project (Table 18.13). Based on SWH criteria, there will be an estimated loss of 3,245.7 ha or 25% of the candidate Sharp-tailed Grouse breeding habitat (Table 18.14, Figure 18.2.5). There will be approximately 206,929 ha of habitat available for upland gamebirds (98% of the habitat will remain) within the RSA following construction of the Project (Table 18.15, Figure 18.4.8).

All three upland gamebird species are present in the LSA year-round and may experience indirect habitat loss through sensory disturbance during construction. Sharp-tailed Grouse are particularly vulnerable to disturbance during the lekking period (Roy and Coy 2021, Baydack and Hein 1987).

The residual effects of the construction phase on upland gamebird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of moderate (winter) to high (lekking/nesting) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. While early successional and open habitats will be restored during and post-closure, there will be a loss of forested habitat. For this reason, loss of gamebird habitat is irreversible. Diversity and abundance of upland gamebird species is predicted to remain stable in the LSA during construction due to the availability of suitable habitat.

## Marsh Birds

Construction of the Project will result in a loss of 752 ha of marsh bird habitat (58% loss of marsh wetlands from baseline), which supports American Bittern, Sora, Virginia Rail, Sandhill Crane and Swamp Sparrow (Table 18.13, Figure 18.4.3). Construction will also result in an increase in sensory disturbance in ~90 ha of marsh habitat that is adjacent to the PA (Table 18.16). Loss of habitat will affect breeding birds only; there are no year-round residents and the LSA supports few migrants given its northern location in the province. Habitat for marsh birds is relatively uncommon throughout the LSA and RSA; it is present in small, scattered patches (Figure 18.4.3). There will be approximately 4,500 ha of marsh bird habitat (94% of the habitat will remain) available within the RSA following construction of the Project (Table 18.15).

The residual effects of the construction phase on marsh bird habitat are expected to be adverse, moderate in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration, continuous and loss of marsh bird habitat is expected to be irreversible, although a small amount of marsh habitat may be restored along the periphery of lakes and ponds in the PA. The abundance of marsh birds may decline in the LSA during construction due to loss of marsh habitat.

## Shorebirds

The LSA provides habitat for seven species of shorebirds in the breeding season. A small number of shorebirds (e.g., Semipalmated Plover, Lesser Yellowlegs) that breed in arctic and sub-arctic regions may also stopover in the LSA during spring or fall (eBird 2024). Spotted Sandpiper, Solitary Sandpiper, Lesser Yellowlegs, Greater Yellowlegs and Wilson's Snipe use wetland and aquatic habitats in the PA and LSA including but not limited to ponds, streams, wet meadows, bogs, fens and marshes. Construction of the Project will result in a direct loss of 8,667 ha of wetland habitat and 26 ha of aquatic habitat that may be used by breeding shorebirds within the LSA, a 22% and 9% change respectively from existing conditions (Table 18.13). Following construction of the Project, there will be approximately 261,662 ha of shorebird habitat available (97% of habitat will remain) within the RSA (Table 18.15). Shifts in shorebird distribution within the LSA are expected due to loss of habitat within the PA.

There will also be a loss of habitat for American Woodcock during construction. This species prefers early successional habitats such as deciduous thickets, young hardwood forests, open fields, and bogs (McAuley et al. 2020). Habitat loss for woodcock could not be quantified based on the available land cover mapping but given that there are forestry operations within the LSA and RSA, which creates early successional habitats, suitable habitat is likely to be readily available for American Woodcock.

Killdeer is a common shorebird species that nests on the ground, commonly in anthropogenic areas but also in natural habitats where there are fields or on gravel (Jackson and Jackson 2020). Habitat for Killdeer may be created by the Project because this species has been known to nest on cleared areas and gravel roads; however, nests located on roads are at risk of being destroyed. With the implementation of mitigation, including regular pre-construction nest surveys during the breeding season, timing windows and buffer zones around active nests, loss of habitat for Killdeer is not anticipated.

Breeding shorebirds may also experience indirect habitat loss through sensory disturbance during construction. Pearce-Higgins et al. (2012) found that Common Snipe populations (*Gallinago gallinago*) showed a decline of 53% during construction of a wind farm. Based on this, a reduction in breeding habitat for some shorebird species may occur during construction.

The residual effects of the construction phase on shorebird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. Loss of shorebird habitat is considered irreversible. The composition of the shorebird community is predicted to change and there may be some declines in abundance of shorebirds in the LSA, particularly for those that use marsh habitats.

### **Waterbirds**

There are only four waterbird species that were recorded as nesting within the LSA, two of which nest in trees (Great Blue Heron, Bonaparte's Gull) and the other two species nest over water (Common Loon, Pied-billed Grebe).

Construction of the Project will result in a direct loss of 26 ha (-9%) of open water habitat (lakes, ponds, rivers) from within the LSA, some of which may provide nesting habitat for Common Loon and Pied-billed Grebe (Table 18.13). Great Blue Herons will experience direct habitat loss from vegetation clearing in swamp habitat (4,768 ha), which is used for nesting and marsh habitat (752 ha), which may be used for foraging (Table 18.13). Great Blue Heron nests were not noted during baseline surveys, so the presence of large colonies is unlikely. However, individual nests may be present in the LSA. Bonaparte's Gulls, which nest in coniferous trees near lakes or bogs will also experience direct habitat loss from construction of the PA.

Overall, the direct and indirect habitat loss or alteration of waterbird habitat due to the Project are relatively small and are unlikely to result in a measurable change in the abundance of breeding waterbirds in the LSA or RSA as habitats are readily available. Following construction of the Project, there will be an estimated 185,813 ha of waterbird habitat available (96% of habitat will remain) within the RSA (Table 18.15).

The residual effects of the construction phase on waterbird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration, and continuous. Although aquatic features (lakes, ponds) will be present in the PA post-closure, there will be a loss of swamp and marsh habitat for waterbirds; therefore, loss of waterbird habitat is expected to be irreversible. The diversity and abundance of waterbirds is predicted to remain stable in the LSA during construction due to the availability of suitable habitat.

## Waterfowl

The LSA supports a variety of waterfowl species during the breeding season, the most numerous of which are: Canada Goose, Mallard and Ring-necked Duck, which may be found in areas of appropriate freshwater marshes, ponds, lakes, and rivers within the LSA and RSA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement], eBird 2024). Little loss of habitat for migrating waterfowl is expected as no features supporting diverse or large groups of staging waterfowl were found during targeted surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

Construction of the Project will result in a direct loss of 3,186 ha of candidate waterfowl nesting habitat (defined using SWH criteria) from the LSA, a 40% change from existing conditions (Table 18.14). Waterfowl habitat will remain abundant within the RSA as these habitat types are common on the landscape (Figure 18.2.1). There will be approximately 206,708 ha of waterfowl habitat available (96% of habitat will remain) within the RSA after construction of the Project (Table 18.15).

Construction will also result in an increase in sensory disturbance, which can reduce habitat quality. Research on effects of anthropogenic disturbance on the breeding success of waterfowl ranges from positive (Roy 2018, Skaggs et al. 2020) to neutral or a weak negative effect (e.g., Kemkink et al. 2019, Singer et al. 2020). The sensory disturbance from construction is a change from the existing conditions and considered an adverse effect.

The residual effects of the construction phase on waterfowl habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. Loss of waterfowl habitat is expected to be irreversible. The diversity and abundance of waterfowl is predicted to remain stable in the LSA during construction due to the availability of suitable habitat.

## Species at Risk

### ***Bank Swallow***

Although the LSA is within the range of Bank Swallow, this species was not observed during field studies and no suitable habitat was documented in the PA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). However, there is potential for Bank Swallow to be present in the LSA.

Based on this, a negligible direct loss of Bank Swallow habitat is expected and there are no predicted changes to the abundance and density of Bank Swallow populations within the LSA as a result of Project construction. Bank Swallows are also unlikely to experience indirect habitat as they are tolerant of disturbance and often nest in human-made environments including aggregate pits and waste topsoil on construction sites.

### ***Barn Swallow***

Barn Swallow, which is only present in small numbers within the LSA, is not expected to experience direct loss of breeding habitat because no anthropogenic structures will be impacted by the Project. Foraging habitat may be lost, but this is not a limiting factor for the species (COSEWIC 2011). Barn Swallow is unlikely to experience indirect habitat loss due to sensory disturbance as this species is often present in disturbed areas (e.g., adjacent to roads). There are no predicted changes to the abundance of Barn Swallow populations within the LSA because of Project construction.

### ***Canada Warbler***

Canada Warbler will experience a direct loss of habitat during construction of the Project. There will be a loss of 2,251 ha of forested habitat, 420 ha of treed bog/fen and 7,414 ha of swamp habitat, all of which could support breeding Canada Warblers (total: 10,085 ha).

The Canada Warbler Recovery Strategy ranks the effects of mining as medium for Canada Warbler (EC 2016a). However, the relative contribution of factors on the breeding versus wintering grounds that are contributing to the Canada Warbler population decline are not well understood; nor is the importance of various threats (EC 2016a). It has been estimated that 24% of Canada Warbler's breeding habitat in the boreal forest of Canada has been disturbed by anthropogenic activities, but the extent to which those disturbances directly affect the species' population is not known (EC 2016a).

Critical Habitat for Canada Warbler was not identified in the Recovery Strategy due to a lack of understanding of habitat requirements (EC 2016a). Changes in abundance and distribution of Canada Warblers in the LSA is not expected during construction because sufficient habitat is expected to be available in the RSA. An estimated 308,372 ha will be available (97% of habitat will remain) to support the Canada Warbler population post-construction (Table 18.15). Encouraging the restoration of a high shrub layer during closure will help create Canada Warbler habitat. A low magnitude loss of habitat is predicted for this species.

### ***Eastern Whip-poor-will***

Eastern Whip-poor-will was not recorded during field surveys but may be present in the LSA at low densities. This species preferred habitat (early successional, open forests, rock barrens) could not be quantified using existing land cover data. This species avoids scrub habitat and wetland habitats (Rand 2014), so much of the LSA may be unsuitable given the wet conditions (Section 16.2.2, Chapter 16 of the Impact Statement [Vegetation, Riparian and Wetland Environments]).

The main threat to Eastern Whip-poor-will is believed to be reduced availability of insect prey and loss of insect-producing habitats (ECCC 2018a). However, the Eastern Whip-poor-will Recovery Strategy ranks the effects of energy development and mineral extraction as a medium level of concern because of habitat loss, degradation and fragmentation in some areas of the Eastern Whip-poor-will's distribution (ECCC 2018a).

Construction of the Project will result in a direct loss of Eastern Whip-poor-will habitat but the magnitude is predicted to be low given that the species has not been documented in the LSA (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]) and much of the LSA does not contain suitable habitat (Section 16.2.2, Chapter 16 of the Impact Statement [Vegetation, Riparian and Wetland Environments]). Based on critical habitat identified by ECCC (2018a), none is present within the PA or LSA.

A study on the effects of sensory disturbance associated with mining exploration found no effect on the stress physiology (i.e., stress induced corticosterone levels) of Eastern Whip-poor-wills that were sampled at distances that ranged 1 – 33 km from a mining exploration site (Rand 2014). For this reason, and due to the low likelihood of the species being present, negligible indirect loss of habitat is expected. As a result, there are no predicted changes to the abundance of the Eastern Whip-poor-will population within the LSA because of Project construction.

### ***Lesser Yellowlegs***

Lesser Yellowlegs, which may inhabit bogs, fens and marshes and is present in small numbers in the LSA (Section 18.2.2.10), will experience a direct loss of 3,899 ha of potential habitat during construction of the Project (Table 18.13). Following construction of the Project, there will be approximately 43,686 ha of Lesser Yellowlegs habitat (96%) remaining in the RSA (Table 18.15).

There may also be a small loss of habitat for migrating Lesser Yellowlegs, but no concentrations of migrants were observed during field studies, so the magnitude of loss (if any) will be small (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). Indirect loss of habitat due to sensory disturbance may be experienced by Lesser Yellowlegs in areas where breeding habitat is located close to the PA.

Energy production and mining was ranked as a low impact threat to this species (COSEWIC 2020) and critical habitat has not yet been identified for this species. Given the low density of Lesser Yellowlegs observed during field surveys, negligible change is expected from the loss of habitat during construction of the Project.

### ***Short-eared Owl***

Short-eared Owl, which is found in open habitats, could experience a direct loss of approximately 3,147 ha of bog and fen habitat and 752 ha of marsh habitat (Table 18.13) and indirect habitat loss as discussed above for raptors. Short-eared Owls are most vulnerable to disturbance during the nesting period but with the implementation of mitigation, including pre-construction monitoring for breeding territories and buffer zones if breeding activity is observed, indirect habitat loss will be negligible.

Mining was identified as a low impact threat in the Short-eared Owl Management Plan ECCC (2018b), and Short-eared Owl critical habitat has not yet been identified by ECCC. Bog and fen habitats are readily available within the LSA and RSA to support Short-eared Owls (Figure 18.4.16). There will be approximately 9,900 ha of Short-eared Owl habitat available within the LSA and 47,086 ha available within the RSA (97% of habitat will remain) following construction of the Project. For this reason, loss of

habitat from construction of the Project is expected to be negligible in magnitude. As a result, there are no predicted changes to the abundance of the Short-eared owl population within the LSA because of Project construction.

### ***Species at Risk Summary***

The residual effects of the construction phase on SAR habitat are expected to be adverse, negligible to moderate in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. Loss of SAR habitat will be irreversible for some species. While there will be a direct loss of SAR habitat within the PA and indirect loss in the LSA, it is predicted that species distribution will shift to undisturbed areas of the LSA where suitable habitat is available, and diversity and abundance of SAR will remain stable.

### **Species of Conservation Concern**

#### ***Evening Grosbeak, Olive-sided Flycatcher and Rusty Blackbird***

Landbird SOCC that rely on forested habitat will experience a direct loss of habitat during construction. A direct loss of 2,521 ha of potential Evening Grosbeak habitat, 8,070 ha of potential Olive-sided Flycatcher habitat and 8,070 ha of potential habitat for Rusty Blackbird is anticipated using the habitat affiliations as identified in Table 18.13. Following construction of the Project, habitat for these species will remain readily available within the LSA and RSA (Figure 18.4.10, Figure 18.4.11, Figure 18.4.12). The amount of habitat that will remain in the RSA for these species after construction of the Project is as follows:

- Evening Grosbeak: 134,686 ha (99%)
- Olive-sided Flycatcher: 297,985 ha (97%)
- Rusty Blackbird: 218,448 ha (96%)

Habitat loss on the breeding grounds from a variety of threats including but not limited to roads, forestry, development and mining were ranked as low or negligible in the Evening Grosbeak Management Plan (ECCC 2022). The overall impact of the threat of energy production and mining is considered negligible for Evening Grosbeak in Canada. The drivers of population decline for this species are not understood but may be related to changes in Spruce Budworm outbreaks (ECCC 2022). For this reason, change in habitat for Evening Grosbeak is expected to be low in magnitude and there is predicted to be sufficient habitat available in the LSA and RSA to support this species. The abundance of Evening Grosbeaks in the LSA is expected to remain stable during construction.

The largest threat to the population of Olive-sided Flycatcher is thought to be loss of habitat on the wintering grounds, however loss of breeding habitat may also be affecting this species (COSEWIC 2018b). Energy production and mining was identified as a low impact threat to Olive-sided Flycatcher (COSEWIC 2018b). Construction of the Project will result in a direct loss of Olive-sided Flycatcher, but suitable habitat will be available within the LSA and RSA and therefore the abundance of the Olive-sided Flycatcher population in the LSA is expected to remain stable.

Although the reasons for the decline of Rusty Blackbird are not well understood, loss of habitat on the wintering grounds in the southern United States is likely a main factor contributing to this species decline (COSEWIC 2017). Mining is not addressed in the Rusty Blackbird Management Plan, but forest clearing is ranked as a medium threat (EC 2015). Similar to the other SOCC, the population of Rusty Blackbird is expected to experience a shift in distribution in the LSA, but impacts to abundance are not expected.

These three SOCC could also experience indirect habitat loss through sensory disturbance during construction, as discussed above for landbirds. Evening Grosbeak is a year-round resident and is therefore vulnerable to sensory disturbance in all seasons whereas the other two SOCC are only present during the breeding season.

### ***Common Nighthawk***

Common Nighthawk was documented within the PA and LSA during field studies (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). It was recorded at 28 ARU locations and was also recorded incidentally during other surveys. Logging within the LSA has likely created the open habitats that this species prefers (EC 2016b). Common Nighthawk will experience a direct loss of habitat from construction of the Project, including 2,837 ha of forested habitat, 3,147 ha of bog and fen, and 23 ha of bedrock. Suitable habitat for Common Nighthawk is readily available outside of the PA within the LSA and RSA (Figure 18.4.9) and therefore, changes to abundance are not predicted.

Common Nighthawk may also experience indirect habitat loss due to sensory disturbance; however, this species is attracted to anthropogenic light sources due to an increased availability of insect prey (EC 2016b).

### ***Yellow Rail***

If Yellow Rail is present within the LSA, it is at very low densities. This species was not recorded on ARUs and only one suspected Yellow Rail call (which could not be confirmed) was documented during field surveys (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]). The core of this species' range in Ontario is in the Hudson's Bay lowlands (COSEWIC 2001). There will be a direct loss of 752 ha of marsh habitat from the construction of the Project; however, not all marsh habitat is suitable as this species prefers marshes dominated by sedges, grasses, and rushes with little standing water (COSEWIC 2001).

### ***Species of Conservation Concern Summary***

The residual effects of the construction phase on SOCC habitat are expected to be adverse, low to moderate in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be short (indirect loss) to long-term (direct habitat loss) in duration and continuous. Loss of SOCC habitat will be irreversible for all SOCC species, except Common Nighthawk. While there will be direct loss of SOCC habitat within the PA and indirect loss in the LSA, it is predicted that species distribution will shift to undisturbed areas the LSA where suitable habitat is available and diversity and abundance of SOCC will remain stable.

### 18.4.2.3.2 Operations

Most of the direct bird habitat loss will occur during the construction phase. As discussed in Section 18.4.2.3.1, changes in habitat as a result of water management activities are not expected. An indirect loss of bird habitat from sensory disturbance, as described above during the construction phase is also anticipated during operations. Sensory disturbance will vary during the operations phase. Disturbance from blasting and ore extraction will end after operations phase 2 (Year 30; Chapter 3 of the Impact Statement [Project Description]). Disturbance due to hauling, however, will continue throughout operations, ending in Year 41 (Chapter 3 of the Impact Statement [Project Description]).

During operations, most of the LSA (outside of the PA) is not predicted to experience sound levels above 50 dBA. There are three areas within the LSA where sound levels are predicted to exceed 50 dBA (Figure 13.7, Chapter 13 of the Impact Statement [Assessment of Potential Effects on the Acoustic Environment]):

- On the east side of the PA, the 50 dBA sound level contour is estimated to fall a maximum of 250 m past the PA.
- On the east and south edges of the TMF, the 50 dBA sound level contour is estimated to fall a maximum of 100 m past the PA.
- Areas between the TMF and the rail spur, and the processing plant and 600 m north of Davis Lake are expected to experience levels at or above 50 dBA.

The indirect loss of bird habitat due to noise effects will be greatest for swamp habitat (1,511 ha), coniferous forest (897 ha) and bog habitat (478 ha; Table 18.17).

**Table 18.17 Predicted Noise Effects (> 50 dBA) on Bird Habitat during Operations within the Local Study Area**

Habitat Type	Amount (ha)
Coniferous Forest	897
Deciduous Forest	174
Swamp	1511
Bog	478
Fen	118
Marsh	90
Water	102
<b>TOTAL</b>	<b>3,371</b>

## Forest Birds

No additional direct loss of habitat for forest birds is anticipated during the operations phase. Similar to effects discussed for construction, forest birds may be present in lower densities in areas with high noise levels (Bayne et al. 2008) and behaviour of birds may also be negatively affected. Noise can obscure territorial defense signals, which may result in decreased breeding success (Zwart et al. 2016). An estimated 897 ha of coniferous forest, 174 ha of deciduous forest and 1,511 ha of swamp habitat will experience noise levels  $\geq 50$  dBA, which may deter nesting birds of lower habitat quality. Site lighting and increased traffic during operations may also result in sensory disturbance to forest birds. Increased traffic may also cause an indirect loss of habitat for forest birds in areas adjacent to access roads and Highway 655.

The residual effects of operations on forest bird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of moderate (winter and migration) to high sensitivity, be medium-term in duration, continuous, and reversible. The diversity and abundance of forest birds in the LSA is expected to remain stable during operations due to the availability of suitable habitat in the LSA.

## Other Landbirds

There will be no additional direct loss of habitat for other landbirds due to vegetation clearing during the operations phase of the Project. However, other landbirds may experience an indirect loss of breeding habitat due to sensory disturbance during operations as discussed above for forest birds.

The residual effects of operations on other landbird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high sensitivity, be medium-term in duration, continuous, and reversible. The abundance and diversity of other landbird species is predicted to remain stable during operations due to the availability of suitable habitat in the LSA and this species group's tolerance to disturbance.

## Raptors

No additional direct loss of habitat for raptors is anticipated during the operations phase of the Project. Similar to the construction phase, nesting raptors may be affected by indirect change in habitat due to sensory disturbance in areas where the PA is immediately adjacent to raptor nests.

An estimated 897 ha of coniferous forest, 174 ha of deciduous forest and 1,511 ha of swamp habitat will experience noise levels  $\geq 50$  dBA, which could displace forest nesting raptors or otherwise lower habitat quality. Raptors such as Northern Harrier that use bog, fen, and marsh habitats may experience an indirect habitat loss of 686 ha from noise effects during operations. Increased traffic may also cause an indirect loss of habitat for raptors in areas adjacent to access roads and Highway 655.

The residual effects of the operations phase on raptor habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of moderate (winter and migration) to high (breeding) sensitivity, be medium-term in duration, continuous and reversible. The diversity and abundance of raptors is expected to remain stable due to the availability of suitable habitat in the LSA.

## Upland Gamebirds

No additional direct loss of habitat for upland gamebirds will occur during the operations phase of the Project. However, upland gamebirds may experience indirect habitat loss year-round due to sensory disturbance during operations. Increased traffic during operations may also result in indirect habitat loss in areas adjacent to access roads and Highway 655. Upland gamebirds are particularly sensitive to disturbance during the lekking and nesting season, as discussed for the construction phase.

The residual effects of the operations phase are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of moderate (winter) to high (lekking/nesting) sensitivity, be medium-term in duration, continuous and reversible. The diversity and abundance of upland gamebirds is expected to remain stable due to the availability of suitable habitat in the LSA.

## Marsh Birds

There will be no additional direct loss of marsh bird habitat due to vegetation clearing during the operations phase of the Project. Marsh birds may experience a small (157 ha) indirect loss of habitat due to noise disturbance during operations.

The residual effects of the operations phase are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (nesting) sensitivity, be medium-term in duration, continuous and reversible. No additional declines in marsh bird species abundance are expected during operations.

## Shorebirds

There will be no additional direct loss of shorebird habitat due to vegetation clearing during the operations phase of the Project. Shorebirds may also experience an indirect loss of habitat due to sensory disturbance in areas of the LSA where sound levels are  $\geq 50$  dBA (Table 18.17), but the effects of noise disturbance on breeding shorebirds are not well understood.

The residual effects of the operations phase on shorebird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be medium-term in duration, continuous and reversible. No additional declines in shorebird abundance in the LSA are anticipated during operations.

## Waterbirds

There will be no additional direct loss of waterbird habitat due to vegetation clearing during the operations phase of the Project. Breeding waterbirds may also experience an indirect loss of habitat due to sensory disturbance from operations and from increased traffic on access roads and Highway 655. There were no large concentrations of breeding waterbirds observed within the LSA; rather these species are present in low densities (2023 Terrestrial Ecology Baseline Study [Appendix B.7.4 of the Impact Statement]).

The residual effects of the operations phase on waterbird habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be

medium-term in duration, continuous, and reversible. Diversity and species abundance is expected to remain stable during operations due to the availability of suitable habitat in the LSA.

### **Waterfowl**

No additional direct loss of habitat for waterfowl will occur as a result of vegetation clearing during operations. Breeding waterfowl may also experience an indirect loss of habitat due to sensory disturbance during the operations phase. Approximately 1,511 ha of swamp habitat, 156 ha of marsh habitat and 745 ha of bog habitat will experience noise levels  $\geq 50$  dBA during operations. Waterfowl may be displaced from these habitats or habitat quality may decline due to disturbance.

The residual effects of the operations phase on waterfowl habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (nesting) sensitivity, be medium-term in duration, continuous and reversible. The diversity and abundance of waterfowl is expected to remain stable during operations due to the availability of suitable habitat in the LSA.

### **Species at Risk**

#### ***Barn Swallow and Bank Swallow***

No loss of habitat is anticipated for Bank Swallow and Barn Swallow as habitat for these species is unlikely to be present, and if present, is unlikely to be impacted during operations. These species are also unlikely to be affected by sensory disturbance, as discussed for the construction phase. Changes in species abundance are not anticipated.

#### ***Canada Warbler***

No additional habitat loss due to vegetation clearing is expected for Canada Warbler during operations. Canada Warbler may also experience an indirect loss of habitat due to noise disturbance during operations. An estimated 897 ha of coniferous forest, 174 ha of deciduous forest and 1,511 ha of swamp will experience noise levels  $\geq 50$  dBA during operations. The abundance of this species is expected to remain stable during operations due to the availability of suitable habitat in the LSA.

#### ***Lesser Yellowlegs***

No additional habitat loss due to vegetation clearing is expected for Lesser Yellowlegs during operations. Approximately 686 ha of suitable habitat (bog, fen, marsh) will experience noise levels  $\geq 50$  dBA during operations. The abundance of this species is expected to remain stable during operations due to availability of suitable habitat in the LSA.

#### ***Short-eared Owl***

There will be no additional direct loss of habitat for Short-eared Owls during operations, but this species may experience indirect habitat loss due to sensory disturbance. Approximately 686 ha of suitable habitat (bog, fen, marsh) will experience noise levels  $\geq 50$  dBA during operations. The abundance of this species is expected to remain stable during operations due to availability of suitable habitat in the LSA.

### ***Species at Risk Summary***

The residual effects of the operations phase on SAR habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of no (winter) to high (breeding) sensitivity, be medium-term in duration, continuous, and reversible. The abundance and density of SAR are predicted to remain stable due to availability of suitable habitat in the LSA.

### **Species of Conservation Concern**

No additional direct loss of habitat during the operations phase of the Project is expected for SOCC. The following SOCC may also experience indirect habitat loss from sensory disturbance during operations as discussed for the construction phase of the Project:

- Evening Grosbeak (year-round)
- Olive-sided Flycatcher (breeding)
- Rusty Blackbird (breeding)
- Common Nighthawk (breeding)
- Yellow Rail (breeding)

The residual effects of the operations phase on SOCC habitat are expected to be adverse, low in magnitude, restricted to the LSA, occur during times of low (winter) to high (breeding) sensitivity, be medium-term in duration, continuous, and reversible. The abundance and diversity of SOCC in the LSA are predicted to be stable during operations.

#### **18.4.2.3.3 Decommissioning and Closure**

During the decommissioning and closure phase, there will be a progressive increase in bird habitat as Project infrastructure is removed and vegetation re-establishes in the PA. Removal of Project infrastructure and other components will result in temporary noise and other sensory disturbance. The effects of light and noise on birds during decommissioning are expected to be lower than the construction phase, as discussed in Section 18.4.2.3.1. Following decommissioning, sensory disturbance will return to baseline conditions.

Bird habitat will increase as the Open Pit fills with water and transitions to aquatic habitats which will provide suitable habitat for a variety of bird species including waterbirds and waterfowl. Over time, vegetation in the PA will re-establish, which will result in an increase in habitat for some bird species, but not to the pre-construction levels. Open habitats will succeed to scrub and eventually forest, and the representative bird community will change over time as the habitats change. Negative impacts associated with edge effects will be reduced over time during active closure and passive closure as vegetation succeeds in the PA and softens the transition between the PA and adjacent habitat.

During passive closure, the quality and quantity of bird habitat will continue to increase until mature forests reestablish to become more similar to habitats in the LSA. The LSA is not expected to return to baseline conditions because there will be an increase in aquatic features (lakes, ponds) and open habitats; however, habitat improvements over construction and operations are anticipated. The diversity and abundance of the bird community is expected to increase in the PA over time during decommissioning and closure. However, species composition is expected to differ from baseline

conditions, due to changes in vegetation communities (e.g., increase in aquatic and early successional habitat).

### **Forest Birds**

Following decommissioning, forest birds are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. Due to progressive reclamation, which will begin during operations, some habitat will be suitable for forest birds during closure, particularly species that use young or early successional forests. Mature forests, however, are not expected to be restored until the Project is many years into passive closure (Year 46+).

The residual effects of the decommissioning and closure on forest bird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of moderate to high sensitivity, be short to long-term in duration, continuous, and reversible. Forest bird diversity and abundance is expected to increase over time in the PA as mining activities end and forested habitat re-establishes.

### **Other Landbirds**

Following decommissioning, other landbirds within the LSA are expected to move back into habitats where they may have been displaced due to sensory disturbance from mining activities. Many of the species in this group use early successional habitats, which will re-establish quickly during closure.

The residual effects of the decommissioning and closure on other landbird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of moderate to high sensitivity, be short to long-term in duration, continuous and reversible. Diversity and abundance of other landbirds is expected to increase over time in the PA as mining activities end and habitat re-establishes,

### **Raptors**

Following decommissioning, raptor species in the LSA are expected to resume use of habitat as sensory disturbance from mining activities ends. Habitat for species that nest/forage in open habitats will increase following reclamation (e.g., Northern Harrier), but habitat for raptors that use more mature forests (e.g., Boreal Owl, American Goshawk) will be slow to recover.

The residual effects of the decommissioning and closure phase on raptor habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of moderate to high sensitivity, be short to long-term in duration, continuous, and reversible. Raptor diversity and abundance is expected to increase over time in the PA as mining activities end and suitable habitat re-establishes.

## Upland Gamebirds

Following decommissioning, upland gamebirds are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. A direct change in habitat for upland gamebirds is expected during closure. Habitat for Sharp-tailed Grouse, which use open or early successional habitats may become suitable during reclamation whereas habitat for Ruffed and Spruce Grouse (forested areas) will be slower to recover.

The residual effects of the decommissioning and closure phase on upland gamebird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of moderate to high sensitivity, be short to long-term in duration, continuous, and reversible. Upland gamebird diversity and abundance is expected to increase over time in the PA as mining activities end and suitable habitat re-establishes.

## Marsh Birds

Following decommissioning, marsh birds are expected to resume use of habitats within the LSA as sensory disturbance from mining activities ends. No direct increase in marsh bird habitat is expected during decommissioning and closure.

The residual effects of the decommissioning and closure phase on marsh bird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of no to high sensitivity, be short to long-term in duration, continuous, and reversible. Marsh bird diversity and abundance is expected to increase over time in the PA as mining activities end and suitable habitat is created.

## Shorebirds

Following decommissioning, shorebirds are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. A direct increase in shorebird habitat is also expected during decommissioning and closure as open habitats for species such as Killdeer are restored. As open areas succeed to scrub during the closure phase, habitat for American Woodcock may be created. Wetland habitats are not expected to reestablish during this phase.

The residual effects of the decommissioning and closure phase on shorebird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of no to high sensitivity, be short to long-term in duration, continuous, and reversible. Shorebird diversity and abundance is expected to increase over time in the PA as mining activities end and suitable habitat re-establishes.

## Waterbirds

Following decommissioning, waterbirds are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. Habitat for waterbirds will increase following decommissioning and closure relative to baseline conditions once ponds and lakes are established within the PA.

The residual effects of the decommissioning and closure phase on waterbird habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of no to high sensitivity, be short to long-term in duration, continuous, and reversible. Waterbird diversity and abundance is expected to increase over time in the PA as mining activities end and aquatic habitat is established.

### **Waterfowl**

Following decommissioning, waterfowl are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. Habitat for waterfowl will increase relative to baseline conditions following decommissioning and closure once ponds and lakes are established within the PA.

The residual effects of the decommissioning and closure phase on waterfowl habitat are expected to be positive relative to conditions during operations, low in magnitude, restricted to the LSA, occur during times of no to high sensitivity, be short to long-term in duration, continuous, and reversible. Waterfowl diversity and abundance is expected to increase over time in the PA as mining activities end and aquatic habitat is established.

### **Species at Risk and Species of Conservation Concern**

Following decommissioning, bird SOCC and SAR are expected to resume use of habitat within the LSA as sensory disturbance from mining activities ends. There will be no direct increase in habitat for the following forest bird and raptor SOCC and SAR following decommissioning and closure because forested habitat will be slow to recover in the LSA:

- Canada Warbler
- Eastern Whip-poor-will
- Evening Grosbeak
- Olive-sided Flycatcher
- Rusty Blackbird

No change in habitat is expected for Bank Swallow or Barn Swallow during this phase. Habitat for Lesser Yellowlegs and Yellow Rail, which rely on wetland habitats may increase relative to conditions during operations due to wetland restoration during closure. Habitat for Short-eared Owl and Common Nighthawk may also increase relative to conditions during operations as these two species use open and early successional habitats.

The residual effects of the decommissioning and closure phase on SAR and SOCC habitat are expected to be positive low in magnitude, restricted to the LSA, occur during times of no to high sensitivity, be short to long-term in duration, continuous, and reversible. Diversity and abundance of SAR and SOCC are expected to increase over time in the PA as mining activities end and habitat re-establishes.

#### **18.4.3 Change in Mortality Risk**

This Section describes the pathways, mitigation measures, and predicted Project residual effects related to changes in bird mortality risk.

### 18.4.3.1 Project Pathways

#### 18.4.3.1.1 Construction

Site preparation activities (vegetation clearing, stripping and grading), construction of Project infrastructure and components, and Project-related transportation within the LSA have the greatest potential to result in change in mortality risk during construction. Site preparation involves vegetation removal and soil disturbance, which may result in the direct mortality of eggs or flightless young birds, primarily if these activities are conducted during the bird nesting period. Additionally, Project-related traffic during construction could result in equipment and vehicles crushing or colliding with birds and/or birds colliding with Project-related infrastructure or equipment during excavation and pre-stripping, hauling of graded material, and construction of mine infrastructure, haul roads, access roads, power supply, overpass, Highway 655 by-pass and the rail spur. In the absence of mitigation, the presence of Project workers could also result in an increase in harvesting of waterfowl and gamebirds.

Noise due to construction can cause physiologic stress responses in birds (Kight et al. 2012, Blickey et al. 2012), which can result in a weakened immune function and reduced breeding success (Halfwerk et al. 2010, Blickey et al. 2012).

#### 18.4.3.1.2 Operations

Activities during operations of the Project may also result in increased adverse encounters with birds through collisions with Project vehicles, construction equipment, and infrastructure. The increase in traffic due to ore hauling within the mine site and transportation of site personnel and materials and supplies to the mine site along the highway could result in an increase in mortality risk for birds near the PA. The presence of utilities, site infrastructure, and facilities may also lead to mortality through migratory bird collisions with utility wires, poles, or buildings.

Although noise and activity associated with operations activities will likely deter birds from the PA, some birds may interact with untreated water in the spillways or TMF Collection Ponds when migrating through or staging in the area. A change in mortality risk may result from the ingestion and/or absorption of water with potential exceedances in chemicals of potential concern (see Chapter 21 of the Impact Statement [Assessment of Potential Effects on Health]). If birds drink from ponds associated with TMFs or feed on aquatic flora and fauna within these water features, the exposure to chemicals of potential concern could result in a change in mortality.

Edge effects from vegetation clearing can indirectly result in bird mortality during operations through increased access by predators, nest parasites, and hunters. Nest predators can occur more frequently within forest edges (Lloyd et al. 2005, Robinson et al. 1995) and predators such as *Canis* (including coyotes) and humans use linear features (e.g., trails, cutlines) to increase hunting efficiency and gain access to prey species (Dickie et al. 2017). Similar to construction and in the absence of mitigation, the presence of Project workers could also result in an increase in harvesting of waterfowl and gamebirds.

### 18.4.3.1.3 Decommissioning and Closure

Human presence, site traffic, and equipment activity during active closure are expected to be similar to, or less than, that occurring during construction. During post-closure, there may be increased access for humans and predators and consequently increased mortality. Linear features (e.g., access roads) created during construction and operations will cease to have mine-related activity after closure and may be used by predators and hunters. However, haul roads, and access roads will be revegetated during the transition into passive closure and vegetation will succeed over time.

### 18.4.3.2 Mitigation Measures

The mitigation measures listed in Section 18.4.2.2 are applicable to reducing the likelihood of bird mortality. The following mitigation measures have been incorporated into the design of the Project and/or are proposed to avoid or reduce Project-related effects on bird mortality:

- Canada Nickel will not disturb or destroy active nests of migratory birds, which are protected under the MBCA. Canada Nickel will also comply with the MBR, including the Schedule 1 species (e.g., Pileated Woodpecker and Great Blue Heron).
- Canada Nickel will complete vegetation clearing and site preparation activities outside the core breeding period for migratory birds (Zone C5: April 30 to August 20). If activities that could result in risk of harm cannot be avoided, Canada Nickel will develop a Project-specific bird monitoring activities within the Wildlife Management Plan to outline how risk of harm will be managed in accordance with Environment and Climate Change Canada guidance.
- If small scale, localized vegetation clearing is required during the migratory bird breeding season and the area can be effectively searched for presence of nests, Canada Nickel will have an experienced biologist/scientist survey for signs of nesting before vegetation removal.
- Canada Nickel will not disturb or remove nests of provincially protected species (e.g., Bald Eagle, Osprey) unless a permit has been issued through the FWCA.
- Canada Nickel will complete pre-disturbance surveys to locate raptor nests and nests of species protected on Schedule 1 of the MBR (Pileated Woodpecker, Great Blue Heron).
- Canada Nickel will implement appropriate setbacks and timing windows for active raptor nests that are within 800 m of the PA. Mitigation will vary according to the species, location of nest, distance from the PA and type of activity.
- Canada Nickel will notify the ECCC-Canadian Wildlife Service of mortality of any migratory bird SAR in the PA.
- Canada Nickel will prohibit hunting and harvesting by Project personnel while performing work on the Project.
- Canada Nickel will follow best management practices for general site housekeeping to reduce wildlife attraction (e.g. food and chemical storage, prompt removal of roadkill).

- Canada Nickel will develop and implement a Site-Wide Water Management Plan (Appendix J of the Impact Statement) for the Project that will treat effluent prior to discharge to the environment, which will reduce the likelihood of harmful effects to migratory birds.
- Canada Nickel will implement road safety measures such as speed limits and signage to reduce the chance for bird mortality.
- Canada Nickel will provide environmental personnel responsible for site monitoring during construction with training to recognize SAR and SOCC that may be present in the PA.
- Canada Nickel will provide relevant Project personnel with training on recognizing migratory bird and raptor nests, signs of active nest disturbance and associated bird response behaviour.
- If an active nest is found, or evidence of nesting behaviours observed, Canada Nickel will suspend work in the area until applicable mitigations have been implemented.
- Canada Nickel will deploy bird deterrents (e.g., noise makers, wire barricades) as necessary to discourage birds from entering onsite ponds, including the TMF NE and NW Collection Ponds or other Project infrastructure that could attract birds.
- Canada Nickel will maintain embankments of the TMF and Collection Ponds to be free of trees and shrubs to limit the attraction of waterfowl and/or wildlife to these ponds for foraging or breeding.
- Prior to demolishing existing building and infrastructure, Canada Nickel will have experienced biologists/ scientists conduct surveys for breeding birds. Where practical, Canada Nickel will demolish existing buildings and infrastructure outside of the migratory breeding bird season.
- Canada Nickel will prohibit Project personnel from hunting and bringing firearms to the site while working.
- Canada Nickel will track, and report bird mortality including bird-vehicle collisions or collisions with equipment or project infrastructure and develop adaptive management measures as required.

### **18.4.3.3 Project Residual Effects**

#### **18.4.3.3.1 Construction**

The Project activities during the construction phase have the potential to contribute to a direct change in mortality. During the construction phase (Years -3 to -1), vegetation clearing, stripping, blasting, and construction of Project infrastructure and components are the pathways that are most likely to result in an increase in bird mortality risk. The risk of mortality will be low for adult birds because they are able to move away from construction activities; change in mortality risk will be greatest during sensitive time periods (e.g., during the breeding period) and for eggs or unfledged birds. Risk of mortality will be reduced through the application of timing windows for activities that involve vegetation removal.

Transportation of materials and equipment and increased vehicular traffic during construction could result in equipment or vehicles crushing or colliding with birds and/or birds colliding with Project-related infrastructure or equipment. A study that estimated annual bird mortality due to vehicular collisions during

the breeding and fledging season in Canadian ecozones found that roads through wetlands, followed by mixed and deciduous forests, had the highest rates of avian mortality (Bishop and Brogan 2013). Species at high risk of vehicle collisions include those that hunt adjacent to roads (e.g., owls), scavenge roadkill (e.g., corvids, raptors), and roost or nest near roads (e.g., passerines) (Kociolek et al. 2015). The application of mitigation, such as speed limits and signage, will reduce the overall likelihood of bird mortalities related to vehicle collisions.

The construction of roads can increase access to the PA for both people and wildlife during construction, which can result in increased hunting pressure. To reduce this pressure, hunting / harvesting will be strictly prohibited on the mine site. Workers will not be permitted to hunt / harvest while working and will not be permitted to bring firearms to site.

Noise due to construction can cause physiologic stress responses in birds (Kight et al. 2012, Blickey et al. 2012), which can result in a weakened immune function and reduced breeding success (Halfwerk et al. 2010, Blickey et al. 2012). This impact may extend to the LSA by negatively affecting the breeding success of birds nesting in close proximity to the PA.

### **Forest Birds**

An increase in mortality from vegetation clearing and stripping is more likely to affect breeding and wintering forest birds than other bird groups, because they are most numerous within the PA. Vegetation clearing is likely to result in an increase in forest bird mortality if site clearing takes place during the prime nesting season. Pre-construction nesting surveys have a low likelihood of detecting nests within forested habitats and are therefore not considered effective mitigation and are not recommended by ECCC (ECCC 2023). The implementation of timing windows will greatly reduce the likelihood of mortality to forest birds during construction.

An increase in forest bird mortality may also occur from collisions with vehicles, equipment and Project components during construction. Passerines (perching birds) are the bird group that is most likely to be reported as roadkill in North America (Bishop and Brogan 2013). Implementing mitigation, including reducing speed limits during construction will reduce the magnitude of this effect. An indirect increase in mortality may result from loss of fitness due to noise during construction.

The effects of construction on mortality of forest birds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular and reversible.

## Other Landbirds

An increase in mortality from vegetation clearing and stripping may affect other landbirds, particularly those that are most numerous within the PA (e.g., Alder Flycatcher, American Goldfinch). Vegetation clearing is likely to result in an increase in forest bird mortality if site clearing takes place during the prime nesting season. Pre-construction nesting surveys have a low likelihood of detecting nests within shrub habitats, which are used by many species in this bird group and are therefore not considered effective mitigation and are not recommended by ECCC (ECCC 2023). The implementation of timing windows will greatly reduce the likelihood of mortality to other landbirds during construction.

Similar to forest birds, an increase in mortality may also occur from collisions with vehicles, equipment and Project components during construction but mitigation, including reducing speed limits during construction will reduce the magnitude of this effect. An indirect increase in mortality may result from loss of fitness due to noise during construction.

The effects of construction on mortality of other land birds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular and reversible.

## Raptors

Vegetation clearing and stripping could result in an increase in raptor mortality if clearing takes place during the nesting season. However, pre-clearing surveys and implementation of buffer zones around known nests will reduce the likelihood of raptor mortality during this activity. Raptor mortality may also increase due to collisions with vehicles, equipment and Project components during construction. Raptors, especially owls, are particularly susceptible to road mortality due to their hunting in open areas (Bishop and Brogan 2013, Boves and Belthoff 2012). Increase in raptor mortality may take place year-round because many raptors are year-round residents.

The effects of construction on mortality of raptors are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular and reversible.

## Upland Gamebirds

Vegetation clearing and stripping could result in an increase in gamebird mortality if site clearing takes place during the nesting season. Collisions with vehicles and equipment may also result in an increase in upland gamebird mortality. Upland gamebirds may be particularly vulnerable to vehicle collisions because they spend most of their time on the ground and are slow moving. Indirect effects of noise on fitness may also affect upland gamebirds, particularly during lekking and nesting.

The effects of construction on mortality of upland gamebirds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular, and reversible.

## Marsh Birds

Vegetation clearing and stripping could result in direct or indirect increases in mortality, if marsh habitat is cleared during the prime nesting season. Marsh birds are uncommon within the PA and LSA. Collisions with vehicles, equipment and Project components are unlikely to occur outside of marsh habitat.

The effects of construction on mortality of marsh birds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no (winter) to high (breeding) sensitivity, be medium-term, irregular, and reversible.

## Shorebirds

Vegetation clearing and stripping could result in an increase in mortality for breeding shorebirds, including Killdeer, Spotted Sandpiper, Wilson's Snipe, and American Woodcock, particularly if site clearing takes place during the nesting season. A change in mortality for these species may also occur from collisions with vehicles, equipment, and Project components, and indirectly through effects of noise on fitness. Killdeer are most likely to experience a change in mortality because they will quickly move into and nest in disturbed areas. Mitigation identified will reduce the magnitude of potential mortality during construction.

The effects of construction on mortality of shorebirds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, be medium-term, irregular, and reversible.

## Waterbirds

Vegetation clearing and other construction activities are unlikely to result in direct or indirect increases in waterbird mortality, particularly if vegetation clearing takes place outside of the prime nesting season or nest sweeps are conducted prior to clearing and construction. There are no concentrations of waterbirds in the PA and even within the LSA, waterbirds are present at low densities. Collisions with vehicles, equipment and Project components could occur in areas adjacent to waterbird habitat (i.e., wetland and aquatic areas).

The effects of construction on mortality of waterbirds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no (winter) to high (breeding) sensitivity, be medium-term, irregular, and reversible.

## Waterfowl

Vegetation clearing and other construction activities are unlikely to result in an increase in waterfowl mortality, particularly if site clearing takes place outside of the nesting season and after dewatering of aquatic features. Collisions with vehicles, equipment and Project components are also unlikely for waterfowl because they were most likely to be encountered open aquatic habitats.

The effects of construction on mortality of waterfowl are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular, and reversible.

## Species at Risk

No change in mortality is expected for Bank Swallow or Barn Swallow as vegetation clearing will not impact the habitat of these species, and there is a low likelihood that they will interact with equipment of vehicles in the PA.

Vegetation clearing could result in an increase in Canada Warbler mortality if site clearing takes place during the prime nesting season. However, avoidance of vegetation clearing during Canada Warbler's breeding season will greatly reduce the likelihood of mortality. A change in Canada Warbler mortality may also result from collisions with vehicles, equipment and Project components. Canada Warblers are highly vulnerable to collisions with structures; particularly high-rise buildings but also with communication towers (Loss et al. 2014, Longcore et al. 2013). These types of structures are not present, but this species could collide with other Project components. The threat of accidental mortality due to collisions with anthropogenic structures and vehicles is ranked as a high level of concern in the Canada Warbler Recovery Strategy (EC 2016a). Implementation of speed restrictions within the PA will lower the likelihood of Canada Warbler road mortality.

Vegetation clearing and other construction activities are unlikely to result in an increase in Eastern Whip-poor-will mortality if clearing is avoided during the breeding bird season because this species is either absent from the LSA or present in low densities.

Vegetation clearing could result in an increase in Lesser Yellowlegs mortality if site clearing takes place during the prime nesting season. However, avoidance of vegetation clearing during Lesser Yellowlegs breeding season will greatly reduce the likelihood of mortality. Collisions with vehicles is considered unlikely as this species is present in wetland habitats.

Vegetation clearing could result in an increase in Short-eared Owl mortality if site clearing takes place during the prime nesting season. However, avoidance of vegetation clearing during Short-eared Owl breeding season will greatly reduce the likelihood of mortality. Short-eared Owls are vulnerable to collisions with vehicles because they perch along roads and fly low to the ground when hunting (COSEWIC 2021b). Given that Short-eared Owls were not observed during field surveys the likelihood of this species interacting with the Project is low.

The effects of construction on mortality of SAR are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no (winter) to high (breeding) sensitivity, be medium-term, irregular, and reversible.

## Species of Conservation Concern

Change in mortality risk for bird SOCC is unlikely as long as vegetation clearing does not take place during the breeding bird season, or nest sweeps are conducted prior to clearing and construction. Collisions with vehicles, equipment and Project components could result in a low magnitude increase in mortality. Common Nighthawk has a higher likelihood of experiencing increased mortality because it nests in disturbed habitats, forages in open areas, is a ground nester and is relatively common within the LSA.

The effects of construction on mortality of SOCC are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no (winter) to high (breeding) sensitivity, be medium-term, irregular, and reversible.

#### 18.4.3.3.2 Operations

The primary pathway for bird mortality during operations is through bird-vehicle collisions from transportation of ore to stockpiles and processing plants. Increased vehicular traffic is expected on access roads and on Highway 655, which could result in increased bird mortality as described in Section 18.4.3.3.1.

Mitigation measures will be implemented to reduce the likelihood of bird-vehicle collisions. Project vehicles will be required to comply with posted speed limits on the highway, haul roads and site roads. Speed limits will be set in accordance with provincial regulations and industry standards (e.g., for haul roads). Once the mine is in operations phase, most birds are anticipated to avoid the mine due to loss of habitat and sensory disturbance; therefore, the likelihood of bird-vehicle collisions is expected to be low within the mine site. However, progressive reclamation during operations will result in an increase in habitat quality and quantity over time, which could increase collision risk.

A change in bird mortality risk may result from possible ingestion and/or absorption of water in the Collection Ponds or from watercourses where treated water will be discharged back to the environment. Birds have been reported drinking from ponds associated with TMF (Eisler and Wiemeyer 2004, Donato et al. 2007) and could therefore be exposed by ingesting water from Collection Ponds within the PA. Deterrents will be used as needed to reduce the likelihood of bird gaining access to the Collection Ponds. Therefore, the likelihood of change in bird mortality associated with mine contaminants is low.

As discussed for construction, access routes and the edge habitats from vegetation clearing can indirectly result in bird mortality through increased access by predators, nest parasites and hunters. However, no additional effects are expected during operations and hunting/harvesting will be strictly prohibited at the mine site.

During operations, there could be a change of mortality risk for birds that nest on anthropogenic structures. Although most bird species will avoid the PA, some are more tolerant to disturbance. For example, Bank Swallow, Barn Swallow and American Robin, use anthropogenic areas for nesting, often close to human disturbance. Operations activities have the potential to disturb these species if they are using the area / infrastructure as habitat.

Another potential pathway for bird mortality during operation is collisions with transmission lines. Transmission lines in Canada are estimated to kill 2.5 million to 25.6 million birds per year (Rioux et al. 2013). Large-bodied birds with poor maneuverability, such as cranes and waterfowl (Bevanger 1998, Loss et al. 2014), and species that form flocks (Scott et al. 1972, Liguori 2009, Loss et al. 2014) are more likely to be killed by collisions with transmission lines. Collisions are more common among shorebirds, waterfowl, cranes, herons, grouse, and passerines (Rioux et al. 2013, Bevanger 1998). There is unlikely to be large movements of birds in the area where the transmission lines will be relocated (on the west side of the PA [Figure 3.2 of the Impact Statement]) because the disturbance from the mine is likely to

deter birds from the area. Also, the transmission line is being sited where an existing line is already present. For this reason, a negligible increase in mortality due to collisions with power lines is expected.

### **Forest Birds and Other Landbirds**

Forest birds and other landbirds are the most common bird groups within the PA and are found in all habitats; therefore, they are more likely to interact with vehicles and equipment. However, forest birds and other landbirds are less likely than larger bodied birds to experience an increase in mortality due to collisions with transmission lines. Change in mortality due to road mortality and edge effects is the same as discussed for the construction phase.

The effects of operations on mortality of forest birds and other land birds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular, and reversible.

### **Raptors**

In general, raptors have a lower risk of collisions with transmission lines compared to other bird families because of their sharp eyesight and flight agility (Bernardino et al. 2018). However, collision risk can increase when they are focused downward searching for prey (Martin 2012). Change in mortality due to road mortality, is the same as discussed for the construction phase.

The effects of operation on mortality of raptors are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular, and reversible.

### **Upland Gamebirds**

Similar to the construction phase, upland gamebirds may be vulnerable to vehicle collisions because they spend most of their time on the ground and are slow moving. Upland gamebirds may also experience an increase in mortality from collisions with transmission lines. Collisions of grouse and ptarmigan with power lines has been observed in Norway (Bevanger 1995). However, the siting of the transmission lines adjacent to the PA makes the risk of collisions low.

The effects of operations on mortality of upland gamebirds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of moderate to high sensitivity, be medium-term, irregular, and reversible.

### **Marsh Birds**

Transmission lines are unlikely to result in an increase in marsh bird mortality; because marsh birds are not expected to fly through the PA, so the magnitude of the effect (if any) is expected to be small. Changes in mortality due to vehicle collisions is expected to be low, as discussed for the construction phase.

The effects of operations on mortality of marsh birds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, be medium-term, irregular, and reversible.

### **Shorebirds**

An increase in shorebird mortality from collisions with transmission lines is not expected because shorebirds are unlikely to be present in the PA where the transmission lines will be sited. Changes in mortality due to vehicle collisions is expected to be low, as discussed for the construction phase.

The effects of operation on mortality of shorebirds are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, medium-term, irregular, and reversible.

### **Waterbirds and Waterfowl**

Transmission lines could result in an increase in waterfowl mortality; however, the transmission lines are not located close to any large concentrations of waterfowl, and waterfowl are unlikely to fly through the PA, so the magnitude of the effect (if any) is expected to be small. Changes in mortality due to vehicle collisions is expected to be low, as discussed for the construction phase.

The effects of operations on mortality of waterbirds and waterfowl are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, be medium-term, irregular, and reversible.

### **Species at Risk and Species of Conservation Concern**

Barn Swallow and Bank Swallow are two SAR that have potential to nest within the PA during operations. Both species will nest in anthropogenic habitat and close to human disturbance. Preventative measures such as contouring of stockpiles to make them less attractive to Bank Swallows, closing doors to keep birds out of buildings, and design features and bird nesting deterrents to make buildings less attractive to nesting birds will be used to reduce the likelihood of birds nesting on anthropogenic structures and being adversely affected by mine activities during operations.

Changes in mortality due to vehicle collisions and collisions with power lines are expected to be low in magnitude for SAR and SOCC as discussed above for bird species groups. SAR and SOCC are not uniquely vulnerable to collisions and other than Bank Swallow and Barn Swallow, birds are likely to avoid the PA.

The effects of operations on mortality of SAR and SOCC are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, be medium-term, irregular, and reversible.

#### 18.4.3.3.3 Decommissioning and Closure

Decommissioning and closure activities are expected to have similar residual effects on change in mortality risk as those described for the construction phase. Removal of Project infrastructure has the potential to result in bird mortality for species using these structures for nesting (e.g., Barn Swallow). However, with the implementation of mitigation measures to deter nesting, this is unlikely to result in mortality. Pre-removal bird surveys will reduce the potential for interactions with birds and nests.

Similar to the construction phase, traffic during decommissioning and closure could result in a change in bird mortality from collisions; however, with the application of mitigation measures the overall likelihood of vehicle collision related mortality for birds will be low.

When Project activities end, there could be an indirect increase in bird mortality due to increased access from predators and hunters. The PA will be a single anthropogenic disturbance, but there will be no new roads or access trails leading from the PA into the LSA. For this reason, there is unlikely to be a large increased in mortality due to predator access.

Effects on bird species groups will be the same as those discussed for construction phase. The effects of construction on mortality of all birds during decommissioning and closure are expected to be adverse, low in magnitude, restricted to the LSA, occur in times of no to high sensitivity, be short-term, irregular and reversible.

### 18.4.4 Summary of Project Residual Effects

Table 18.18 summarizes Project residual effects on birds and bird habitat.

**Table 18.18 Project Residual Effects on Birds and Bird Habitat**

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility
Change in Bird Habitat	C	A	L-M	LSA	NS-HS	ST/LT	C	R/I
	O	A	L	LSA	NS-HS	MT/LT	C	R
	D	P	L	LSA	NS-HS	ST-LT	C	R
Change in Mortality Risk	C	A	L	LSA	NS-HS	MT	IR	R
	O	A	L	LSA	NS-HS	MT	IR	R
	D	A	L	LSA	NS-HS	ST	IR	R
<p><b>KEY</b>                      See Table 18.3 for detailed definitions</p> <p><b>Project Phase</b>                      C: Construction                      O: Operations                      D: Decommissioning</p> <p><b>Direction:</b>                      P: Positive                      A: Adverse                      N: Neutral</p> <p><b>Magnitude:</b>                      N: Negligible                      L: Low                      M: Moderate                      H: High</p> <p><b>Geographic Extent:</b>                      PA: Project Area                      LSA: Local Study Area                      RSA: Regional Study Area</p> <p><b>Timing</b>                      NS: No sensitivity                      MS: Moderate sensitivity                      HS: High sensitivity</p> <p><b>Duration:</b>                      ST: Short-term                      MT: Medium-term                      LT: Long-term</p> <p>N/A: Not applicable</p> <p><b>Frequency:</b>                      S: Single event                      IR: Irregular event                      R: Regular event                      C: Continuous</p> <p><b>Reversibility:</b>                      R: Reversible                      I: Irreversible</p>								

Change in bird habitat during construction will primarily occur through vegetation removal, grading, and dewatering activities, which will result in loss of upland, wetland, and aquatic habitats. Project activities during operations and decommissioning will result in indirect habitat loss, primarily through sensory disturbance. Residual effects are predicted to be adverse during construction and operations, with low to moderate magnitude and restricted to the LSA. These effects will vary from short- to long-term with continuous frequency, and they are expected to be partially reversible through reclamation efforts during decommissioning. Habitat for species that use open, early successional habitats will re-establish relatively quickly whereas habitats such as mature forest will be slower to recover. Habitat for species that use aquatic habitats (e.g., waterfowl, waterbirds) will increase during decommissioning and closure relative to baseline conditions.

Change in mortality risk during construction will primarily occur through site preparation, vegetation clearing, and increased traffic and potential for collisions or removal of active nests. During operations and decommissioning and closure, risk of collisions and interactions with Project infrastructure may persist, with potential risks of ingestion of contaminated water from Collection Ponds. Residual effects are predicted to be adverse but low across all Project phases and confined to the LSA. The risk is predicted to be medium-term during construction and operations, and short-term during decommissioning, with irregular frequency. These effects are considered reversible with appropriate mitigation measures.

#### **18.4.4.1 Summary of Adverse Residual Effects**

The Project will have adverse residual effects on change in bird habitat during the construction and operations phases. Direct habitat loss will occur in the PA during the construction phase, and indirect habitat loss will occur in the LSA during the construction and operations phases. This effect will be low to moderate in magnitude, occur during times of no sensitivity to high sensitivity, and will be continuous in frequency. During the construction phase, the duration of the effect will be both short-term (e.g., the noise disturbance created by blasting), and long term (e.g., habitat loss/conversion) in nature. Changes will be both reversible (e.g., light and noise disturbance) and irreversible (e.g., loss of mature forest habitat). During the operations phase, the duration of the effect will be medium term to long term, and the effect will be reversible.

The Project will have adverse residual effects on change to mortality risk during the construction, operations, and decommissioning and closure phases. The magnitude of these effects will be low in all phases and will be restricted to the LSA. Change in mortality risk will occur during times of no sensitivity to high sensitivity, will be irregular in frequency and reversible. During the construction and operations phases, the duration of this effect will be medium term. During the decommissioning and closure phase, the effect will be short term.

#### **18.4.4.2 Summary of Positive Residual Effects**

During the decommissioning and closure phase, the Project will have a positive residual effect on change in habitat for birds. Progressive reclamation will be initiated in Year 7 to restore habitat lost within the PA by incorporating biodiversity-focused strategies. Over time, it is predicted that birds will return to the area. Habitat for waterbirds and waterfowl is expected to increase relative to baseline conditions following decommissioning and closure because aquatic habitats such as lakes and ponds will be established in the PA, which can be used by waterfowl and waterbirds for nesting and foraging.

### **18.4.5 Significance of Adverse Federal Effects**

#### **18.4.5.1 Change in Bird Habitat**

##### **Migratory Birds**

Residual effects are not expected to threaten the long-term persistence or viability of migratory birds within the RSA, nor are they expected to diminish conservation efforts for the survival, management, and recovery of SAR.

Land clearing and development within the PA will result in the direct loss of 11,785 ha of habitat that may be used by migratory birds, including 2,837 ha of upland forests, 8,667 ha of wetland, and 255 ha of anthropogenic and poorly vegetated habitats. There will be an anticipated loss of 7,605 ha (a 19% decrease) of habitat for forest birds and raptors (forests and swamps), 752 ha (a 58% decrease) of marsh bird habitat, and 26 ha (a 9% decrease) of waterbird habitat. Direct habitat loss is restricted to the PA, whereas indirect habitat loss due to edge effects and sensory disturbance (i.e., noise) will extend to the LSA, which is conservatively estimated as 3,371 ha. The magnitude change in migratory bird habitat during construction is anticipated to be moderate for forest birds, marsh birds and raptors and low for other bird species groups. For all species guilds and species, the suitable habitat remaining within the RSA ranges from 94% to 99%.

Most of the habitat loss for all bird groups will occur during construction as a result of stripping, grading, and other construction activities and will continue through operations. Progressive reclamation will reverse a portion of the habitat loss beginning in operations. When mining activities cease following decommissioning and closure habitat within the LSA that was lost due to disturbance is expected to return to baseline conditions.

Progressive reclamation, beginning during operations and continuing into active closure, will restore habitat for some groups of migratory birds, but some habitat types (e.g., mature forest, bogs/fens), will be slow to recover and loss was therefore considered irreversible. However, habitat for migratory birds that are habitat generalists and those that use open or early successional habitats is considered reversible. Following active closure, habitat for migratory birds that rely on aquatic habitats (e.g., waterbirds, waterfowl) is expected to increase due to the establishment of lakes and ponds in the PA.

As such, with the mitigation measures described above, Project residual effects to migratory bird habitat are predicted to be of moderate extent of significance.

### **Species at Risk**

There will be a loss of 10,085 ha of Canada Warbler forested habitat within the PA during construction, which represents 3% of the available Canada Warbler habitat within the RSA. There will also be an indirect loss due to sensory disturbance during construction, operations and decommissioning and closure. After decommissioning and closure, sensory disturbance will cease and Canada Warblers are expected to resume use of pre-construction habitats. No Critical Habitat for Canada Warbler was defined in the Recovery Strategy due to a lack of understanding of habitat requirements (EC 2016a). Changes in abundance and distribution of Canada Warblers in the LSA is not expected because sufficient habitat is expected to be available in the RSA. As such, Canada Warbler habitat is expected to remain common in the RSA following construction of the Project.

As such, with the mitigation measures described above, Project residual effects to Canada Warbler habitat are predicted to be of moderate significance.

Barn Swallow and Bank Swallow have not been observed within the PA or LSA, and no suitable habitat was documented. In addition, these species are tolerant of human disturbance, and are known to nest in anthropogenic habitats (e.g., aggregate pits [Bank Swallow], bridges/culverts [Barn Swallow]). Eastern Whip-poor-will was not documented in the PA or LSA during targeted surveys, so if present, would likely only occur at a low density. Suitable habitat may be present in the LSA but will also be readily available in the RSA post-construction.

As such, with the mitigation measures described above, Project residual effects to the three remaining SAR considered in this assessment (Bank Swallow, Barn Swallow and Eastern Whip-poor-will habitat) are predicted to be of negligible/low extent of significance.

#### **18.4.5.2 Change in Mortality Risk**

The potential for an increase in mortality of migratory birds is most likely associated with impacts to bird nests and flightless birds. However, through the implementation of mitigation including avoidance of vegetation clearing during the breeding bird season, the likelihood of increased bird mortality is reduced. Further, while collisions with vehicles and equipment may also impact bird mortality, it is expected that birds will avoid the PA and associated construction activity due to the high levels of disturbance (i.e., noise, human presence) and due to the loss of suitable habitat, which will lessen the likelihood that birds will interact with construction equipment. Increased mortality risk associated with the operation of the realigned Highway 655 and relocated transmission lines is expected to be negligible given that these facilities already exist and no substantive increase in traffic is anticipated.

As such, with the mitigation measures described above, Project residual effects to a change in mortality for migratory birds, including the four SAR that are protected on Schedule 1 of SARA, are predicted to be of negligible/low extent of significance.

### **18.5 Potential Effects on Federal Lands**

There are no federal lands within the LSA or RSA. The closest lands under federal jurisdiction are the Taykwa Tagamou Nation Reserve lands located approximately 37 km away (straight line) from the PA (14 km southeast of Cochrane). No additional mitigation measures beyond those identified are specifically required for federal lands.

### **18.6 Prediction Confidence**

Confidence in the residual effects predictions for birds and bird habitat is high. Factors contributing to high confidence in prediction are:

- The potential environmental effects and effects pathways for this Project are common to mining operations and other large construction projects and are generally well understood
- The mitigation measures are well understood and align with best industry practices
- The understanding of existing conditions for birds and bird habitat is supported by results of background review, literature review, and field data collected for the Project

- Bird/habitat associations were determined based on professional judgement and literature review
- The assessment used a conservative approach and methodology to increase the level of confidence, specifically:
  - a conservative-case scenario is used for the predictions of direct and indirect habitat loss (Section 18.4.2)
  - indirect effects are determined as though they were static over time and not influenced by factors such as season, habitat type, vegetation cover, and topography

## 18.7 Assumptions

This assessment used a habitat-based approach, which focused on identifying habitat types affected by the Project relative to the availability of those habitats in the LSA and RSA. This approach assumed that bird species are present if the habitat is available. Relatively broad habitat classes were used to categorize the vegetation in the LSA and RSA, which is likely an overestimate of both the amount of habitat that is being lost and the amount of habitat available for the bird species groups in the LSA.

This assessment assumed that all habitat within the PA will be lost during construction and will not be rehabilitated and revegetated until decommissioning and active closure. In reality, progressive reclamation will begin during operations (Appendix F to the Impact Statement [Conceptual Closure Plan]).

Although residual effects were assessed separately for each bird group, the determination of significance was assessed collectively for migratory birds. A conservative approach was used, whereby the species group with the highest level of impacts was incorporated into the overall determination of significance.

Indirect loss of habitat due to noise disturbance assumed that all habitat within the 50 dBA noise contour would be lost but impacts of noise will vary by bird group, species, and vegetation structure. The assessment also assumed there was no vegetation between the source of the noise and the receptor; in reality, some vegetation will attenuate sound pressure

## 18.8 Follow-up and Monitoring

Canada Nickel will implement follow-up and monitoring programs to verify the accuracy of effects and to evaluate the effectiveness of mitigation measures, the results of which will be used to identify and implement adaptive management measures, as appropriate. As it relates to birds and bird habitat, follow-up and monitoring measures will be implemented to verify and confirm the predicted effects identified and meet regulatory requirements. This may include the completion of bird surveys at varying distances from the PA and targeted surveys to confirm habitat restoration during closure. Chapter 34 of the Impact Statement includes additional details on follow-up and monitoring programs proposed by Canada Nickel.

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## 18.10 Figures





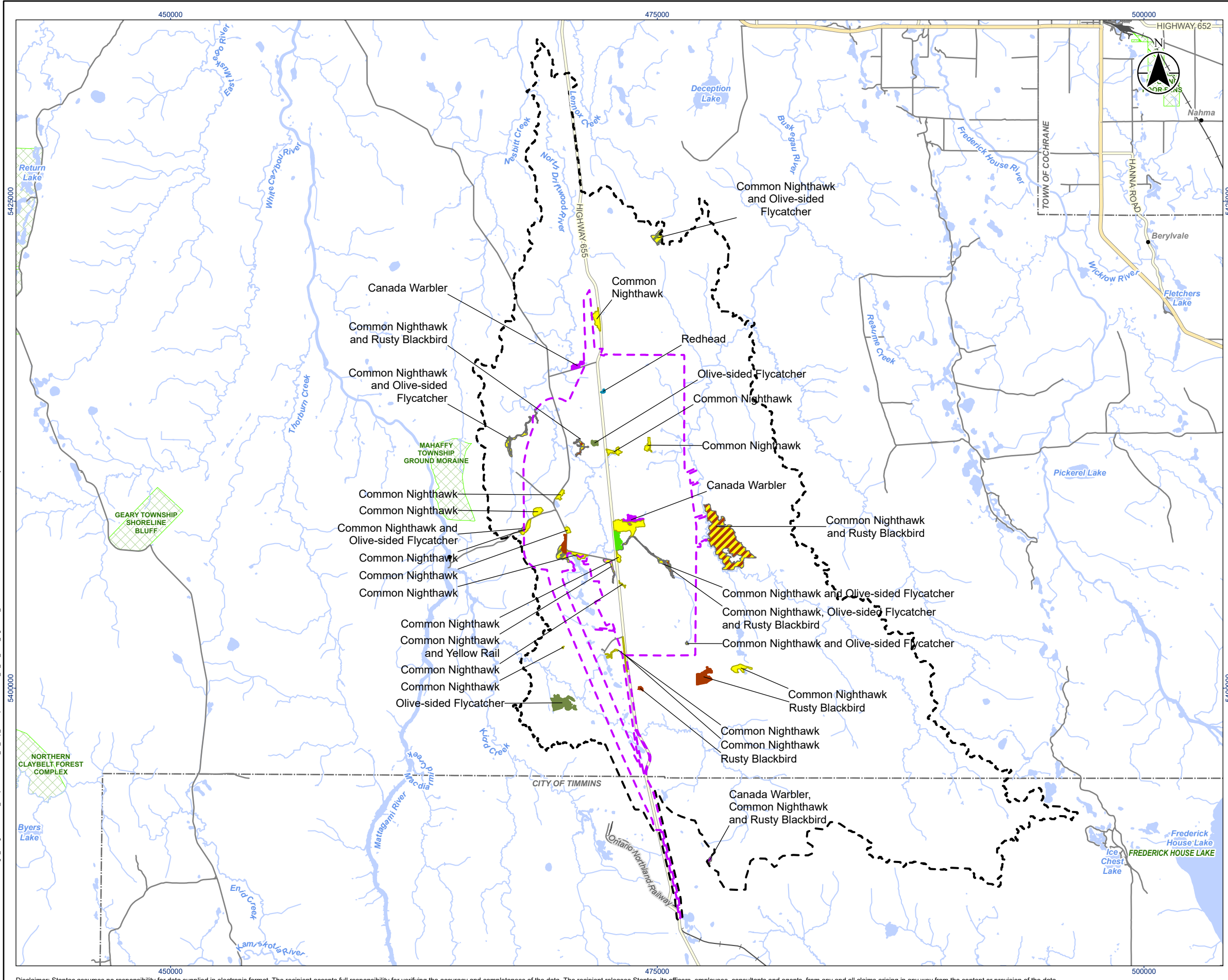












**Legend**

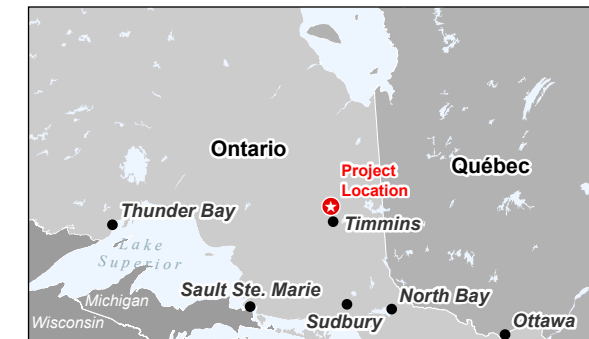
- Project Area
- Local Study Area
- Canada Warbler
- Common Nighthawk
- Evening Grosbeak
- Redhead
- Rusty Blackbird
- Olive-sided Flycatcher
- Common Nighthawk and Rusty Blackbird
- Common Nighthawk and Olive-sided Flycatcher
- Common Nighthawk and Yellow Rail
- Common Nighthawk, Olive-sided Flycatcher and Rusty Blackbird
- Canada Warbler, Common Nighthawk and Rusty Blackbird

**Base Features**

- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse
- Conservation Reserve (Regulated)
- Municipal Boundary - Lower Tier
- Provincial Park
- Waterbody

0 5 10 km  
1:200,000 (At original document size of 11x17)

**Notes**  
 1. Coordinate System: NAD 1983 UTM Zone 17N  
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.



Project Location: Timmins, Ontario  
 160930456 REVA  
 Prepared by: awhite on 2024-09-23

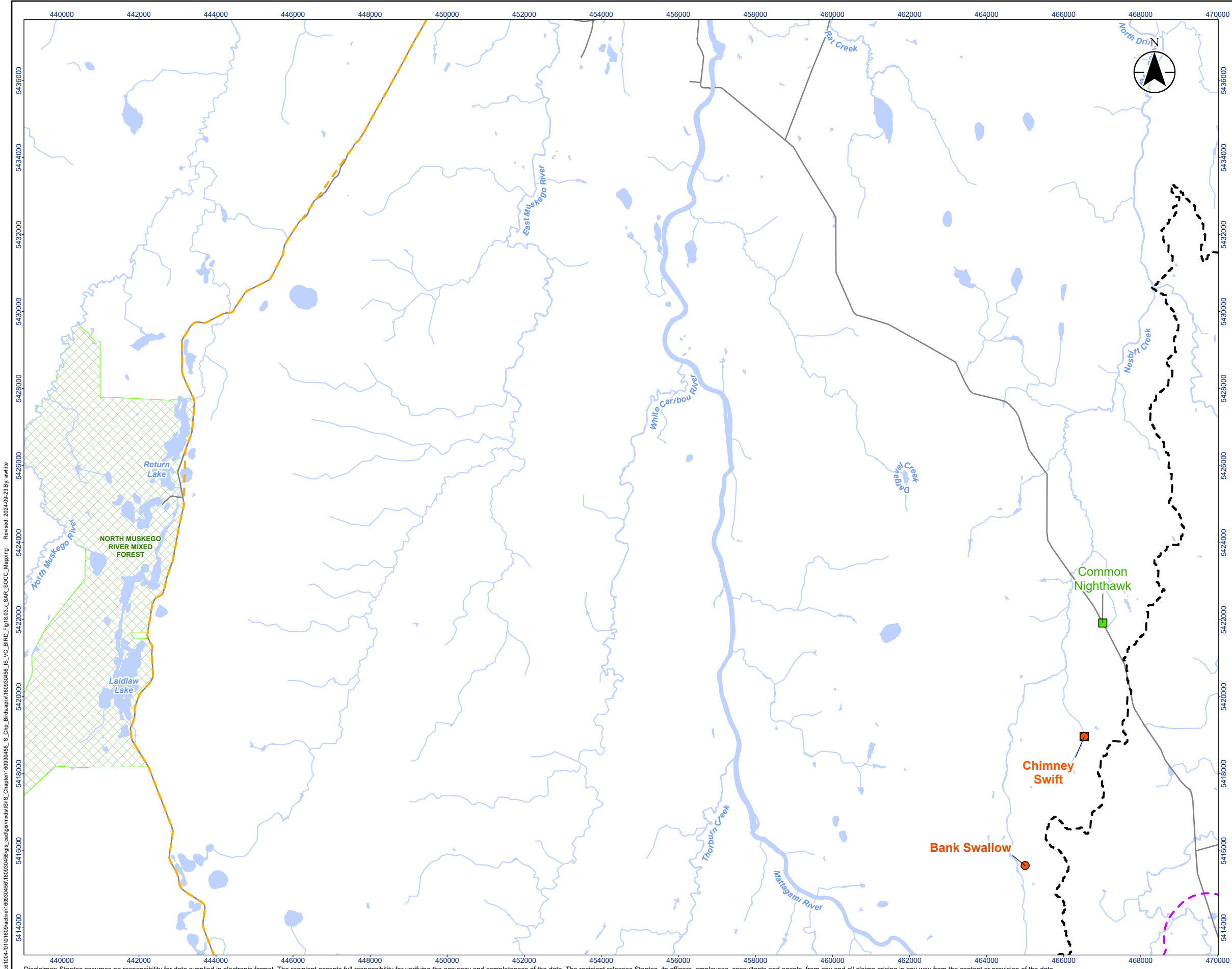
Client/Project: Canada Nickel Company (CNC)  
 Crawford Nickel Project









Figure No. **18.2.7**

Title: **Bird Habitat Mapping  
 Confirmed Habitat for Special Concern and Rare Species**

\srt1004-101009\active\160930456\160930456\gis\_cad\gis\_md\160930456\_Chapter1\160930456\_IS\_VC\_BIRD\_Fig18.02.7\_Confirmed SOC SAR Habitat Revised: 2024-09-23 By: awhite





- Legend**
-  Project Area
  -  Local Study Area
  -  Regional Study Area
  -  Bird Observation - Species at Risk
  -  Minor Road
  -  Watercourse
  -  Conservation Reserve (Regulated)
  -  Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
  2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.



Project Location: Timmins, Ontario  
 160930456 REV B  
 Prepared by awhite on 2024-09-23

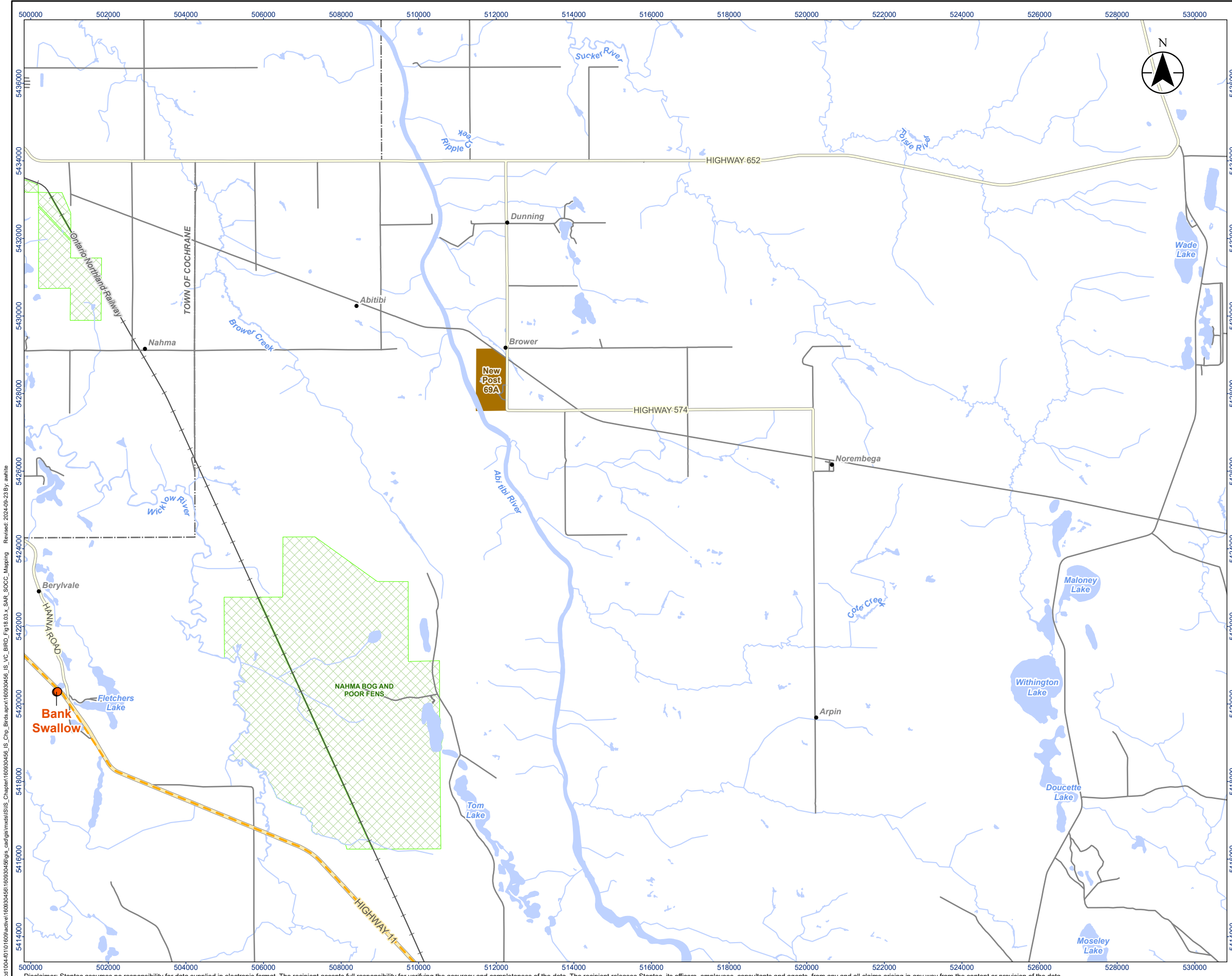
Client/Project:  
 Canada Nickel Company (CNC)  
 Crawford Nickel Project

Figure No.  
**18.3.2**












Title  
**Species at Risk and Species of Concern Observations within the RSA**

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 Chapter: 160930456\_IS\_VC\_BIRD\_Fig18.03.x\_SAR\_SCCC\_Mapping  
 Revised: 2024-09-23 By: awhite





**Legend**

-  Regional Study Area
-  Bird Observation - Species at Risk
-  Expressway / Highway
-  Major Road
-  Minor Road
-  Railway
-  Watercourse
-  Conservation Reserve (Regulated)
-  First Nation Reserve
-  Municipal Boundary - Lower Tier
-  Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location: Timmins, Ontario  
 160930456 REV B  
 Prepared by: awhite on 2024-09-23

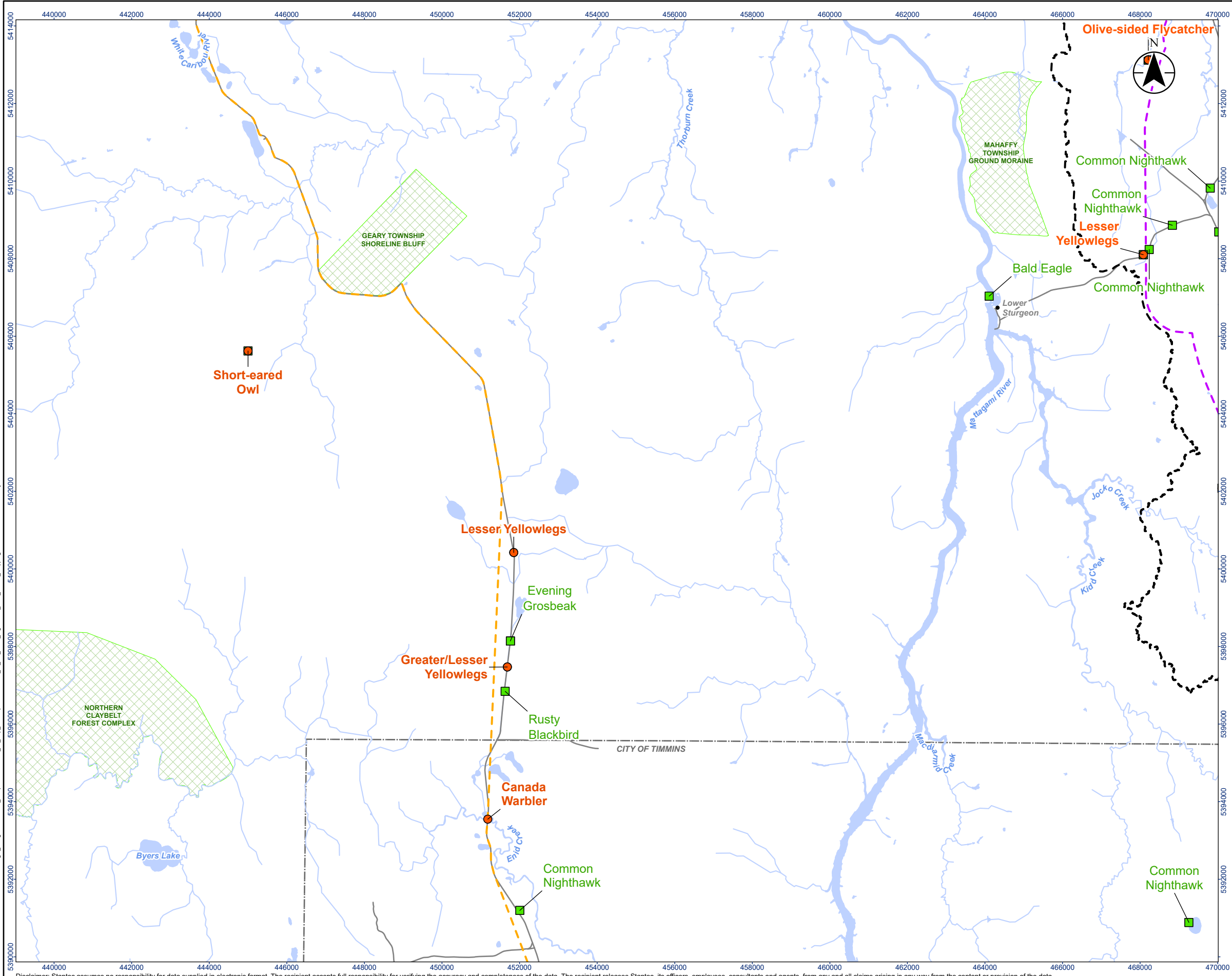
Client/Project:  
 Canada Nickel Company (CNC)  
 Crawford Nickel Project

Figure No.  
**18.3.4**

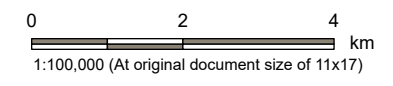
Title  
**Species at Risk and Species of Concern Observations within the RSA**

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 Revised: 2024-09-23 By: awhite

\mnt\04-10\1009\active\160930456\gis\mxd\BISIS\_Chapter1\BISIS\_Chapter1\BISIS\_VC\_BIRD\_Fig18.03.x\_SAR\_SCCC\_Mapping\_2024-09-23 By: awhite  
 Revised: 2024-09-23 By: awhite



- Legend**
- Project Area
  - Local Study Area
  - Regional Study Area
  - Bird Observation - Species at Risk
  - Bird Observation - Species of Conservation Concern
  - Minor Road
  - Watercourse
  - Conservation Reserve (Regulated)
  - Municipal Boundary - Lower Tier
  - Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location: Timmins, Ontario  
 Prepared by: awhite on 2024-09-23

Client/Project: Canada Nickel Company (CNC)  
 Crawford Nickel Project

Figure No. **18.3.5**

Title: **Species at Risk and Species of Concern Observations within the RSA**



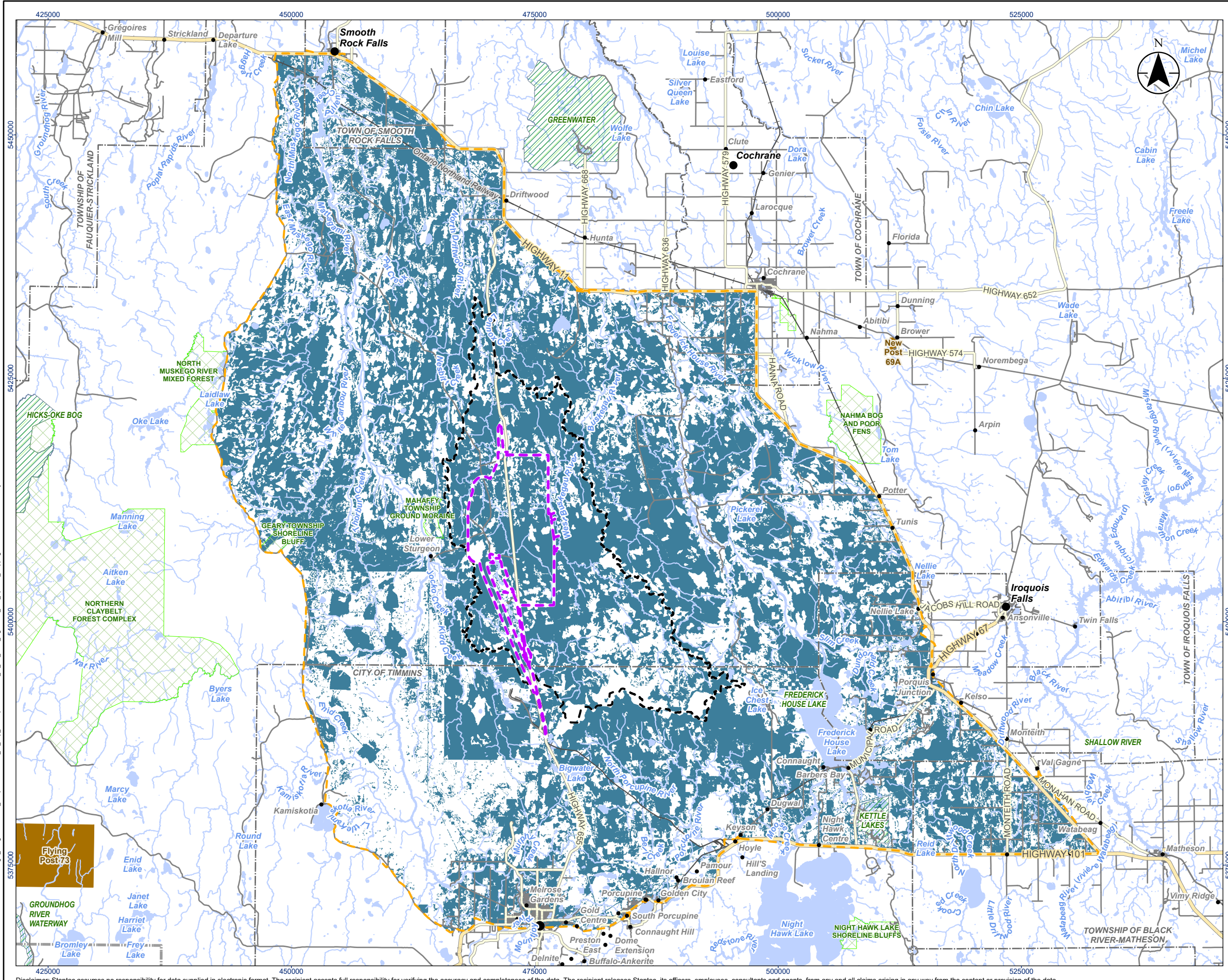






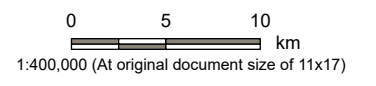






Legend

- Project Area
  - Local Study Area
  - Regional Study Area
  - Other Landbirds
- Base Features
- Expressway / Highway
  - Major Road
  - Minor Road
  - Railway
  - Watercourse
  - Conservation Reserve (Regulated)
  - First Nation Reserve
  - Municipal Boundary - Lower Tier
  - Municipal Boundary - Upper Tier
  - Provincial Park
  - Waterbody



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
  2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
  3. Ontario Land Cover Data Base, 2nd ed. (MNR 2000) modified with Ontario Wetland Evaluation System (MNRF 2023).



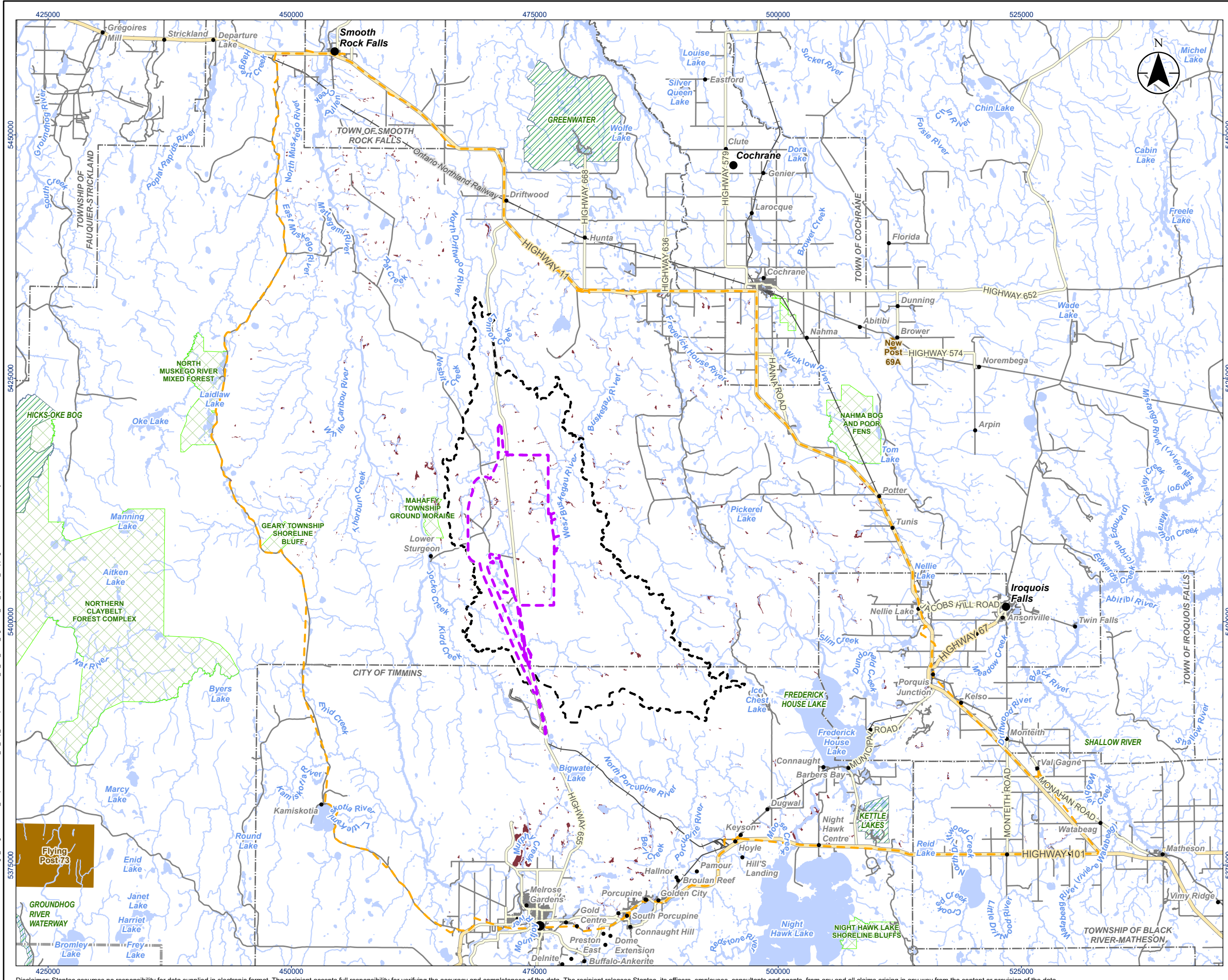
Project Location: Timmins, Ontario  
 Prepared by: awhite on 2024-09-23

Client/Project: Canada Nickel Company (CNC)  
 Crawford Nickel Project

Figure No.: 18.4.2

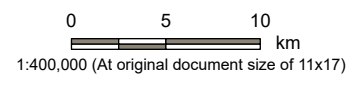
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 Revised: 2024-09-23 By: awhite



**Legend**

- Project Area
- Local Study Area
- Regional Study Area
- Marshbirds
- Base Features**
- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse
- Conservation Reserve (Regulated)
- First Nation Reserve
- Municipal Boundary - Lower Tier
- Municipal Boundary - Upper Tier
- Provincial Park
- Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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  3. Ontario Land Cover Data Base, 2nd ed. (MNR 2000) modified with Ontario Wetland Evaluation System (MNRF 2023).



Project Location: Timmins, Ontario  
 Prepared by: awhite on 2024-09-23

Client/Project: Canada Nickel Company (CNC)  
 Crawford Nickel Project

Figure No.: **18.4.3**

Title: **Species Groups: Marshbirds**

V:\1004-10\1009\active\160930456\gis\_cad\gis\mxd\BIS\_Chapter\160930456\_IS\_VC\_BIRD\_Fig18.04.x\_Bird\_Species\_Mapping\_Revise\_2024-09-23\_By\_ahwhite

























