TECHNICAL MEMORANDUM

TO:

Impact Assessment Agency of Canada
Ontario Ministry of Environment, Conservation and Parks

FROM	EMAIL	REF
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DATE

08 April 2026

SUBJECT

Webequie Supply Road Project – Addendum to the Final Environmental Assessment Report / Impact Statement Responses to Comments on the Assessment of Effects on Species at Risk – Bats, Birds, Wolverine, and Lake Sturgeon

The attached report is Addendum #6 to the Final Environmental Assessment Report / Impact Statement (EAR/IS) for the Webequie Supply Road Project (the Project, WSR). The purpose of the Addendum is to provide supplemental information in response to comments on Section 13: Assessment of Effects on Species at Risk of the Webequie Supply Road (WSR) Environmental Assessment Report/Impact Statement (EAR/IS). Specifically, the addendum was prepared to address comments from:

- Ministry of the Environment, Conservation and Parks (MECP):
  - Comments on Species at Risk (SAR) – Bats: MECP-SAR-075, 140, 170, and 171.
  - Comments on SAR – Birds: MECP-SAR-049, 076, 077, 078, 079, 081, 082, 083, 084, 114, 141, 142, 143, 154, and 155.
  - Comments on SAR – Wolverine: MECP-SAR-041, 043, 044, 069, 089, 091, 104, 105, 108, 128, 130, 131, 132, 133, 134, 135, 136, 137, 138, 152, 159, 161, 165, 177, and 180.
- Ministry of Natural Resources (MNR): Comment on SAR Lake Sturgeon – MNR-275.

Details of these comments are presented in Appendix P2.M of the Record of Engagement and Consultation for the Project.

Webequie Supply Road
Environmental Assessment
Report / Impact Statement

April 8, 2026
AtkinsRéalis Ref: 661910

ADDENDUM 6: Species at Risk

AtkinsRéalis

WSR
WEBEQUIE
SUPPLY ROAD

WEBEQUIE FIRST NATION

Preface

The purpose of this report (Addendum #6) is to provide supplemental responses to address outstanding comments and items of concern received from the review of the Draft Environmental Assessment Report / Impact Statement (EAR/IS) from:

- Ministry of the Environment, Conservation and Parks (MECP):
  - Comments on Species at Risk (SAR) – Bats: MECP-SAR-075, 140, 170, and 171.
  - Comments on SAR – Birds: MECP-SAR-049, 076, 077, 078, 079, 081, 082, 083, 084, 114, 141, 142, 143, 154, and 155.
  - Comments on SAR – Wolverine: MECP-SAR-041, 043, 044, 069, 089, 091, 104, 105, 108, 128, 130, 131, 132, 133, 134, 135, 136, 137, 138, 152, 159, 161, 165, 177, and 180.
- Ministry of Natural Resources (MNR): Comment on SAR Lake Sturgeon – MNR-275.

Details of these comments are presented in Appendix P2.M of the Record of Engagement and Consultation that support the Final EAR/IS.

This Addendum #6 includes the following:

- Providing the rationale and justification to support the conclusions for each threat assessment criterion associated with each individual threat for species at risk bats.
- Updating mitigation measures and the Characterization of Net Effects relating to Injury or Death from Incidental Take during the Construction phase.
- Identifying ELC classes used to map potential bat maternity habitat and rationale and justification for the inclusion of each.
- Providing additional information and discussion on why some Acoustic Recording Units recorded no, or very few, bat passes.
- Providing further information on the effect of noise disturbance on Short-eared Owl and Lesser Yellowlegs.
- Quantifying the potential loss of habitat for Short-eared Owl and Lesser Yellowlegs as potential number of breeding pairs affected.
- Quantifying the potential effect of hydrology changes on Short-eared Owl and Lesser Yellowlegs habitat..
- Elaborating on rationale for characterizing magnitude of effects on Short-eared Owl and Lesser Yellowlegs

The general format of the Addendum #6Technical Report is a description of the reviewers' comment followed by the Project Team's response.

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1 Introduction

This Technical Memorandum serves as an addendum to the Webequie Supply Road (WSR) Project ("the Project") Environmental Assessment Report/Impact Statement (EAR/IS) to strengthen the Crown's assessment of potential impacts on Species at Risk (SAR).

This Addendum has been prepared to provide additional context, clarification, and supporting information regarding the assessment of potential effects on SAR associated with both Project-specific activities and cumulative effects. It aims to strengthen the understanding of how Project components may interact with existing environmental conditions.

The content of the Addendum reflects data, clarifications, and input received up to the submission of the Final EAR/IS. The Addendum is intended to fulfill a commitment to respond and resolve the comments received from provincial departments and Indigenous communities on the Draft EAR/IS, associated with SAR.

2 Terrestrial SAR

2.1 Bats

2.1.1 MECP-SAR-075

In their response, MECP requested additional rationale and justification to support the conclusions for each threat assessment criterion associated with each individual threat for species at risk (SAR) bats (Little brown myotis [*Myotis lucifugus*] and Northern myotis [*Myotis septentrionalis*]).

The threat assessment methodology and criteria were defined in the Tailored Impact Statement Guidelines (TISG) for the Webequie Supply Road (WSR) Project and the threat assessment approach is presented in Section 13.3.1 of the Final WSR Environmental Assessment Report/Impact Statement (EAR/IS). The threat assessment is conducted without consideration of mitigation measures and is further refined in the net effects assessment after the application of mitigation measures. As such the Threat Assessment is limited to the physical direct removals or alteration of species at risk habitat, while the predicted net effects assessment incorporates a qualitative and quantitative description of the effects using criteria to assess adverse effects, taking into account any important contextual factors and mitigation. Identification of potential effects to SAR bats, including relevant literature sources, is provided in Section 13.3.5 of the Final WSR EAR/IS. For context, potential effects for SAR bats were evaluated at the Local Study Area (LSA) level (i.e., 1 km [276 km^2] from the centreline of preferred route, and 500 m from temporary or permanent supportive infrastructure). **Table 1-1** below provides the summary of the threat assessment as presented in Table 13-30 of Section 13.3.5.5 of the WSR EAR/IS, followed by a detailed breakdown of each threat criterion associated with each individual threat.

Table 2-1: Summary of Threat Assessment for Potential Effects on Little Brown Myotis and Northern Myotis

Threat	Scope	Severity	Magnitude	Irreversibility	Degree of Effect
Habitat Loss – Clearance Activities	Small	Moderate	Low	Very High	Medium
Habitat Alteration or Degradation – Habitat Structural Change	Small	Moderate	Low	High	Low
Habitat Alteration or Degradation – Sensory Disturbances	Small	Moderate	Low	Low	Low
Habitat Alteration or Degradation – Hydrological Changes	Small	Serious	Low	High	Low
Alteration in Movement – Loss of Connectivity	Small	Slight	Low	High	Low
Alteration in Movement – Sensory Disturbances	Small	Moderate	Low	Low	Low
Injury or Death – Collisions with Vehicles	Small	Moderate	Low	High	Low
Injury or Death – Incidental Take	Small	Slight	Low	High	Low
Injury or Death – Changes to Predator-Prey Dynamics	Small	Moderate	Low	High	Low
Injury or Death – Increased Energy Expenditure	Small	Slight	Low	Medium	Low

Habitat Loss – Clearance Activities

Scope was characterized as small as the effect is likely to be narrow, affecting SAR bats across a small proportion (1-10%) of their occurrence or population within the LSA. The total combined loss of potentially suitable maternity roosting habitat and potentially suitable foraging habitat in the LSA is 5.6%, and furthermore, only 1.91% of high-use habitat in the LSA will be removed, based on RSF modelling for high-use SAR bat habitat.

Severity was characterized as moderate within the scope as SAR bat activity in the LSA was predicted by Poisson modelling to decrease by 11.8% in the LSA due to “anthropogenic disturbance”, which includes clearance activities.

Irreversibility was characterized as very high due to the permanence of the proposed road and associated infrastructure. It is unlikely the full extent of the habitat loss effects can be reversed within 100 years.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as medium based on the table provided in the TISG, crossing magnitude (low) by irreversibility (very high).

Habitat Alteration or Degradation – Habitat Structural Change

Scope was characterized as small as habitat structural change is only expected to occur along the road edge and in cleared areas undergoing change into early seral communities within the 5.6% of roosting and foraging habitat removed in the LSA.

Severity was characterized as moderate within the scope as SAR bat activity in the LSA was predicted by Poisson modelling to decrease by 11.8% in the LSA due to “anthropogenic disturbance”, which includes habitat structural changes.

Irreversibility was characterized as high due to the 21-to-100-year timespan it would take to restore altered or degraded habitats, i.e., early seral growth into mature forest.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Habitat Alteration or Degradation – Sensory Disturbances

Scope was characterized as small as the effect would be constrained to the Project Footprint and edges, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as moderate within the scope as SAR bat activity in the LSA was predicted by Poisson modelling to decrease by 11.8% in the LSA due to “anthropogenic disturbance”, which includes sensory disturbances.

Irreversibility was characterized as low as the effects of noise and light can be stopped by turning off the noise and light sources and halting road use.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (low).

Habitat Alteration or Degradation – Hydrological Changes

Scope was characterized as small as the effect could extend up to 250 m from the ROW, or approximately 8.7% of the potentially suitable foraging habitat in the LSA.

Severity was characterized as moderate within the scope as SAR bat activity in the LSA was predicted by Poisson modelling to decrease by 11.8% in the LSA due to “anthropogenic disturbance”, which includes hydrological changes.

Irreversibility was characterized as high due to the 21-to-100-year timespan it would take to restore habitats altered or degraded by hydrological changes.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Alteration in Movement – Loss of Connectivity

Scope was characterized as small as the Project Footprint intersects a small amount (1.91%) of high-use SAR bat habitat in the LSA.

Severity was characterized as slight within the scope as fragmentation may positively affect the abundance of Little brown myotis (Ethier and Fahrig, 2011), and the baseline condition of the SAR bat LSA includes frequent gaps in the form of waterbodies and watercourses.

Irreversibility was characterized as high due to the 21-to-100-year timespan it would take to restore connectivity across habitats via mature forest.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (slight).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Alteration in Movement – Sensory Disturbances

Scope was characterized as small as the effect would be constrained to the Project Footprint and edges, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as moderate within the scope as SAR bat activity in the LSA was predicted by Poisson modelling to decrease by 11.8% in the LSA due to “anthropogenic disturbance”, which includes sensory disturbances.

Irreversibility was characterized as low as the effects of noise and light can be stopped by turning off the noise and light sources and halting road use.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (low).

Injury or Death – Collisions with Vehicles

Scope was characterized as small as the effect would be constrained to the Project Footprint, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as moderate within the scope as Little brown myotis and Northern myotis have low rates of occurrence in the LSA such that infrequent collisions (i.e., mortality rate of 1 – 3% annually) have the potential to moderately reduce the population by 11 – 30% in the LSA within ten years or three generations.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of SAR bats, which could take decades to recover from the loss of reproductively mature adults from collisions with vehicles.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Injury or Death – Incidental Take

Scope was characterized as small as the effect would be constrained to the Project Footprint, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as slight due to the constrained temporal period (i.e., the Construction Phase) in which incidental take may occur. While there is still potential during the Operations Phase, vegetation management would typically involve younger vegetation growth and is less likely to host roosting bats (e.g., small diameter with no snag attributes, shorter, less leaf cover). Given the low rate of occurrence of SAR bats in the LSA, encounters resulting in incidental take would likely be rare.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of SAR bats, which could take decades to recover from the loss of reproductively mature adults and potentially non-volant pups due to incidental take.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Injury or Death – Changes to Predator-Prey Dynamics

Scope was characterized as small as the effect would be constrained to the Project Footprint and edges, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as moderate within the scope as Little brown myotis and Northern myotis have low rates of occurrence in the LSA such that infrequent predation (i.e., mortality rate of 1 – 3% annually) has the potential to moderately reduce the population by 11 – 30% in the LSA within ten years or three generations.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of SAR bats, which could take decades to recover from the loss of reproductively mature adults from changes to predator-prey dynamics.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Injury or Death – Increased Energy Expenditure

Scope was characterized as small as the effect would be constrained to the Project Footprint and edges, affecting a small proportion (1-10%) of SAR bats where they occur throughout the LSA.

Severity was characterized as slight within the scope as Little brown myotis in northwestern Ontario are capable of making large movements between summer colonies and hibernacula (up to 647 km) and are also known to switch sites between years with some individual movements exceeding 500 km (Norquay et al., 2013).

Additionally, SAR bats occur in urbanized environments where such effects occur with more frequency and energetic effects during the active season were not identified as a threat in the recovery strategy for these species (Humphrey and Fotherby, 2019).

Irreversibility was characterized as medium as certain effects are more easily reversed while others are not, but overall SAR bat increased energy expenditure would be expected to decrease within 6-20 years as the cumulative effects are reversed, particularly those generated by sensory disturbances.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (medium).

2.1.2 MECP-SAR-140

MECP requested the following:

- Additional rationale to support the Project Team's conclusions that direction and likelihood of occurrence associated with injury or death to species at risk bats due to incidental take during construction is Neutral and Unlikely, respectively, including updating the wording associated with all relevant mitigation measures in Section 13.4 and Appendix E to clearly state vegetation clearing will not be carried out during the bat maternity roost season (no exceptions); or
- Reconsider the assessment of direction and likelihood of occurrence associated with the injury or death of species at risk bats due to incidental take during construction.

The list of mitigation measures from Section 13.4.5.4.1 of the Final WSR EAR/IS relating to injury or death of species at risk bats due to incidental take during construction has been updated, below. It is acknowledged that federal or provincial species at risk permitting requirements, if applicable, may supersede any of the listed measures and additional site-specific mitigation measures may be developed in consultation with the Ontario Ministry of Natural Resources (MNR), the Ontario Ministry of the Environment, Conservation and Parks (MECP), and Canadian Wildlife Service (CWS)-Environment and Climate Change Canada (ECCC).

Construction: Incidental Take

- Preparing and following the requirements of the Wildlife Management Plan and Construction Blasting Plan prior to construction. These plans will be reviewed and updated, as necessary, prior to being implemented during the operations phase.
- Following all environmental conditions of approval for the Project, including any issued by MNR, CWS-ECCC or MECP.
- Avoiding any blasting activity within 500 m of suitable maternity roosting habitat for SAR bats during their roosting period (April 15 and October 15).
    - If it is determined that there is a need to conduct blasting within 500 m of suitable roosting habitat for SAR bats between April 15 and October 15, qualified biologists will carry out pre-blasting ground sweeps to assess habitat occupancy.
        - Habitat occupancy will be determined using a combination of thermal imaging and acoustic monitoring, with visual observation exit surveys where safe to do so, for a minimum of two consecutive evenings in suitable conditions. The following protocols with sections pertaining to tree surveys will be used to assess habitat occupancy:

- *Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology* (MNRF, 2014) - relating to survey conditions and methodologies for visual observation and acoustic monitoring; and
- *Thermal Imaging: Bat Survey Guidelines* (Williams and BCT, 2021).

- Should use of the roosting habitat be confirmed, a 500 m setback from the habitat will be flagged, or otherwise appropriately marked. Blasting within the 500-m setback will only be permitted once additional ground sweeps confirm the habitat is no longer occupied or after October 15, whichever occurs first. The activity (blasting) will be subject to federal or provincial species at risk authorizations, depending on jurisdiction. The activity will also likely require site-specific mitigation measures developed in cooperation with the relevant regulatory agency (e.g., CWS-ECCC, MECP).

- Blasting, regardless of location, shall have control measures for fly-rock generated so there is no danger from projectiles.

- To the extent practicable, avoiding other construction or maintenance-related activities within 120 m of suitable maternity roosting habitat for SAR bats between April 15 and October 15.
  - If there is a proposal to remove potential maternity roosting habitat during this window, qualified biologists will carry out pre-clearance ground sweeps to assess habitat occupancy.
    - Habitat occupancy will be determined using a combination of thermal imaging and acoustic monitoring, with visual observation exit surveys where safe to do so, for a minimum of two consecutive evenings in suitable conditions. The following protocols with sections pertaining to tree surveys will be used to assess habitat occupancy:
      - *Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology* (MNRF, 2014) - relating to survey conditions and methodologies for visual observation and acoustic monitoring; and
      - *Thermal Imaging: Bat Survey Guidelines* (Williams and BCT, 2021).

  - If habitat occupancy is confirmed, construction activities within 120 m of roosting habitat will only be permitted once additional ground sweeps confirm the habitat is no longer occupied or after October 15, whichever occurs first.
  - Removal of confirmed maternity roosting habitat or its buffer will be subject to federal or provincial (depending on jurisdiction) species at risk permitting requirements and site-specific mitigation measures that would be developed in consultation with MNR, MECP, and CWS/ECCC. Local Indigenous communities will be notified.

- If any other previously unidentified bat maternity roosting habitat is encountered during construction:
  - The contractor will immediately halt work in that location and notify the proponent.
  - They will also clearly flag or otherwise mark a setback 120 m from the feature and document its location.
  - The incident may need to be reported to the appropriate regulatory agencies.
  - Local Indigenous communities will be informed.
  - Activity will not resume in that location until qualified personnel have assessed the feature (i.e., for occupancy, as above) and determined a suitable course of action, after consulting the appropriate regulatory agencies, as necessary.

- Restricting construction traffic to designated areas, and limit pullout areas along the road.
- Restricting access to the Right of Way to Project personnel during the construction phase.
- Prohibiting the use of personal recreational vehicles during Construction within the LSA.

- Restricting traffic to approved access routes during construction.

The following mitigation measures from Appendix E will be updated or added, as applicable:

- From 5.1 Clearing and Grubbing:
  - Clearing and grubbing shall only be undertaken between October 16 of any year and April 14 of the following year outside the active season for species at risk (SAR) birds and SAR bats in Northern Ontario (MECP, 2023). If vegetation clearing is required between April 15 and August 31, an avian biologist will be retained to conduct a survey for nesting activities/behaviours to manage risks to active nests protected by *the Migratory Bird Convention Act*. If vegetation clearing in suitable bat maternity roosting habitat is required between April 15 and October 15, a qualified biologist will be retained to assess habitat occupancy to manage risks to species protected by the *Endangered Species Act*.
    - Habitat occupancy will be determined using a combination of thermal imaging and acoustic monitoring, with visual observation exit surveys where safe to do so, for a minimum of two consecutive evenings in suitable conditions. The following protocols with sections pertaining to tree surveys will be used to assess habitat occupancy:
    - Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology (MNRF, 2014) - relating to survey conditions and methodologies for visual observation and acoustic monitoring; and
    - Th*ermal Imaging: Bat Survey Guidelines* (Williams and BCT, 2021).
- Add to 5.14 Wildlife and Wildlife Habitat:
  - During vegetation clearing, if bats are observed flying from felled trees or trees to be felled, stop work immediately and contact a qualified biologist to assess the site and provide recommendations prior to any further selective removal of trees. MECP or CWS-ECCC, depending on jurisdiction, must also be notified immediately.

The following text and table from Section 13.5.2.4.3 of the Final WSR EAR/IS pertaining to Characterization of Net Effects, Injury or Death for species at risk bats has been amended in relation to the updated mitigation measures.

Incidental Take

Construction

After mitigation measures have been applied, including timing windows avoiding vegetation clearing in little brown myotis and northern myotis habitat during the roosting season (April 15 – October 15), it is less likely that little brown myotis and northern myotis injury or death will occur. While the avoidance window has been established, it is acknowledged that select vegetation removal may rarely be required during the roosting season, and while surveys to determine habitat occupancy will be required, they are not infallible. Overall, a net negative effect may occur; however, it is unlikely with the appropriate application of mitigation measures. A summary of the net effect assessment relating to little brown myotis and northern myotis injury and death resulting from incidental take during the construction phase based on the Characterization Criteria is presented in **Table 2-2** below.

Table 2-2: Criteria Results for Little brown myotis and Northern myotis Injury or Death from Incidental Take – Construction

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative. While mitigation measures are expected to effectively manage incidental take by limiting vegetation removal in little brown myotis and northern myotis habitat to outside of the roosting season, select vegetation removal may occur where surveys have determined bats are not present. There remains residual potential for undetected bats to occupy vegetation requiring removal during the roosting season.
Magnitude	Moderate	The magnitude of the effect is predicted to be moderate, as little brown myotis or northern myotis are rare in the RSA and have low population numbers due to White Nose Syndrome. Any mortality would result in a measurable change but would not necessarily exceed the ability for these species to continue sustained existence within the area.
Geographic Extent	Project Footprint	The effect will be limited to the Project Footprint.
Timing	Sensitive	Incidental take may occur at any time during the little brown myotis and northern myotis active season, including the maternity roosting season.
Duration	Short-term	Incidental take from construction activities will cease at the end of the construction phase.
Frequency	Infrequent	Incidental take is expected to be rare with the implementation of mitigation measures such as timing windows.
Context	Moderate	Little brown myotis and northern myotis are expected to be moderately resilient to a low number of mortalities that may result from incidental take during construction.
Reversibility	Reversible	The net effect is reversible once construction concludes.
Likelihood of Occurrence	Unlikely	A negative effect is unlikely to occur.

2.1.3 MECP-SAR-170

MECP requested a list of each Ecological Land Classification (ELC) class used to map potential bat maternity habitat and rationale and justification provided for the inclusion or exclusion of each.

Both coniferous and deciduous tree species are used by little brown myotis and northern myotis for roosting (COSEWIC, 2013). Deciduous roosts are more common in southern Ontario but roost preferences in northern Ontario are not well known (Humphrey and Fotherby 2019). The provincial guidance document available at the while WSR baseline studies were being planned, *Survey Protocol for Species at Risk Bats within Treed Habitats* (MNRF, 2017), identifies deciduous, coniferous, or mixed wooded ecosites, including treed swamps, that include trees at least 10 cm diameter at breast height as suitable habitat for little brown myotis and northern myotis. Therefore, the following ELC communities were used to identify potential maternity roost habitat, as identified in the Species at Risk Study Plan developed for the WSR Project:

- Deciduous Forests (FOD);
- Mixedwood Forests (FOM);

- Coniferous Forests (FOC);
- Deciduous Swamp (SWD);
- Mixedwood Swamps (SWM); and,
- Coniferous Swamps (SWC).

In the Boreal ecozone of Ontario the above ELC communities translate to the following ELC codes:

- G/B015-019 – Very Shallow: Dry to Fresh Mixedwood/hardwood;
- G/B023-028 – Very Shallow: Humid Conifer/Mixedwood;
- G/B039-043 – Dry, Sandy Hardwood/Mixedwood;
- G/B054-059 – Dry to Fresh: Coarse Mixedwood/Hardwood;
- G/B069-076 – Moist, Coarse Mixedwood/Hardwood;
- G/B087-092 – Fresh, Clayey Mixedwood/hardwood;
- B103-108 – Fresh, Silty to Fine Loamy Mixedwood/Hardwood;
- B118-125 – Moist, Fine Mixedwood/Hardwood; and,
- B130-133 – Swamps.

2.1.4 MECP-SAR-171

MECP requested additional information and discussion on why ARUs deployed at stations BAT4, BAT5, BAT6 and BAT9 recorded few or no passes during the maternity roosting seasons in 2019 and 2020.

In 2019, BAT4 had the lowest number of passes recorded across 19 nights (June 16 – July 5, 2019) with just 11 passes confirmed from 3 bat species (7 from hoary bat [*Lasiurus cinereus*], 1 from big brown bat [*Eptesicus fuscus*] and 3 from silver-haired bat [*Lasionycteris noctivagans*]). Similarly, in 2020 the ARU deployed at BAT4 recorded just 5 passes (2 from big brown bat, 2 from silver-haired bat, and 1 from big brown/silver-haired bat). Whereas the other three units deployed in 2019 were in proximity to suitable bat maternity roosting habitat, BAT4 was deployed along a creek feature in an open grassy wetland (**Figure 2-1**) to determine if such a feature was used for foraging or commuting. Results indicate that bats rarely used this feature in both 2019 and 2020.

Figure 2-1: BAT4 in situ upon deployment, June 15, 2019

For the 2020 maternity roosting period, five new stations (BAT5 – BAT9) were established in open areas along linear habitat features, such as watercourses and clearing edges, that may be used for foraging and commuting. While the ARUs deployed at BAT7 and BAT8 each recorded more than 100 passes, the remaining three stations recorded few: BAT5 recorded 3 passes (silver-haired bat), and no passes were recorded at BAT6 and BAT9. BAT5 was deployed in a shrubby wetland adjacent to a lakeshore, while BAT6 to BAT9 were established along the treed edges of narrow (<25 m) watercourses. BAT7 was located south of BAT5 and BAT5 along the same chain of lakes; however, it was also adjacent to a patch of forest that was identified as one of the “best candidate maternity colony ecosites” (refer to Figure 10.6 in Appendix F of the EAR/IS) (i.e., hardwood and mixed treed ecosites older than 80 years) which likely contributed to the higher number of passes recorded at BAT7. The watercourse along which BAT8 was deployed happened to be relatively straight for several (>4) kilometres and may provide foraging habitat and a commuting corridor that are energetically optimal – the only bat identified to species from the recorded passes was hoary bat, which is known to have a more direct flight pattern than other bats (Saunders, 1988).

3 SAR Birds

3.1 Short-eared Owl

3.1.1 MECP-SAR49

In their response MECP requests further information on the potential area of Short-eared Owl habitat within the LSA and footprint and the number of breeding pairs within the footprint and LSA.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include additional information to support characterization of existing conditions for Short-eared Owl and effects assessment.

Response

**NOTE – the Bird LSA and RSA were not delineated using the extra laydown area at the southeast end of Winisk Lake. The RSA completely encompasses this addition, but the LSA does not. Calculations of habitat within the LSA therefore do not include the entirety of the area surrounding this laydown area. Calculations of habitat within the footprint does include this area.

Habitat area was generated using open and sparsely treed wetland cover types. No suitable grassland, field, or agricultural habitat exists within the Project study areas.

Total SAR bird habitat overlap with LSA → **3,833.857978 ha**

Total SAR bird habitat overlap with footprint → **73.342332 ha**

Based on these calculations, the LSA may support up to approximately **47** Short-eared Owl territories. The footprint constitutes less than one area of potential territory.

3.1.2 MECP-SAR-081 and MECP-SAR-082

In their response MECP requests information on hydrological impacts on Short-eared Owl habitat

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to clarify the distance(s) in which the potential for hydrological changes may result in Short-eared Owl habitat loss.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include a table summarizing the amount of potential Short-eared Owl habitat within 250 m of the Project components.

Response

The Project Team clarifies that the distances used to calculate the areas of Short-eared Owl affected by changes to hydrology are those discussed in **Section 11.3.2.3.7** of the EAR/IS and shown in **Table 11-31**, with high magnitude effects within 20 m of the road edge, with moderate to high effects up to 40 m, moderate effects at 60 m, and minimal effects up to 250 m. The following table shows the areas of Short-eared Owl within these

zones. Based on these zones, habitat loss is most likely to occur within the zones located adjacent to the roadway and project facilities with the potential for degradation within the outermost zone.

Table 3-1: Effect Zones

Area	Affected Habitat	Total Habitat Affected[1]
Project Footprint	73.34 ha	73.34 ha
0 – 20 m	79.39 ha	152.73 ha
20 – 40 m	76.64 ha	229.37 ha
40 – 60 m	80.41 ha	309.78 ha
60 – 250 m	766.50 ha	1,076.28 ha

[1]Includes the sum of all areas up to the outer boundary mentioned (e.g. PF + 0-20 m + 20-40 m)

3.1.3 MECP-SAR-083

In their response MECP requests information on sensory impacts on Short-eared Owls, particularly during the nesting period.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include additional information on the distance between Short-eared Owl habitat and Project activities which are likely to result in sensory disturbances (e.g., noise, light, dust, vibration), particularly during the nesting period.

Response

There is limited evidence that Short-eared Owls are sensitive to disturbance. While the COSEWIC report on Short-eared Owls states “most Short-eared Owls nest away from human activity and may be sensitive to disturbance during laying and incubation (Leasure and Holt 1991; Reid et al. 2011)”, findings from these cited sources actually suggest the opposite. Leasure and Holt (1991) state “We experienced no egg breakage, nestling mortality, or nest abandonment [during studies]”; Reid et. al (2011) report that only 1 of 8 studied nests demonstrated abandonment, citing that disturbance early in the nesting process is more likely to lead to abandonment than later in the nesting process. There is even some evidence suggesting that Short-eared Owls prefer recently disturbed areas: a study by Herkert et. al (1999) examined habitat selection by Short-eared Owls and found that all individuals observed nested in fields that had been recently disturbed by grassland management activities. Repeatedly flushing an adult from the nest has no currently known effect on survival (COSEWIC, 2021).

COSEWIC (2021) lists transportation and service corridors, as well as human intrusions and disturbance as low threat impacts to Short-eared Owls. There is currently no literature on the specific effects of mining on Short-eared Owls; however, a recent study by Shonfield and Bayne (2017) demonstrated that chronic industrial noise had no effect on multiple species of owl site occupancy in the boreal forest. While site occupancy is unaffected by industrial noise, traffic noise may affect foraging ability up to 120 m from a road (Senzaki et al, 2016).

Based on the available literature, guidelines from the ECCC (<50 dB to avoid harm to birds), the acoustic modelling from the Noise and Vibration IAR (50 dB zone of influence at 125 m), the Project Team believes a setback distance of 125 m from Short-eared Owl is suitable to avoid sensory disturbances.

3.1.4 MECP-SAR-084

In their response MECP requests information on the number of breeding pairs of Short-eared Owls within the LSA to support the assessment of impacts on injury or death due to incidental take and predator-prey dynamics .

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to update the threat assessment for injury or death due to incidental take and predator-prey dynamics associated with Short-eared Owl.

Response

Based on the amount of suitable habitat in the LSA and mean defended territory size (COSSARO, 2021), up to 47 defended territories may be affected by Project activities. Based on the amount of suitable habitat in the Project Footprint one defended territory may be removed by the project footprint.

Breeding density of Short-eared Owls is highly variable and dependent on prey availability. Leasure and Holt (1993) observed a maximum breeding density in good habitat with high prey abundance during an irruptive year was approximately 1 pair/5.5 ha. The available habitat within the LSA would support 1,394 birds (697 pairs) at this density. However, average breeding density for this species is typically around 5 birds/km^2 (Johnsgard, 1988; Lockie, 1955), which would mean the LSA could support approximately 192 birds (96 pairs).

Due to the suboptimal breeding habitat and the lack of observations of Short-eared Owl in the Project area, 192 birds is a more reasonable estimate of the maximum population within the LSA. This would correspond to approximately 2 pairs/defended territory, using maximum available habitat calculations. Using calculations of habitat availability within the LSA and average breeding densities, 96 pairs of Short-eared Owl may be located in the LSA.

3.1.5 MECP-SAR-142

In their response MECP requests information to support use of 125m as the sensory impact distance for Short-eared Owls.

Please update this section of the Final EAR/Is Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusion, or modify the distance to align with the setback distance of 500 m.

Response

While the Project team recognizes that the Saskatchewan protocol uses a 500 m setback for Short-eared Owls, there does not seem to be any scientific support to suggest this distance is based on Short-eared Owl sensitivity to sensory disturbances. Based on a recent study by Senzaki et al (2016), the foraging ability of Short-eared Owls is affected up to 120 m away from noise disturbance, and chronic industrial noise has been shown not to affect site occupancy in multiple species of owl (Schonfield and Bayne, 2017).

For dust as discussed in **Section 11.3.2.3.4** of the Assessment of Effects on Vegetation, the potential effects from dust that may result in the alteration or loss of vegetation will occur up to 50 m from the road centerline, with moderate and minor effects occurring at distances up 100 and 150 m.

Additionally, the Saskatchewan Activity Restriction Guidelines do not include peer-reviewed studies or any references supporting the setback distances listed.

Environment and Climate Change Canada recommends setbacks when noise will exceed 50 dB (ECCC, 2025). Based on noise modelling results (Appendix J), it is anticipated that noise will be below 50 dB at 125 m away from Project activities.

Based on the available literature, the Project Team believes that habitat degradation due to sensory disturbances will not exceed 125 m from the Project Footprint.

3.1.6 MECP-SAR-143

In their response MECP requests additional rationale to support the Project Team's conclusions on the threat of incidental take on Short-eared Owl during construction.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to: provide additional rationale to support the Project Team's conclusions, including updating the wording associated with all relevant mitigation measures in Section 13.4 and Appendix E to clearly state vegetation clearing will not be carried out during the Short-eared Owl nesting period (no exceptions); or reconsider the assessment of magnitude and likelihood of occurrence associated with the injury or death of Short-eared Owl due to incidental take during construction.

Response

To clarify the nesting period for zone C6 is between April 25 and August 29 as per Nesting periods – Canada.ca (ECCC, 2025) (Figure 1).

As described in sections 1.1.3 – 1.1.5, and below in section 1.1.7, the Project Team believes that suitable effort has been taken to survey for Short-eared Owls, and evidence has been provided to support low sensory impacts to this species during Project activities. Effort will be taken to avoid sensitive nesting periods for this species, however, in the event that vegetation clearing is required within the nesting period in order to advance progress on the Project, consultation will be undertaken with MECP and the proponent will obtain an authorization under the ESA (i.e., permit) or SCA (e.g., permit or registration) in advance of any activities. This would include detailed mitigation measures as outlined in Section **13.4.6.** of the EAR/IS.. Based on the lack of detections within the project area suggesting low population numbers, evidence from peer-reviewed studies describing that industry is not a significant disturbance to owl species, and the mitigation measures proposed in the EAR/IS (**Section 13.4.6**), the Project Team stands by its conclusion that the threat of incidental take on Short-eared Owls during construction is low.

3.1.7 MECP-SAR-154

In their response, MECP requests information to support the Project's conclusions for the level of confidence for Short-eared Owl impacts.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions regarding the level of confidence in the predictions for Project-related net effects on Short-eared Owls.

Alternatively, consider revising the level of confidence to Low and remove reference to "multi-year data collected from baseline studies"

Response

Twenty-five (25) of 113-point counts were completed within suitable Short-eared Owl habitat. Due to the lack of feasibility of working outside of daylight in the study area, ARUs were programmed to record during dusk and overnight in order to capture crepuscular and nocturnal species. 26 of 93 ARU stations were within Short-eared Owl habitat. Over 800 recordings were analysed; no Short-eared Owl were observed. No Short-eared Owl were observed during any other field survey over multiple years.

ARUs are a proven suitable method for detecting owls (Goyette et al. 2011, Rognan et al. 2012, Schonfield et al. 2018). While Short-eared Owls are a relatively quiet species, they are quite vocal during the breeding season when establishing territory. As the ARUs and breeding bird point counts were completed during the breeding season when Short-eared Owl are expected to be most vocal and active, it is very likely that if Short-eared Owl were to be breeding within the Project area, they would have been recorded.

In addition to the extensive field surveys, based on a background review of available literature, there is little evidence that Short-eared Owls exist in high numbers within the project area. Nesting Short-eared Owls in the northern regions of Canada prefer tall, dense grasses and areas with high vantage points (Reid et al, 2011; COSEWIC Assessment and Status Report); no habitat matching this description exists within the project region. As they are ground-nesting birds, this species prefers dry, raised ground, with grassy vegetation 30-60 cm high (Schmelzer, 2005). The Project area is in the James Bay Lowlands, which is dominated by low, wet, frequently flooded ground, which makes nesting for this species very difficult. There are no eBird observations of this species within the LSA.

Short-eared Owls also typically share habitat preferences with Northern Harriers, and often co-occur, as they compete directly for prey (kleptoparasitism). While Northern Harriers have been observed within the project region, no Short-eared Owls were detected during any field program.

Short-eared Owls are more abundant breeders in the tundra and typically use boreal habitats more for migration (Reid et. al, 2011).

Additionally, as described in **Section 1.1.3**, there is little evidence that industry is a major disturbance to owl species.

Therefore, with no detections of Short-eared Owls during the project, coupled with evidence from peer-reviewed studies demonstrating that industrial noise does not have an effect on site occupancy, but may affect foraging up to 120 m from the disturbance, the Project Team stands by their conclusion that the level of confidence in net effects to this species is medium.

3.2 Lesser Yellowlegs

3.2.1 MECP-SAR-076 and MECP-SAR-077

In their response MECP requests information on hydrological impacts on Lesser Yellowlegs habitat.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include a table summarizing the amount of potential Lesser Yellowlegs habitat within 250 m of the Project components.

Response

The Project Team clarifies that the distances used to calculate the areas of Lesser Yellowlegs habitat affected by changes to hydrology are those discussed in **Section 11.3.2.3.7** of the EAR/IS and shown in **Table 3-2** bellow, with high magnitude effects within 20 m of the road edge, moderate to high effects up to 40 m, moderate effects at 60 m, and minimal effects up to 250 m. The following table shows the areas of Lesser Yellowlegs habitat within these zones. Based on these zones, habitat loss is most likely to occur within the zones located adjacent to the roadway and project facilities with the potential for degradation within the outermost zone.

Table 3-2: Effect Zones

Area	Affected Habitat	Total Habitat Affected[1]
Project Footprint	73.34 ha	73.34 ha
0 – 20 m	79.39 ha	152.73 ha
20 – 40 m	76.64 ha	229.37 ha
40 – 60 m	80.41 ha	309.78 ha
60 – 250 m	766.50 ha	1,076.28 ha

[1]Includes the sum of all areas up to the outer boundary mentioned (e.g. PF + 0-20 m + 20-40 m)

3.2.2 MECP-SAR-078

In their response MECP requests further information on sensory disturbances on Lesser Yellowlegs habitat.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include additional information on the distance between Lesser Yellowlegs nests and Project activities which are likely to result in sensory disturbances (e.g., noise, light, dust, vibration), particularly during the nesting period and trigger defensive behavior from nesting Lesser Yellowlegs.

Response

There is little available information on the effects on construction activities on Lesser Yellowlegs, however, some studies have been completed on other shorebirds. In a pilot study by Dillon & Moore (2020), construction noise was found to have no impact on riparian-nesting birds, at a level of 85 dB broadcast from 50 m away from active nests.

A study by Mueller and Glass (1988) found that colonial waterbird (gulls and terns) nesting density decreased during years of drilling activity but rebounded the year drilling ceased. However, the authors also cite large annual variation in the colony population, so effects of drilling on population density may not explain the entirety of the population decrease for the years of study.

Ambient noise is typically measured around 50-60 dB; chronic noise above this threshold may cause behavioural changes (e.g. site avoidance), but there is a lack of data outlining the physiological effects chronic noise has on birds (including shorebirds) (Dooling & Popper, 2007; Wright et. al, 2010). This noise level corresponds to the guidelines set out by Environment and Climate Change Canada (disturbance when noise levels are >50 dB). Based on the limited literature available, the Project Team defers to the recommendations by ECCC and the acoustic modeling completed for the Noise and Vibration IAR to suggest an 125 m area of sensory disturbance around the proposed Project work.

For dust as discussed in **Section 11.3.2.3.4** of the Assessment of Effects on Vegetation, the potential effects from dust that may result in the alteration or loss of vegetation will occur up to 50 m from the road centerline, with moderate and minor effects occurring at distances up 100 and 150 m. As bird habitat is ultimately dependent on vegetation ecosystems, the use of 125 m as the area of sensory disturbance is deemed appropriate by the Project Team.

3.2.3 MECP-SAR-079

In their response MECP requests additional information on the amount of habitat and breeding territories for Lesser Yellowlegs.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to update the threat assessment for injury or death due to incidental take and predator-prey dynamics associated with Lesser Yellowlegs.

Response

The LSA contains 3,833.86 ha of suitable Lesser Yellowlegs habitat; this could support approximately 433 territories, corresponding to about 433 breeding pairs of Lesser Yellowlegs (~ 866 birds) based on numbers within the COSEWIC status report (COSWEIC, 2020). However, Project Team will note, the density estimates are based on surveys conducted in Alaska not in Northern Ontario and that the number of affected breeding pairs is likely much lower based on field results and density modelling done by the Boreal Avian Modelling Project (BAM, 2024) which estimates density at 0.0016 adult males per hectare within the LSA and RSA, or six breeding pairs.

3.2.4 MECP-SAR-141

In their response MECP requests additional rationale to support the Project Team's conclusions on the threat of incidental take on Lesser Yellowlegs during construction.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to: provide additional rationale to support the Project Team's conclusions, including updating the wording associated with all relevant mitigation measures in Section 13.4 and Appendix E to clearly state vegetation clearing will not be carried out during the Lesser Yellowlegs nesting period (no exceptions); or reconsider the assessment of magnitude and likelihood of occurrence associated with the injury or death of Lesser Yellowlegs due to incidental take during construction.

Response

The nesting period giving in the comment was incorrect. To clarify the nesting period for zone C6 is between April 25 and August 29 as per Nesting periods – Canada.ca (ECCC, 2025). (**Figure 3-3**).

Figure 3-1: Nesting Zone Calculations for Zone C6

For nesting zone C6, within the species used, there are 69 species known to nest in forest habitats. The percentages of species actively nesting are: less than 5 percent from April 28 to May 1 and from August 13 to 19, 6 to 10 percent from May 2 to 5 and from August 9 to 12, 11 to 20 percent from May 6 to 14 and from August 4 to 8, 21 to 40 percent from May 15 to 20 and from July 31 to August 3, 41 to 60 percent from May 21 to 28 and from July 24 to 30, 61 to 100 percent from May 29 to July 23. The markers are on April 25 and August 29. The rest of the calendar dates are zero percent.

For nesting zone C6, within the species used, there are 80 species known to nest in open habitats. The percentages of species actively nesting are: less than 5 percent on May 1 and from August 10 to 20, 6 to 10 percent from May 2 to 8 and from August 5 to 9, 11 to 20 percent from May 9 to 15 and from August 2 to 4, 21 to 40 percent from May 16 to 22 and from July 28 to August 1, 41 to 60 percent from May 23 to 26 and from July 23 to 27, 61 to 100 percent from May 27 to July 22. The markers are on April 30 and August 29. The rest of the calendar dates are zero percent.

For nesting zone C6, within the species used, there are 69 species known to nest in wetland habitats. The percentages of species actively nesting are: less than 5 percent from April 28 to May 1 and from August 4 to 19, 6 to 10 percent from May 2 to 3 and from NA, 11 to 20 percent from May 4 to 11 and from August 1 to 3, 21 to 40 percent from May 12 to 18 and from July 26 to 31, 41 to 60 percent from May 19 to 23 and from July 22 to 25, 61 to 100 percent from May 24 to July 21. The markers are on April 25 and August 20. The rest of the calendar dates are zero percent.

The Project Team Effort will be taken to avoid sensitive nesting periods for this species, however, in the event that vegetation clearing is required within the nesting period in order to advance progress on the Project, consultation will be undertaken with MECP and the proponent will obtain an authorization under the ESA (i.e., permit) or SCA (e.g., permit or registration) in advance of any activities. This would involve detailed mitigation measures as outlined in Section **13.4.6.** of the EAR/IS.

As Lesser Yellowlegs are extremely vocal when on breeding territory, it is expected that nest sweeps would be an effective strategy for locating and protecting active nests. Based on the ease of detecting breeding Lesser Yellowlegs, the low detection rate indicating very few individuals occur within the project area, and the mitigation measures proposed, the Project Team stands by its conclusion that the threat of incidental take on Lesser Yellowlegs during construction is low.

3.3 All Birds

3.3.1 MECP-SAR-114

In their response MECP requests a commitment to obtain an authorization under the ESA.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices (e.g., Appendix E) as appropriate, to specify that the proponent of the Project will obtain an authorization under the ESA (i.e., permit) or SCA (e.g., permit or registration) in advance of activities if vegetation clearing cannot be avoided during the nesting period for Lesser Yellowlegs and/or Short-eared Owl.

Response

The nesting period giving in the comment was incorrect. To clarify the nesting period for zone C6 is between April 25 and August 29 as per Nesting periods – Canada.ca (ECCC, 2025) (**Figure 1**).

The Project makes a commitment that in the event that vegetation clearing is required within the nesting period, the proponent of the Project will obtain an authorization under the ESA (i.e., permit) or SCA (e.g., permit or registration) in advance of activities.

3.3.2 MECP-SAR-155

In their response MECP requests additional rationale to support the Project Team's conclusions that sufficient baseline monitoring was completed for Lesser Yellowlegs and Short-eared Owl.

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions that the field studies undertaken meet the requirements for pre-construction monitoring for Lesser Yellowlegs and Short-eared Owl and additional pre-construction monitoring is not required.

Response

The Project Team agrees aerial surveys were not effective at detecting Lesser Yellowlegs, as Greater and Lesser Yellowlegs are too similar to differentiate while surveying via aircraft. However, ARU and point count surveys are effective measures in identifying and differentiating yellowlegs species due to their differences in call, and visual differences that can be seen while an observer is on the ground with binoculars.

Twenty-five (25) of 113 point counts (22%) and 26 of 93 ARU stations (28%) were within suitable Lesser Yellowlegs habitat. Lesser Yellowlegs were observed during ARU surveys in 2020 (1 station) and 2021 (12 stations). This suggests that while aerial surveys were unsuccessful at differentiating Lesser Yellowlegs, other survey methods were suitable at detecting presence of this species.

Twenty-five (25) of 113 (22%) point counts and 26 of 93 ARU (28%) stations were within suitable Short-eared Owl habitat. ARUs were programmed to record during dusk and overnight in order to capture crepuscular and nocturnal species. Over 800 recordings were analysed; no Short-eared Owls were observed. No Short-eared Owls were observed during any other field program over multiple years or surveys.

Roadside surveys are a common method for surveying for Short-eared Owls and are the recommended method by the Government of Saskatchewan. Due to the lack of road access and inability to survey past dusk, ARUs were used in place of in-person point counts. Timing of the ARU recordings matched the point count requirements as laid out by the Government of Saskatchewan (3-minute point counts completed between 1 hour before sunset and 30 minutes after sunset). While not as effective as visual surveys, ARUs are a proven suitable method for detecting owls (Goyette et al. 2011, Rognan et al. 2012, Schonfield et al. 2018). While Short-eared Owls are a relatively quiet species, they are quite vocal during the breeding season when establishing territory. As the ARUs and breeding bird point counts were completed during the breeding season when Short-eared Owls are expected to be most vocal and active, it is likely that if Short-eared Owls were to be breeding within the Project area, they would have been recorded via ARU.

Given the effort described above the Project Team stands by its conclusion that the surveys conducted meet the requirements for pre-construction monitoring for Short-eared Owl and additional pre-construction monitoring is not required.

3.4 Wolverine

3.4.1 MECP-SAR-041

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include additional information associated with the population estimates and rationale for why the estimated population using the study area is less than the minimum number of individuals confirmed to use the LSA based on the results of the Occupancy Study..

Response

In 2021, 7 unique individuals were identified during camera trap sampling through 26 observations. Of these 26 observations, 20 observations were identified as the 7 known individuals and 6 observations could not be identified due to a lack of distinctive markings visible. In 2022, 11 unique individuals were identified through 142 observations, 6 of which were individuals previously identified in 2021 and 5 of which were not. Of these 142 observations, 129 observations were identified as the 11 known individuals and 13 observations could not be identified.

From these data, we can apply total count, Lincoln-Peterson (Lincoln, 1930; Peterson, 1896), or Schnabel Model (Schnabel, 1938) interpretations to estimate the total wolverine population size in the study area in each year.

Lincoln-Peterson Model

The Lincoln-Peterson Model can be applied to mark-recapture studies with two sampling sessions, where conditions meet the following assumptions:

1. The study population is closed, with no births, deaths, immigration, or emigration
2. Animals captured in the second sample are a random subsample of the total population
3. The time between samples must be very small compared to the life span of the organism
4. The act of marking an animal does not affect its probability of recapture
5. Marks are not lost, gained, or overlooked during the study period

If these assumptions are met, population size is calculated as follows:

$$N = \frac{CM}{R} \qquad \text{(Equation 1)}$$

where:

N = estimate of total population size
M = number of individuals marked in the first sample
C = number of individuals captured in the second sample
R = number of marked individuals recaptured in the second sample

With small sample sizes, the Lincoln-Peterson Equation can be modified as follows to reduce bias:

$$N = \frac{(M+1)(C+1)}{R+1} - 1 \qquad \text{(Equation 2)}$$

For this model, 95% confidence intervals around the population estimate can be calculated as follows:

$$N \pm (1.96)[Var(N)]^{0.5} \quad \text{(Equation 3)}$$

where:

$$Var(N) = \frac{[(M+1)(C+1)(M-R)(C-R)]}{[(R+1)^2(R+2)]} \quad \text{(Equation 4)}$$

This study does not meet all assumptions of the Lincoln-Peterson Model. In the time span of the study, assumptions 1 and 3 should be met. However, assumptions 2 and 4 are not necessarily met, as wolverines are a territorial species. Assumption 5 is not necessarily met, as the "marks" (distinctive pattern markings) on individuals could be overlooked in camera trap photos due to the position of the animal or other factors. Unidentified individuals were excluded from calculations, but could be known individuals positioned such that their patterns are not visible. These potential violations must be considered when interpreting results from the Lincoln-Peterson Model. Applying the Lincoln-Peterson Model to get multiple estimates produces the results in **Table 3-3** below, noting that each estimate applies to a pair of consecutive photo intervals. Each photo interval between dates when camera trap SD cards and bait were changed is treated as one mark-recapture sample.

Table 3-3: Lincoln-Peterson Estimates for 2021 Data

First sample	Second sample	N (unmodified, Equation 1)	N (modified, Equation 2)	Standard Error
February – March 2021	March – April 2021	10	8	4.80
March – April 2021	April – May 2021	7.5	7	2.77
January – February 2022	March 2022	7.5	7	2.77
March 2022	March – April 2022	12.5	12.2	3.18
March – April 2022	May 2022	10	10	0*

*These data produce a standard error of 0 because the total number of individuals identified in the May 2022 photo interval (7) and number of "recaptures" (7) are equal (all individuals were previously identified), producing a numerator of 0 in Equation 4.

Schnabel Model

The Schnabel Model is an extension of the Lincoln-Peterson Model that allows for multiple mark-recapture sampling sessions, producing an N value that represents a weighted average of Lincoln-Peterson population estimates. The assumptions of this model are the same as for the Lincoln-Peterson Model. If these assumptions are met, population size is calculated as follows:

$$N = \frac{\sum_{i=1}^{S} M_i C_i}{\sum_{i=1}^{S} R_i} \quad \text{(Equation 5)}$$

where:

C_i = number of individuals captured in the *ith* sample (total)
R_i = number of previously marked individuals captured in the *ith* sample
U_i = number of individuals marked for the first time and released in the *ith* sample
M_i = number of individuals marked prior to the *ith* sample, across all previous samples
i = sampling interval number
S = total number of sampling intervals

such that:

$C_i = R_i + U_i$

For this model, 95% confidence intervals around the population estimate can be calculated as follows for small sample sizes, where the total number of recaptured individuals is less than 50 (Krebs, 1989):

R_L = lower confidence limit, determined from a Poisson distribution table based on the value of $\sum_{i=1}^{S} R_i$
R_U = upper confidence limit, determined from a Poisson distribution table based on the value of $\sum_{i=1}^{S} R_i$

such that the confidence interval is

Lower limit on N = $\frac{\sum_{i=1}^{S} M_i C_i}{R_U}$ (Equation 6)

Upper limit on N = $\frac{\sum_{i=1}^{S} M_i C_i}{R_L}$ (Equation 7)

The confidence interval will be asymmetric due to the use of the Poisson distribution. Applying the Schnabel Model to the 2021 data to account for the repeated marking produces a population estimate of approximately 9.33 wolverines in the study area, with a lower confidence limit of N_L = 3.46 and upper confidence limit of N_U = 34.23. The wide confidence interval reflects uncertainty in the calculation due to the small sample size and low total recapture number of 3 individuals in 2021. Applying the Schnabel Model to the 2022 data produces a population estimate of approximately 11.69 wolverines in the study area, with a lower confidence limit of N_L = 7.11 and upper confidence limit of N_U = 22.73. All calculations are provided in the Appendix.

Conclusion

Based on these estimates, we conclude that there were at least 7 wolverines in the study area in 2021 and at least 11 wolverines in the study are in 2022, with a total of at least 12 individuals across the two years. Accurate population estimation beyond total count data is hindered by the small sample sizes inherent to wolverine populations and habitat use, as well as the study design. However, the Lincoln-Peterson model produces estimates ranging from 7-12.5 individuals and the Schnabel model produces estimates ranging from 9.33-11.69 individuals, providing general context for the population.

3.4.2 MECP-SAR-043

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to revise the statement as follows:

"Evidence of lactation was noted for two (2) of the three (3) females whose territories are expected to overlap more widely across the LSA, indicating that a minimum of two (2) reproductive females are present. Both females were recorded in 2021 and 2022.

The Draft EAR/IS Report should include a discussion on the likelihood that all Wolverine within the LSA and/or RSA visited the run pole stations and/or were captured on camera (i.e., what is the likelihood there are other Wolverine with home ranges that overlap the LSA and/or RSA that did not visit or approach the run pole stations).

Response

The Final EAR/IS and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, has been revised to state *"Evidence of lactation was noted for two (2) of the three (3) females whose territories are expected to overlap more widely across the LSA, indicating that a minimum of two (2) reproductive females are present. Both females were recorded in 2021 and 2022."*

A total of 12 individual wolverines were identified across two years of study, which included the identification of seven (7) individuals in 2021 and 11 individuals in 2022. Individual W09 was only recorded once across both years, while W07, and W12 were each only recorded twice. In 2022, 6 of 11 individuals recorded were recorded five (5) or more times.

In 2021, six (6) Wolverine occurrences were captured on camera, yet the individual could not be identified conclusively. In 2022, 13 such occurrences occurred. In 2021, unidentified occurrences accounted for 23.0% of total observations, while in 2022 unidentified occurrences accounted for 9.2% of total occurrences.

Given the high number of occurrences recorded in 2022 (142) and the fact that 8 of 11 individuals recorded in this year were recorded three (3) times or more, there is strong evidence most of the individuals occurring regularly within the study area and that had home ranges overlapping with the LSA were accounted for via the remote traps and hair snags.

Further analysis of unidentified occurrences might examine whether occurrences of Wolverines bypassing run pole stations happened after bait had been removed/consumed and thus there was no reason for the Wolverine to inspect the station more closely.

3.4.3 MECP-SAR-044

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide a qualitative description and quantification that supports the stated characterization of Wolverine habitat – including current state of large undisturbed areas, food abundance (i.e., moose, caribou, beaver, etc.), and denning habitat – as it relates to the existing condition, effects assessment, residual effects, and cumulative effects. This should include:

a quantification of large undisturbed areas that considers an appropriate amount and arrangement necessary to support Wolverine (e.g., use a range of average home range sizes estimated for males and females reported from supporting literature);

a quantification of food abundance drawing on the results of the relevant wildlife disciplines in the Final EAR/IS Report (e.g., moose, caribou, beaver) and/or literature; and

a quantitative and/or qualitative description of potential denning habitat (e.g., amount of forested habitat which may provide the necessary structure[s] to support den establishment).

Response

Wolverine Habitat Characterization

Undisturbed Areas

Undisturbed habitat in the Wolverine LSA (11 km from the centreline) and Wolverine RSA (86 km from the centreline) was quantified, using the anthropogenic disturbance footprint within the Far North caribou range (ECCC, 2020) for disturbed areas with a 4-km buffer applied to account for indirect effects. There is a quantification for “summer” that excludes waterbodies, and a quantification for “winter” that includes waterbodies (which can be traversed when frozen).

Across the literature, Wolverine home range measurements vary from 23 km^2 to 3,513 km^2 , with males occupying larger home ranges than females, and single females having larger home ranges than females with young (Hornocker and Hash, 1981; Gardner, 1985; Magoun, 1985; Whitman et al., 1986; Banci, 1987; Banci and Harestad, 1990; Copeland, 1996; Mulders, 2000; Krebs et al., 2007; Copeland and Yates, 2006; Squires et al., 2006; Inman et al., 2007; Dawson et al., 2010; Persson et al., 2010; Ontario Wolverine Recovery Team, 2013). Home ranges for both sexes can expand or contract for a variety of reasons, such as resource availability or reproductive status (CWF & EC, 2013). In Red Lake, Ontario, winter home ranges are at the high end of reported ranges for North America, with those of males averaging 2,563 km^2 and females 428 km^2 (Dawson et al. 2010).

The available undisturbed habitat in the summer in the Wolverine LSA is 124,308.7 ha and 3,168,578.2 ha in the Wolverine RSA. In the winter, the available undisturbed habitat in the Wolverine LSA is 203,190.8 ha and 3,544,276.5 ha in the Wolverine RSA. Considering the available undisturbed habitat in the winter, using the larger average winter home ranges reported by Dawson et al. (2010) and assuming no territorial overlap within the same sex, the Wolverine LSA could support approximately 5 female home ranges of 428 km^2 (42,800 ha) that also include forest at least 500 m^2 in area (refer to *Potential Denning Habtiat*, below) or 1 male home range of 2,563 km^2 (256,300 ha). The Wolverine RSA could support approximately 82 female home ranges of 428 km^2 that also include forest at least 500 m^2 in area or 14 male home ranges of 2,563 km^2.

Food Abundance

As quoted in the Recovery Strategy (Ontario Wolverine Recovery Team, 2013), Wolverine "habitat is probably best defined in terms of adequate year-round food supplies in large, sparsely inhabited wilderness areas, rather than in terms of particular types of topography or plant assemblages," (Kelsall, 1981). COSSARO (2014) identifies Caribou *(Rangifer tarandus caribou*), Beaver *(Castor canadensis*), and Moose (*Alces alces*) as important prey species in the province, all three of which have been documented in the study area and are addressed in the WSR Final EAR/IS and Appendix F (baseline studies).

Studies conducted in other North American Wolverine populations have found that diet varies both seasonally and across years depending on food availability and other environmental changes (Dalerum et al., 2009; Scrafford and Boyce, 2018). During the summer, Wolverines consume both fresh prey and carrion, including cached food items, and are considered an opportunistic omnivore (Magoun, 1987; Banci, 1994). Fresh prey can include small mammals and ground-nesting birds (COSEWIC, 2014), particularly when carrion is scarce (Wolverine Recovery Team, 2013). Small animal prey availability may be important to reproductive females during the denning and rearing periods due to higher energy demands coupled with restricted movements (Lofroth et al. 2007; Koskela et al. 2013). There are a number of small mammal species with ranges within the Wolverine LSA and RSA, including Eastern Chipmunk (*Tamias striatus*), Eastern Heather Vole (*Phenacomys ungava*), Least Chipmunk (*Neotamias minimus*), Meadow Vole (*Microtus pennsylvanicus*), Muskrat (*Ondatra zibethicus*), Northern Bog Lemming (*Synaptomys borealis*), Snowshoe Hare (*Lepus americanus*), Southern Bog

Lemming (*Synaptomys cooperi*), Southern Red-backed Vole (*Clethrionomys gapperi*), Star-nosed Mole (*Condylura cristata*), and Woodchuck (*Marmota monax*), along with Deer Mouse (*Peromyscus maniculatus*), Meadow Jumping Mouse (*Zapus hudsonius*) and shrews (*Sorex* spp.). Populations of species such as Eastern Chipmunk, Deer Mouse, and Southern Red-backed Vole in northern Ontario have been found to fluctuate across years with trends consistent with dispersal effects or a Moran effect caused through synchronous food crops (Bowman et al., 2008), while Snowshoe Hare typically has a cyclical population (8-11 years) related to predation and food availability (Hodges et al., 1999); however, Wolverine numbers have not been found to correlate with hare or vole populations and are not susceptible to fluctuations in Snowshoe Hare, likely due to their generalist diet (Boutin et al., 1995; Erlinge, 1986).

During the winter in Ontario, Wolverine actively hunt Beaver lodges and along lakeshores and also scavenge Moose and Caribou (Ontario Wolverine Recovery Team, 2013). In Alberta, increased ungulate and beaver activity in the spring increases the rate of Wolverine encounter with these prey animals (Scrafford and Boyce, 2018), which may also be the case in Ontario. Wolverine predation on Moose and Caribou has also been recorded in other regions of North America (Magoun et al., 2005; Lofroth et al., 2007; Gustine et al., 2006). In 2019 during WSR baseline studies, Wolverine tracks were observed moving back and forth to a moose carcass which was likely the result of a wolf-kill.

Seasonal abundance of Wolverine prey is difficult to quantify in the WSR standard LSA (1-km from the centreline) or standard RSA (6-km from the centreline) without recent, targeted studies in the region designed to measure temporal abundance versus occurrence or presence/absence, as baseline WSR studies were. On a broader scale, availability of suitable habitat for prey species can be quantified where other data are lacking.

Targeted small mammal studies were not conducted as part of the WSR baseline, although Snowshoe Hare tracks were recorded during winter aerial surveys. RSF probability modelling for Snowshoe Hare based on winter aerial data collected in 2018, 2019, and 2021 indicates that occurrence of this species in the standard RSA has strong habitat associations with disturbed (207.43 ha), sparse treed swamp (poor conifer swamp, 19,891.17 ha) mixed forest (343.99 ha), and burned/cut forest (554.08 ha) ELC communities. At a baseline level, these communities comprise approximately 20,996.67 ha or 15.67% of the standard RSA. While Wolverine avoids disturbed habitat, such areas may serve as a source for Snowshoe Hares that disperse into other habitats used by Wolverine.

Targeted beaver studies were not conducted as part of the WSR baseline, although beaver dams and lodges were identified during aquatic surveys in the standard LSA (34 observations). Beaver dams are common features on small to medium streams and beaver activity throughout the standard LSA is described as "prolific", with both the LSA and RSA "highly impacted by beaver activity". To identify important habitat for beaver a habitat model was developed to map high value beaver habitats in the project area. Habitat suitability rankings were developed for the standard RSA based on known habitat requirements that have been identified in literature and through expert review. The model was developed using the vegetation layers developed as part of vegetation surveys that are described in Appendix F of the Final WSR EAR/IS. Overall, open water lakes (<20 ha), river, shoreline wetlands (includes open shore fen, open water marsh, open shore shrub fen, river/floating marsh, open shore fen/thicket swamp, shore thicket swamp) and deciduous/mixedwood forest/swamp 0-30 m from shoreline (includes hardwood forest, mixed forest, mixedwood swamp and hardwood swamp) have the highest habitat suitability for beavers in the standard RSA, totalling 6,796.57 ha. Moderately suitable habitats include open water lakes (20-40 ha), deciduous/mixedwood forest/swamp 30-100 m from shoreline (includes hardwood forest, mixed forest, mixedwood swamp and hardwood swamp), fen 0-30 m from shoreline (includes sparse treed fen, organic poor fen, and open moderately rich fen), thicket swamp 0-30 m from shoreline and thicket swamp 30-100 m from shoreline, totalling 1,430.92 ha. Low suitability habitats include open water lakes (>40 ha), bog 0-100 m from shoreline (includes low treed bog, open bog and sparse treed bog), conifer forest/swamp 0-30 m from shoreline (includes conifer forest, conifer swamp, organic rich conifer

swamp, poor conifer forest and poor conifer swamp), and fen 30-100 m from shoreline (includes sparse treed fen, organic poor fen and open moderately rich fen), totalling 22,733.03 ha. Together, these represent approximately 23.10% of the total available beaver habitat in the standard RSA, with the remainder (103,048.23 ha) being considered “poor”.

Winter aerial surveys for the WSR baseline conducted in 2018, 2019 and 2021 found Moose throughout the entire survey area with an average of 0.162 occurrences per kilometre. Moose were more prevalent west of Webequie where mixed and coniferous forests are regenerating from a burn that occurred over 40 years ago, and RSF probability modelling indicates that areas of high Moose occurrence are distributed evenly across the Moose LSA and that these areas follow rivers and other waterbodies.

Winter aerial surveys for the WSR baseline conducted in 2018, 2019 and 2021 found Caribou were concentrated to an area between 5 km and 30 km east of Webequie (95% of observations). Individuals counted during the winter aerial surveys ranged widely across years, with 45 in 2018; 13 in 2019; and 552 in 2021. Overall, there was an average of 0.177 Caribou occurrences per kilometre across the three survey years. Inter-annual variation in Caribou presence may be influenced by changes in movement and range utilization of both Boreal and Eastern Migratory populations. Of 29 female Caribou fitted with satellite collars in 2021, 26 were Eastern Migratory, 2 were Boreal, and 1 could not be assigned a population as it did not survive the winter. Winter Wolverine diet in the LSA and RSA may rely less on Caribou outside of years with larger migratory movements or range shifting from other populations.

Potential Denning Habitat

Snow-covered fallen trees and boulder piles are two important den site characteristics documented in Wolverine studies throughout North America (Magoun and Copeland, 1998; Krebs and Lewis, 2000; Lofroth, 2001; Copeland and Yates, 2006). Studies in Red Lake, Ontario have found that reproductive dens (i.e., natal and maternal dens) included the use of slash piles, rocks or boulders, and downed trees or root balls (Scrafford et al., 2022; Dawson et al., 2010). Females may establish a denning area with multiple dens, moving between them depending on conditions in or near the den and security of the den (Heeres, 2021). A single denning area may be clustered within several hundred metres of each other, as found by Dawson et al. (2010) in Red Lake, Ontario where three dens were located within a 300 m radius. Maternal dens are typically less than 3 km from natal dens (Magoun and Copeland, 1998; Jokinen et al., 2019). Generally, denning areas span approximately 500 m^2 (Scrafford and Ray, 2021) and offer security from predators and human activity (May et al., 2012). Dawson et al. (2010) suggested that large areas of undisturbed forest in central lowland boreal forests with low road densities (<0.44 km/km2) may be important in reducing predation risk and human disturbance.

Forest habitat in the Wolverine LSA and RSA that is likely to contain downed trees and root balls includes those classified in the Far North land cover data (Ontario GeoHub, 2014; MNRF, 2014) as Deciduous Treed, Mixed Treed and Coniferous Treed. Forest patches (Deciduous Treed, Mixed Treed and Coniferous Treed combined) that are at least 500 m^2 in size comprise 21,084.1 ha in the Wolverine LSA and 638,603.4 ha in the Wolverine RSA.

Boulders were noted underlaying surficial soils during WSR baseline studies, with surficial boulders occurring in proximity to the edges of lakes and watercourses but are otherwise rare features in the forest and wetland communities. Site TP19-09, described in Section 4 (Geology, Terrain and Soils) of Appendix F of the Final WSR EAR/IS, was identified as a potential aggregate/rock source, with surficial boulders present along the shoreline of an unnamed lake. The boulders are within 1 to 1.65 km from the known Wolverine denning site location detected during baseline studies, and the aggregate area begins approximately 750 m north from the den site. As MECP considers the den and the area within a 4-km radius (Scrafford and Ray, 2021) as the “denning area”, the boulders and potential aggregate source are located within the denning area identified in the Wolverine LSA.

Effects

Section 13.3.4 of the Final WSR EAR/IS identifies habitat loss as a potential effect due to vegetation clearing activities and disturbance during construction and throughout operations. Physical habitat loss was calculated considering all ecotypes, acknowledging that Wolverine are wide-ranging and may use even low-quality habitat for movement purposes. This includes disturbed areas, which may be used by prey species such as Snowshoe Hare; wetlands and open water that may be used by Beaver (reproduction, foraging) and Moose (foraging); and forested areas that may provide Wolverine denning habitat. In this context, the assessment conducted for habitat loss in the Wolverine LSA and RSA has broadly accounted for the undisturbed and denning habitat components described above, as well as prey habitat.

Relating to prey, Moose and Caribou both share the same LSA as Wolverine (11 km from the centreline) but have a larger RSA, at the scale of the Missisa and Ozhiski Caribou Ranges (108,600 km^2), while Beaver and Snowshoe Hare were evaluated in the typical LSA and RSA. **Table 3-4** below compiles the probability of habitat use under future conditions (habitat alteration or degradation) for Snowshoe Hare and Moose (no RSF modelling available for Beaver). **Table 3-5** shows the percent change of average probability of use of General Habitat Description Category 2 habitat for the future conditions of the Ozhiski and Missisa Caribou Ranges. **Table 3-6** summarizes the changes in habitat suitability by study area for Beaver.

Table 3-4: Snowshoe Hare and Moose Probability of Habitat Use Percent Change by Study Area

Species	% Change by Study Area		
	Project Footprint	Standard LSA	Moose/Wolverine LSA
Snowshoe Hare	100.0%	23.7%	n/a
Moose	-25.3%	-8.7%	-1.2%

Table 3-5: Ozhiski and Missisa Caribou Ranges Probability of GHD Category 2 Habitat Use Percent Change by Season

Range	% Change in Caribou RSA by Season			
	Spring	Summer	Fall	Winter
Ozhiski	0%	0%	0%	0%
Missisa	2.6%	3.0%	1.3%	2.0%

Table 3-6: North American Beaver Changes in Habitat Suitability by Study Area

Habitat Suitability	Standard LSA			Standard RSA		
	Area Removed (ha)	Pre-Construction (ha)	% Removed	Area Removed (ha)	Pre-Construction (ha)	% Removed
High	7.81	1,386.22	0.56	8.11	6,796.57	0.12
Moderate	1.67	284.5	0.59	1.67	1,430.92	0.12
Low	20.41	4,036.72	0.51	20.42	22,733.03	0.09
Poor	414.36	21,945.65	1.89	521.09	103,048.23	0.51

Within the Wolverine LSA, Moose habitat use due to the construction and operation of the road is expected to decrease by 1.2%, while Snowshoe Hare habitat use is expected to increase by 23.7% in the standard LSA. Seasonal habitat use by Caribou in the Ozhiski Range is not expected to change in any season, while it is expected to slightly increase (1.3 – 3.0%) across all seasons in the Missisa Range. Beaver habitat loss as a result of road construction and operation is expected to be minimal, at less than 0.6% of high, moderate and low habitat suitability areas in the standard LSA and less than 0.13% of the same habitat suitability areas in the standard RSA.

While habitat use may increase for Caribou and Snowshoe Hare in portions of Wolverine habitat, there may also be a slight decline in Moose habitat use and Beaver habitat availability. Given the uncertainty around prey preference, resource allocation, seasonal prey abundance, and frequency of scavenging opportunities in the Wolverine LSA and RSA, it cannot be assumed that these changes will have a positive or neutral effect relating to Wolverine habitat. Therefore, the effect on prey is negative.

Net Effects

This assessment does not change the negative net effect assessed for Wolverine habitat loss as presented in Section 13.5.2.2.1 of the Final WSR EAR/IS.

Cumulative Effects

Habitat loss as a cumulative effect on Wolverine was addressed in Section 21.4.8.2.3 of the Final WSR EAR/IS, with habitat loss resulting from anthropogenic disturbances related to resource exploration, mine development/operation, and road construction/operation as well as climate change. Cumulative effects were also assessed for Caribou, Moose, and North American Beaver. The predicted cumulative effects for Wolverine do not change when incorporating the cumulative effects on prey species: adverse, moderate to high in magnitude, occurring within the RSA, and largely medium to long-term. The effects will be continuous throughout each project. Changes resulting from habitat loss will be irreversible.

3.4.4 MECP-SAR-069

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the EAR/IS Report and associated Appendices (e.g., Appendix F) as appropriate, to include a detailed description of rationale and justification to support the conclusions for each threat assessment criteria associated with each individual threat for Wolverine.

Response

The threat assessment methodology and criteria were defined in the Tailored Impact Statement Guidelines (TISG) for the Webequie Supply Road (WSR) Project and the threat assessment approach is presented in Section 13.3.1 of the Final WSR Environmental Assessment Report/Impact Statement (EAR/IS). The threat assessment is conducted without consideration of mitigation measures and is further refined in the net effects assessment after the application of mitigation measures. As such the Threat Assessment is limited to the physical direct removals or alteration of species at risk habitat, while the predicted net effects assessment incorporates a qualitative and quantitative description of the effects using criteria to assess adverse effects, taking into account any important contextual factors and mitigation. Identification of potential effects to Wolverine, including relevant literature sources, is provided in Section 13.3.4 of the Final WSR EAR/IS. For context, potential effects for Wolverine was evaluated at the Wolverine Local Study Area (LSA) level (i.e., 11 km [2,513 km^2] from the centreline of preferred route). **Table 3-7** below provides the summary of the threat

assessment as presented in Table 13-26 of Section 13.3.4.5 of the Final WSR EAR/IS, followed by a detailed breakdown of each threat criterion associated with each individual threat.

Table 3-7: Summary of Threat Assessment for Potential Effects on Wolverine

Threat	Scope	Severity	Magnitude	Irreversibility	Degree of Effect
Habitat Loss – Clearance Activities	Large	Serious	High	Very High	Very High
Habitat Alteration or Degradation – Habitat Structural Change	Small	Slight	Low	Medium	Low
Habitat Alteration or Degradation – Sensory Disturbances	Large	Serious	High	High	High
Habitat Alteration or Degradation – Hydrological Changes	Small	Moderate	Low	High	Low
Alteration in Movement – Loss of Connectivity	Large	Moderate	Medium	High	Medium
Alteration in Movement – Sensory Disturbances	Large	Serious	High	Low	Medium
Injury or Death – Collisions with Vehicles	Small	Serious	Low	High	Low
Injury or Death – Increased Access	Restricted	Moderate	Medium	High	Medium
Injury or Death – Changes to Predator-Prey Dynamics	Small	Moderate	Low	High	Low
Injury or Death – Increased Energy Expenditure	Small	Slight	Low	High	Low

Habitat Loss – Clearance Activities

Scope was characterized as large as the effect is likely to be widespread, affecting Wolverines across much (31-70%) of their occurrence or population within the LSA.

Severity was characterized as serious within the scope as Wolverine activity in the LSA was predicted by RSF modelling to decrease by 1.96% in the LSA due to “anthropogenic disturbance”, which includes clearance activities.

Irreversibility was characterized as very high due to the permanence of the proposed road and associated infrastructure. It is unlikely the full extent of the habitat loss effects can be reversed within 100 years.

Magnitude was characterized as high based on the table provided in the TISG, crossing scope (large) by severity (serious).

Degree of effect was characterized as very high based on the table provided in the TISG, crossing magnitude (high) by irreversibility (very high).

Habitat Alteration or Degradation – Habitat Structural Change

Scope was characterized as small as habitat structural change is only expected to occur along the road edge and in cleared areas undergoing change into early seral communities within the 3.0% modelled high-use habitat removed in the LSA.

Severity was characterized as slight within the scope as Wolverine activity in the LSA was predicted by RSF modelling to decrease by 1.96% in the LSA.

Irreversibility was characterized as medium due to the 21-to-100-year timespan it would take to restore altered or degraded habitats, i.e., early seral growth into mature forest.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (slight).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (medium).

Habitat Alteration or Degradation – Sensory Disturbances

Scope was characterized as large, despite that the effect would be constrained to the Project Footprint and edges throughout the LSA. During construction, activities such as blasting at quarries or pits, earth hauling and vegetation clearing, and the use of construction lighting, may reduce the ability of wolverine to use habitat along the ROW and supportive infrastructure due to sensory disturbances. Along the Trans-Canada Highway in Yoho National Park and Banff National Park, wolverines preferred areas more than 1.1 km from the highway (Austin, 1998). Studies have also indicated that wolverines are sensitive to forestry activities (e.g., Krebs et al., 2007, Bowman et al., 2010, Fisher et al., 2013) which include road building and would be similar to the activities undertaken by heavy machinery to clear vegetation and move earthen materials during the construction phase.

Severity was characterized as serious within the scope as Wolverine activity in the LSA was predicted by RSF modelling to decrease by 1.96% in the LSA, which includes sensory disturbances.

Noise and light generated by construction may degrade Wolverine habitat by reducing utilization of the area. Irreversibility was characterized as high as the effects of noise and light can be stopped by turning off the noise and light sources and halting road use.

Magnitude was characterized as high based on the table provided in the TISG, crossing scope (large) by severity (serious).

Degree of effect was characterized as high based on the table provided in the TISG, crossing magnitude (high) by irreversibility (high).

Habitat Alteration or Degradation – Hydrological Changes

Scope was characterized as small as the effect could extend up to 250 m from the ROW, with significant effects expected within 20 m, moderate effects within 60 m and minimal effects experienced at 250 m. These effects are small when compared to the avoidance distance of 1.1 km described for sensory disturbance from the literature.

Severity was characterized as moderate within the scope as Wolverine activity in the LSA was predicted by RSF modelling to decrease by 1.96% in the LSA, which includes hydrological changes.

Irreversibility was characterized as high due to the 21-to-100-year timespan it would take to restore habitats altered or degraded by hydrological changes.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Alteration in Movement – Loss of Connectivity

Scope was characterized as large as the Project Footprint intersects 107 km of continuous Wolverine habitat and result4s in the removal of (3.0 %) of Wolverine habitat in the LSA.

Severity was characterized as moderate, as Wolverines are known to avoid crossing roads, which therefore act as a barrier and result in a loss of habitat connectivity that will extend into the operations phase.

Irreversibility was characterized as high due to the 21-to-100-year timespan it would take to restore connectivity across habitats via mature forest.

Magnitude was characterized as medium based on the table provided in the TISG, crossing scope (large) by severity (moderate).

Degree of effect was characterized as medium based on the table provided in the TISG, crossing magnitude (medium) by irreversibility (high).

Alteration in Movement – Sensory Disturbances

Scope was characterized as large, despite that the effect would be constrained to the Project Footprint and edges throughout the LSA. During construction, activities such as blasting at quarries or pits, earth hauling and vegetation clearing, and the use of construction lighting, may reduce the ability of wolverine to use habitat along the ROW and supportive infrastructure due to sensory disturbances. Along the Trans-Canada Highway in Yoho National Park and Banff National Park, wolverines preferred areas more than 1.1 km from the highway (Austin, 1998). Studies have also indicated that wolverines are sensitive to forestry activities (e.g., Krebs et al., 2007, Bowman et al., 2010, Fisher et al., 2013) which include road building and would be similar to the activities undertaken by heavy machinery to clear vegetation and move earthen materials during the construction phase.

Severity was characterized as serious within the scope as Wolverine activity in the LSA was predicted by RSF modelling to decrease by 1.96% in the LSA, which includes sensory disturbances.

Irreversibility was characterized as low as the effects of noise and light can be stopped by turning off the noise and light sources and halting road use.

Magnitude was characterized as high based on the table provided in the TISG, crossing scope (large) by severity (serious).

Degree of effect was characterized as medium based on the table provided in the TISG, crossing magnitude (high) by irreversibility (low).

Injury or Death – Collisions with Vehicles

Scope was characterized as small as the effect would be constrained to the Project Footprint.

Severity was characterized as serious within the scope as a small number of Wolverines occupy large home ranges within the LSA such that infrequent collisions have the potential to greatly reduce the population by 8 to 14% in the LSA.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of Wolverines, which could take decades to recover from the loss of reproductively mature adults from collisions with vehicles.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (serious).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Injury or Death – Increased Access

Scope was characterized as restricted as the effect would be constrained to the Project Footprint, affecting a small proportion of Wolverines where they occur throughout the LSA.

Severity was characterized as moderate. Limited incidental or purposeful take is expected during the construction phase, as construction activities likely preclude trappers from using the corridor, and sensory disturbance may reduce Wolverine activity in proximity to the project footprint. The potential for harvest is also likely greater during the operations phase as it will operate over a long period of time with complete public access and provide new areas for trappers to deploy traplines, which may result in intentional or incidental harvest of Wolverine. A study near Red Lake, ON found that incidental trapping killed 6 of 56 individual wolverines between 2018 and 2022 (Scrafford et al. 2024). In 2009, the season for wolverine was closed to non-Indigenous trappers in Ontario (Wolverine Recovery Team, 2013); however, licenced trappers may apply to the MNR to possess incidentally trapped and killed wolverine as per Section 23.19 of Ontario Regulation (O. Reg.) 242/08 under the ESA and Part II of O. Reg. 666/98 under the FWCA.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of Wolverines, which could take decades to recover from the loss of reproductively mature adults due to incidental take and increased trapping.

Magnitude was characterized as medium based on the table provided in the TISG, crossing scope (restricted) by severity (moderate).

Degree of effect was characterized as medium based on the table provided in the TISG, crossing magnitude (medium) by irreversibility (high).

Injury or Death – Changes to Predator-Prey Dynamics

Scope was characterized as small as the effect would be constrained to the Project Footprint.

Severity was characterized as moderate. Predators such as wolves and bears may be attracted to the active road due to roadside foraging opportunities, including hunting (e.g., rodents, berries) and scavenging (e.g., roadkill). Loss of Wolverine adults or kits would greatly affect the Wolverine population within the LSA , as a small number of Wolverines occupy large home ranges within the LSA such that infrequent collisions have the potential to greatly reduce the population by 8 to 14% in the LSA. However, Wolverines not a typical foot source for other predators that may occur, such as wolves and bears.

Irreversibility was characterized as high due to the low population numbers and low reproduction rate of Wolverines, which could take decades to recover from the loss of reproductively mature adults.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (moderate).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high).

Injury or Death – Increased Energy Expenditure

Scope was characterized as small as the effect would be constrained to the Project Footprint and edges, affecting a small proportion of the Wolverine LSA.

Severity was characterized as slight recognizing that Wolverine have low population numbers and low reproductive rates, such that any loss of individuals is a considerable threat to the species. Likelihood of occurrence remains at possible for both phases as there is not enough evidence in the literature to support probable injury or death to Wolverine resulting from increased energy expenditure related to road construction and operation

Irreversibility was characterized as high as certain effects are more easily reversed while others are not, but overall Wolverine increased energy expenditure would be expected to decrease within 6-20 years as the cumulative effects are reversed, particularly those generated by sensory disturbances.

Magnitude was characterized as low based on the table provided in the TISG, crossing scope (small) by severity (slight).

Degree of effect was characterized as low based on the table provided in the TISG, crossing magnitude (low) by irreversibility (high)

3.4.5 MECP-SAR-089

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices (e.g., Appendix E) as appropriate, to provide rationale and justification, including references to literature, should be provided to support the Project Team's conclusion that the operational sensory disturbances associated with predicted traffic volume on the road is expected to have little effect on species at risk.

Response

The second half of the paragraph quoted in comment MECP-SAR-089 from Sensory Disturbance under Section 13.4.2.1.2 of the WSR EAR/IS notes "net effects will remain for SAR in the LSA and RSA, and additional discussion about potential impacts from sensory disturbance during the operations phase has been carried forward to the net effect characterization." The general comments relating to species at risk provided in the Mitigation and Enhancement Measures Section 13.4 do not supersede the identification of potential effects (Section 13.3.4, providing rationale and justification, including references to literature) or the characterization of net effects and determination of significance of sensory disturbances for Wolverine that follow in Section 13.5.2.2 and Section 13.6.2 of the Final WSR EAR/IS. Habitat alteration or degradation resulting from sensory disturbance generated by road operation is predicted to be significant for Wolverine.

3.4.6 MECP-SAR-091

In their response MECP…

Please updated the Final EAR/IS Report, and all other relevant locations within the Report (e.g., 13.4.2.1.1; 13.4.2.2.1) and associated Appendices (e.g., Appendix E) as appropriate, to include additional mitigation, as appropriate.

Response

Instruction will be provided as part of tendering during the detailed design phase that traffic speed limits will be reduced to 40 km/h across construction areas occurring within 4km of suspected or known Wolverine dens.

3.4.7 MECP-SAR-104

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices (e.g., Appendix E) as appropriate, to clarify if pre-construction surveys will also be undertaken to identify potential Wolverine dens and/or denning areas through the identification of tracks leading to/from areas of fallen trees, boulders, snow drifts, etc.

Response

Pre-construction surveys will be undertaken to identify potential Wolverine dens and/or denning areas through the identification of tracks leading to/from areas of fallen trees, boulders, snow drifts, etc. within 4km of the project footprint.

3.4.8 MECP-SAR-105

In their response MECP requests:

this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices (e.g., Appendix E) as appropriate, to modify the proposed mitigation measure as follows:

Clearly marking a vegetation protection zone (buffer or setback) between key ecological features for wolverine (e.g., confirmed and suspected wolverine den sites) and the Project Footprint. A minimum setback distance of ~~2~~ 4 km or more from den sites will be implemented between January 15 to May 31 ~~June 2 and January 31~~ of the calendar year, unless den use continues beyond this date, in which case these measures will continue to be implemented."

Response

Instruction will be provided as part of tendering during the detailed design phase that "a minimum setback distance of 4 km or more from den sites must be implemented between January 15 to May 31 of the calendar year, unless den use continues beyond this date, in which case these measures will continue to be implemented."

3.4.9 MECP-SAR-108

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices (e.g., Appendix E) as appropriate, to modify the proposed mitigation, as follows:

"If an active den is encountered, construction work will stop immediately, and the appropriate project personnel and regulatory agencies will be contacted. The den will be marked, and a 4 km buffer established. No work will take place within the buffer until clearance is issued by the MECP after the denning period. Where this is not possible, an authorization under the Endangered Species Act, 2007 or Species Conservation Act, 2025 will be required, as appropriate."

Response

Instruction will be provided as part of tendering during the detailed design phase that “If an active den is encountered, construction work will stop immediately, and the appropriate project personnel and regulatory agencies will be contacted. The den will be marked, and a 4 km buffer established. No work will take place within the buffer until clearance is issued by the MECP after the denning period. Where this is not possible, an authorization under the Endangered Species Act, 2007 or Species Conservation Act, 2025 will be required, as appropriate.”

3.4.10 MECP-SAR-128

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide clarity on how the amount of Wolverine habitat was quantified.

If it does not reflect both direct and indirect habitat loss, update this section of the EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to include a quantification of both direct and indirect habitat loss; and update relevant assessments of potential effects, net effects, significance, and proposed mitigation measures.

Response

Please refer to the response to comment MECP-SAR-044 relating to how the amount of Wolverine habitat was quantified.

With a 4-km disturbance buffer applied to the Project Footprint (546.6 ha), including laydown areas and quarries, the area of indirect habitat loss may extend to 87,927.7 ha, representing 35.0% of the Wolverine LSA and 2.3% of the Wolverine RSA.

3.4.11 MECP-SAR-130

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team’s conclusions, or reconsider the assessment of direction associated with habitat alteration or degradation from habitat structural change during construction

Response

The characterization of net effects for habitat alteration or degradation resulting from habitat structural change due to construction has been reconsidered, below.

Habitat Structural Change

Construction

Vegetation removals, creation of the ROW and construction of the paved and gravel road surfaces may alter or degrade wolverine denning, foraging, and movement habitat near the Project Footprint, extending into the LSA by changing vegetation height, density, and community composition. The ROW will be 35 m wide with a road surface spanning 12 m composed of gravel (eastern half) and asphalt or chip seal treatment (western half) (refer to Section 4.3.1). After the implementation of mitigation measures, construction of the road may lead to edge effects, including abiotic, direct biotic, and indirect biotic effects on the habitat, along with the physical habitat structural changes. Overall, the net effect is expected to be negative. A summary of the net effect assessment relating to habitat alteration and degradation due to habitat structural change as a result of the construction phase based on the Characterization Criteria is presented in **Table 3-8**.

Table 3-8: Criteria Results for Wolverine Habitat Alteration or Degradation from Habitat Structural Change – Construction

Characterization Criteria	Result	Rationale
Direction	Negative	While disturbed vegetation sites and early seral communities may provide habitat and forage for the prey species of Wolverine (e.g., Snowshoe Hare and Moose), Wolverines typically do not use these sites for denning, foraging or movement and will constitute habitat loss when converted from undisturbed habitat.
Magnitude	Low	The amount of habitat structural change is expected to have a minimal effect on the population as other factors such as sensory disturbance will influence Wolverine use of these areas.
Geographic Extent	LSA	The effects will occur beyond the Project Footprint into the LSA.
Timing	All Time Periods	The effects are expected to occur throughout the year.
Duration	Medium-term	The effects are expected to extend through road operations.
Frequency	Continuous	Vegetation permanently removed from road construction will generate continuous habitat structural changes.
Context	Moderate	Wolverines take advantage of certain habitat structural changes such as disturbed sites and have capacity to assimilate change.
Reversibility	Reversible	The effects are reversible if the cleared vegetation is restored.
Likelihood of Occurrence	Certain	Habitat structural changes will occur because of construction.

3.4.12 MECP-SAR-131

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of duration associated with the alteration in Wolverine movement due to sensory disturbance during operations.

Response

While the initial duration of the net effects was made on the assumed 75 year period for operations of the Project the project team acknowledges that the road will likely be maintained in some capacity and therefore acknowledges that the net effects of habitat alteration or degradation from sensory disturbance from sensory disturbance during operations is anticipated to be Permanent.

3.4.13 MECP-SAR-132

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of duration associated with the alteration in Wolverine movement due to loss of connectivity during construction and operations.

Response

While the initial duration of the net effects was made on the assumed 75 year period for operations of the Project the project team acknowledges that the road will likely be maintained in some capacity and therefore acknowledges that the net effects of alteration in Wolverine movement due to loss of connectivity during construction and operations is now anticipated to be Permanent.

3.4.14 MECP-SAR-133

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of duration associated with the alteration in Wolverine movement due to sensory disturbance during operations.

Response

While the initial duration of the net effects was made on the assumed 75 year period for operations of the Project the project team acknowledges that the road will likely be maintained in some capacity and therefore acknowledges that the net effects of alteration in Wolverine movement due to sensory disturbance during operations is anticipated to be Permanent.

3.4.15 MECP-SAR-134

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide an assessment of the net effects associated with Wolverine injury and death due to incidental take.

Response

Net effects and significance for incidental take of Wolverine during the construction and operations phases are provided below.

Incidental Take

Construction

Strictly enforcing mitigation measures during the construction phase is expected to fatalities of wolverines from incidental take by construction vehicles and equipment. Vegetation clearing in suitable denning habitat (Deciduous Treed, Mixed Treed and Coniferous Treed forests) will be conducted outside of the Wolverine denning period (i.e., avoid January 15 – May 31). While the avoidance window has been established, it is acknowledged that select vegetation removal may rarely be required during the denning season, and while surveys for evidence of denning within 4 km of project activities will be required, they are not infallible. Overall, a net negative effect may occur; however, it is unlikely with the appropriate application of mitigation measures. A summary of the net effect assessment relating to wolverine injury and death resulting from incidental take during the construction phase based on the Characterization Criteria is presented in **Table 3-9**.

Table 3-9: Criteria Results for Wolverine Injury or Death Due to Incidental Take – Construction

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative. While mitigation measures are expected to effectively manage incidental take by limiting vegetation removal in Wolverine denning habitat to outside of the denning period, select vegetation removal may occur where surveys have determined Wolverine dens are not present. There remains residual potential for undetected Wolverine to establish a den where vegetation removal is required during the denning period.
Magnitude	Low	The magnitude of the effect is predicted to be low as the unlikely occurrence of incidental take would not cause significant losses of Wolverine and the net effect would be unlikely to affect the population.
Geographic Extent	Project Footprint	The effect will be limited to the Project Footprint.
Timing	Sensitive	Incidental take may occur at any time during the Wolverine denning period.
Duration	Short-term	Incidental take from construction activities will cease at the end of the construction phase.
Frequency	Infrequent	Incidental take is expected to be rare with the implementation of mitigation measures such as timing windows and pre-clearance surveys.
Context	Moderate	Wolverines are expected to be moderately resilient to a low number of mortalities that may result from incidental take during construction.
Reversibility	Reversible	The net effect is reversible once construction concludes.
Likelihood of Occurrence	Unlikely	A negative effect is unlikely to occur.

Operations

Injury and/or death from incidental take is unlikely during the operations phase for Wolverine. Though smaller in scale, periodic clearing of the ROW may occur during operations as part of line-of-sight maintenance, while timing windows will be enforced maintenance may be required inside of the Wolverine denning period. Given that work would solely occur in previously cut areas, Wolverine habitat is unlikely to be affected directly; however, Wolverine dens may occur within 4 km of the road where maintenance activities are required and could be subject to indirect disturbances that result in den relocation, putting kits at risk of injury or death. Other mitigation measures such as screening for denning activity within 4 km of maintenance locations are expected to effectively prevent direct and indirect effects to denning Wolverines. After implementation of mitigation methods, including timing windows, pre-clearance surveys and buffer establishment, any remaining effects will be negligible. A summary of the net effects relating to Injury and death through incidental take during the operations phase based on the Characterization Criteria is presented in **Table 3-10**.

Table 3-10: Criteria Results for Wolverine Injury or Death Due to Incidental Take – Operations

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative, as deaths of Wolverine may occur as a result of incidental take.
Magnitude	Low	The magnitude of the effect is predicted to be low as the unlikely occurrence of incidental take would not cause significant losses of Wolverine and the net effect would be unlikely to affect the population.
Geographic Extent	LSA	The effect will extend out into the LSA.
Timing	Sensitive periods	If it occurs, incidental take would primarily occur during the Wolverine denning period.
Duration	Permanent	The potential for incidental is expected to continue in perpetuity as there are no plans to return the road and associated infrastructure to baseline conditions.
Frequency	Infrequent	Timing mitigation and surveys will limit the number injuries or deaths due to clearance activities.
Context	Low	Mitigations will limit any impacts on Wolverine populations.
Reversibility	Reversible	Incidental take would stop once road operations are concluded.
Likelihood of Occurrence	Unlikely	With mitigations it's unlikely incidental take will occur during operations even given the extended lifetime of the road.

Determination of Significance

The net effect for incidental take is low in magnitude during both the construction and operations phases. Vegetation clearing during the denning period may be necessary but should be a rare occurrence and will not be conducted within 4 km of active dens identified by pre-clearance surveys. Net effects on Wolverine is predicted to be not significant.

3.4.16 MECP-SAR-135 and MECP-SAR-136

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of magnitude and likelihood of occurrence associated with the injury or death due to increased energy expenditure during construction and operations.

And

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of duration associated with Wolverine injury or death due to increased energy expenditure during construction and operations.

Response

The predicted net effects to Wolverine from increased energy expenditures (Section 13.5.2.2.4 of the WSR EAR/IS) has been revised, with magnitude increasing from low to moderate due to the construction and operation phases, recognizing that Wolverine have low population numbers and low reproductive rates, such that any loss of individuals is a considerable threat to the species. Likelihood of occurrence remains at possible for both phases as there is not enough evidence in the literature to support probable injury or death to Wolverine resulting from increased energy expenditure related to road construction and operation. Duration has changed from long-term and medium-term, respectively, to permanent, recognizing there are no plans to restore the road.

Predicted Net Effects

Injury or Death

Increased Energy Expenditures

Construction

The cumulative effects of habitat loss, alteration and degradation, and alteration of movements on wolverine due to construction will likely lead to increased efforts to travel throughout their home ranges, forage for food, and access denning habitat in the RSA. Mitigation measures applied during construction to the individual effects will cumulatively minimize increased energy expenditure to some degree but cannot eliminate it. It is possible there will be a net negative effect on wolverine survival in the RSA from construction due to increased energy expenditures. A summary of the net effect assessment relating to wolverine injury and death due to increased energy expenditure caused by construction phase based on the Characterization Criteria is presented in **Table 3-11**.

Table 3-11: Criteria Results for Wolverine or Death Due to Increased Energy Expenditure – Construction

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative, as injury or death of wolverine due to increased energy expenditure from construction is adverse and undesirable.
Magnitude	Moderate	The magnitude of the effect is predicted to be moderate, as the effect may cause a measurable change in wolverine survival and reproduction but is likely within the adaptive capability of the species.

Characterization Criteria	Result	Rationale
Geographic Extent	RSA	The effect will likely extend beyond the LSA into the RSA as wolverines have very large home ranges.
Timing	All Time Periods	Increased energy expenditure may occur year-round.
Duration	Permanent	Increased energy expenditure from road construction is expected to continue in perpetuity as there are no plans to return the road and associated infrastructure to baseline conditions.
Frequency	Frequent	Increased energy expenditure in the RSA is expected to be intermittent due to construction activities.
Context	Moderate	Wolverines are expected to be moderately resilient to a slight increase in energy expenditures related to road construction.
Reversibility	Reversible	Increased energy expenditure is reversible if construction activities cease, and vegetation has re-established in the linear features.
Likelihood of Occurrence	Possible	While it is not likely to occur, increased energy expenditure may result in increased mortality of wolverine.

Operations

Wolverines may experience increased energy expenditures from road operations because of other effects combined such as alteration in movement due to road avoidance, attraction of predators from road operations, and sensory disturbances generated by road operations. A net negative effect is possible. A summary of the net effect assessment relating to wolverine injury and death due to increased energy expenditure from the operations phase based on the Characterization Criteria is presented in **Table 3-12**.

Table 3-12: Criteria Results for Wolverine Injury or Death Due to Increased Energy Expenditure – Operations

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative, as injury or death of wolverine due to increased energy expenditure from road operations is adverse and undesirable.
Magnitude	Moderate	The magnitude of the effect is predicted to be moderate, as the effect may cause a measurable change in wolverine survival and reproduction but is likely within the adaptive capability of the species.
Geographic Extent	RSA	The effect will likely extend beyond the LSA into the RSA as wolverines have very large home ranges.
Timing	All Time Periods	Increased energy expenditure may occur year-round.
Duration	Permanent	Increased energy expenditure from road operation is expected to continue in perpetuity as there are no plans to return the road and associated infrastructure to baseline conditions.
Frequency	Frequent	Increased energy expenditure in the RSA is expected to be intermittent due to road operations.
Context	Moderate	Wolverines are expected to be moderately resilient to a slight increase in energy expenditures related to road operations.
Reversibility	Reversible	Increased energy expenditure is reversible once operations cease, and vegetation has re-established in the linear features.

Characterization Criteria	Result	Rationale
Likelihood of Occurrence	Possible	While it is not likely to occur, increased energy expenditure may result in increased mortality of wolverine.

3.4.17 MECP-SAR-137 and MECP-SAR-138

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of magnitude and likelihood of occurrence associated with the injury or death due to access during operations.

And

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to provide additional rationale to support the Project Team's conclusions, or reconsider the assessment of context associated with the injury or death due to increased access during operations.

Response

MECP have provided additional information relating to Wolverine incidental harvest reported to MECP and MNR in the southern portions of Wolverine distribution in Ontario: a minimum of 8 to 12 Wolverine are reported incidentally trapped in the province each year. The predicted net effects to Wolverine from increased access (Section 13.5.2.2.4 of the WSR EAR/IS) and determination of significance (Section 13.6.2.4 of the WSR EAR/IS) have been revised, with magnitude increasing from moderate to high due to the operation phase, recognizing that Wolverine have low population numbers and low reproductive rates, such that increases in incidental harvest may not be manageable and exceed the ability for Wolverine to continue sustained existence within the area. Likelihood of occurrence has changed from probable to certain as MECP have confirmed the frequency of Wolverine annual incidental harvest in the species' southern distribution. Given these two changes, context has also changed from moderate to high.

Predicted Net Effects

Injury or Death

Increased Access

Operations

Increased access to wolverine habitat from the operations phase may result in increased legal harvest, incidental harvest, and illegal poaching of wolverine. While the remote nature of the project location may pose a challenge to monitoring for poaching, it is expected that the federal and provincial authorities will continue to enforce laws and regulations relating to wolverines in the RSA; however, the effect cannot be eliminated. Overall, a net negative effect is expected due to increased access. A summary of the net effect assessment relating to wolverine injury and death resulting from increased access due to the operations phase based on the Characterization Criteria is presented in **Table 3-13**.

Table 3-13: Criteria Results for Wolverine Injury or Death Due to Increased Access – Operations

Characterization Criteria	Result	Rationale
Direction	Negative	The direction of this effect will be negative, as poaching of wolverines and incidental harvest are undesirable and considered to be adverse relating to wolverine survival.
Magnitude	High	The magnitude of the effect is predicted to be high, as wolverine and have low population numbers and low reproductive rates. Additional mortality from poaching or incidental harvest may not be manageable and the change could exceed the ability for Wolverine to continue sustained existence within the area.
Geographic Extent	LSA	The Project Footprint may provide increased access to the LSA.
Timing	All Time Periods	Increased access resulting in harvest or poaching may occur year-round.
Duration	Long-term	Increased access will persist long-term if the corridor continues to provide access after the operations phase, such as by all-terrain vehicle or snowmobile.
Frequency	Infrequent	Poaching and incidental harvest of wolverine due to increased access are expected to be rare.
Context	High	Wolverines may not have the capacity to assimilate change in increased incidental harvest and poaching from increased access.
Reversibility	Reversible	The effects are reversible if access to the road is restricted.
Likelihood of Occurrence	Certain	While laws are in place to prevent poaching, incidental trapping of wolverine is known to occur in northern Ontario with a minimum annual rate of 8-12 individuals. The effect is certain to occur due to the operations phase.

Determination of Significance

Injury or Death

With effective implementation of mitigation measures, mortalities due to collisions with vehicles, changes to predator-prey dynamics, and increased energy expenditure are likely to have a low to moderate magnitude negative impact in the LSA as there is a lower likelihood for these effects to occur. Collisions with vehicles will be rare as most travel is anticipated to occur during daylight periods when wolverines are not as active, and wolverines are also less likely to cross the road. Changes to predator-prey dynamics are possible as the road will provide a corridor for predators and competitors to travel along, and predators may be attracted to the road for foraging and scavenging opportunities during operations. Wolverines are also known to move more quickly in the presence of roads and avoid roads, which will lead to increased energy expenditures in their home ranges throughout the RSA; however, wolverines are already adapted to move long distances over the landscape through nearly all types of terrain. These effects on survival and reproduction of wolverine are predicted to be not significant.

Increased access during operations is certain to lead to more trappers using the area over the lifetime of the road which will result in intentional or incidental harvest of wolverine, which is a known threat to the species as they are attracted to bait used by trappers. The net effects of injury or death due to increased access is negligible in magnitude and moderate in context during the construction phase and high in magnitude and high in context during the operations phase. Overall, this effect is predicted to be significant.

3.4.18 MECP-SAR-159

In their response MECP requests:

Please update this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to either:

Include the species-specific methodology, frequency, response (e.g. stop work processes), and training associated with the proposed pre-clearing surveys; or

If this level of detail will not or cannot be provided during the EAR/IS, include the following language:

"The details of the ground-based and/or aerial-based pre-clearing surveys will be described during the detailed design stage of the Project in the Wildlife Management and Monitoring Plan which will be prepared prior to the project authorization process so as to inform provincial and federal authorizations, as necessary."

Response

The details of the ground-based and/or aerial-based pre-clearing surveys will be described during the detailed design stage of the Project in the Wildlife Management and Monitoring Plan which will be prepared prior to the project authorization process so as to inform provincial and federal authorizations, as necessary.

3.4.19 MECP-SAR-161

In their response MECP requests:

Please consider updating this section of the Final EAR/IS Report, and all other relevant locations within the Report and associated Appendices, as appropriate, to include Wolverine in the cumulative effects assessment associated with Juno Corporation Mining Exploration Activity.

Response

Mine claims owned by Juno Mining Corporation (Juno) as well as jointly owned by Juno and Wyloo Metals extend across the western half of the Project footprint and within the wolverine RSA. However, no mine development is currently occurring within these claims except for the establishment of small borehole clearings. There is no further development anticipated in the foreseeable future.

3.4.20 MECP-SAR-177

In their response MECP requests:

Please update this section of Appendix F, and all other relevant locations within the EAR/IS Report as appropriate, to include Figures showing the MCP's created for each Wolverine.

Please update Appendix 11-A2 of Appendix F to include the relevant information for distinct visits by Wolverine to run pole stations in 2022.

Response

Relevant figures showing MCP for W01, W02, W03, W04, W05, and W08 have been appended to this document.

3.4.21 MECP-SAR-180

In their response MECP requests:

Please update Appendix 11-A2 of Appendix F to include the relevant information for distinct visits by Wolverine to run pole stations in 2022.

Response

An amended table of all Wolverine visits to run poles in 2021 and 2022 has been appended to this document.

Please see **Table 3-14** below.

Table 3-14: Summary of Wolverine Occurrences Documented via Trail Camera in 2021 and 2022

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
March 2021	L6	2/10/2021	6	12	W01	Extensive white on throat	Unknown	No
March 2021	L6	2/13/2021	0	24	Unknown	Chest markings	Unknown	No
March 2021	H6	2/15/2021	0	6	Unknown	none	Unknown	No
March 2021	E4	2/24/2021	18	48	W02	Chest markings	Female	Yes
March 2021	L6	3/12/2021	0	54	Unknown	none	Unknown	No
April 2021	F6	3/20/2021	24	210	W02	Chest markings	Female	Yes
April 2021	F6	3/21/2021	24	42	W02	Chest markings	Female	Yes
April 2021	G6	3/20/2021	0	28	W05	Chest markings	Unknown	No
April 2021	F5	3/22/2021	426	816	W03	Chest markings	Male	Yes
April 2021	F5	3/22/2021	0	18	W03	Chest markings	Male	No
April 2021	F5	3/24/2021	6	18	W05	Head spot	Unknown	Yes
April 2021	F6	3/23/2021	12	6	Unknown	none	Unknown	No
April 2021	E3	3/31/2021	15	54	W03	Chest markings	Unknown	Yes
April 2021	H7	4/1/2021	24	84	W06	Chest marking (lack)	Likely Female	Yes
April 2021	E5	4/3/2021	171	150	W02	Chest markings	Female	Yes
April 2021	F4	4/3/2021	18	54	W04	Chest markings	Unknown	No
April 2021	E4	4/10/2021	42	30	W02	Chest markings	Female	Yes
April 2021	F4	4/10/2021	0	18	W04	Chest markings	Unknown	No
April 2021	H7	4/16/2021	12	6	W06	Chest marking (lack thereof)	Likely Female	Yes
April 2021	G6	4/19/2021	54	66	W05	Chest marking (lack) and head spot	Unknown	Yes
May 2021	H7	4/24/2021	816	372	W06	Chest marking (lack) and scarring	Female	Yes

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
May 2021	H7	4/30/2021	24	36	W06	Chest marking (lack) and scarring	Female	Yes
May 2021	J6	5/5/2021	0	24	Unknown	none	Unknown	No
May 2021	G6	5/6/2021	13	30	W05	Chest marking (lack) and head spot	Unknown	Yes
May 2021	G4	5/7/2021	12	18	Unknown	Chest markings	Unknown	No
May 2021	K7	5/11/2021	60	78	W07	Chest markings	Female	Yes
n/a	Den01	3/8/2021	3	-	Unknown	none	Unknown	N/A
n/a	Den01	3/13/2021	3	-	Unknown	none	Unknown	N/A
n/a	Den01	3/23/2021	3	-	Unknown	White throat seen from side view	Unknown	N/A
n/a	Den01	4/1/2021	3	-	Unknown	none	Unknown	N/A
n/a	Den01	4/6/2021	3	-	Unknown	none	Unknown	N/A
n/a	Den02	3/13/2021	3	-	W04	Chest markings	Unknown	N/A
February	G6	1/2/2022	108	108	W03	Chest Markings	Male	Yes
February	G6	1/2/2022	18	12	W03	Chest Markings	Male	No
February	G6	2/2/2022	18	2	W03	Chest Markings	Male	No
February	E6	5/2/2022	0	114	W05	Chest Markings	Male	No
February	E6	6/2/2022	2868	192	W08	Chest Markings	Female	Yes
February	E6	6/2/2022	1444	180	W08	Chest Markings	Female	Yes
February	E6	6/2/2022	24	84	W08	Chest Markings	Female	Yes
February	E6	9/2/2022	12	144	W08	Chest Markings	Female	No
February	E6	13/2/2022	*	396	W05	Chest Markings	Male	Yes
February	E6	13/2/2022	-	-	W08	Chest Markings	Female	No

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
February	E6	14/2/2022	0	84	W08	Chest Markings	Female	No
February	E6	14/2/2022	18	6	W05	Chest Markings	Male	Yes
February	F7	24/2/2022	54	36	W08	Chest Markings	Female	Yes
February	F7	24/2/2022	0	72	W08	Chest Markings	Female	No
February	F7	25/2/2022	0	6	W08	Chest Markings	Female	No
March	D5	14/3/2022	-	66	W05	Chest Markings	Male	Yes
March	E5	22/3/2022	99	279	W05	Chest Markings	Male	Yes
March	E5	22/3/2022	12	69	W05	Chest Markings	Male	No
March	E5	23/3/2022	45	111	W05	Chest Markings	Male	Yes
March	E5	23/3/2022	6	24	W05	Chest Markings	Male	No
March	E6	8/3/2022	0	12	Unknown	No view of chest	Unknown	No
March	F7	8/3/2022	72	42	W08	Chest Markings	Female	Yes
March	F7	9/3/2022	12	18	W08	Chest Markings	Female	Yes
March	I6	6/3/2022	36	150	W01	Chest Markings	Male	Yes
March	J6	8/3/2022	54	78	W01	Chest Markings	Male	Yes
March	I6	8/3/2022	0	12	Unknown	No view of chest	Unknown	No
March	J6	15/3/2022	36	78	W07	Chest Markings	Female	Yes
March	J7	11/3/2022	48	0	W01	Chest Markings	Male	Yes
April	D5	23/3/2022	*	15	W02	Chest Markings	Female	Yes
April	D5	24/3/2022	*	81	W02	Chest Markings	Female	Yes
April	D5	24/3/2022	*	45	W02	Chest Markings	Female	Yes
April	D5	2/4/2022	*	78	W02	Chest Markings	Female	Yes
April	D5	3/4/2022	*	36	W02	Chest Markings	Female	Yes

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
April	D5	5/4/2022	*	18	W02	Chest Markings	Female	Yes
April	D5	6/4/2022	*	57	W02	Chest Markings	Female	Yes
April	D5	7/4/2022	*	21	W02	Chest Markings	Female	Yes
April	D5	13/4/2022	*	45	W02	Chest Markings	Female	Yes
April	D5	23/4/2022	*	24	W02	Chest Markings	Female	Yes
April	E3	28/3/2022	147	195	W10	Chest Markings	Male	Yes
April	E3	29/3/2022	72	198	W10	Chest Markings	Male	Yes
April	E3	30/3/2022	6	321	W10	Chest Markings	Male	Yes
April	E4	24/3/2022	372	132	W03	Chest Markings	Male	Yes
April	E4	24/3/2022	342	30	W03	Chest Markings	Male	Yes
April	E4	25/3/2022	30	12	W03	Chest Markings	Male	Yes
April	E4	25/3/2022	666	192	W03	Chest Markings	Male	Yes
April	E4	25/3/2022	1197	210	W03	Chest Markings	Male	Yes
April	E4	26/3/2022	303	102	W03	Chest Markings	Male	Yes
April	E5	24/3/2022	27	21	W04	No white on neck	Male	No
April	E5	24/3/2022	36	156	W05	Chest Markings	Male	No
April	E5	24/3/2022	51	57	W08	Chest Markings	Female	No
April	E5	25/3/2022	42	18	W05	Chest Markings	Male	Yes
April	E5	25/3/2022	84	0	W05	Chest Markings	Male	No
April	E5	25/3/2022	9	3	W05	Chest Markings	Male	Yes
April	E5	30/3/2022	18	9	W05	Chest Markings	Male	No
April	E5	6/4/2022	9	6	W08	Chest Markings	Female	No
April	E5	10/4/2022	15	3	W05	Chest Markings	Male	Yes

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
April	E5	11/4/2022	21	15	W05	Chest Markings	Male	No
April	E6	25/3/2022	18	66	W08	Chest Markings	Female	Yes
April	E6	29/3/2022	450	12	W05	Chest Markings	Male	Yes
April	E6	31/3/2022	600	24	W05	Chest Markings	Male	Yes
April	E6	31/3/2022	204	6	W05	Chest Markings	Male	Yes
April	E6	1/4/2022	18	24	W08	Chest Markings	Female	Yes
April	E6	8/4/2022	6	6	W05	Chest Markings	Male	Yes
April	E6	27/3/2022	0	12	W08	Chest Markings	Female	No
April	E6	4/4/2022	0	6	Unknown	No clear identification	Unknown	No
April	E6	23/4/2022	0	6	W11	Chest Markings	Unknown	No
April	F4	31/3/2022	18	36	W04	Chest Markings	Unknown	Yes
April	F4	30/3/2022	0	18	W04	Chest Markings	Unknown	No
April	F4	30/3/2022	0	6	Unknown	Most likely W04. Not confirmed	Unknown	No
April	F4	31/3/2022	0	6	Unknown	Most likely W04. Not confirmed	Unknown	No
April	F4	31/3/2022	0	72	W04	Chest Markings	Unknown	Yes
April	F5	28/4/2022	43	120	W03	Chest Markings	Male	Yes
April	F6	8/4/2022	1152	246	W08	Chest Markings	Female	Yes
April	F6	8/4/2022	150	75	W08	Chest Markings	Female	Yes
April	F6	8/4/2022	324	99	W08	Chest Markings	Female	Yes
April	F6	8/4/2022	612	129	W08	Chest Markings	Female	Yes
April	F6	9/4/2022	288	402	W08	Chest Markings	Female	Yes
April	F6	16/4/2022	114	0	W05	Chest Markings	Male	Yes

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
April	F6	21/4/2022	42	15	W12	Chest Markings	Unknown	Yes
April	F6	28/4/2022	138	48	W05	Chest Markings	Male	Yes
April	F7	29/3/2022	126	84	W08	Chest Markings	Female	Yes
April	F7	29/3/2022	18	30	W08	Chest Markings	Female	Yes
April	F7	4/4/2022	30	12	W08	Chest Markings	Female	Yes
April	F7	17/4/2022	12	12	W08	Chest Markings	Female	Yes
April	G6	28/3/2022	186	132	W05	Chest Markings	Male	Yes
April	G6	28/3/2022	102	72	W05	Chest Markings	Male	Yes
April	G6	29/3/2022	84	54	W05	Chest Markings	Male	Yes
April	G6	29/3/2022	96	42	W08	Chest Markings	Female	Yes
April	G6	1/4/2022	54	60	W08	Chest Markings	Female	Yes
April	G6	4/4/2022	36	18	W08	Chest Markings	Female	Yes
April	G6	9/4/2022	30	18	W05	Chest Markings	Male	Yes
April	G6	19/4/2022	36	0	W08	Chest Markings	Female	Yes
April	G6	28/4/2022	36	36	Unknown	No clear identification		Yes
April	G7	2/4/2022	66	102	W05	Chest Markings	Male	Yes
April	G7	9/4/2022	12	36	W05	Chest Markings	Male	Yes
April	G7	19/4/2022	6	12	W05	Chest Markings	Male	Yes
April	H6	18/4/2022	1	0	W05	Chest Markings	Male	Yes
April	H6	19/4/2022	1	0	W05	Chest Markings	Male	Yes
April	I5	24/3/2022	210	150	W09	Chest Markings	Female	Yes
April	I5	1/4/2022	24	54	W01	Chest Markings	Male	Yes
April	J6	4/4/2022	6	0	Unknown	No clear identification	Unknown	No

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
April	J7	29/3/2022	0	6	Unknown	No clear identification	Unknown	No
April	K5	1/4/2022	12	12	W01	Chest Markings	Male	Yes
May	E5	5/5/2022	60	102	W08	Chest Markings	Female	
May	E5	9/5/2022	75	15	W08	Chest Markings	Female	Yes
May	E5	9/5/2022	54	87	W11	Chest Markings	Female	Yes
May	F5	24/5/2022	24	18	W03	Chest Markings	Male	Yes
May	G6	6/5/2022	102	204	W05	Chest Markings	Male	Yes
May	G6	6/5/2022	90	162	W05	Chest Markings	Male	Yes
May	G6	6/5/2022	54	30	W05	Chest Markings	Male	Yes
May	G6	6/5/2022	18	24	W05	Chest Markings	Male	Yes
May	G6	7/5/2022	12	30	W08	Chest Markings	Female	Yes
May	G6	15/5/2022	18	0	W05	Chest Markings	Male	Yes
May	G6	7/5/2022	0	12	W08	Chest Markings	Female	No
May	D6	8/5/2022	288	132	W02	Chest Markings	Female	Yes
May	D6	8/5/2022	102	60	W02	Chest Markings	Female	Yes
May	D6	9/5/2022	114	66	W02	Chest Markings	Female	
May	E6	3/5/2022	336	102	W08	Chest Markings	Female	Yes
May	E6	3/5/2022	-	-	W08	Chest Markings	Female	Yes
May	E6	3/5/2022	6	30	Unknown	No clear identification	Unknown	Yes
May	E6	4/5/2022	792	222	W08	Chest Markings	Female	Yes
May	E6	5/5/2022	78	30	W08	Chest Markings	Female	Yes
May	E6	5/5/2022	18	42	W05	Chest Markings	Male	Yes
May	E6	10/5/2022	24	6	W08	Chest Markings	Female	Yes

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
May	E6	15/5/2022	12	0	W12	Chest/Head Markings	Unknown	Yes
May	E6	16/5/2022	6	6	W08	Chest Markings	Female	Yes
May	E6	23/5/2022	12	12	W11	Chest Markings	Female	No
May	E6	7/5/2022	0	18	W05	No white on neck	Male	No
May	E6	7/5/2022	0	6	W05	Chest Markings	Male	No
May	E6	9/5/2022	0	30	W05	Chest Markings	Male	No
May	E6	26/5/2022	0	6	Unknown	No clear identification	Unknown	No
May	E6	30/5/2022	0	12	Unknown	No clear identification	Unknown	No
May	E6	31/5/2022	0	6	Unknown	No clear identification	Unknown	No
May	E6	13/6/2022	0	12	Unknown	No clear identification	Unknown	No
May	E6	14/6/2022	0	6	Unknown	No clear identification	Unknown	No
May	E6	26/6/2022	0	6	Unknown	No clear identification	Unknown	No
May	F4	9/5/2022	84	108	W03	Chest Markings	Male	Yes
May	F4	15/5/2022	18	6	W03	Chest Markings	Male	Yes
May	F4	22/5/2022	30	18	W04	Chest Markings	Unknown	Yes
May	F6	2/5/2022	66	39	W08	Chest Markings	Female	Yes
May	F6	2/5/2022	54	30	W08	Chest Markings	Female	Yes
May	F6	5/5/2022	6	6	W05	Chest Markings	Male	Yes
May	F6	16/5/2022	6	6	W08	Chest Markings	Female	Yes
May	G4	4/5/2022	16	0	W04	Chest Markings	Unknown	No
May	L6	14/6/2022	0	6	Unknown	No clear identification	Unknown	No
May	Den Cam 4a	21 1 2022	-	3	Unknown	No clear identification	Unknown	N/A
May	Den Cam 4a	23/3/2022	-	3	Unknown	No clear identification	Unknown	N/A

Study Interval	Station	Date	Photos (White flash Camera)	Photos (Infrared Camera)	Animal ID	Identifying Features	Gender from Photo	Climbed Run Pole?
May	Den Cam 4b	21 1 2022	-	3	Unknown	No clear identification	Unknown	N/A
May	Den Cam 4b	5/5/2022	-	3	Unknown	No clear identification	Unknown	N/A
May	Den Cam 4b	9/5/2022	-	3	Unknown	No clear identification	Unknown	N/A

*** Camera Malfunction resulting in no photos**

Station	Date	Animal ID	Gender
L6	2021-02-10	W01	Unknown
I6	2022-03-06	W01	Male
J6	2022-03-08	W01	Male
J7	2022-03-11	W01	Male
I5	2022-04-01	W01	Male
K5	2022-04-01	W01	Male

Legend

Route Label

- Alternative 1
- Alternative 2
- Alternative 3
- Wolverine Local Study Area (LSA 11 km from Centreline of Route Alternatives)
- Wolverine Regional Study Area (RSA 75 km from either side of LSA Boundary)
- Wolverine Sampling Station Location
- 2022 Station Visited
- 2021 Station Visited
- 2022
- First Nation Reserve
- Waterbody
- Watercourse
- Provincial Park

DRAFT

WSR WEBEQUIE SUPPLY ROAD

NOTES

1. Coordinate System: NAD 1983 UTM Zone 16N.
2. Cadastral boundaries are for informational purposes only and should not be considered suitable for legal, engineering, or surveying purposes.
3. Topographic/landcover features obtained from CanVec v12.0 dataset, Natural Resources Canada Earth and Sciences Sector Centre for Topographic Information; and, Land Information Ontario (LIO) Warehouse Open Data (https://geohub.lio.gov.on.ca/), Ontario Ministry of Natural Resources and Forestry (OMNRF) Download Date : 2021-02-04

DISCLAIMER

0 10 20 Km

Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W01

Figure Number:	X	REV:	PA
Client: Webequie First Nation	Project Number: 661910	Date: 3/25/2026	

DSC	DRN	CHK	APP
	LZ	JP	JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

Document Path: \\tor01\PROJECTS\E&W\Projects\661910 - Webequie First Nation Supply Rd\40_Execution\45_GIS_Dwgs\MXD\Wildlife\Wolverine\Runpole\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001.aprx

SIZE 11x17

SIZE 11x17

Station	Date	Animal ID	Gender
E4	2021-02-24	W02	Female
F6	2021-03-20	W02	Female
F6	2021-03-21	W02	Female
E5	2021-04-03	W02	Female
E4	2021-04-10	W02	Female
D5	2022-03-23	W02	Female
D5	2022-03-24	W02	Female
D5	2022-03-24	W02	Female
D5	2022-04-02	W02	Female
D5	2022-04-03	W02	Female
D5	2022-04-05	W02	Female
D5	2022-04-06	W02	Female
D5	2022-04-07	W02	Female
D5	2022-04-13	W02	Female
D5	2022-04-23	W02	Female
D6	2022-05-08	W02	Female
D6	2022-05-08	W02	Female
D6	2022-05-09	W02	Female

Legend

Route Label

- Alternative 1
- Alternative 2
- Alternative 3
- Wolverine Local Study Area (LSA 11 km from Centreline of Route Alternatives)
- Wolverine Regional Study Area (RSA 75 km from either side of LSA Boundary)
- Wolverine Sampling Station Location
- 2022 Station Visited
- 2021 Station Visited
- 2022
- 2021
- First Nation Reserve
- Waterbody
- Watercourse
- Provincial Park

DRAFT

WSR WEBEQUIE SUPPLY ROAD

NOTES

1. Coordinate System: NAD 1983 UTM Zone 16N.
2. Cadastral boundaries are for informational purposes only and should not be considered suitable for legal, engineering, or surveying purposes.
3. Topographic/landcover features obtained from CanVec v12.0 dataset, Natural Resources Canada Earth and Sciences Sector Centre for Topographic Information; and, Land Information Ontario (LIO) Warehouse Open Data (https://geohub.lio.gov.on.ca/), Ontario Ministry of Natural Resources and Forestry (OMNRF) Download Date : 2021-02-04

0 10 20 Km

Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W02

Figure Number:		REV:
X		PA
Client:	**Project Number:**	**Date:**
Webequie First Nation	661910	3/25/2026

DSC	DRN	CHK	APP
	LZ	JP	JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

Document Path: \\tor01\PROJECTS\E&W\Projects\661910 - Webequie First Nation Supply Rd\40_Execution\45_GIS_Dwgs\MXD\Wildlife\Wolverine\Runpole\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001.aprx

Station	Date	Animal ID	Gender
F5	2021-03-22	W03	Male
F5	2021-03-22	W03	Male
E3	2021-03-31	W03	Unknown
G6	2022-02-01	W03	Male
G6	2022-02-01	W03	Male
G6	2022-02-02	W03	Male
E4	2022-03-24	W03	Male
E4	2022-03-24	W03	Male
E4	2022-03-25	W03	Male
E4	2022-03-25	W03	Male
E4	2022-03-25	W03	Male
E4	2022-03-26	W03	Male
F5	2022-04-28	W03	Male
F5	2022-05-24	W03	Male
F4	2022-05-09	W03	Male
F4	2022-05-15	W03	Male

Legend

Route Label

- Alternative 1
- Alternative 2
- Alternative 3
- Wolverine Local Study Area (LSA 11 km from Centreline of Route Alternatives)
- Wolverine Regional Study Area (RSA 75 km from either side of LSA Boundary)
- Wolverine Sampling Station Location
- 2022 Station Visited
- 2021 Station Visited
- 2022
- 2021
- First Nation Reserve
- Waterbody
- Watercourse
- Provincial Park

DRAFT

WSR WEBEQUIE SUPPLY ROAD

NOTES

1. Coordinate System: NAD 1983 UTM Zone 16N.
2. Cadastral boundaries are for informational purposes only and should not be considered suitable for legal, engineering, or surveying purposes.
3. Topographic/landcover features obtained from CanVec v12.0 dataset, Natural Resources Canada Earth and Sciences Sector Centre for Topographic Information; and, Land Information Ontario (LIO) Warehouse Open Data (https://geohub.lio.gov.on.ca/), Ontario Ministry of Natural Resources and Forestry (OMNRF) Download Date : 2021-02-04

Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W03

Figure Number:		REV:
X		PA
Client:	**Project Number:**	**Date:**
Webequie First Nation	661910	3/25/2026

DSC	DRN	CHK	APP
	LZ	JP	JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

Document Path: \\tor01\PROJECTS\E&W\Projects\661910 - Webequie First Nation Supply Rd\40_Execution\45_GIS_Dwgs\MXD\Wildlife\Wolverine\Runpole\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001\661910_WSR_WLD_WolverineRunPoleMCP_0001_0001.aprx

SIZE 11x17

Station	Date	Animal ID	Gender
Den02	2021-03-13	W04	
F4	2021-04-03	W04	Unknown
F4	2021-04-10	W04	Unknown
E5	2022-03-24	W04	Male
F4	2022-03-30	W04	Unknown
F4	2022-03-31	W04	Unknown
F4	2022-03-31	W04	Unknown
G4	2022-05-04	W04	Unknown
F4	2022-05-22	W04	Unknown

Legend

Route Label

- Alternative 1
- Alternative 2
- Alternative 3
- Wolverine Local Study Area (LSA 11 km from Centreline of Route Alternatives)
- Wolverine Regional Study Area (RSA 75 km from either side of LSA Boundary)
- Wolverine Sampling Station Location
- 2022 Station Visited
- 2021 Station Visited
- 2022
- 2021
- First Nation Reserve
- Waterbody
- Watercourse
- Provincial Park

DRAFT

WSR WEBEQUIE SUPPLY ROAD

NOTES

1. Coordinate System: NAD 1983 UTM Zone 16N.
2. Cadastral boundaries are for informational purposes only and should not be considered suitable for legal, engineering, or surveying purposes.
3. Topographic/landcover features obtained from CanVec v12.0 dataset, Natural Resources Canada Earth and Sciences Sector Centre for Topographic Information; and, Land Information Ontario (LIO) Warehouse Open Data (https://geohub.lio.gov.on.ca/), Ontario Ministry of Natural Resources and Forestry (OMNRF) Download Date : 2021-02-04

0 10 20 Km

Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W04

Figure Number:		REV:
X		PA
Client:	**Project Number:**	**Date:**
Webequie First Nation	661910	3/25/2026

DSC	DRN	CHK	APP
	LZ	JP	JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

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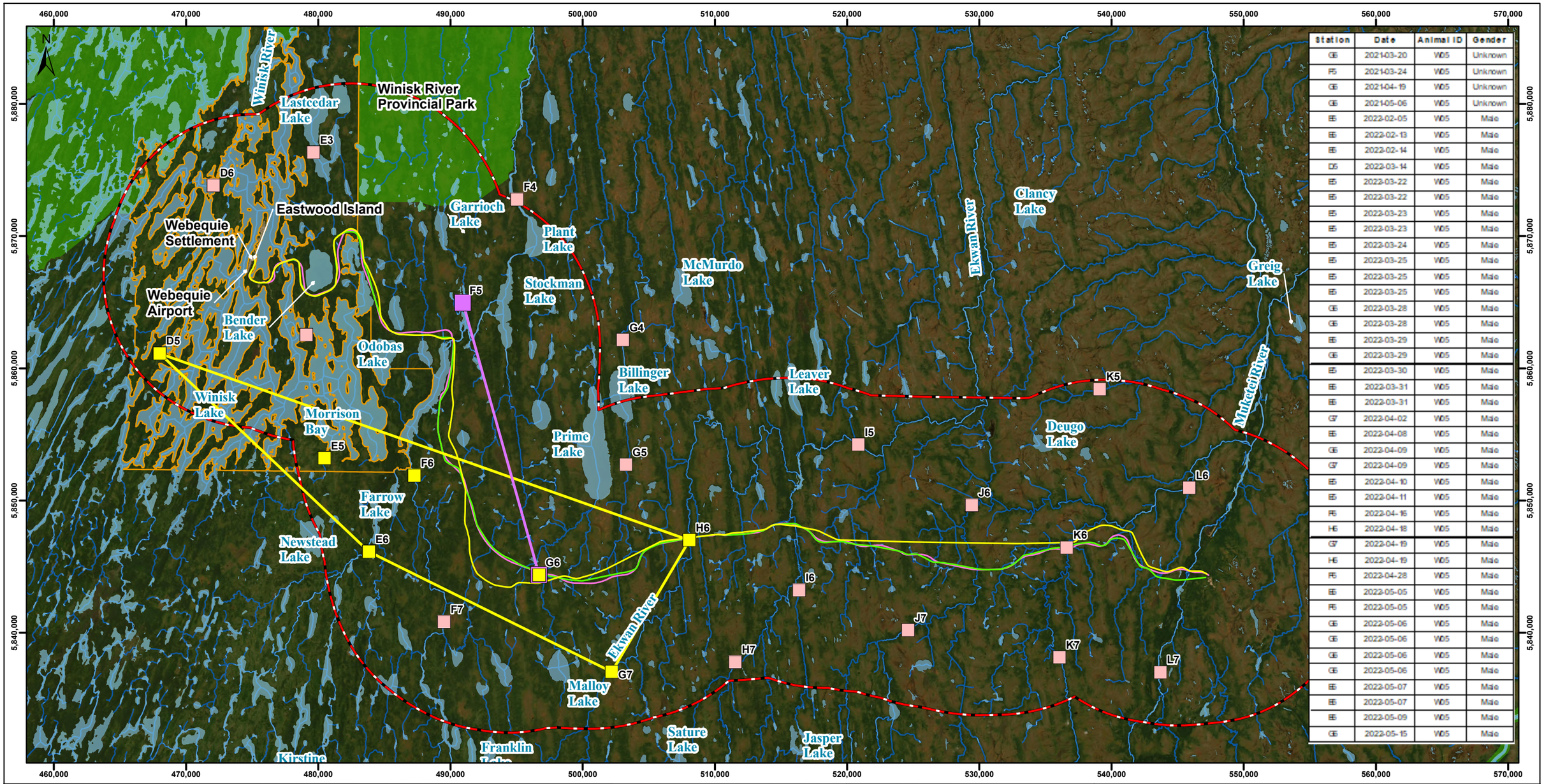


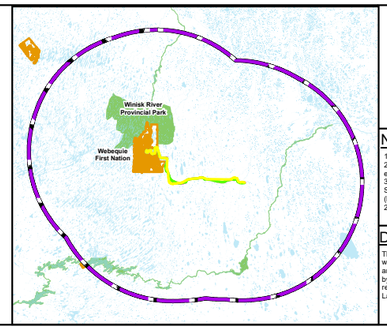
Station	Date	Animal ID	Gender
G6	2021-03-20	W05	Unknown
F5	2021-03-24	W05	Unknown
G6	2021-04-19	W05	Unknown
G6	2021-05-06	W05	Unknown
E5	2022-02-05	W05	Male
E5	2022-02-13	W05	Male
E5	2022-02-14	W05	Male
D5	2022-03-14	W05	Male
E5	2022-03-22	W05	Male
E5	2022-03-22	W05	Male
E5	2022-03-23	W05	Male
E5	2022-03-23	W05	Male
E5	2022-03-24	W05	Male
E5	2022-03-25	W05	Male
E5	2022-03-25	W05	Male
E5	2022-03-25	W05	Male
G6	2022-03-28	W05	Male
G6	2022-03-28	W05	Male
E5	2022-03-29	W05	Male
G6	2022-03-29	W05	Male
E5	2022-03-30	W05	Male
E5	2022-03-31	W05	Male
E5	2022-03-31	W05	Male
G7	2022-04-02	W05	Male
E5	2022-04-08	W05	Male
G6	2022-04-09	W05	Male
G7	2022-04-09	W05	Male
E5	2022-04-10	W05	Male
E5	2022-04-11	W05	Male
F5	2022-04-16	W05	Male
H6	2022-04-18	W05	Male
G7	2022-04-19	W05	Male
H6	2022-04-19	W05	Male
F5	2022-04-28	W05	Male
E5	2022-05-05	W05	Male
F5	2022-05-05	W05	Male
G6	2022-05-06	W05	Male
G6	2022-05-06	W05	Male
G6	2022-05-06	W05	Male
G6	2022-05-06	W05	Male
E5	2022-05-07	W05	Male
E5	2022-05-07	W05	Male
E5	2022-05-09	W05	Male
G6	2022-05-15	W05	Male

SIZE 11x17

Legend

Route Label

- Alternative 1
- Alternative 2
- Alternative 3
- Wolverine Local Study Area (LSA 11 km from Centreline of Route Alternatives)
- Wolverine Regional Study Area (RSA 75 km from either side of LSA Boundary)
- Wolverine Sampling Station Location
- 2022 Station Visited
- 2021 Station Visited
- 2022
- 2021
- First Nation Reserve
- Waterbody
- Watercourse
- Provincial Park



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WSR WEBEQUIE SUPPLY ROAD

0 10 20 Km

NOTES

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Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W05

Figure Number: X		**REV:** PA	
Client: Webequie First Nation	**Project Number:** 661910	**Date:** 3/25/2026	
DSC		**DRN**	**CHK** / **APP**
		LZ	JP / JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

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460,000 470,000 480,000 490,000 500,000 510,000 520,000 530,000 540,000 550,000 560,000 570,000

5,880,000 5,870,000 5,860,000 5,850,000 5,840,000

N

Winisk River
Winisk River Provincial Park
Lastcedar Lake
E3
D6
Eastwood Island
Webequie Settlement
Webequie Airport
Bender Lake
D5
Odobas Lake
Winisk Lake
Morrison Bay
E5
F6
Farrow Lake
Newstead Lake
E6
G6
F7
F4
Garrioch Lake
Plant Lake
F5
Stockman Lake
McMurdo Lake
G4
Billinger Lake
Prime Lake
G5
Leaver Lake
Ekwan River
Clancy Lake
K5
Mukeetei River
Greig Lake
Deugo Lake
I5
L6
J6
H6
K6
I6
J7
K7
L7
H7
G7
Malloy Lake
Sature Lake
Jasper Lake
Franklin Lake
Kirstine

Station	Date	Animal ID	Gender
E6	2022-02-06	W08	Female
E6	2022-02-06	W08	Female
E6	2022-02-06	W08	Female
E6	2022-02-09	W08	Female
E6	2022-02-13	W08	Female
E6	2022-02-14	W08	Female
F7	2022-02-24	W08	Female
F7	2022-02-24	W08	Female
F7	2022-02-25	W08	Female
F7	2022-03-08	W08	Female
F7	2022-03-09	W08	Female
E5	2022-03-24	W08	Female
E6	2022-03-25	W08	Female
E6	2022-03-27	W08	Female
F7	2022-03-29	W08	Female
F7	2022-03-29	W08	Female
G6	2022-03-29	W08	Female
E6	2022-04-01	W08	Female
G6	2022-04-01	W08	Female
F7	2022-04-04	W08	Female
G6	2022-04-04	W08	Female
E5	2022-04-06	W08	Female
F6	2022-04-08	W08	Female
F6	2022-04-08	W08	Female
F6	2022-04-08	W08	Female
F6	2022-04-08	W08	Female
F6	2022-04-09	W08	Female
F7	2022-04-17	W08	Female
G6	2022-04-19	W08	Female
F6	2022-05-02	W08	Female
F6	2022-05-02	W08	Female
E6	2022-05-03	W08	Female
E6	2022-05-03	W08	Female
E6	2022-05-04	W08	Female
E5	2022-05-05	W08	Female
E6	2022-05-05	W08	Female
G6	2022-05-07	W08	Female
G6	2022-05-07	W08	Female
E5	2022-05-09	W08	Female
E6	2022-05-10	W08	Female
E6	2022-05-16	W08	Female
F6	2022-05-16	W08	Female

SIZE 11x17

Legend

Route Label

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- Alternative 2
- Alternative 3
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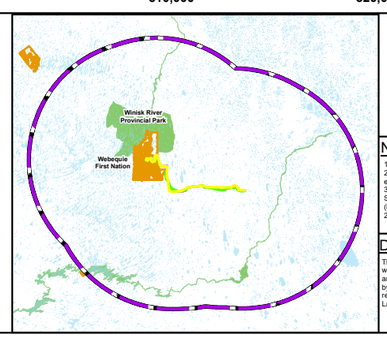

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WSR WEBEQUIE SUPPLY ROAD

NOTES

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0 10 20 Km

Webequie Supply Road (WSR)

Wolverine Occupancy Sampling Station Occurrences and Movement MCP: Animal W08

Figure Number: X		**REV:** PA	
Client: Webequie First Nation	**Project Number:** 661910	**Date:** 3/25/2026	
DSC		**DRN** LZ	**CHK** JP	**APP** JP

SIZE 11 X 17 Service Layer Credits: World Imagery: Earthstar Geographics

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4 Aquatic Species at Risk

The only identified Aquatic Species at Risk in the local study area and regional (encompassing tertiary watersheds crossed by the Project) study area is the Lake Sturgeon. Lake Sturgeon are the largest freshwater fish species that occurs in Ontario, and Ontario's only member of the sturgeon family. Lake Sturgeon are potamodromous (i.e., migratory and live strictly within freshwater). They are a large, slow–growing, and late maturing, migratory species that move extensively between habitats to fulfil seasonal and life history stage requirements.

4.1 Lake Sturgeon (Southern Hudson Bay – James Bay Population)

Ontario recognizes the Southern Hudson Bay – James Bay Lake Sturgeon population is listed as a species of **Special Concern** under the Ontario *Endangered Species Act* (ESA) and the Species at Risk in Ontario (SARO) list. Similarly, Lake Sturgeon is listed as a species of **Special Concern** under the federal *Species at Risk Act* under a Section 11 agreement. Under ESA, a species of **Special Concern** is considered a species that may become **Threatened** or **Endangered** if conditions worsen but is not yet at that level. While Ontario also does not provide automatic prohibitions for Special Concern species, it does require monitoring and management.

4.1.1 MNR-275

In Section ES 8.8.3 of the EAR/IS, Ministry of Natural Resources (MNR) notes that there doesn't seem to be any mitigation specific to Lake Sturgeon. Further, the Southern Hudson Bay-James Bay population (Lake Sturgeon) is listed as **Special Concern** on the Species at Risk in the Ontario list. These fish can easily be impacted by human development, especially through increased access to fish stocks and habitat degradation from water crossing structures (that are often planned within waterbody narrowings that function as spawning habitat).

MNR requests that in the Final EA, that the Project Team describe the mitigation and potential impacts specific to Lake Sturgeon (See **Section 1.1.2**). For example, if no structures are going to be designed to have abutments within the watercourse, please state this (See **Section 1.1.3**).

4.1.1.1 Lake Sturgeon Potential Impacts and Mitigation

The Project Team asks MNR to note that the potential effects and mitigation measures presented in Section ES 8.8.3 are generic measures for all Species at Risk (SAR) including terrestrial and aquatic SAR. The detailed assessment for fish and fish habitat, in general, is presented Section 10 (Sections 10.3 (effects) and 10.4 (mitigation)). While the detailed assessment of effects and mitigation measures for each Species at Risk is presented in Section 13 for all SAR. The Final EAR/IS provides the potential impacts and mitigation measures specific to Lake Sturgeon as part of Section 13. MNR is specifically referred to Table 13-48 as it provides an overall summary of the potential effects and mitigation measures that are presented above for Species at Risk VC – Lake Sturgeon during the construction and operations phases.

The Project is located entirely within the Southwestern Hudson Bay Primary Watershed. All waterbodies in this watershed generally flow northeast towards Hudson Bay. Major rivers in the watershed in Ontario include the Severn River, Winisk River, Ekwan River, and the Attawapiskat River. The RSA for Lake Sturgeon extends into three secondary watersheds including the Ekwan River, Winisk River, and Attawapiskat River. The RSA for the Project extends into four tertiary watersheds (Figure 10.2):

1. Upper Winisk Watershed;
2. Middle Winisk Watershed;
3. Upper Ekwan Watershed; and
4. Lower Attawapiskat Watershed.

The specific impacts and mitigation measures for Lake Sturgeon are covered in the various Subsections/Tables of Section 13 of the EAR/IS as referred to below.

Table 13-11 summarizes project interactions with Fish and Fish Habitat Valued Component (VC) and potential effects. These interactions are discussed in subsequent sections as they apply to Lake Sturgeon.

Table 13-40 presents the currently proposed bridge structures and area of potential impact. Waterbodies that have the potential to support Lake Sturgeon based on their habitat characteristics will be crossed using bridge structures. These watercourses and waterbodies are:

- Winisk Lake (WB-1);
- Winiskesis Channel (WC-3);
- Muketei River (WC-26); and
- WC-27 (inferred based on direct connection to WC-3 and Winisk Lake).

Table 13-41 presents a summary of the threats assessment for potential effects on Lake Sturgeon which suggests a low degree of effect. Threats are assessed prior to any mitigative measures being applied. The threat assessment process is generally done at the population level but can be done at a more regional level. Lake Sturgeon, which can travel hundreds of kilometres as part of their reproduction, were evaluated at the tertiary watershed level which is the Lake Sturgeon specific RSA level. The Degree of Effect was evaluated as low across all threats based on screening by scope, severity, magnitude and irreversibility of the effect.

Table 13-42 summarizes the potential effects, effects pathways, effect indicators, nature of effect, and linked VCs for all the SAR including for Lake Sturgeon and Lake Sturgeon Habitat VC. This Table provides the links to the effects assessment of other VCs in the EAR/IS that informed the VCs in this Table.

Table 13-48 provides an overall Summary of Potential Effects, Mitigation Measures and Predicted Net Effects for Species at Risk VC – Lake Sturgeon. This table includes the Fish and Fish Habitat Valued Component, the indicator of impact, the project phase, project component/activity, the effect pathway, and the key mitigation measures to be implemented.

Similar to the Fish and Fish Habitat Section (Section 10), Lake Sturgeon potential effects and indicators were selected based on review of similar environmental assessments for linear projects (such as roadways, transmission lines, and pipelines) in Ontario and within Canada, comments provided during the engagement process, and professional judgement.

The potential effects (Section 13.3.12) fall within five categories:

- Destruction of Fish Habitat (Section 13.3.12.1.1);
- Harmful Alteration or Disruption of Fish Habitat (Section 13.3.12.1.2);
- Barriers to Fish Passage (Section 13.3.12.1.3);
- Injury or Death of Fish (Section 13.3.12.2.1); and
- Increased Harvest (Section 13.3.12.1.4).

Section 13.4.7 provides detailed descriptions of proposed mitigations measures to prevent or limit the effect of construction and operations on Lake Sturgeon.

Habitat offsetting and enhancement (Section 13.4.7.2.2) indicates while the number of temporary and permanent water crossings for the Project will be minimized, that the Project will result in death of fish and Harmful Alteration, Disruption, and/or Destruction (HADD) of fish habitat within the Project Footprint. As a result, waterbodies where HADD and/or death of fish occur will require habitat offsetting in order to comply with the *Fisheries Act* and conditions anticipated in the *Fisheries Act* authorization(s). Habitat offsetting and enhancement requirements will be determined in consultation with DFO and First Nations during the detail design permitting phase of the Project.

Net effects after proposed mitigation measures are presented in Section 13.5.2.11. Although potential effects will be reduced with the implementation of the proposed mitigation measures outlined in Section 13.4.7, net effects on the Species At Risk VC (relating to Lake Sturgeon) may remain. Predicted net effects on the Fish and Fish Habitat VC are:

- Changes to Quantity and Quality of Fish Habitat:
  - Destruction/Loss of fish habitat;
  - Harmful alteration and disruption of fish habitat; and
  - Changes to fish access to habitats.
- Changes to Fish Populations:
  - Injury or Death of fish; and
  - Changes to public access resulting in increased harvest of fish.

Table 13-239 through to Table13-245 provide the characterization criteria, result and reason for the effect.

Tables 13-246 and Table 13-247 provide summaries of the characterized predicted net effects for Lake Sturgeon for the Project during the construction and operations phases, respectively.

Section 13.6.11 related to determination of significance for Lake Sturgeon infers that while net effects on Lake Sturgeon and Lake Sturgeon habitat are expected to occur, that due to the limited size of the roadway and the effectiveness of proposed mitigation measures, the Project's net effects are considered to be negligible to low in magnitude.

Section 13.7 provides the predicted net effects of the Project on the Lake Sturgeon that are carried forward for the assessment of cumulative effects and include:

- Changes in Fish Access to Habitats (during the operations phase); and
- Changes to Public Access to Fish Habitats (during operations phase).

Section 13.8.11 prediction confidence of Lake Sturgeon assessment is as follows:

- Overall confidence in the assessment of net effects on Lake Sturgeon and Lake Sturgeon habitat is high as the destruction of Lake Sturgeon habitat is relatively well known;
- Confidence in the assessment of net effects of changes to Lake Sturgeon access to habitats as a result barriers to Lake Sturgeon passage and Injury or Death of Lake Sturgeon is also considered high; and
- The confidence in the assessment of net effects of change in public access that may lead to increased Lake Sturgeon harvest is moderate.

For an overall synopsis, MNR is referred to Table 13-48 as it provides summaries of the potential effects and mitigation measures that are presented above for Species at Risk VC – Lake Sturgeon during the construction and operations phases.

4.1.1.2 Bridge Design for Lake Sturgeon Mitigation

The Project Team notes for MNR that 6 bridges are proposed over waterbody crossings will eliminate the potential for creation of barriers to fish passage (in particular, Lake Sturgeon). All the bridges will have abutments to support and anchor the bridge at both ends (up to 12 abutments with 6 bridges). The number of supporting piers with associated footings in the water will depend on the length of the bridge (e.g., large waterbody crossings, such as Winisk Lake (WB-1) requires a six-span bridge for a 250 m span over water). In addition, the Winisk Lake crossing will require the use a floating barge to install bridge piers within the lake. Waterbodies that have the potential to support Lake Sturgeon based on their habitat characteristics will be crossed using bridge structures (**Table 4-1**) below. These watercourses and waterbodies are Winisk Lake (WB-1), Winiskesis Channel (WC-3), Muketei River (WC-26), and WC-27 (inferred based on direct connection to WC-3 and Winisk Lake). Two additional proposed crossings include an unnamed tributary to Muketei River (WC-19 – single span) and Ekwan River crossing (WC-10 – single span). Table 4-2 (Section 4 Project Description) provides a complete list of waterbody crossings and proposed structure type for the Webequie Supply Road.

Table 4-1: Structure Types and Spans that may affect Lake Sturgeon

WC Number	Width (m)	Maximum Span (m)	Stream Width (m)	Number of Spans	Foundation Type	Number of Piers	Area of Aquatic Impact (m^2)	Area of Riparian Impact (m^2)
WC-1	253	253	250	7	Footing	7	437.5	115
WC-3	48	48	46	2	Footing	1	62.5	230
WC-26	35.0	35.0	30	1	Footing	0	0	322
WC-27	48	48	48	2	Footing	1	62.5	598

There are six composite steel-concrete bridges proposed for the WSR. Each bridge consists of a substructure comprised of the foundations, abutments and piers, all supporting the superstructure, which consists of the steel plate girders, the deck and the side barriers with railings. The primary activities (Section 4.4.2.5) associated with bridge construction include:

- Excavation and construction of land-based footings for abutments and where applicable for multispan bridges the drilling for piers located in-water;
- Placement of reinforced rebar for abutments and piers;
- Production and pouring of concrete for abutments and piers;
- Placement of steel girders to support bridge deck;
- Construction of bridge deck using reinforced concrete;
- Installing/forming side concrete barrier walls and railing on bridge deck; and
- Earth backfilling and compaction at bridge site to establish road.

To construct the required cast-in-place structural concrete elements of a bridge, there will be a requirement for an on-site concrete batch plant to produce concrete. A concrete batch plant will be established in close proximity to each bridge crossing location to produce concrete for the bridge abutments, piers and deck.

All of the proposed bridge crossings structures will be designed to maintain fish habitat underneath the bridge deck. Indigenous communities have identified the loss of fish habitat as a concern related to the project construction and have emphasized that fish habitat loss should be avoided, especially in spawning areas. Although there may be future refinements to the project design (such as pier footings for bridges) as the Project proceeds to the Detail Design Phase, the effects of bridge water-crossings are expected to be similar as assessed in this EAR/IS.

The bridge design considerations for Lake Sturgeon includes the following:

- Sturgeon will migrate long-distances upstream to spawn and depend on free-flowing rivers with coarse cobble substrates and fast-water areas below barriers.
- Sturgeon requires spawning sites that have clean cobble/rubble, continuous flows and unrestricted connectivity.
- While sturgeon are strong sustained swimmers, they are poor at leaping and require ample depth and low turbulence to move efficiently.

Therefore, to allow free sturgeon passage, the bridge design must be similar natural river conditions avoiding hydraulic constriction. Such, constrictions can cause increased downstream velocities potential creating a velocity barrier and downstream scour. A confined channel can also create a backwatering effect upstream. The bridge design and installation should:

- Span the entire bankfull channel plus allowances for channel migration (reduces constriction).
- Maintain natural substrate within the crossing (coarse gravel/cobble).
- Provide natural depth profiles, especially during high-flow migration periods.
- Preserve natural velocity regimes—avoid increasing velocity through constriction (e.g., depth, velocity and turbulence).
- Flow and migratory fish passage routes will be maintained at all crossings including bridges and culverts.
- Ensure bridge installation does not armour or smooth the channel.
- Restore coarse substrate if construction disturbs it.
- Model hydraulics for design flows relevant to migration timing to ensure Lake Sturgeon passage at high, moderate and low flows.

Overall bridge design includes consideration of abutments and pier/footings impact on local scour at abutments, upstream aggradation (sediment buildup)/downstream degradation (bed lowering), depth barriers, physical barriers, excessive turbulence, uneven flow distribution, downstream eddies, and possible downstream habitat disruption.

A bridge provides the best fish passage alternative, but care must be taken in its design and installation. Construction of watercourse crossings will occur outside of restricted activity periods to minimize or avoid risk of injury or mortality to fish.

5 References

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