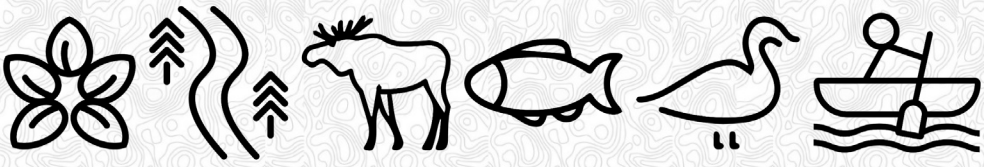
MARTEN FALLS FIRST NATION
ALL SEASON COMMUNITY ACCESS ROAD

FINAL

Ungulates (Moose and Caribou) Study Plan

May 2021



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Revision History

Rev #	Date	Revision Description
Draft	May 2020	Submitted “Study Plan –Ungulates [Moose (*Alces alces*) and Caribou (boreal population) (*Rangifer tarandus)* DRAFT FOR DISCUSSION” to the Agency
Final	May 2021	Revised to address federal and provincial agency comments

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Acronyms and Abbreviations

Agency, the ... Impact Assessment Agency of Canada
CAR ..... Community Access Road
CST..... Caribou Screening Tool

EA ..... Environmental Assessment
ENDM ..... Ontario Ministry of Energy, Northern Development and Mines
ESA..... Ontario Endangered Species Act, 2007
GHD..... General Habitat Description
HSI..... Habitat Suitability Index
IA ..... Impact Assessment
IAA..... *Impact Assessment Act*
IK ..... Indigenous Knowledge
IRA..... Integrated Range Assessments
IRAR ..... Integrated Range Assessment Reports
IS ..... Impact Statement
km ..... kilometre
LSA..... Local Study Area
MECP ..... Ontario Ministry of the Environment, Conservation and Parks
MFFN..... Marten Falls First Nation
MNRF ..... Ontario Ministry of Natural Resources and Forestry
NHIC ..... Natural Heritage Information Centre
OLCC..... Ontario Land Cover Compilation
PDA ..... Project Development Area
QA / QC ..... Quality assurance / Quality control
ROW ..... Right-of-way
RSA ..... Regional Study Area
RSPF ..... Resource Selection Probability Function
SAR ..... Species at Risk
TISG ..... Tailored Impact Statement Guidelines
ToR..... Terms of Reference
VC..... Valued Component
WMU..... Wildlife Management Unit

1. Introduction

The Proponent of the Community Access Road (CAR or the Project) is Marten Falls First Nation (MFFN), a remote First Nation community in northern Ontario located at the junction of the Albany and Ogoki rivers, approximately 430 kilometres (km) from Thunder Bay, Ontario. The MFFN community is proposing an all-season Community Access Road that will connect the MFFN community to Ontario's provincial highway network (Highway 643) to the south via the existing Painter Lake Road. MFFN, as the Proponent of the Project, has formed a MFFN CAR Project Team that includes MFFN CAR Community Member Advisors and MFFN CAR Project Consultants who act with input, guidance and direction from the MFFN Chief and Council.

This document outlines the Study Plan for the valued component (VC) Ungulates (moose [*Alces alces*] and caribou [boreal population; *Rangifer tarandus caribou*]) to support a coordinated Impact Assessment (IA) required for Project review by the Impact Assessment Agency of Canada (the Agency) under the federal *Impact Assessment Act* (IAA) and Environmental Assessment (EA) required for Project review by the Ontario Ministry of the Environment, Conservation and Parks (MECP) under the Ontario *Environmental Assessment Act*.

1.1 Federal and Provincial Terminology

The study plans have been prepared using federal terminology, however, the respective provincial terminology has been provided in **Table 1-1** for reference. The terms can be used interchangeably.

Table 1-1: Equivalent Federal and Provincial Terms

Provincial Term	Federal Term
Criteria	Valued Component
Impact Management Measure	Mitigation Measure
Net Effects	Residual Effects
Record of Consultation	Record of Engagement

1.2 Project Study Plans

This Study Plan is one of a group of study plans created for the Project. **Table 1-2** includes the study plans for each environmental[1] discipline currently planned for the Project and the valued components (VCs) covered by the study plans where applicable.

Table 1-2: Project Study Plans and Valued Components

Environmental Discipline	Study Plan Name	Valued Component(s)
Aboriginal and Treaty Rights and Interests	■ Aboriginal and Treaty Rights and Interests Study Plan	■ Indigenous Current Use of Lands and Resources for Traditional Purposes ■ Cultural Continuity (ability to practice and transmit cultural traditions)
Atmospheric Environment	■ Atmospheric Environment and Greenhouse Gases Study Plan	■ Air Quality ■ Greenhouse Gas Emissions
Climate Change	■ Climate Adaptation and Resiliency Study Plan	■ Climate Change
Acoustic and Vibration Environment	■ Acoustic and Vibration Environment Study Plan	■ Noise ■ Vibration
Physiography, Geology, Terrain and Soils	■ Physiography, Terrain and Soils Study Plan	■ Physiography, Terrain and Soils
Surface Water	■ Surface Water Study Plan	■ Surface Water
Groundwater and Geochemistry	■ Groundwater and Geochemistry Study Plan	■ Groundwater
Vegetation	■ Vegetation Study Plan	■ Wetland and Riparian Ecosystems ■ Upland Ecosystems ■ Designated Areas (Areas of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations) ■ Traditional Use Plants and SAR Plant Populations (including species with special conservation status or rarity in the province)
	■ Peatlands Study Plan	■ Peatland Ecosystems (bogs and fens)
Wildlife	■ Wildlife Study Plan	■ Bats (including SAR-bats such as: Little Brown Myotis [*Myotis lucifugus*], Northern Myotis [*Myotis septentrionalis*] and Tricolored Bat [*Perimyotis subflavus*]) ■ Fur Bearers (proxy VC[2] American Marten [*Martes americana*], Beaver [*Castor canadensis]* and Wolverine [*Gulo gulo*])

1. *The use of the term environment in this document is inclusive of the components of the environment that are included in the Ontario Environmental Assessment Act definition, which includes a general description of the social, cultural, built and natural environments.*
2. *A proxy VC is used when looking at the effects of one species that represents many others.*

Environmental Discipline	Study Plan Name	Valued Component(s)
		■ Amphibians and Reptiles ■ Pollinating Insects
	■ Ungulates (Moose and Caribou) Study Plan	■ Moose (*Alces alces*) ■ Caribou, boreal population (*Rangifer tarandus*)
	■ Bird Study Plan	■ Forest Birds (proxy VC of Red-eyed Vireo [*Vireo olivaceus*] for deciduous forest, Ovenbird [*Seirus aurocapilla*] for mixedwood forest, Dark-eyed Junco [*Junco hyemalis*] for coniferous forest and disturbed forest ■ Raptors (proxy VC of Osprey [*Pandion haliaetus*] for diurnal raptors and Boreal Owl [*Aegolius funereus*] for nocturnal raptors ■ Shorebirds (proxy VC of Wilson's Snipe [*Gallingo delicata*]) ■ Waterfowl (proxy VC of Mallard [*Anas platyrhynchos*]) ■ Bog / Fen Birds and Other Wetland Birds (proxy VC of Palm Warbler [*Setophaga palmarum*] for bogs, Common Yellowthroat [*Geothlypis trichas*] for fens; and Northern Waterthrush [*Parkesia noveboracensis*] for swamps. ■ SAR birds: Canada Warbler (*Cardellina canadensis*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Whip-poor-will (*Antrostomus vociferous*), Eastern Wood-Pewee (*Contopus virens*), Evening Grosbeak (*Coccothraustes vespertinus*), Olive-sided Flycatcher (*Contopus cooperi*), Bald Eagle (*Haliaeetus leucocephalus)*, Peregrine Falcon (*Falco peregrinus*), Short-eared Owl (*Asio flammeus)*, Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Black Tern (*Childonias niger*), Rusty Blackbird (*Euphagus carolinus*), Yellow Rail (*Coturnicops noveboracensis*)
Fish and Fish Habitat	■ Fish and Fish Habitat Study Plan	■ Lake Sturgeon (*Acipenser fulvescens*) ■ Walleye (*Sander vitreus*) ■ Brook Trout (*Salvelinus fontinalis*) ■ Northern Pike (*Esox lucius*) ■ Lake Whitefish (*Coregonus clupeaformis*) ■ Chain Pickerel (*Esox niger*) ■ Yellow Perch (*Perca flavescens*) ■ Cisco (*Coregonus artedii*) ■ Burbot (*Lota lota*) ■ Longnose Sucker (*Catostomus catostomus*) ■ White Sucker (*Catostomus commersonii*) ■ Forage / Prey Species (including species such as Lake Chub [*Couesius plumbeus*]) ■ Lower Trophic Organisms (e.g., benthic invertebrates)

Environmental Discipline	Study Plan Name	Valued Component(s)
Social	■ Social Study Plan	■ Housing and Accommodation ■ Community Service and Infrastructure ■ Transportation ■ Community Well-being ■ Populations and Demographics
Economy	■ Economic Study Plan	■ Regional Economy ■ Labour Force and Employment ■ Government Finances
Land and Resource Use	■ Land and Resource Use Study Plan	■ Land Use Compatibility ■ Parks and Protected Areas ■ Extractive Industry ■ Forestry Industry ■ Energy and Linear Infrastructure ■ Recreation and Tourism
Human Health and Community Safety	■ Human Health and Community Safety Study Plan	■ Public Safety ■ Public Health ■ Diet ■ Environmental Factors Influencing Health
Visual Aesthetics	■ Visual Aesthetics Study Plan	■ Visual Contrast / Character ■ Visibility ■ Visual Sensitivity
Archaeological and Cultural Heritage	■ Cultural Heritage Study Plan	■ Archaeological Sites and Resources ■ Built Heritage Resources and Cultural Heritage Landscapes

It should be noted that while there is not a consultation study plan, the Project has developed the *Consultation and Engagement Plan to Support the Environmental Assessment / Impact Statement* (AECOM 2020) (referred to as the Impact Statement [IS] / EA Consultation Plan).

2. Purpose and Objectives

The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative, direct and indirect) of the Project and alternatives on the environment, determine measures needed to avoid or minimize adverse Project effects, and enhance beneficial Project effects where feasible, and to undertake consultation and engagement throughout. The purpose of this Study Plan is to explain:

- A baseline[3] study methodology that will result in a comprehensive description of the existing environment potentially impacted by the Project;
- How efficient and transparent data management and analysis will be undertaken;
- Effects assessment scoping inputs specific to Ungulates (moose and caribou [boreal population]) that will allow for potential effects of the Project on the existing environment to be appropriately assessed in the IS / EA Report; and
- How the Study Plan aligns with federal and provincial requirements and guidance, including the Agency's Tailored Impact Statement Guidelines (TISG), dated February 24, 2020 (the Agency 2020c), for this Project and applicable provincial agency comments on the Draft Terms of Reference (ToR)[4].

As required by the IAA and referenced in TISG Section 7.3, work plans will also be developed for disciplines as required. It is anticipated the work plans will include further details on how to action the study plans; for example they would contain such information as location of sampling sites, scheduling, and sequencing.

For the purposes of establishing appropriate context, the Study Plan begins with background and relevant information on:

- Study Plan related discussions with the Agency, the MECP and applicable agencies to date (**Section 3**);
- The approach to Project consultation and engagement (**Section 4**);
- How Indigenous Knowledge will be collected and used in the IA / EA (**Section 5**); and
- The spatial and temporal boundaries that will be used for the IA / EA (**Section 6**).

3. *Baseline refers to the current conditions of the environment potentially impacted by the Project. Baseline conditions serve as a reference against which changes due the Project are measured.*
4. *If necessary, the Study Plan will be updated to reflect the approved ToR if approval is obtained.*

2.1 Approach to Handling Confidential Information

2.1.1 Indigenous Knowledge

Permission from the Indigenous community will be sought before including Indigenous Knowledge in the IS / EA Report, regardless of the source of the Indigenous Knowledge. Sensitive and / or confidential information will be specifically collected through the Indigenous Knowledge Program to inform the IS / EA Report, and its use and publication will be governed by Indigenous community-specific Indigenous Knowledge Sharing Agreements. Sensitive and / or confidential information collected through Indigenous Knowledge Sharing Agreements will be protected from public or third-party disclosure and will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information. Instances where Indigenous Knowledge sharing has taken place during consultation activities (e.g., meetings) will be recorded in the Record of Consultation and Engagement, including where Indigenous Knowledge was incorporated into Project decisions and into the IS / EA Report (i.e., specifics will not be included in the Record of Consultation and Engagement given the potential sensitivity and / or confidentiality of the information shared).

2.1.2 Species at Risk

Sensitive information related to species at risk, such as those provided by the MECP or by the Ministry of Natural Resources and Forestry (MNRF), will be presented in materials in accordance with the Sensitive Data Licence Agreements applicable to this Project.

3. Study Plan Technical Discussions

To facilitate the development of satisfactory study plans and eventually a satisfactory IS / EA Report, MFFN previously submitted draft study plans in an effort to hold technical discussions with the Agency, the MECP and applicable agencies. A summary of technical discussions and correspondence held to date on this Study Plan has been provided in **Table 3-1**.

Table 3-1: Summary of Study Plan Technical Discussions

Attendees / Responsible Party	Correspondence	Discussion Point	Solution
■ **MECP** ■ **Ontario Ministry of Energy, Northern Development and Mines (ENDM)** ■ **MFFN CAR Project Team**	■ Technical discussion to review the MECP requirements on caribou studies and assessment.	■ **31-July-2019**: A discussion to review the MECP's expectations regarding caribou studies and impact assessment. A discussion on the Range Management Principles.	■ Additional guidance and literature was provided by the MECP.
■ **MECP** ■ **ENDM** ■ **MFFN CAR Project Team**	■ Technical discussion related to comments received on caribou in the summer 2019 (based on the MECP and the MNRF review of the Draft ToR)	■ **18-December-2019**: A discussion to review previous work on caribou in the area (either by ministries or proponents, including MFFN). Review of comments provided by the MECP on early drafts of the Draft ToR.	■ Information requests from both the MECP and the Proponent were made. Additional information was obtained and shared.
■ **MECP** ■ **MNRF** **ENDM** ■ **MFFN CAR Project Team**	■ Technical discussion of collaring program.	■ **28-January-2020**: A discussion to inform the development of a detailed work plan. Details included size of study area and recommended approach to study design. Information regarding available data and other collaring programs in the area.	■ Additional details and clarification to be provided within a more detailed work plan.
■ **MECP** ■ **MNRF** **ENDM** ■ **MFFN CAR Project Team**	■ Technical discussion of collaring program.	■ **5-March-2020**: A discussion on the proposed March 2020 collaring program, schedule considerations, and permit requirements.	■ Ultimately, the program was delayed to the following year. Additional details and clarification to be provided within a more detailed work plan.

Attendees / Responsible Party	Correspondence	Discussion Point	Solution
■ **The Agency**	■ Comments received following submission and review of draft Study Plan.	■ **10-July-2020:** Comments and clarification questions received, including editorial comments, additional information requirements regarding Study Plan, assessment and data analysis.	■ Additional details and clarification provided within this Study Plan and Work Plan.
■ **MECP**	■ Comments received following the MECP review of draft Study Plan.	■ **23-July-2020:** Comments and clarification questions received, including editorial comments, considerations for proposed field studies, additional information requirements regarding Study Plan, assessment and data analysis.	■ Additional details and clarification provided within this Study Plan and Work Plan. Technical procedures and standard practices for carrying out the proposed studies will be considered during the planning stages of the field work plan.
■ **The Agency** ■ **Environment and Climate Change Canada** ■ **MECP** ■ **MNRF** ■ **ENDM** ■ **MFFN CAR Project Team**	■ Technical discussions of comments received following agency review of draft Study Plan.	■ **11-September-2020:** Comment and technical discussion pertaining primarily to the federal Far North range, clarification about the requirement for predator surveys, winter aerial survey approach and methods, caribou collaring and requests for additional data collection (biological samples) to inform baseline conditions and Study Plan.	■ Additional details and clarification provided within this Study Plan and Work Plan.
		■ **20-October-2020**: Comment and technical discussion pertaining primarily to winter aerial survey approach and methods, requests for additional data collection to inform baseline conditions and Study Plan, caribou capture approach and methods, and data sharing agreement.	■ Additional details and clarification provided within this Study Plan and Work Plan.
		■ **2-November-2020**: Comment and technical discussion pertaining primarily to winter aerial survey approach and methods, caribou capture approach and methods, mortality investigations approach, and data sharing agreement.	■ Additional details and clarification provided within this Study Plan and Work Plan.

Attendees / Responsible Party	Correspondence	Discussion Point	Solution
■ **The Agency** ■ **MECP** ■ **ENDM (*17-Dec-2020* and *18-Dec-2020 meetings only*)** ■ **MFFN CAR Project Team**	■ Technical discussions of comments received about the caribou collaring program following Ministry review of the application for an *Endangered Species Act* (ESA) Species Protection or Recovery Permit ("B Permit").	■ **17-December-2020:** Comment and technical discussion pertaining to the proposed collaring approach and additional captures in 2022 and 2023 that would be necessary to acquire data from the minimum 20 animals for three years, and the applicant named on the permit (The MFFN CAR Project Consultants vs the Proponent).	■ Additional meeting was requested to review new request and change in approach.
		■ **18-December-2020:** comment and technical discussion pertaining to the duration of the permit given timing and funding constraints of the Project.	■ Additional meeting was requested to review alternative approaches to collaring program.
		■ **23-December-2020:** comment and technical discussion pertaining to the collaring program and revised approach to deploy 30 collars in 2021 and not do any additional capture efforts in 2022 or 2023.	■ Revised approach provided in this study plan and work plan, and in a revised application to the MECP for an ESA B Permit.

4. IS / EA Report Consultation and Engagement Process

4.1 Interested Persons and Government Agencies

The Proponent will provide Project notices and advise of opportunities for consultation and engagement with interested persons[5] which includes, at a minimum, members of the public outlined in the *Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020) (referred to as the Public Participation Plan). This will include the opportunity to provide input on the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures as applicable. A variety of activities will be offered so that members of the public are informed of the IS / EA Report as it progresses and are aware of the opportunities and means to provide their input. The study plans have recognized public and agency input received on the Project to date. Government agencies and interested persons will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process. The Project's approach to handling confidential and sensitive information is outlined in **Section 2.1**.

4.2 Indigenous Communities

The Proponent will provide Project notices and opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020a) (referred to as the Indigenous Engagement and Partnership Plan).

Indigenous communities will be provided the opportunity to be involved at critical decision-making points throughout the IS / EA Report so that the Proponent can consider and incorporate, where appropriate Indigenous Knowledge and Indigenous land and resource use information into the Project as it pertains to the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures. A variety of activities will be offered so that Indigenous communities are informed of the IS / EA Report as it progresses and are aware of the opportunities, means and timelines to

5. *Interested persons, as defined in the IS / EA Consultation Plan, are individuals and groups (e.g., associations, non-governmental organizations, industry and academia) who could have an interest in the Project, including but not limited to communities in the region, those with commercial interests (e.g., forestry, trappers, outfitters, other mineral tenure holders in the area) and recreational users or those with recreational interest (e.g., campers, hunters and environmental groups).*

provide their input. The study plans have recognized Indigenous community input received on the Project to date. Indigenous communities will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process.

Table 4-1: Identified Neighbouring Indigenous Communities, including their Provincial Territorial Organizations and / or Tribal Council Affiliations

Tribal Council Affiliation	Indigenous Community or Organization
Matawa First Nations Management *(Nishnawbe Aski Nation)*	■ **Marten Falls First Nation** (Proponent and potentially affected Indigenous community) ■ Aroland First Nation ■ Constance Lake First Nation ■ Eabametoong First Nation ■ Ginoogaming First Nation ■ Neskantaga First Nation ■ Nibinamik First Nation ■ Webequie First Nation
Matawa First Nations Management and the Union of Ontario Indians / Nishnawbe Aski Nation	■ Long Lake #58 First Nation**
Mushkegowuk Council *(Nishnawbe Aski Nation)*	■ Attawapiskat First Nation ■ Fort Albany First Nation ■ Kashechewan First Nation
Shibogama First Nations Council *(Nishnawbe Aski Nation)*	■ Kasabonika Lake First Nation ■ Kingfisher Lake First Nation ■ Wapekeka First Nation ■ Wawakapewin First Nation ■ Wunnumin Lake First Nation
Independent First Nations Alliance *(Nishnawbe Aski Nation)*	■ Kitchenuhmaykoosib Inninuwug First Nation
Independent First Nations *(Nishnawbe Aski Nation)*	■ Mishkeegogamang First Nation ■ Weenusk First Nation
Nokiiwin Tribal Council	■ Animbiigoo Zaagi'igan Anishinaabek First Nation*
Métis Nation of Ontario	■ Métis Nation of Ontario; Region 2*
Independent Métis Nation	■ Red Sky Independent Métis Nation*

*Notes: * Indigenous communities or organizations identified by the MECP who should be consulted on the basis that they may be interested in the Community Access Road.*
*** The MECP indicated in a letter to MFFN that Long Lake #58 First Nation was moved from interest-based to rights-based.*

4.3 Consideration of Identity and Gender-Based Analysis Plus in Engagement

To fulfill requirements of the IAA, the Consultation and Engagement Program will consider a diverse range of perspectives from interested persons and interested Indigenous communities and their members identified in the Agency's Indigenous Engagement and Partnership Plan and the Public Participation Plan. This will include at a minimum providing ongoing opportunities for engagement to:

- **Neighbouring Indigenous communities, including relevant subpopulations:**
  - Women;
  - Youth; and
  - Elders.
- **Non-Indigenous communities including:**
  - Women;
  - Youth; and
  - Activity-based subgroups (e.g., recreationalists, snowmobilers, tourism establishment operators).

The Proponent will also consult and engage with other subpopulations identified by communities during consultation and engagement. The information from these activities and any additional identity groups identified by communities through consultation and engagement will be considered by applicable environmental disciplines for the purposes of data collection and considering disproportionate effects.

During consultation and engagement, these aforementioned groups will be consulted and engaged with on targeted input**.** Specialized knowledge will be gathered through other disciplines such as Social, Economic, Land and Resource Use and Aboriginal and Treaty Rights and Interests. The Socio-economic Data Collection Program is expected to include targeted interviews, focus groups, questionnaires and other niche tools to gather information from diverse populations to resolve gaps in socio-economic secondary data. These diverse populations include the aforementioned identity groups, which are also referenced in the IS / EA Consultation Plan, and those identified by communities during consultation and engagement. The importance of soliciting inputs and perspectives from diverse subgroups has also been factored into the Indigenous Knowledge Program and associated materials (see **Section 5**).

When feedback is received from interested persons and Indigenous communities, issues, comments and questions will be tracked, which is consistent with the process described in the IS / EA Consultation Plan. Specific to Gender-Based Analysis Plus objectives, this will include efforts to engage with diverse populations. It is expected this will include activities specific to subgroups and tabulation of consultation and engagement participation with respect to identity factors. This will provide summary statistics to demonstrate the diversity achieved in consultation and engagement.

5. Consideration of Indigenous Knowledge in the IS / EA Report

The following provides a general description of how Indigenous Knowledge will be considered in the IA / EA process. The extent to which Indigenous Knowledge is considered by each specific VC will vary depending on the nature of the VC, the potential for Project effects on the VC and whether Indigenous Knowledge that relates to a VC is provided / obtained. As such, not all aspects of the general approach described below may apply to all VCs / study plans.

There are two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. Both programs serve to support the collection of Indigenous perspectives, values, and input on the Project, including Aboriginal and Treaty Rights and how they may be impacted by the Project, to be integrated throughout the IA / EA process. However, the Indigenous Knowledge Program specifically aims to solicit and incorporate information that is considered sensitive and may have confidentiality requirements, including Indigenous Knowledge and information on Indigenous land and resource use. Indigenous Knowledge Sharing Agreements will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information.

All Indigenous communities and groups identified by the MECP and the Agency through the Indigenous Engagement and Partnership Plan have the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provides interested Indigenous communities an opportunity to: share existing Indigenous Knowledge and information on Indigenous land and resource use and cultural values that may be relevant to the Project, and / or complete Project-specific studies to collect and share Indigenous Knowledge and information on Indigenous land and resource use and cultural values. The Indigenous Knowledge Program includes opportunities for Indigenous communities and groups to meet with the Proponent to discuss the program, ask questions, and share concerns and interests. In support of this, the Proponent has created an Indigenous Knowledge Program Guidance Document (the Guidance Document) that provides:

- An overview of the Indigenous Knowledge Program and information on how Indigenous Knowledge, Indigenous land and resource use and cultural values and practices can be collected and / or shared;

- Information on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values and practices may be used in the planning and design processes; and
- A suite of guidance materials that were developed based on the information requirements of both the federal and provincial assessment processes, including: question guides to support the collection of information on historical and current community context; Indigenous Knowledge that may be relevant to the various technical disciplines; information on Indigenous land and resource use , cultural values and practices and associated spatial data, and perspective on potential Project-related effects and associated mitigation and / or enhancement measures.

The Guidance Document will also support participating Indigenous communities in providing Project-specific information in a manner that facilitates meaningful incorporation into the IS / EA Report.

The IS / EA Consultation Plan outlines the process for obtaining information and feedback about the Project from Indigenous communities (i.e., the Consultation and Engagement Program). Indigenous communities identified by the MECP and the Agency have the opportunity to participate in the Consultation and Engagement Program through community-specific meetings, Public Information Centres, web conferences, and other formats. All Indigenous communities identified by the MECP and the Agency will be provided information related to the Project and invited to participate at various points throughout the IA / EA process.

There are also opportunities for technical teams to engage with Indigenous communities to solicit perspectives and information relevant to the Project, including information related to collection of existing information and the development of the IS / EA Report. The Proponent also invites feedback and inputs throughout the Project via the Project website and ongoing communications with the Proponent.

The Indigenous Knowledge and Consultation and Engagement programs are designed to be complementary and provide multiple opportunities for communities to offer feedback and information, including perspectives on Aboriginal and Treaty Rights and interests and how these may be impacted by the proposed Project. Relevant information collected through both the Indigenous Knowledge and Consultation and Engagement programs, including potential effect pathways on Aboriginal and Treaty Rights and interests, will be shared with each of the relevant disciplines throughout the IA / EA to: guide and inform VCs; support characterization of the existing environment; identify the potential effects of the Project on VCs; help identify mitigation measures and potential monitoring programs; and ultimately guide Project planning. The nature of how the Indigenous Knowledge becomes integrated into the IS / EA Report will be dictated by the specific information provided by each Indigenous community and the parameters set out in the Indigenous Knowledge Sharing Agreements. A description of how Indigenous Knowledge was considered in the IA / EA and in each of the technical discipline areas will be included in the IS / EA Report.

It is also important to note that information collected through the various activities (e.g., field studies and programs, effects assessments) of each discipline area (e.g., wildlife, vegetation, cultural heritage) will be shared with the Indigenous Knowledge Program leads. This will support the establishment of the existing environment and the effects assessment for the Aboriginal and Treaty Rights and Interests environmental discipline, as well as the identification of potential mitigation measures and monitoring programs, given the interrelated nature of Indigenous peoples and other environmental disciplines.

The Proponent will strive to respectfully collaborate with Indigenous communities on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values will become part of the IS / EA Report, and how potential effects to Aboriginal and Treaty Rights and interests will be assessed. It is expected that measures to support this may include but are not limited to: engaging Indigenous communities to solicit information on Indigenous Knowledge and Indigenous land and resource use and cultural values to inform baseline conditions, providing Indigenous communities with draft sections of the IS / EA Report to illustrate how Indigenous Knowledge and information on Indigenous land and resource use and cultural values has been integrated and to confirm it has been presented appropriately, and completing collaborative working sessions with Indigenous communities for the effects assessment on Aboriginal and Treaty Rights and Interests. Further information on how potential effects on Indigenous rights will be assessed is provided in the Aboriginal and Treaty Rights and Interests Study Plan.

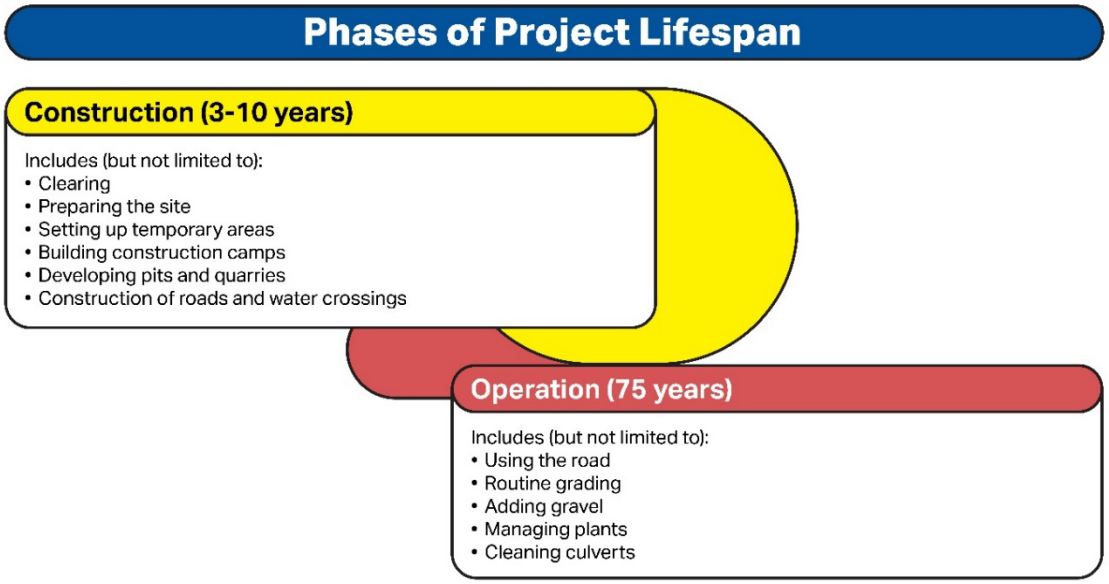
6. Assessment Boundaries

6.1 Temporal Boundaries: Project Phases

Project phases, which are temporal boundaries, are developed to establish the timeframes within which potential effects of the Project will be considered in the IS / EA Report. The Project is planned to occur in two phases, which are briefly described below and shown in **Figure 6-1**.

- **Construction Phase:**
  The time from start of construction, including site preparation activities, to the start of operations and maintenance of the CAR. Decommissioning of construction works is included in the construction phase. The construction phase is anticipated to take approximately 3 to 10 years to complete.
- **Operations and Maintenance Phase:**
  The operations and maintenance phase starts once construction activities are complete and lasts for the life of the Project. The operations and maintenance phase of the Project is considered to be 75 years based on the expected timeline for when major refurbishment of road components (e.g., bridges), is anticipated.

Figure 6-1: Project Schedule



There are currently no plans to decommission the CAR as there is no expected / known end date for its need. Therefore, future suspension, decommissioning and eventual abandonment of the CAR will not be considered in the IS / EA Report. It will be considered if and when a decommissioning or abandonment application is made for the road.

In determining the temporal boundaries, in particular the long operations and maintenance phase, consideration was given to the long-term effects on the well-being of present and future generations (Sustainability Principle #2[6]). The final temporal boundaries to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation process.

6.2 Spatial Boundaries: Study Areas

6.2.1 General Information

Study areas identify the geographic extents within which potential effects of the Project are likely to occur and will be considered in the IS / EA Report. The existing conditions and potential effects are documented for three study areas selected for the Project:

- **Project Development Area (PDA)**: area of direct disturbance;
- **Local Study Area (LSA)**: the area where most of the direct effects of the Project are likely to occur; and
- **Regional Study Area (RSA)**: the area where indirect effects of the Project are likely to occur.

The PDA encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The preliminary LSA currently being considered within the scope of the ongoing provincial regulatory review process generally includes the area within 2.5 km of the centreline of Alternative 1 and Alternative 4. The preliminary study area generally allows for the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide study area also allows for route refinements during development of Project design (e.g., adjustment of the alignment to avoid sensitive features).

6. *Sustainability Principles #2 is one of four sustainability principles included in Section 25 of the Project's TISG as further elaborated on Section 9.7.*

The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report. While most of the Project components are expected to be located within the preliminary 5 km wide study area, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the IA / EA process. If the need to locate Project components outside the 5 km wide study area is determined to be required or of benefit to the Project, the study area would be adjusted.

The study area for each environmental discipline may vary from the above-described general study area based on the potential for the Project to directly or indirectly affect each environmental discipline; therefore, discipline-specific LSAs and RSAs have been defined for the Project. In defining the final LSAs and RSAs, each environmental discipline will consider:

- Location and other characteristics of the environmental discipline relative to the Project;
- The anticipated extent of the potential Project effects;
- Federal, provincial, regional, and local government administrative boundaries;
- Indigenous groups listed in **Table 4-1**;
- Community knowledge and Indigenous Knowledge;
- Current or traditional land and resource use by Indigenous communities;
- Exercise of Aboriginal and Treaty Rights of Indigenous peoples, including cultural and spiritual practices; and
- Physical, ecological, technical, social, health, economic and cultural considerations;

The study areas included in this document are preliminary, covering the extent to which readily available information suggests the Project may have noticeable effects on the environment. The size, nature and location of past, present and reasonably foreseeable projects will be taken into consideration in the development of the cumulative effects assessment study area(s). The appropriate study area(s) to assess cumulative effects are dependent on the VCs predicted to have direct residual adverse effects as a result of the Project, and therefore, cannot be defined until the IS / EA Report has sufficiently advanced.

As further detailed in **Section 4**, the Proponent will continue to provide opportunities for neighbouring Indigenous communities and interested persons to provide input and inform the effects assessment, including the LSAs and RSAs.

6.2.2 Ungulates Study Areas

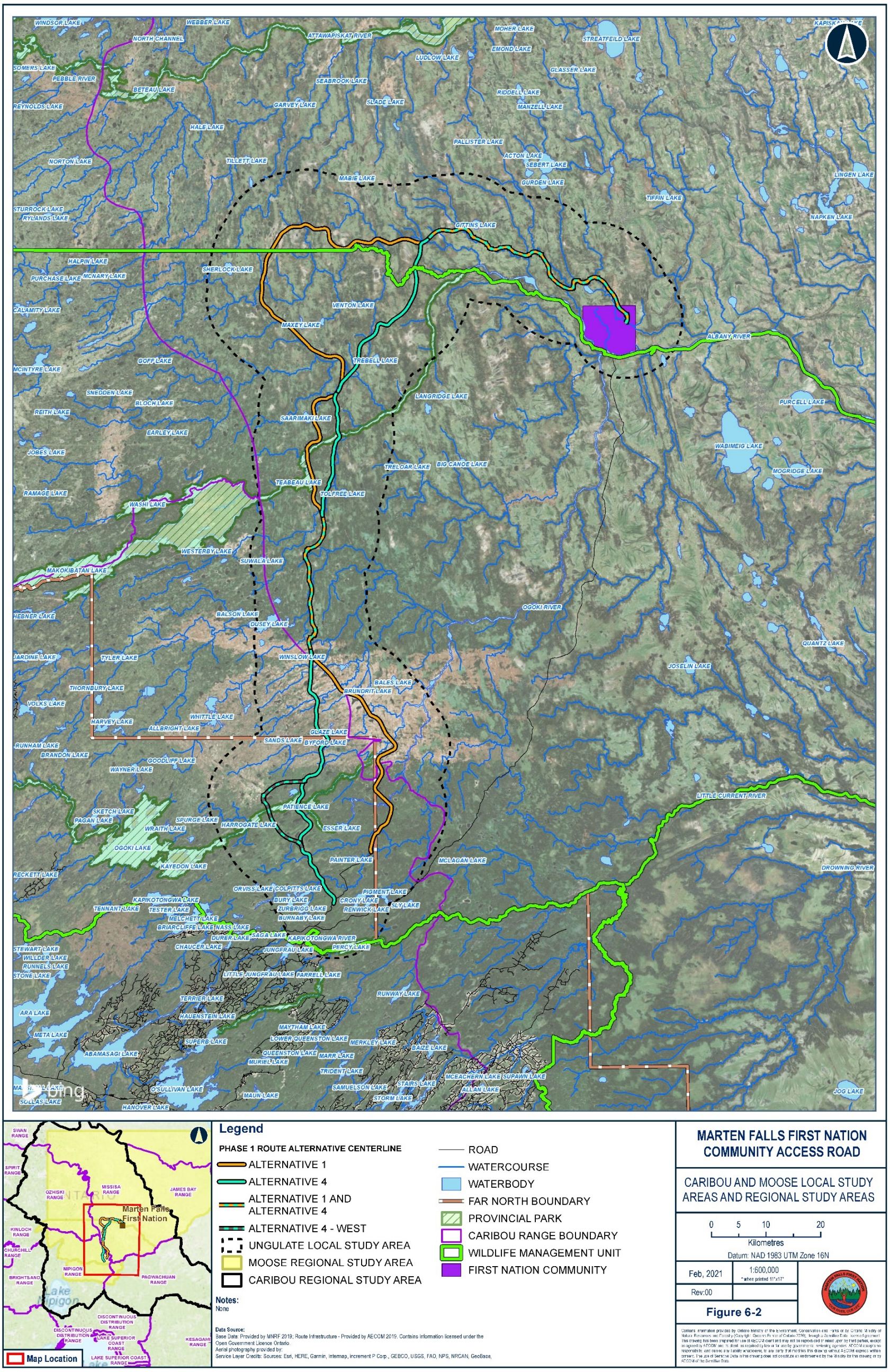
The LSA and RSA boundaries for Ungulates (moose and caribou) are detailed in **Table 6-1** and shown on **Figure 6-2.**

Table 6-1: Ungulates (moose and caribou) Study Areas

Study Area	Geographic Extent	Rationale
Ungulate Local Study Area	The proposed Project route alternatives and 10 km buffer on either side of the centreline of the route alignments and all other proposed Project infrastructure (permanent and temporary)	This area captures local effects of the Project on ungulates that may extend beyond the PDA (e.g., dust and noise). Provincial Best Management Practices for industry, and MECP comments on the draft study area included in the draft Study Plan, recommend a 10 km buffer around high use areas where sensory disturbances should be minimized.
Moose		
Moose Regional Study Area	All Wildlife Management Units (WMU) that intercept the Moose LSA (17, 1D, 18A).	Moose in Ontario are managed at the WMU level according to the Cervid Ecological Framework Guidelines (MNR 2009a). While WMU 17 contains most of the proposed routes, there are sections of the route proposed that also intersect with WMUs 1D and 18A. The geographic extent for the moose RSA aligns with the wolverine RSA (a predator of moose) and captures the moose population at an ecologically appropriate scale to assess the dynamics between wolves, moose and caribou in the region.
Caribou		
Caribou Regional Study Area	Caribou Ranges: Missisa Range, Ozhiski Range, Nipigon Range, and Pagwachuan Range	The proposed Project routes intersect the four caribou ranges listed on the left. Population metrics for Ontario's caribou are monitored within these ranges.

The draft Study Plan for Ungulates proposed a **Caribou LSA** of a 35 km buffer around the route alignments. This size was consistent with the surveys conducted over the Project route alternatives in 2018 (Zoetica 2018) and aligned with the direction in the TISG for a study area with a 10 km to 40 km buffer around the route. Following a review of the draft Study Plan by the MECP, the MNRF, ECCC and the Agency, and discussions in subsequent meetings with the regulators, the caribou study areas have been defined to align with provincial best management guidance about the area where sensory disturbance from an activity has the potential to directly and indirectly impact caribou (MNR 2013a,b,c; MNR 2014).

Figure 6-2: Ungulates (Moose and Caribou) Local and Regional Study Areas



The revised **Ungulate LSA** for the Project currently being considered includes the area within 10 km of the centreline of the route alternatives. This study area allows for the characterization of existing conditions and prediction of potential environmental effects for the Project.

The revised **Moose RSA** for the Project currently being considered includes the geographic extent of three Wildlife Management Units (WMUs) that intersect the proposed routes and Ungulate LSA (WMU 17, 1D and 18A). A characterization of the WMUs will provide a broad description of the baseline conditions which have the potential to be affected by direct and indirect effects of the Project.

The **Caribou RSA** for the Project currently being considered within the scope for the ongoing regulatory review process generally includes the geographic extent of four caribou ranges that intersect the proposed routes (Missisa, Ozhiski, Nipigon and Pagwachuan ranges). The federal Far North range (EC 2012) will be considered in the context of regional effects, but analysis of caribou indicators will be geographically restricted to the RSA. A characterization of the caribou ranges will provide a broad description of the baseline conditions which have the potential to be affected by direct and indirect effects of the Project. These areas are consistent with the recommendations provided in the TISG.

7. Baseline Study Design

7.1 Desktop Assessment

A desktop review of existing information sources will be completed to identify information gaps that will need to be addressed through further study. A preliminary list of applicable information sources has been included in **Appendix A** and reflects federal and provincial guidance received to date. In addition, peer-reviewed literature about caribou and moose life cycles and population dynamics in northern Ontario will be reviewed.

This Study Plan focuses on the additional studies that are anticipated to be required to gather information beyond what is currently available through existing information sources, including those described in Section 7.2 'Sources of baseline information' in the Agency's TISG for this Project. The information that will be compiled for the desktop assessment will include:

- Landscape composition: Ontario Land Cover Compilation (OLCC) (LIO 2020) will be analyzed in the Missisa, Ozhiski, Nipigon, and Pagwachuan caribou ranges and the overlapping WMUs to gain a broad understanding of the current landscape composition within the LSA.
- Federal Recovery Strategy: the updated federal recovery strategy for boreal caribou (ECCC 2019) will be reviewed to assess the current conditions of the federal Far North range, which includes the Missisa and Ozhiski provincial ranges.
- Caribou Screening Tool (CST): it is anticipated that the MECP will provide CST results of the route alternatives in relation to the Missisa, Ozhiski, Nipigon, and Pagwachuan caribou ranges. The CST reports provide information based on estimates of the condition of Ranges at the beginning of a given calendar year as a benchmark of the landscape conditions within each Range prior to the addition of the Project, as well as the predicted quantitative changes to landscape within the Ranges as a result of the addition of the Project PDA.
- Resource Selection Probability Function (RSPF): a RSPF was prepared by MNRF (Hornseth and Rempel 2016) to identify predicted high and low-use areas for caribou. The RSPF will be acquired from the MECP and will be examined at the scale of the Missisa, Ozhiski, Nipigon and Pagwachuan ranges and the LSA in an effort to understand the study area as a subset of the larger landscape within which caribou exist.

- Integrated Range Assessment Reports: the provincial Integrated Range Assessment Reports (IRARs; MNRF 2014a, b) document the assessed condition for each range by way of a comprehensive analysis of caribou survey results, collaring data, population state metrics (minimum animal count, recruitment, survival, and population trend), habitat disturbance conditions, habitat amount and arrangement (Simulated Range of Natural Variation) and important historical, contextual and ecological knowledge relevant to the management of each caribou range. The data, analysis, and results from the IRARs will be reviewed for the Missisa, Ozhiski, Nipigon and Pagwachuan ranges.
- Ontario Far North Report: The Far North Report (Berglund *et al*. 2014) describes the distribution, movement, population dynamics and habitat use patterns of caribou in the Far North, and will be examined at the range level to understand the context of caribou and their habitat that will may be impacted by the Project.
- Caribou General Habitat Description (GHD; MNR 2013d): spatial files of Category 1, 2, and 3 habitats will be acquired from the MECP and will be spatially analyzed in relation to the PDA, the LSA, and the Missisa, Ozhiski, Nipigon and Pagwachuan Ranges to gain an understanding on how the Project may affect each category type in the LSA and RSA.
- Occupancy models: Caribou occupancy models produced by Poley *et al*. (2014) illustrate the probability of occupancy of these species across the Far North. The models will be acquired from MECP and will be examined at the Missisa, Ozhiksi, Nipigon and Pagwachuan Ranges level and at the LSA scale in an effort to understand the study area as a subset of the larger landscape in which caribou exist.
- Provincial records of moose surveys: historic results from aerial surveys from Wildlife Management Unit 1D, 17 and 18A will be reviewed to identify trends in population estimates and population dynamics (e.g., seasonal ranges, migration, movement patterns, sensitive periods) on a regional scale.

Available existing information will be reviewed to characterize the context of ungulate habitat and species population state within the study areas of the Project as defined in **Section 6**. The focus of the existing information review will include life cycle, seasonal migration and movements, significant habitat features for caribou (e.g., nursery, winter use areas, travel corridors as described in the provincial GHD; MNRF 2013d), and moose seasonal use habitat.

Indigenous knowledge collected through engagement with MFFN community members as well as other First Nation communities with traditional territories in the vicinity of the Project will be considered with the

background data and field data collected for the Project. Through consultation with Indigenous community members and interested persons, the MFFN CAR Project Team intends to collect specific ungulate information and traditional uses of ungulates in the study areas, such as traditional and current caribou calving and winter grounds and travel corridors.

7.2 Existing Field Data and Field Studies Undertaken

Field studies have been undertaken, preceding this Study Plan, with the purpose of informing baseline conditions for ungulates. Previous studies of ungulates completed in support of the Project are briefly summarized below.

7.2.1 2018 Aerial Surveys

Aerial surveys were completed in a preliminary study area (35 km buffer around the proposed routes) in February 2018 (Zoetica 2018). The primary objective of the surveys was to determine the distribution of caribou and moose relative to the potential alternative routes. Secondary objectives included discerning caribou and moose associations with ecoregions and ecozones, estimating total numbers of each species, and collecting demographic data to aid in predicting population stability.

A fixed-wing survey was conducted in February 2018 over a 12-day period in the study area which included alternative road route options buffered by 35 km (26,543 km^2). This survey involved the use of a high-powered infrared device mounted to the aircraft. The survey entailed flying 15 north-south transects that were 10 km apart. Caribou, moose, and other large mammal observations were recorded. Remote viewing using the infrared device was able to pick up heat signatures generally up to 2 km away and up to 5 km under ideal flying conditions over open landscapes. A follow-up helicopter survey was conducted over a three-day period with the intent of collecting caribou and moose demographic (sex / age) data.

Fifty-eight caribou in nine groups, and 31 moose in 13 groups were observed during the fixed wing surveys in the preliminary study area. During the subsequent helicopter survey, five caribou in two groups and nine moose in four groups were observed. Caribou were observed most often in the Hudson Plains ecozone whereas moose were more often observed in the Boreal Shield ecozone. The observed caribou were female-biased (58%), and a ratio of approximately 25 calves to 100 cows was calculated which suggests the population in the study area is potentially unstable. The observed moose were also female-biased (56%) and had a ratio of approximately 43 calves to 100 cows; this recruitment estimate suggests a stable moose population (Zoetica 2018).

The Zoetica 2018 report has been shared with interested agencies including the Agency, the MECP, the MNRF, and the ENDM.

7.2.2 2019 Field Surveys

The 2019 natural sciences field work program for the CAR included ground-based surveys for breeding birds, acoustic monitoring for bats, nocturnal and crepuscular birds, amphibians, and remote camera surveys targeted for mammals. Incidental observations of caribou, moose and their sign (i.e., tracks, browse) were documented during all field surveys. Remote cameras captured photographs of both species (Golder 2020).

The results of the 2019 wildlife investigations will be presented at a later date.

7.3 Study Methods for Future Studies

In addition to the collection and review of existing information relevant to the Project, field studies will be conducted to substantiate existing data and supplement previous assessments in the Ungulate LSA to adequately characterize the baseline conditions of the VC and assess the potential effects.

Existing information was reviewed, and field studies were carried out as described in **Section 7.2** in 2018 and 2019. The field studies were conducted in advance of the finalization of this Study Plan. However, the data collected through these surveys remain relevant, and additional studies are proposed in this Study Plan. The proposed field studies intended for 2021 to 2024 were selected in consideration of existing background and Indigenous Knowledge, data gaps, habitat areas identified as valuable to the species or of cultural importance to MFFN through consultation, logistics and safety, and survey area necessary to provide sufficient coverage to achieve a baseline characterisation of the indicators for ungulates (habitat availability and distribution, population dynamics including survival and recruitment) in the revised LSA and RSAs (**Figure 6-2**). These surveys include monitoring seasonal movement patterns and habitat use and evaluating recruitment and mortality in the Ungulate LSA prior to Project disturbance and mitigation. Field studies will be completed under appropriate seasonal and weather conditions.

The following field programs are proposed:

- Habitat assessment where the PDA or Project footprint of route alternatives 1 and 4 intersect with potential moose habitat;

- Caribou radio collaring, including collection of biological samples and mortality investigations, initiated in 2021 and maintained until 2024;
- Winter aerial transect survey, in 2022; and
- Remote camera monitoring survey, initiated in 2021 and maintained until 2023.

7.3.1 Moose Habitat Assessment

Characterization of potential moose habitat during aerial surveys will be made using the guidance provided in the *Significant Wildlife Habitat Technical Guide* (MNR 2000) and *Selected Wildlife and Habitat Features: Inventory Manual for use in Forest Management Planning* (Ranta 1997). Observations of moose recorded during winter aerial surveys will be used to characterize location, function, suitability, abundance, and relative use of potential moose aquatic feeding areas and late season winter habitat (Ranta 1997; MNR 2000). Observations of cows with calves during field surveys may indicate a calving / nursery area and will be documented to supplement the existing information about important seasonal and annual habitat use in the LSA and RSA.

Data collected during wetland field surveys outlined in the Vegetation Study Plan will help characterize the potential for moose aquatic feeding areas using the above-mentioned provincial guidance as well as habitat selection characteristic from occupancy and habitat suitability models (e.g., Fraser *et al*. 1984; Poley *et al*. 2014).

Incidental observations of moose and their sign will be recorded during all the natural sciences field surveys including the aerial surveys and ground-based surveys described in **Section 7.3.2** below, as well as the field surveys described in other terrestrial wildlife and vegetation study plans.

7.3.2 Caribou Population and Habitat Assessment

7.3.2.1 Caribou Radio Collaring

Global Positioning System (GPS) radio collars will provide data to quantify habitat selection, seasonal movements patterns (including identifying Category 1 High Use areas that are protected under the ESA; MNR 2013d), and survival and recruitment prior to any influence from Project construction or operation (i.e., baseline conditions). Data can also be compared to historical and more recent collar data collected by the MNRF in the caribou RSA (2009 – 2012, MNRF 2014a, b, c; 2018 - present, and technical discussions summarized in **Section 3**) to quantify changes in the populations.

Thirty (30) GPS collars will be deployed on female adult caribou between February and early March 2021. Radio collars will ideally be deployed on female caribou throughout the LSA (**Figure 6-2**), but the individuals that are selected for capture and collaring will ultimately depend on where caribou are located at the time and safe net gunning and landing spots for the helicopter. An initial sample size of 30 animals was selected following technical discussions (summarized in **Section 3**) and will allow for data from 20 animals to be used in the baseline assessment while accounting for mortalities that may occur between 2021 to 2024, including incidental mortalities that may occur as a consequence of the caribou capture and collaring program.

The MNRF caribou capture protocols (MNRF 2020) will be followed for this work, and all work will be conducted by experienced wildlife capture professionals in a manner consistent with animal care considerations to prevent harassment and undue stress (CCAC 2003). If works occurs on any federal lands, an authorization under Section 73 of the *Species at Risk Act* (SARA) would be required to engage in capturing and deploying radio collars on a species listed on Schedule 1 of SARA. However, the only federal lands in the caribou LSA are within the boundaries of the MFFN community, where collaring will not occur; as such, a SARA permit is not anticipated to be required for this work. Approval from the MNRF's Wildlife Animal Care Committee was received in November 2020 (Protocol #21-471) and an application for a B Permit under the *Ontario Endangered Species Act,* 2007 (ESA) was submitted in December 2020. An application to conduct work in Ontario's provincial parks was submitted in January 2021. These permits were received in February 2021 prior to the commencement of the collaring program.

Caribou captures and collar deployment will be subcontracted to an operator who has performed caribou captures in Ontario and is on the MNRF-approved subcontractor database (technical discussions summarized in **Section 3**), using a low-flying helicopter and shooting a net onto an individual (female) in an open area. Capture personnel includes the pilot and net-gunner. The operator will fly pre-established flight lines spaced approximately 5 km apart in the LSA (5,435 km^2) to locate groups of caribou. If an insufficient number of caribou groups are located, then transects will be extended to a 35 km buffered area around the proposed route alternatives (18,000 km^2). Should insufficient groups of caribou be observed in the LSA and surrounding area, the MECP and the MNRF will be contacted to discuss options for the Project.

When a group of caribou are sighted, they will be circled to check for existing radio collars, count all members of the group, and classify age and sex of the animals, if possible. When only caribou sign is observed, the number of animals will be estimated and recorded. Locations of caribou and sign will be recorded in a GPS unit. After it has been determined that there are uncollared adult female in a group in an appropriate location, the operator will use the aircraft to herd the animals to a safe capture area (i.e., avoiding rough terrain, cliffs, thin ice); effort will be made to minimize the herding time prior to pursuit. Following a terrain assessment, an

individual caribou will be moved slowly by the helicopter towards a selected capture site (relatively open, flat areas with minimal debris and obstructions and deep snow to minimize risk of injury). Pursuit of an individual will not exceed three minutes, and a net will be discharged over the animal by the helicopter when they are within five metres (MNRF 2020). Once an individual is captured, the helicopter will land, and crew will physically restrain the animal with hobbles. A physical examination will be conducted, and measurements recorded on a standard data sheet. While the caribou is physically restrained, the capture crew will collect blood, hair and fecal samples (CCAC 2003; Joly *et al*. 2012; MNRF 2018). Blood will be drawn from the cephalic or jugular vein, hair with roots will be collected from the shoulder area, and fecal sample will be taken directly from the anus. Upon return to the helicopter base on each day of the captures, blood samples will be spun to separate the serum from the red blood cells. Samples will be processed and frozen until they can be transferred. The 30 hair and fecal samples will be submitted to the MNRF's Science and Research Branch (Thunder Bay office) for their ongoing provincial caribou research program (NRDPFC 2020). The 30 blood samples will be submitted to Herd Health Diagnostics (Pullman, Washington, USA) for pregnancy analysis. After biological samples are taken, the radio collar will be attached to the neck, and the caribou will be released back to the group. Capture crew will observe the animal from a safe distance to identify any signs of injury or abnormal behaviour. Total handling time will not exceed 30 minutes and minimizing stress and monitoring the well-being of the animal will be prioritized by the capture crew (MNRF 2020).

Radio collars are embedded with GPS, Iridium and very high frequency (VHF) antennae. Geographic location information will be transmitted via satellite to an online database, and caribou movements can be monitored in near real-time. Collars will be programmed to transmit a location every 3 hours for 24 hours per day, for a total of 8 locations per day over the duration of their deployment. The VHF will be programmed to be active from 0900 to 1700 daily.

The radio collars will be programmed such that if a collared caribou doesn't move for 12 hours, a mortality message will be sent containing GPS positions from the past 12 hours to the user and a mortality investigation can be undertaken to assess cause of mortality (e.g., predation, hunter, poor health, capture myopathy, natural causes) and to collect the collar from the field. When predation is assessed as the cause, the predator will be identified based on signs at the carcass and around the kill site. For consistency with the MNRF's approach and for efficiency, mortality investigations will occur in snow-free conditions and only after a minimum of three (3) collars are on mortality (per technical discussions summarized in **Section 3**) or at least once per year. Mortality investigations are expected to occur at most once in 2021, maximum twice per year in 2022 and 2023, and if necessary once in 2024 when collars are being retrieved.

Collars will be fit with a drop off mechanism programmed to deploy after 156 weeks (three years). Collars will be collected when weather conditions allow for access, and before the battery stops transmitting a VHF signal. The collar retrieval program will occur between March and August 2024.

All caribou and other species at risk (e.g., wolverine) observed during the collaring surveys will be reported to the Natural Heritage Information Centre (NHIC) and the MECP-SARB.

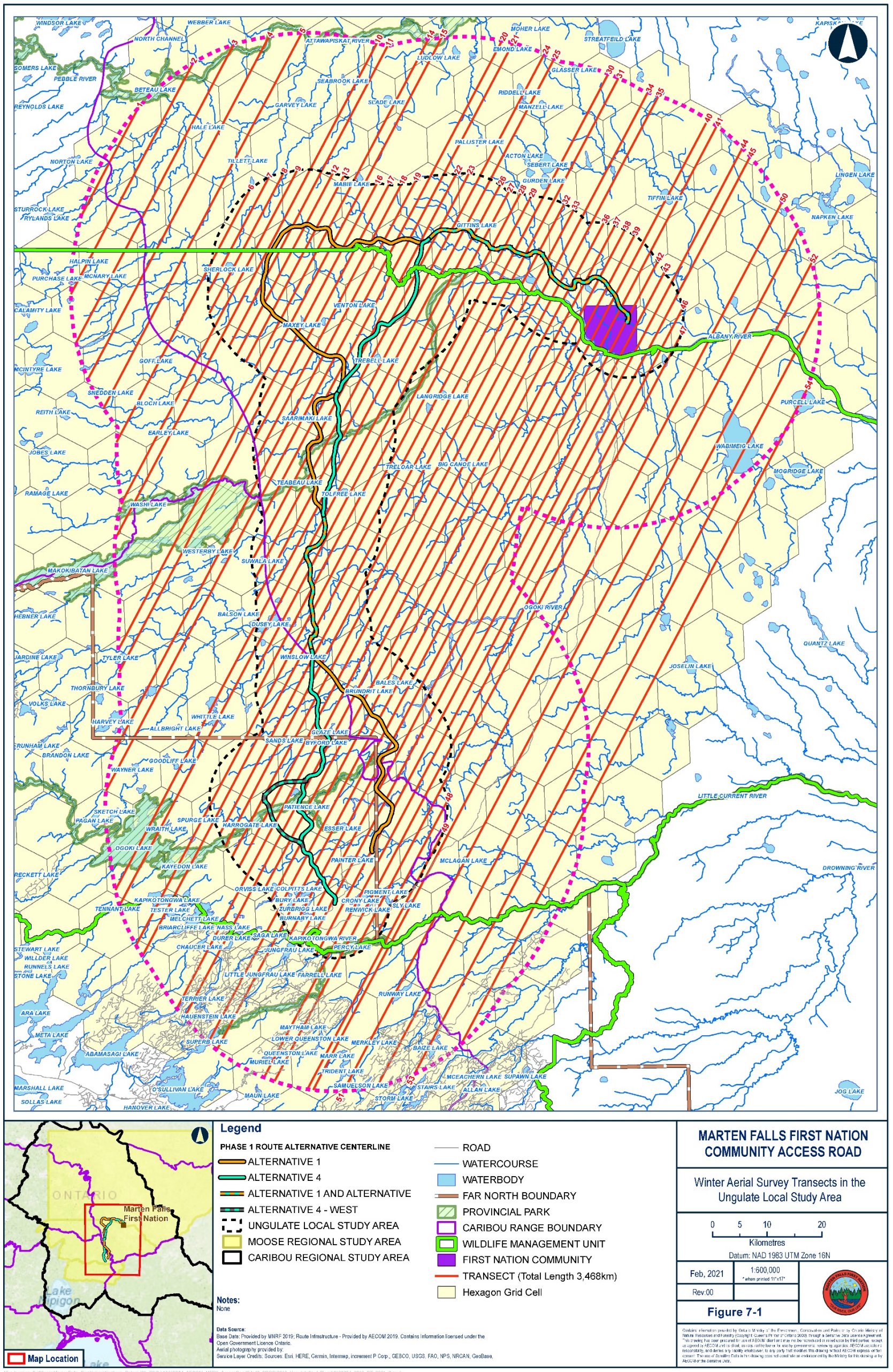
7.3.2.2 Winter Aerial Transect Survey

A winter aerial transect survey will be completed in the Ungulate LSA (**Figure 7-1**) between February and mid-March 2022, assuming radio collars are deployed in 2021. The objectives of the survey will be: 1) to determine survival of calves of collared caribou (i.e., recruitment), 2) to gather population and distribution data on caribou in the LSA, and, 3) to observe individuals and sign of other wildlife (moose, wolves and wolverine). The survey design is adapted from Ranta (1997) and follows guidance provided by the MECP and the MNRF during technical meetings in 2020 (**Section 3**). The aerial survey is expected to be conducted as per the methods described in the MNRF's "Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background" (MNRF 2018, draft; referred to hereafter as the Ozhiski Protocol) which is a two-stage approach. The two-stages involve a fixed wing and a rotary wing survey. The pilot will be experienced with conducting low-level, low-speed ungulate surveys in Ontario.

Parallel transects on a northeast to southwest orientation will be flown through the centroids of a 10 km^2 hexagonal grid by a fixed wing. This orientation is consistent with the methods in the IRAR (MNRF 2014d). Transects will be spaced approximately 2 km apart, and every fifth transect will extend to a larger area of potential impact (35 km buffer from the Project). Additional transects will be flown in the northwest and east sides of the LSA to allow for broader coverage in the area of potential impact. This results in a total of 54 transects and 6,145 km flown (**Figure 7-1**) and reflects technical discussions summarized in **Section 3**.

Using the Avenza Maps app (Avenza Systems Inc.), running on an iPad wirelessly connected to a GPS, pre-established flight lines loaded onto a geospatial PDF map will be followed. Transects will be flown at a low altitude (100-200 metres above ground) and at slow speeds that are safe for the fixed wing aircraft and necessary for optimal search effort for caribou and their sign (tracks, cratering, and slushing). The survey will be conducted during high-visibility weather conditions and 100% snow cover (ideally minimum 15 cm; MNRF 2018). The Ozhiski Protocol (MNRF 2018) will be used as guidance for crew responsibilities, data collection methods, double-observer protocol. When a group of caribou are sighted by the observers, they can be circled to get an estimate of group size or to confirm tracks, but the circle will not exceed more than 2 km on either side of the transect line (MNRF 2018). Caribou will not be pursued by the fixed wing aircraft. When only caribou sign is observed, the number of animals will be estimated and recorded. All locations of caribou, caribou tracks, and cratering will be logged using the Collector tool for ArcGIS app (ESRI) running on an iPad, waypoints will be recorded in a GPS unit, and georeferenced/ time stamped photos will be taken.

Figure 7-1: Winter Aerial Survey Transects



The rotary wing survey is a targeted activity that involves relocating caribou groups or target search areas that were initially observed, or flagged, during the fixed wing flight on the previous day. The goal of the rotary wing survey is to estimate the caribou group size (total count) and sex structure; every effort will be made not to double count caribou from the fixed wing data if a new group is incidentally observed by the survey crew. Priority for site searches will be based on estimated degree of use and proximity to other hexagon cells that may be surveyed and will also consider covering the area in a systematic and efficient manner. Areas with high degree of use (animal sightings or evidence consistent with 20 or more caribou) will be surveyed first. The Ozhiski Protocol (MNRF 2018) will be used as guidance for crew responsibilities and data collection methods. When caribou are detected by the rotary wing crew, the crew lead (sitting in the front seat) will take numerous photos of the caribou group, particularly from behind the caribou; these photos will be reviewed later to confirm group size and age-sex composition estimations made in the field. Photos should initially be taken from a distance while caribou are stationary or walking. The helicopter can circle the group from a distance to try to manoeuvre them into an open area for better photographs. After photographs have been taken, the observers will estimate the number of adults (unknown sex), adult males, adult females, calves / yearlings, and unknown age and class in the group. All locations of caribou, caribou tracks, and cratering will be logged using the Collector tool for ArcGIS app (ESRI) running on an iPad. Waypoints will be recorded in a GPS unit, and general habitat type will also be recorded. Sightings and signs of moose as well as wolverine, and wolves will also be recorded to support multi-species monitoring and to reduce the need for duplicated efforts for other species.

The most recent GPS location of collared animals will be reviewed prior to the survey. For those animals that are not located during the transects in the caribou LSA, a VHF antenna will be affixed to the nose of the helicopter and the lead biologist will use a receiver to pinpoint exact locations and identification of collared animals. All live collared animals will be located to observe whether the female has a calf.

This survey will provide an estimate of recruitment rate, which is the number of the previous year's calves that survived to their first winter (pregnancy rate of collared caribou based on blood samples collected at the time of capture). Recruitment rate is expressed as a ratio of the number of calves per 100 adult females. The recruitment rate will be combined with the survival rate of adult collared females to estimate change in population size (Hatter and Bergerud 1991; McLoughlin *et al*. 2003). All collared caribou should be relocated in this survey to confirm calf survival for females that were pregnant at the time of capture.

All caribou and other species at risk (e.g., wolverine) observed during the aerial surveys will be reported to the Natural Heritage Information Centre (NHIC) and the MECP-SARB.

7.3.2.3 Remote Camera Monitoring Program

Linear features (e.g., roads, trails) may negatively affect caribou survival because they have been associated with increased predator mobility, leading to a greater risk of predation for caribou when on or near these features (James 1999, Whittington *et al*. 2011). Wolves in northern Ontario were found closer to roads than expected, particularly in summer (Anderson 2012) and caribou are thought to be at greater risk of predation where road densities are higher (Moffatt 2012). Caribou may therefore avoid these areas in winter due to a perceived increase in predation risk (Hornseth and Rempel 2016). Given our understanding of wolf predation as a limiting factor and the potential for linear features to alter caribou predation risk, a remote camera monitoring program focused on detecting wolves and moose (i.e., the target species) will establish baseline levels of wolves, moose, and other wildlife species in the LSA.

The objectives of the remote camera program are to document the presence, seasonal and annual patterns in distribution and amount of use, by wolves, moose and other wildlife in the LSA. To achieve the program's objectives, remote camera will be deployed to collect data across all seasons, over two years (i.e., from spring 2021 to spring 2023).

The RECONYX remote camera is a digital camera equipped with an infrared motion detector allowing it to sense both heat and motion with an infrared illuminator, which allows it to take clear pictures at night without using a flash. All components of this camera are contained within a single housing unit. The cameras use a 4 gigabyte (GB) Compact Flash memory card, with a storage capacity of approximately 15,000 images. Cameras will be equipped with lithium AA batteries to extend function over long periods in the field. Camera settings will be programmed to include a first picture delay set at two seconds, trigger sensitivity on high, with two pictures taken one second apart for each time the camera is triggered.

Camera locations will be selected by applying an access-constrained stratification approach in GIS. Locations will be selected with consideration to access, land cover type, and caribou study areas. The cameras will be deployed on active game trails that intersect the route alternatives and along existing linear disturbances or natural features such as creek banks or habitat edges. Sites will be visited in Fall 2021, and in Spring and Fall 2022 to change memory cards and lithium batteries. Cameras will be retrieved in Spring 2023. Photos will be downloaded and reviewed after each visit. All caribou and other species at risk (i.e., wolverine) observed in the remote camera monitoring program will be reported to the NHIC and the MECP-SARB.

Additional details on the study design and camera locations will be provided in the Work Plan.

8. Data Management and Analysis

Data management including quality assurance / quality control (QA / QC) will be employed to minimize potential for data entry and analysis errors, prepare data sets for analysis and limit sensitive data distribution in accordance to established agreements.

8.1 Data Management and Analysis: Moose

8.1.1 Data Management

The available existing information pertaining to moose will be collected from a variety of resources, including literature, scientific reports and Indigenous Knowledge as described in **Section 4** and **Appendix A**. Relevant data collected from multiple sources will be compiled into a map and data layer per route alternative using ArcGIS for reader reference, to inform and supplement the field investigations. Information from the desktop assessment to be included (but not limited to) are known ranges and presence of moose and important habitat features.

Indigenous knowledge collected through engagement with MFFN community members as well as other Indigenous communities with traditional territories in the vicinity of the Project will be considered with the background data and field data collected for the Project. These data will be used to further inform the location of key habitats for moose.

Moose and moose habitat data collected during field surveys (e.g., moose observations made during the proposed aerial surveys for caribou, remote camera program, vegetation community surveys, sign and sightings during all other field programs) will be documented using electronic data management programs. Using this method will minimize the potential for data loss and errors, will facilitate consistency between field crews and collected data and efficient data analysis. Such electronic data collection programs will allow for accurate location data of habitat survey locations, transects, and location and / or delineation of features such as winter habitat and aquatic feeding areas. A team coordinator will be assigned to manage field planning, logistics and QA / QC. Data will be reviewed for quality, consistency and completeness. This approach will allow for early detection of errors, inconsistencies and troubleshooting, and ongoing QA / QC throughout the duration of the field program.

8.1.2 Data Analysis

Moose occupancy models produced by Poley *et al*. (2014) illustrate the probability of occupancy of moose across the Far North. The Project will attempt to acquire the models from the authors, and it will be examined at the LSA and at the Wildlife Management Unit (WMU) scale in an effort to understand the study area as a subset of the larger landscape in which moose exist. The analysis of species-habitat relationships by Poley *et al*. (2014) showed that caribou and moose selected habitats differently between the boreal shield and the Hudson Bay lowlands ecozones. The results of this study will be used to further inform the habitat suitability model developed for moose as described in **Section 9.4**.

Habitat suitability models will be used to provide spatially explicit descriptions of habitat availability and distribution under existing conditions representing an estimate of available habitat as a result of past and present development and activities in the moose RSA. Habitat suitability models will be constructed using ArcGIS and Model Builder to evaluate the moose indicators of habitat availability and distribution in the effects assessment.

Availability and distribution of moose habitat will be estimated and mapped using Ontario Land Cover Compilation v. 2.0 (OLCC) (LIO 2020) which is a compilation of Far North Land Cover v 1.4 and Provincial Land Cover 2000 Edition in ArcMap. Habitat categorization for moose will follow a Habitat Suitability Index (HSI) model approach, and good quality habitats will be defined according to a threshold representing the minimum value below which the habitat is not suitable for reproduction and survival (Ackakaya *et al*. 2004). Good quality habitats will be displayed spatially.

8.2 Data Management and Analysis: Caribou

8.2.1 Data Management

8.2.1.1 Desktop Analysis

The available existing information pertaining to caribou will be collected from a variety of resources (e.g., literature, scientific reports, Indigenous knowledge) as described in **Section 7.1** and **Appendix A**. Relevant data collected from multiple sources will be compiled into a map and data layer per route alternative using ArcGIS for reader reference, to inform and supplement the field investigations.

8.2.1.2 Field Investigations

Caribou, caribou sign (tracks, cratering, slushing) and caribou habitat feature observations data collected during field surveys will be documented using electronic data management programs. Using this method will minimize the potential for data loss and errors, will facilitate consistency between field crews and collected data and efficient data analysis. Such electronic data collection programs will allow for accurate location data of habitat survey locations, transects, and location and / or delineation of feature such as winter habitat, nursery areas, and travel corridors. A team coordinator will be assigned to manage field planning, logistics and QA / QC. Data will be reviewed for quality, consistency and completeness. This approach will allow for early detection of errors, inconsistencies and troubleshooting, and ongoing QA / QC throughout the duration of the field program.

Hair and fecal samples collected during caribou captures will be submitted to the MNRF's Science and Research Branch (Thunder Bay office) for their ongoing provincial caribou research program (NRDPFC 2020). Blood samples will be submitted to Herd Health Diagnostics (Pullman, Washington, USA) for pregnancy analysis.

8.2.1.3 Radio Collaring

Location fixes from radio collars deployed on caribou in the LSA will be sent daily via the Iridium satellite transmission system to an online Web Data Server (8 fixes per transmission) and remotely downloaded from the online Data Server to an external electronic database approximately every two (2) weeks.

In addition to the data collected from collars deployed for this Project, MFFN and the MNRF have signed a Sensitive Data Use Licence Agreement (Term: September 22, 2020 to September 22, 2023) whereby location data from the MNRF's collars deployed in the Missisa and Ozhiski ranges will be provided twice per year, on approximately September 30 and April 30. These data will be provided as a shapefile containing one collar location per caribou per day and will be stored in an electronic database upon receipt.

Lastly, collaring data collected for the MNRF's IRAR and caribou research between 2008 and 2014 has been acquired and will be spatially analyzed in relation to the Project route alternatives to assess past occurrence, distribution and seasonal habitat movements in relation to the Project LSA and RSA and to assist in the classification or re-classification of high use habitat areas.

8.2.1.4 Remote Camera Monitoring Program

Remote cameras will be deployed in Spring 2021 and visited in Fall 2021, Spring and Fall 2022 to change memory cards and lithium batteries. Cameras will be retrieved in Spring 2023. Following each visit and retrieval of memory cards, photos will be downloaded into a secure electronic database and reviewed.

8.2.2 Data Analysis

Caribou habitat modelling (**Section 7.1**), population (minimum animal counts) and recruitment rate estimates (MNRF 2014a, b, c), and assessment of population state (i.e., self sustaining or not) based on amount of remaining critical habitat (ECCC 2019) have been completed by federal and provincial regulators and researchers in the past decade for the caribou ranges in Ontario. The addition of new location and movement data from GPS radio collars, field data observations from winter aerial survey and remote cameras, and updated land cover classification will compliment the existing caribou modelling to provide for a more comprehensive evaluation of baseline conditions for caribou in the LSA and RSA.

Radio collar data will be reviewed and analyzed to update the spatial extent and distribution of General Habitat Description (GHD) for caribou, which are as follows:

- Category 1 Habitat (nursery areas, winter use areas, and where possible, calving sites and travel corridors);
- Category 2 Habitat (seasonal ranges); and
- Category 3 Habitat (remaining areas).

The movement of collared caribou will be analyzed using step selection analysis to identify potential travel corridors (i.e., new Category 1 habitat) and distance travelled between nursery and winter use areas. Habitat suitability analysis will be conducted to evaluate connectivity within the LSA and between ranges at baseline conditions. In addition, radio collar data will be reviewed to assess seasonal movement timeframes, fidelity to high use areas and to quantify annual home range sizes. The amount (in hectares) of Category 1, 2 and 3 habitat in the LSA will be calculated to determine a baseline assessment of range condition and biophysical attributes (Appendix H in ECCC 2019). Biophysical attributes include calving, post-calving, rutting, winter, travel, and in general, habitats which reduce predation risk and have abundant lichen (ECCC 2019). Updates to GHD will be done in consultation with the MECP, and spatially displayed on maps using ArcGIS.

The assessment of disturbance levels at baseline conditions will be considered for the LSA at the scale of both the provincial ranges (Missisa, Ozhiski, Nipigon and Pagwachuan ranges; MNRF 2014a, b, c) and at the federal ranges (Far North, Pagwachuan ranges; ECCC 2019), where possible. Land cover layers and recent disturbance data will be acquired from the MNRF and / or the MECP to evaluate whether the ranges that overlap the LSA are nearing the federal disturbance threshold for a self-sustaining population (ECCC 2019) and the provincial risk threshold for a stable or increasing population (MNRF 2014a, b, c).

Estimated probability of occupancy will be calculated following methods outlined in the Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (MNRF 2014d), however, the winter aerial survey will only be completed once during the baseline field program so overall precision of the occupancy estimate will be low. Similarly, one year of aerial survey data are unlikely to provide a reliable caribou population estimate with narrow confidence intervals, however, an estimate of population size may be generated using the minimum animal count (MAC) approach outlined in the Integrated Assessment Protocol (MNRF 2014d). This method calculates all the caribou observations recorded from the fixed wing and rotary wing stages of the aerial survey, not including those deemed duplicates, and will be considered the lowest possible estimate of population size in the Ungulate LSA. The MAC calculated for the LSA may be compared to estimates from remote camera surveys, values presented in the Integrated Range Assessments for the Missisa and Ozhiski ranges (MNRF 2014 a) or with more recent provincial survey results, if available, for reporting on general population trends.

Recruitment (calves: 100 adult females) will be estimated from observations of caribou groups encountered during the winter aerial survey, and by monitoring the reproductive success of collared caribou; this will provide a snapshot estimate of trends. Longer-term (i.e., more accurate) recruitment rates for the ranges that overlap with the LSA will be cited from the IRAR (MNRF 2014) for the baseline conditions. Abundance and distribution of wolves and other predators, including seasonal and annual patterns of use, will be assessed based on photo rate and generalized linear models developed for species of interest, and observations of wolves, wolverines and ungulates during winter aerial surveys across the LSA. Occupancy models from Poley *et al*. (2014) will be reviewed and updated where possible to quantify the predation risk across the landscape.

Causes of death for collared caribou will be obtained from mortality investigations, and trends in pregnancy rates, disease and genetic makeup of caribou in the LSA will be interpreted from the biological samples collected during captures. This analysis will provide a general overview of the health of the population and identify trends prior to the Project construction.

9. Effects Assessment

The following sections provide discipline-specific input and considerations as they pertain to the methodology for effects assessment. The Project is in the early stage of the IS / EA Report preparation and it is expected that the effects assessment methodology will be refined iteratively based on regulatory agency guidance, professional judgment and input received through the Project consultation and engagement process.

9.1 Project-Environment Interactions

The Project activities that may result in changes to the environment are described within the identified temporal and spatial boundaries. This includes identification of both direct and indirect changes by comparing the existing setting to the conditions anticipated to occur as a result of the Project. For each environmental discipline, the likely Project-environment interactions will be identified based on professional judgment, activities listed in TISG Section 3.2 as well as projects of similar magnitude and / or location.

A preliminary analysis of Project-environment interactions for the Ungulates (moose and caribou) discipline is provided in **Table 9-1** and will be confirmed during the IA / EA process to identify the Project-environment interactions that are likely to have a potential effect, and to identify measures to avoid or minimize potential negative effects and enhance benefits.

Table 9-1: Project – Environment Interactions

Project Phases	Project Activities	Ungulates (moose and caribou)
Construction Phase	*Mobilization of Equipment and Supplies*	**x**
	Temporary Construction Staging Areas[1]	**x**
	Temporary Access Roads and Trails[1]	**x**
	Temporary Construction Camps[1]	**x**
	ROW Clearing and Grubbing	**x**
	Brush and Timber Disposal	**x**
	Pits and Quarries[1]	**x**
	Drilling / Blasting / Aggregate Production	**x**
	Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	**x**
	Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	**x**
	Construction Site Restoration	**x**
Construction Phase: Decommissioning	*Pits and Quarries*	**x**
	Temporary Camps, Roads / Trails and Staging Areas	**x**

Project Phases	Project Activities	Ungulates (moose and caribou)
Operations Phase	*Road Usage*	**x**
	Maintenance[2]	**x**

Notes: 1. Includes construction and use of
2. Includes General Maintenance (e.g., grading, erosion control, quarrying, borrow pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance), and Special Maintenance (e.g., slope failures, road settlement / break-up.).

9.2 Valued Components and Indicators

VCs are the environmental, health, social, economic or additional elements or conditions of the natural and human environment that may be impacted by a proposed project and are of concern or value to the public, Indigenous peoples, federal authorities and interested parties (the Agency 2020b). Indicators represent the resource, feature, or issue related to the VC that, if changed, may demonstrate an effect on the environment. The indicators and rationale for selection and measurement of potential effects, to be used to assess and evaluate the alternative routes in the IS / EA Report are provided in **Table 9-2.** The table includes both quantitative and qualitative indicators. The final list of VCs and indicators to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

The VCs of the Ungulates (moose and caribou) discipline have been determined through consideration of the following factors listed in the TISG[7]:

- VC presence in the study area;
- the extent to which the VC is linked to the interests or exercise of Aboriginal and Treaty Rights of Indigenous peoples, and whether an Indigenous group has requested the VC;
- the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the VC;
- the extent to which the VC may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes;
- the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies);

7. *The TISG also states that information from ongoing and completed regional assessments in the proposed area of the Project should be used to inform VCs for the Project. In February 2020 a regional assessment of the Ring of Fire region commenced; however, it is not sufficiently advanced at this time to inform the Project VCs. The VCs will be consulted and engaged on early in the IA/ EA process and finalized taking into consideration the input received. Therefore, only information relevant to the Project that arises from the regional assessment of the Ring of Fire within an appropriate timeline will inform the VCs for the Project.*

- the possibility that adverse or positive effects on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and
- whether the potential effects of the Project on the VC can be measured and / or monitored or would be better ascertained through the analysis of a proxy VC.

Inputs received to date from Indigenous communities, agencies and interested persons through the Consultation and Engagement Program, including inputs received on the Draft ToR, have also been used to inform the selection of the VCs and indicators for the Ungulates (moose and caribou) discipline.

Table 9-2: Ungulates (moose and caribou) Indicators

Valued Components	Indicators	Rationale for Selection
Moose (*Alces alces)*	■ Habitat availability ■ Habitat distribution ■ Species population state	■ Cultural importance and local recreational / economic value and sustenance
Caribou (*Rangifer tarandus caribou)*	■ Habitat availability ■ Habitat distribution – includes spatial extent and distribution of GHD Category 1, 2, and 3 habitats (MNR 2013d) and availability and distribution of habitat which contain biophysical attributes necessary for caribou seasonal and life stage activities (ECCC 2019). ■ Species population state (survival and recruitment)	■ Species of conservation concern (designated as Threatened federally under the *Species at Risk Act* and provincially under the *Endangered Species Act*) ■ Cultural importance and local recreational value and sustenance

9.3 Potential Effects

A direct effect occurs through the direct interaction of an activity with an environmental discipline. The Project-environment interactions currently anticipated, based upon preliminary analysis, to result in direct effects to the Ungulates discipline have been identified in **Table 9-1**. The potential direct effects resulting from the Project-environment interactions will be confirmed during the IA / EA process and will be based on input received through the Indigenous Knowledge Program and Consultation and Engagement Program, regulatory agency guidance, and professional judgement.

An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in wildlife could indirectly affect fish and fish habitat). **Table 9-3** provides a preliminary identification of how changes to Ungulates (moose and caribou [boreal population]) may result in indirect effects to other environmental disciplines.

Table 9-3: Potential Discipline Interactions

Discipline and Associated Valued Components	Aboriginal and Treaty Rights and Interests	Atmospheric Environment	Acoustic and Vibration Environment	Physiography, Geology, Terrain and Soils	Surface Water	Groundwater and Geochemistry	Vegetation	Wildlife	Fish and Fish Habitat	Social	Economy	Land and Resource Use	Human Health and Community Safety	Visual Aesthetics	Archaeological and Cultural Heritage
Wildlife ■ **Caribou, Boreal Population** ■ **Moose**	X	-	-	X	-	-	X		X	-	X	X	-	-	-

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

9.4 Methods for Predicting Future Conditions

With respect to quantitative models and predictions, the IS / EA Report must detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained.

ArcGIS will be used to make quantitative and qualitative prediction of future conditions using the data collected during field investigations. A comparative analysis of the potential future conditions, or extent and magnitude of negative and positive residual effects, for Route Alternatives 1 and 4 will serve to inform route selection and measures to minimize or avoid effects. The effects will be assessed with consideration of mitigation, protection and avoidance measures, and structure design.

Predicted changes from baseline conditions for both route alternatives for ungulates will be estimated to describe and characterize potential adverse and positive effects, as follows:

- Changes in habitat availability and animal use will be estimated quantitatively by calculating differences in the amount of Category 1, 2, and 3 habitat and biophysical attributes, and qualitatively considering potential changes in habitat use (e.g., avoidance due to sensory disturbance).
- Changes in habitat distribution, including the effects on wildlife movement (travel corridors) and habitat connectivity, will be estimated qualitatively by examining changes to the distribution of mapped habitat patches within the caribou and moose RSAs and LSAs, and considering potential barriers to movement.
- Changes in species population state (changes to abundance from altering survival and reproduction) will be estimated quantitatively using the results from changes in habitat, recruitment rates, and predation risk in addition to a qualitative estimate of potential changes in abundance from other Project components and activities (e.g., animal-vehicle collisions). Population indicators will be evaluated at the WMU level of moose and the Range level for caribou.

Maps will be constructed to illustrate habitat availability, suitability, and habitats of relative importance to ungulates relative to the LSA and RSA. Maps will be developed illustrating existing disturbance footprints and expected disturbance footprints as a result of the Project route alternatives and overlaid with habitat suitability models. Permanent and temporary disturbances associated with the Project route alternatives will also be mapped. Tables will be constructed to quantify much of these data to be incorporated into the IS / EA Report.

9.4.1 Moose Habitat Modelling

The PDA will be spatially analyzed in relation to previously disturbed areas in the Wildlife Management Unit using cumulative disturbance data from the MECP and / or the MNRF. Habitat suitability models will be constructed using ArcGIS and Model Builder to evaluate the moose indicators of habitat availability and distribution. Mapping of habitat features in relation to Project components will be used to quantify projected changes to these habitat indicators as a result of the Project, and inform mitigation, protection and avoidance measures including alignment shifts to avoid such features, to predict future conditions and potential effects of the Project.

Availability and distribution of moose habitat in the PDA, LSA and RSA will be estimated and mapped using Ontario Land Cover Compilation v. 2.0 (OLCC) (LIO 2020) which is a compilation of Far North Land Cover v 1.4 and Provincial Land Cover 2000 Edition in ArcMap. Habitat categorization for moose will follow an HSI model approach, and good quality habitats will be defined according to a threshold representing the minimum value below which the habitat is not suitable for reproduction and survival (Ackakaya *et al.* 2004). The standard threshold value is typically 0.5, which will be used in this assessment.

The moose HSI is similar to that used by the Ontario Landscape Tool for predicting moose densities (Rempel 2008, Elkie *et al*. 2013). The model considers the following three parameters:

- percent of area in young forest cover types;
- percent of area in mature conifer; and
- percent of area in mature mixed forest.

Provincial forest fire data and fires from the Far North disturbance layer will be combined into a fire layer. The combined fire layer will be intersected with OLCC data to identify areas associated with burns. Areas intersecting with burn area greater than 10 years or less than 20 years in age will be overwritten and classified as young forest habitat (**Table 9-4**).

Table 9-4: Proposed Reclassification Land Cover 2000 / OLCC Land Classification Units and Wildfire Data to Apply Moose Habitat Suitability Index

HSI Land Cover	Land Cover 2000	Provincial Wildfire Data
Young Forest	■ Sparse forest, Regenerating depletion	■ Burn Age is ≥10 to ≤20 years old [since 2016], (i.e., Year of Burn is 2007 to 1997). Land Cover 2000 dense coniferous forest, treed fen, and treed bog were also reclassified as “young forest”.
Mature Conifer	■ Coniferous forest OR Treed fen OR Treed bog OR Coniferous swamp	■ Not applicable
Mature Mixed Wood	■ Mixed forest	■ Not applicable

Note: 1. Land Cover 2000 types of coniferous, treed fen, treed bog, coniferous swamp and mixed forest are assumed to represent mature forest stands.
2. ≥ = greater than or equal to; ≤ = less than or equal to; >= greater than.

Preserving the original resolution of the Land Cover 2000 / OLCC data, a 400 m search radius from each default map unit will be used to quantify the percent young forest, mature conifer and mixed forest and create one new attribute at a 50 ha unit scale (Elkie *et al.* 2013). Subsequently each map unit will then be classified as “moderate to high suitability” (*i.e.,* unit value of 1) if the following conditions are met:

- 5% to 65% of 50 ha area in young forest; or
- 10% to 60% of 50 ha area in mature conifer; or
- 10% to 75% of 50 ha area in mature mixed forest.

If conditions are not met, then unit value = 0 (i.e., habitat was nil to low suitability).

Result of the moose habitat modelling will be verified with the moose occupancy models describing their distribution in the far north (Poley *et al.* 2014).

9.4.2 Caribou Population and Habitat Modelling

Population-level modelling will be used to assess the effects of proposed disturbance on caribou at the scale of the LSA, RSA and the federal Far North. Modelling will consider potential increase in predation risk as a result of a new linear disturbance on the landscape, and potential effects of climate change on the biophysical attributes of caribou habitat. The Project route alternatives will be overlaid with existing models (CST, GHD, RSPF, IRAR) updated in the baseline assessment with new field data to predict future conditions.

The federal recovery strategy for boreal caribou has identified a minimum critical disturbance management threshold of 65% undisturbed habitat in a range, which provides a 60% probability for a local population to be self-sustaining. At this level of undisturbed habitat, there remains a 40% probability that local populations will not be self-sustaining (EC 2011; ECCC 2019). This threshold will be used in the effects assessment as a metric to estimate cumulative impacts[8] to caribou.

Cumulative disturbance data from MECP and / or MNRF will be spatially analyzed with the permanent and temporary areas of the Project route alternatives to determine cumulative disturbance. The Project route alternatives will be buffered by 500 m and the Project disturbance will be estimated using the formula *(Project footprint + 500 m buffer) – overlapping existing disturbances* (EC 2011) to quantify the amount of new disturbance that will be added to the landscape as a result of the Project. This will determine whether the addition of the Project will exceed the disturbance thresholds established in the federal Recovery Strategy (ECCC 2019).

8. *The cumulative impacts discussed here are distinct from the cumulative effects assessment, which will assess the effects of the Project with the effects of past, present and reasonably foreseeable projects.*

The buffered Project route alternatives will be spatially analyzed in relation to provincial GHD Category 1, 2 and 3 habitat and land cover layers to quantify the potential alteration of range condition and loss of biophysical attributes in the LSA and RSA as a result of the Project (Appendix H ECCC 2019).

The buffered Project route alternatives will be spatially analyzed in relation to the provincial and federal range scale, and habitat suitability analysis will be conducted to evaluate habitat and range connectivity and the potential alteration of connectivity as a result of the Project. Movement data of collared individuals will be used in a step selection analysis to evaluate current movement corridors and whether the Project has potential to reduce connectivity within or between ranges.

9.5 Mitigation and Enhancement Measures

Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects, beyond those that are already inherent to the design. These measures will consist of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, Indigenous and community recommendations and recommendations from industry and environmental professionals based on expertise, scientific publications, experience and judgement.

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

9.5.1 TISG Section 20 Requirements

There are a number of generic requirements related to mitigation and enhancement measures listed in the TISG that are applicable to Ungulates. The IA / EA will consider the applicability of these generic measures and those that are specific to Ungulates VC including:

- In relation to caribou, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. In addition, the following mitigation measures should be considered by the Proponent:

  - The following provincial guidance documents should be followed:
    - Best Management Practices for Renewable Energy, Energy Infrastructure and Energy Transmission Activities and Woodland Caribou in Ontario; and
    - Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits.

- Include measures to address sensory disturbance and the resulting functional loss of habitat;
- Incorporate Wildlife Friendly road-design principles and features, which may include underpasses and wildlife bridges (as well as monitoring to estimate bat and other wildlife mortality);
- Identify and describe mitigation measures, including alternative means of carrying out the Project that would avoid or lessen potential adverse effects to terrestrial and aquatic species and / or critical habitat listed under Schedule 1 of the species at Risk Act, including but not limited to woodland caribou and Lake Sturgeon (*Aciper fulvescens*). These measures:
  - Are to be consistent with any applicable recovery strategy, action plan or management plan and will also identify and describe mitigation measures to avoid or lessen adverse effects to COSEWIC-assessed species; and
  - must be described in terms of the effectiveness of each measure to avoid the adverse effects and include a comprehensive science-based rational for proposing the selected mitigation measures.
- Identify measures to prevent and mitigation the risk of engaging in harmful, destructive or disruptive activities in key sensitive periods and locations (e.g., hunting season) to wildlife and wildlife habitat;
- In relation to caribou, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. In addition, the following mitigation measures should be considered by the Proponent:
  - demonstrate that avoidance and minimization measures will be applied for boreal caribou and its critical habitat:
    - assess mitigation measures at the scale of provincial ranges and federal ranges and incorporate the results of population level analyses;
    - describe all reasonable alternative means of carrying out the Project that would avoid the adverse effects of the Project on boreal caribou; a description of how these alternative means have been considered; and a rationale to confirm that the best solution has been adopted to address adverse effects on boreal caribou;

- describe all feasible measures that will be taken to minimize the adverse effects of the Project on boreal caribou and its critical habitat:
  - minimize the footprint of development and consider locations where habitat is already disturbed;
  - restore habitat to provide availability of undisturbed habitat over time;
  - avoid destruction of biophysical attributes (see Appendix H of the recovery strategy);
  - mitigate noise, light, smell, and vibration;
  - develop an access management plan; and
  - use techniques to prevent use of the corridor by predators.

- provide offsetting or compensation plans to address all residual effects to species at risk, and their critical habitat, migratory birds, fish and fish habitat and / or wetland functions (if applicable) for review during the impact assessment process; the plans should:
  - describe the baseline condition of the species at risk, critical habitat, migratory birds and wetland functions potentially impacted by the Project;
  - apply the mitigation hierarchy;
  - identify and describe residual effects;
  - identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial authorities and Indigenous groups have been considered;
  - identify the location and timing of implementation of compensation projects (where feasible);
  - identify and describe the success criteria;
  - identify and detail non-habitat measures;
  - describe how the proposed measures align with published provincial and federal recovery, management, or action plans and strategies for species at risk;
  - identify the parties responsible for implementation, including monitoring and review;
  - identify indicator species for setting compensation objectives. Identification should be based baseline data, Bird Conservation Strategies, and other information where available (note: species at risk should not be used as indicator species; compensation efforts need to be directed specifically to these species);
  - describe the functions gained at the compensation site(s);
  - provide evidence that functions can be replaced by the proposed offset activities;
  - describe the process of selecting proposed compensation site(s) and associated baseline condition(s); and
  - provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities.

Conventional mitigation and avoidance measures to reduce the risk of harm to ungulates and ungulate habitats are available through industry standard practices and agency guidance. Such measures are typical and expected for Projects of such scope of work as the CAR. These are standard practice and are in addition to potential site and / or Project-specific measures which may be identified through Indigenous and community consultation, regulatory processes and agency guidance. These industry-standard practices will be discussed in the IS / EA Report and will be included in construction environmental management plan(s) (CEMP) and contract documents.

Such measures are important for inclusion in the IS / EA Report because the effects assessment process accounts for these measures to identify the net or residual effects of an activity following implementation of such measures. There are certain activities associated with the Project where, left unmitigated, are likely to result in significant harm. However, proper implementation of mitigation and avoidance measures can minimize or completely negate the risk of such harm from occurring as a result of the activity. The IA / EA will describe the framework for a future CEMP (to be developed prior to construction), related to its implementation and the standard measures and practices included therein that will be implemented into the Project. Mitigation measures related to caribou will be developed in collaboration with federal and provincial agencies and included in the IS / EA Report. Provincial best management guidance documents will be followed, including the Best Management Practices for Renewable Energy, Energy Infrastructure and Energy Transmission Activities and Woodland Caribou in Ontario (MNR 2013a). In addition, professional experience in dealing with caribou under the *ESA* and *SARA* will be drawn upon for caribou-specific mitigation measures.

Typically, the contractor is responsible for implementation of the CEMP. The responsible party will be identified in the discussion pertaining to the CEMP. Rationale will be provided in the IS / EA Report in the event that any applicable standard measures are omitted from the environmental construction management plan, if any. If authorization is required, then an offsetting plan will be developed. Mitigation and avoidance measures that are typical and standard practice of construction will be applied to both construction and operation phases of the Project.

9.6 Residual Effects

Residual effects are the effects remaining after the application of mitigation measures. The IS / EA Report will describe in detail the potential adverse and positive residual effects in relation to each temporal phase of the Project (e.g., construction, operation). Residual effects will be described using criteria to quantify or qualify adverse and positive effects, taking into account any important contextual factors. The residual effects will therefore be described in terms of the direction, magnitude, geographic extent, duration,

frequency, likelihood, and whether effects are reversible or irreversible[9]. Ecological and socio-economic context may also be relevant when describing a residual effect. Context relates to the existing setting, its level of disturbance and resilience to adverse effects. Context can also relate to timing as it applies to assessing the worst-case scenario (e.g., effect during migratory or calving season for wildlife). Where appropriate, information regarding residual effects will be disaggregated by sex, gender, age and other community relevant identifying factors to identify disproportionate residual effects for diverse subgroups.

For magnitude, environmental discipline-specific definitions are required and are proposed below in **Table 9-5.**

Table 9-5: Ungulates (moose and caribou) Magnitude Definition

Magnitude Level	Definition	Rationale
Negligible	■ No measurable change to baseline conditions for habitat availability, distribution and function nor to the baseline population state.	■ Minor change in ungulate habitat (availability and distribution), to a degree that does not reduce function or connectivity. ■ Minor disturbance to VC species behaviour that does not impede them from carrying out their life processes.
Low	■ Minor change to baseline habitat availability and distribution, without loss of function or individuals.	■ Habitat reduced in spatial extent and / or change in habitat quality due to sensory disturbance, however, remains suitable and functional (habitat will still be used) and does not exceed disturbance management thresholds[1] ■ Minor or temporary decrease in habitat function and / or connectivity of habitats ■ Minor or temporary disturbance to ungulates that may interrupt a life process but not anticipated to impact the survival of individuals. ■ Minor or temporary disturbance to ungulates that may interrupt a life process but not anticipated to impact the population state (no anticipated reduction in recruitment rate).
Medium	■ Change to baseline habitat and conditions that results in decrease in function and productivity.	■ Habitat reduced in spatial extent and / or change in habitat quality due to sensory disturbance, resulting in reduced quality and function but not completely eliminated and does not exceed disturbance management thresholds[1] ■ Direct and permanent decrease in habitat function and/or connectivity of habitats however change in habitat does not exceed disturbance management thresholds[1] ■ Disturbance which has potential to permanently impede some individuals from carrying out life processes, which may impact the survival of individuals but does not have population-level impacts. ■ Potential incidental death, to a degree that is not likely to have population-level impacts.

9. *TISG Section 13.1 identifies additional effects characteristics for certain disciplines (e.g., wetlands, birds, terrestrial wildlife, species at risk). These additional effects characteristics are described in the respective discipline-specific study plans.*

Magnitude Level	Definition	Rationale
High	■ Change to baseline habitat and conditions that renders them unusable to ungulates.	■ Habitat reduced in spatial extent and/or change in habitat quality due to sensory disturbance, resulting in complete loss of quality and function as a result of species avoidance. ■ Direct and permanent loss of habitat function and / or connectivity, rending it no longer suitable for the function it had at baseline conditions and disturbance management threshold is exceeded[1] ■ Disturbance to individuals which restricts them from carrying out life processes, e.g., disturbance results in complete barrier to Category 1 habitat. ■ Potential incidental death of individuals to a degree that has population-level impacts.

Note: 1. The federal recovery strategy for boreal caribou has identified a minimum critical disturbance management threshold of 65% undisturbed habitat in a range, which provides a 60% probability for a local population to be self-sustaining.

9.7 Consideration of Sustainability Principles

The following provides a generic description of how sustainability principles will be considered in the effects assessment. The extent to which sustainability principles apply to a specific VC will vary depending on the nature of the VC and the potential for Project effects on the VC.

The effects assessment approach for the Project has included the consideration of the sustainability principles outlined in the Project TISG and the Agency's guidance on sustainability. The sustainability principles that have been considered include:

1. Consider the interconnectedness and interdependence of human-ecological systems;
2. Consider the well-being of present and future generations;
3. Consider positive effects and reduce adverse effects of the Project; and
4. Apply the precautionary principle by considering uncertainty and risk of irreversible harm.

The interconnectedness and interdependence of human-ecological systems will be considered through the assessment of potential indirect effects of each alternative. An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in vegetation could indirectly affect wildlife). A preliminary assessment of indirect effects has been included in **Section 9.3**.

The well-being of present and future generations will be considered in the effects assessment through the application of the long-term operations phase temporal boundary of 75 years (**Section 6.1**) and through the effects characteristics description of duration and reversibility for each residual effect predicted.

The consideration of positive effects and reducing adverse effects of the Project is fundamental to the effects assessment methodology through the identification of mitigation measures to reduce potential adverse effects and the identification of the preferred alternative through the evaluation of advantages (e.g., positive effects) and disadvantages (e.g., adverse effects).

The effects assessment will apply the precautionary principle by clearly describing and documenting all uncertainties and assumptions underpinning the analysis and identifying information sources. The effects assessment will consider risk of irreversible harm through the effects characteristics description of reversibility for each residual effect predicted and will describe any uncertainty associated with the assessment of residual effects.

The scope of the sustainability assessment will be defined by issues of importance identified by Indigenous communities and interested persons through consultation and engagement activities, while also ensuring to be inclusive of the diversity of views expressed. The selection of VCs that will be the focus of the sustainability assessment will be aligned with the issues of importance identified by Indigenous communities and interested persons, as well as residual effects identified through the effects assessment process. The sustainability assessment will describe how the planning and design of the Project, in all phases including follow-up monitoring, considered the sustainability principles.

9.8 Consideration of Identity and Gender-Based Analysis Plus in Effects Assessment

The Proponent recognizes that communities and sub-populations within those communities may be impacted differently by the Project with respect to VCs and indicators. As such, the Project aims to collect baseline information for the purpose of assessing differential effects and establishing relevant mitigation measures, as further elaborated on in **Section 4.3**. Gender-Based Analysis Plus will not be limited to community feedback, when offered or discussed in secondary texts, additional sub-population information as is applicable to the relevant assessment will be incorporated.

9.9 Follow-up Programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. Identification of follow-up programs for the Project are not described in this Study Plan as the information needed to determine environmental monitoring requirements is dependent on the outcome of the effects assessment and consultation with Indigenous communities, agencies and interested

persons. Therefore, the Proponent will include information on follow-up programs, that address the requirements outlined in Section 26 of the TISG, in the IS / EA Report and will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required.

Compliance and effects monitoring is a typical component of a Construction Environmental Management Plan (CEMP) to monitor the implementation and effectiveness of mitigation and avoidance measures of the CEMP, contract documents and applicable permits, documentation and monitoring of the predicted residual effects as well as documentation of those effects that are uncertain (if any) and to make recommendations of corrective action if required. As noted above, the need for and / or details of a follow-up program specific to ungulates will be determined following completion of the IS / EA and design details. Where such a program is required, development of the program will take into consideration the predicted residual effect, monitoring, reporting, implementation and intervention responsibilities, input and participation of Indigenous communities, regulatory requirements, and monitoring frequency and duration.

9.9.1 TISG Section 26 Requirements

There are a number of generic requirements related to follow-up programs listed in Section 26 of the TISG that are applicable to Ungulates. The IS / EA Report will consider the applicability of these recommendations and those that are specific to Ungulates including:

- In relation to caribou:
  - monitor effects on boreal caribou and their critical habitat to verify impact assessment predictions, ensure that mitigation measures are effective, and determine whether any unanticipated effects are occurring within the Project area;
  - monitoring methods should follow standardized / established methods and include a robust before-after-control-impact design (or similar field-based approach) to allow for quantitative assessment of potential effects of the Project and identify any adaptive management that may be necessary;
  - the methodology provided should include the monitoring schedule;
  - the methodology should include a description of the performance indicators that will be used to evaluate the effectiveness of the mitigation measures; and
  - identify circumstances and mechanisms under which corrective / adaptive measures may be implemented to address any issue or problem identified through the follow-up programs or environmental monitoring. For example, if unanticipated effects occur or the effects are greater than anticipated;

10. Assumptions

Any assumption used in the effects assessment, for example the assumed average daily traffic on the CAR, will be clearly identified and a rationale provided in the IS / EA Report. Specific assumptions are listed in other sections of the Study Plan (e.g., Section 7).

11. Concordance with Federal and Provincial Guidance

This section provides the best information currently available on how federal and provincial requirements identified for the Project to date will be addressed. The final concordance with federal and provincial requirements will be included in the IS / EA Report, and will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

Table 11-1: Study Plan Federal Concordance – Conformance with Requirements

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
1	TISG Section 01.1, page 4	■ The Guidelines correspond to factors to be considered in the impact assessment. These factors are listed in subsection 22(1) of IAAC and prescribe that the impact assessment of a designated project must take into account any change to the designated project that may be caused by the environment;	■ The potential effects of the project on the environment will be assessed in accordance with applicable standards and guidance.	■ Section 9
2	TISG Section 02.3, pages 6-7	■ The description should focus on aspects of the Project and its setting that are important in order to understand the potential environmental, health, social and economic effects and impacts of the Project. The following information must be included and, where appropriate, located on map(s): – geographic co-ordinates (i.e., longitude/latitude using international standard representation in degrees, minutes, seconds) for the beginning and end points of the proposed road; – current land and/or aquatic uses within the study areas; – distance of the project components to any federal lands and the location of any federal lands within the study areas; – all waterbodies and their location on a map; – navigable waterways; – the environmental significance and value of the geographical setting in which the Project will take place and the study areas; – environmentally sensitive areas, such as national, provincial, territorial and regional parks, UNESCO World Heritage Sites, geological heritage sites, ecological reserves, ecologically and biologically sensitive areas, wetlands, and habitats of federally or provincially listed species at risk and other sensitive areas; – Dedicated Protected Areas3 and any other areas of ecological and social significance identified by the community during the community-based land use planning processes with the Province of Ontario (e.g., Enhanced Management Areas; see Section 6.1 for requirements related to confidentiality); – lands subject to conservation agreements; – current mineral development proposals, and areas of early and advanced mineral exploration in the study areas; – current areas of aggregate extraction; – description and locations of all potable drinking water sources (i.e., municipal or private), including spring water sources; – description of local communities and Indigenous groups that is culturally relevant and gender sensitive; – if the information is not confidential, provide a description and location of Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, Indian Reserve lands, Indigenous harvesting regions (with permission of Indigenous groups), Métis settlements; and – culturally important features of the landscape.	■ The information requested will be provided in the IS / EA Report, if applicable.	■ No reference
3	TISG Section 03.1, page 11	■ The Impact Statement must describe all project components including but not limited to: – borrow pits, gravel or aggregate pits and quarries (footprint, geographic location, ownership, and development plans including pit phases and lifespan), including their location in relation to upland habitats and the presence of rare, limited and/or significant habitat (e.g., federal6, provincial, or Indigenous protected and conserved areas, ANSIs (Areas of Natural and Scientific Interest), Ramsar sites, critical habitat identified under the Species at Risk Act, etc.;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ No reference
4	TISG Section 05.1, page 22	■ Any proposed mitigation measures are to be clearly linked, to the extent possible, to valued components in the Impact Statement as well as to specific project components or activities, as well as comments raised during engagement activities	■ Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects.	■ Section 9.5

10. Federal TISG Reference should be the Section or subsection, page etc. that clearly identifies where comment/issue we are addressing can be found (ex. Section 8.1 of TISG)

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
5	TISG Section 07.1, page 29	■ In describing the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the Project may affect the structure and functioning of biotic and abiotic components with the ecosystem using scientific, community and Indigenous knowledge regarding ecosystem health and integrity, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity, identified during early planning and reflected in the TISG. The presence of habitat (e.g., federal, provincial, or Indigenous protected areas, ANSIs, RAMSAR sites, critical habitat identified under the Species at Risk Act, etc.), such as but not limited to spawning shoals, aquatic vegetation or overwintering pools, potentially effected by the Project should be included in the description of the biophysical baseline conditions.	■ We will take an ecosystem approach that considers how the project may affect structure and functioning of biotic and abiotic ecosystem components and the potential residual effects as a result of these changes. This includes areas of indigenous cultural importance, descriptions of ecosystem health and integrity, the presence of protected areas and critical habitat for SAR species.	■ Section 9
6	TISG Section 07.1, page 30	■ The Impact Statement must consider the resilience of relevant species populations, communities and associated habitats to the effects of the Project. Ecological processes should be evaluated for potential susceptibility to adverse effects from the Project. Considerations include patterns and connectivity of habitat patches; continuation of key natural disturbance regimes; structural complexity; hydrogeological or oceanographic patterns; nutrient cycling; abiotic-biotic and biotic interactions; population dynamics, genetic diversity, Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.	■ The IA / EA will consider the resilience of relevant populations, communities and associated habitat to the effects of the Project. Ecological processes will be evaluated for potential susceptibility to adverse effects from the Project such as considerations for: patterns and connectivity of habitat patches, continuation of key natural disturbance regimes etc.	■ Section 8 ■ Section 9
7	TISG Section 07.1, page 30	■ The Impact Statement must establish appropriate study area boundaries to describe the baseline conditions. The study area boundaries need to encompass the spatial boundaries of the Project, including any associated project components or activities, and the anticipated boundaries of the Project effects, including all potentially impacted local communities, municipalities and Indigenous groups. Considerations in assigning appropriate study areas or boundaries would include, but not be limited to: – areas potentially effected by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters; – areas potentially effected by airborne emissions or odours; – areas determined by dispersion and deposition modelling; – areas within the range of vision, light and sound and the locations and characteristics of the most sensitive receptors; – species habitat areas, usage timing and migratory patterns; – emergency planning and emergency response zones; – the geographic extent of local and regional services; – any impacted local communities, including municipalities; – all potentially impacted Indigenous groups; – areas of known Indigenous land, cultural, spiritual and resource use; and – existing effected infrastructure.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
8	TISG Section 07.1, page 30	■ If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas. Ensure baseline data are representative of project site conditions. If surrogate data from reference sites are used rather than site-specific surveys, the proponent should demonstrate that the data are representative of project site conditions.	■ We will include details on modelling methods and discuss confidence in using desktop and/or field studies when describing baseline conditions.	■ Section 7 ■ Section 8
9	TISG Section 07.1, page 31	■ Where baseline data are available in geographic information system (GIS) format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada.	■ Data provided will meet ISO 19115 standards.	■ Section 8
10	TISG Section 07.2, pages 31-33	■ Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following sources of information. For specific sources of baseline information, see Appendix 1. – Federal government (e.g., Environment and Climate Change Canada, Health Canada, Indigenous Services Canada, Statistics Canada, Women and Gender Equality Canada);	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		– Ontario provincial government (e.g., Ministry of Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry; – Bird Conservation Region plans; – academic institutions; – field studies, including site-specific survey methods; – database searches, including: • federal, provincial, territorial, municipal and local data banks; • Breeding Bird Atlas - Ontario (2001-2005) – monitoring program databases protected areas, watershed or coastal management plans; – natural resource management plans; – species recovery and restoration plans; – field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape); – land cover data, including: • terrestrial ecosystem mapping products; • forest cover maps; • remote sensing resources; • important habitats and features to include: ▪ water bodies, wetlands, watercourses; ▪ riparian habitat; ▪ river banks or other eroded habitats; ▪ artificial water sources; ▪ forest, tree patches, solitary trees (especially old decaying trees); ▪ forest edges and tree rows; ▪ ridges, including eskers; ▪ caves and mines; ▪ cliffs, rock outcrops, exposed bedrock, talus, and other karst topography; ▪ buildings, bridges, and other anthropogenic features, including linear features; ▪ sources of artificial lighting attracting insects; ▪ critical habitat; and ▪ and any other habitat features known to be important in the area. – Published literature, such as peer reviewed journals, reports by think tanks, non-government organizations and government reports; – environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area; – regional studies, project assessments and strategic assessments; – renewable harvest data; – Indigenous knowledge, including oral histories and knowledge gathered by spending time on the land with knowledge holders; – community based monitoring and studies conducted by Indigenous communities; – expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys; – qualitative information gathered from interviews, focus groups or observation; – census data; – baseline human health risk assessments; – community and regional economic profiles; – community well-being studies; and – statistical surveys, as applicable.		

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
11	TISG Section 07.2, page 32	■ The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 ■ Appendix A
12	TISG Section 07.2, page 33	■ Data directly relevant to the area surrounding the Project are limited. With the exception of existing count data that have been collected within the regional study area, the use of existing information sources should be limited to the goals of estimating the species likely to occur in the study areas, and to identifying the potential timing of migration passage (for species that migrate through) or the general dates of breeding (for species that breed in the area).	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A
13	TISG Section 07.2, page 33	■ Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to.	■ We will include details on modelling methods and discuss confidence in using desktop and / or field studies when describing baseline conditions.	■ Section 7 ■ Section 8
14	TISG Section 07.2, page 33	■ If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A
15	TISG Section 07.2, page 33	■ With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data should be considered as a limited augmentation of this new data. See the “Establishing Baseline Conditions” (sections 8.5, 8.9, 8.10, 8.11) in this Tailored Impact Statement Guidelines for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts. Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). ■ Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 ■ Section 8
16	TISG Section 07.2, page 33	■ Consult the Species at Risk Public Registry for information on the list of species at risk and available recovery documents and reference the documents and dates consulted. Ensure the most up to date documents are used and species statuses are up to date.	■ The information requested will be provided in the IS / EA Report.	■ Section 9
17	TISG Section 07.3, page 34	■ The list of valued components must be informed, validated and finalized through engagement with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities, and other interested parties. The Impact Statement must describe valued components, processes, and interactions that are identified to be of concern or that the Agency considers likely to be impacted by the Project and are included in the Guidelines.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available.	■ Section 4
18	TISG Section 07.3, pages 34-35	■ In selecting a valued component to be included, the following factors should be considered: – valued component presence in the study area; – the extent to which the valued component is linked to the interests or exercise of Aboriginal and Treaty rights of Indigenous peoples, and whether an Indigenous group has requested the valued component; – the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the valued component; – the extent to which the valued component may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes;	■ The IS / EA will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the project.	■ Section 9

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		– the extent to which the valued component is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies); – the extent to which the valued component is being addressed through any ongoing or completed regional assessment processes; – the possibility that adverse or positive effects on the valued component would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and – whether the potential effects of the Project on the valued component can be measured and/or monitored or would be better ascertained through the analysis of a proxy valued component.		
19	TISG Section 07.3, page 35	■ The valued components must be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential adverse and positive environmental, health, social and economic effects and impacts arising from the Project activities.	■ The IS / EA will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the project.	■ Section 9
20	TISG Section 07.3, page 35	■ For each of the valued components that will be assessed in the Impact Statement, the proponent must create a study plan and a work plan to be validated by the Agency. Upon receipt of a study plan, the Agency may request that the proponent present and discuss the study plan at technical meetings, which will be scheduled during the impact statement phase.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.	■ Section 3
21	TISG Section 07.4.1, pages 35-36	■ The Impact Statement must describe the spatial boundaries, including project, local and regional study areas, for each valued component included in assessing the potential adverse and positive environmental, health, social and economic effects of the Project and provide a rationale for each boundary. Spatial boundaries are defined taking into account the appropriate scale and spatial extent of potential effects and impacts of the Project; community knowledge and Indigenous knowledge; current or traditional land and resource use by Indigenous groups; exercise of Aboriginal and Treaty rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations. The size, nature and location of past, present and foreseeable future projects and activities are factors that should be included in the definition of spatial boundaries. It should be noted that in some cases, spatial boundaries might extend to areas outside of Canada. These transboundary spatial boundaries should be identified where transboundary effects are expected.	■ The Study Areas are defined and described in the Study Plan.A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available.	■ Section 6 ■ Section 4
22	TISG Section 07.4.1, page 36	■ For biophysical valued components, spatial boundaries should be defined using an ecosystem-centred approach for the project study area, local study area, and regional study area, as wetlands and eskers are features that are likely to be most effected. Ecoregion boundaries or their derivatives should not be used since the Project occurs on, near and across ecoregion boundaries. See Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 for more guidance on determining spatial boundaries. Delineate spatial boundaries (i.e., regional study area, local study area, and project study area) to meet the following objectives: a. range of land cover types should be representative of the defined spatial extent; b. the spatial pattern of the land cover types should be well distributed across the defined spatial extent (e.g., revise if one or more land cover types is concentrated in one sub-area and uncommon in other parts of the area); and c. low to moderate rate of change in the prevalence of one or more land cover types with increasing distance from the (i.e., to use land cover patterns to constrain the distances within which comparisons should be made).	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
23	TISG Section 07.4.1, page 36	■ For valued components establish three study area spatial boundaries to assess impacts to each valued component: 1) Project Study Area: defined as the project footprint for each alternative route;" 2) Local Study Area: defined for each valued component – see below; 3) Regional Study Area: defined for each valued component – see below ■ Provide a rationale for boundaries of the project study area, local study area, and regional study area for each valued component and indicate how the above objectives were met in establishing the boundaries.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
24	TISG Section 07.4.1, page 37	■ For Habitat valued components: The spatial extent of the habitat and the habitat functions should influence the determination of an appropriate local study area and regional study area, considering objectives a-c above. The local study area should be at a minimum: project study area plus a 500-metre buffer. For habitat valued components potentially affected by the Project, a land cover analysis should be conducted to determine if a 500-metre buffer appropriately reflects ecological boundaries.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
25	TISG Section 07.4.1, page 37	■ For Species valued components: The local study area should correspond to the project study area plus a buffer defined with objectives a-c above. Use simulation modelling to help define a buffer that captures objectives a-c for each species or species group.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6

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26	TISG Section 07.4.1, page 37	■ Contact provincial and/or local government authorities to verify appropriate boundaries for wildlife species. Guidance for specific species of interest have been listed below: – for wolverine, the local study area should be at a minimum: project study area plus a 10- kilometre buffer. Simulation modelling may indicate a larger buffer; – for bats, the local study area should be at a minimum: project study area plus a 1-kilometre buffer. Simulation modelling may indicate a larger buffer; and – for caribou, the local study area should be at a minimum: project study area plus a 10-40-kilometre buffer. Simulation modelling may indicate a larger buffer. In addition to assessing project and cumulative effects at the scale of the three study areas defined above, also assess at the scale of the implicated Ontario caribou ranges (Missisa, Nipigon and Pagwachuan), and the federal Far North caribou range."	■ The Study Areas are defined and described in the Study Plan. Cumulative effects assessment will be conducted as part of the IS / EA. The scale of effects assessment for caribou will be the PDA, LSA, RSA and with reference to/qualitatively at the scale of the federal Far North range.	■ Section 6.2
27	TISG Section 07.4.2, page 37	■ The temporal boundaries of the impact assessment span all phases of the Project determined to be within the impact assessment. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. In order to assess a project's contribution to sustainability, consideration should be given to the long-term effects on the well-being of present and future generations. When defining temporal boundaries, the proponent should consider how elements of environmental, health, social and economic well-being that local communities, including municipalities, and Indigenous groups identify as being valuable could change over time.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
28	TISG Section 08.5, page 42	■ The Impact Statement must provide data files of mapped features depicting natural areas and wildlife presence within, and use of, the study area;	■ The information requested will be provided in the IS / EA Report.	■ No reference
29	TISG Section 08.10, page 58	■ The Impact Statement must describe any locations within the study area that might constitute sensitive areas for terrestrial wildlife such as: species at risk critical habitat that has been designated or is under consideration, ecological reserves and protected areas, in proximity to the project location or that could be effected by routine project operations or any lands in the study area that might constitute sensitive areas and habitat for wildlife, or nearby environmentally significant areas such as; National Parks, areas of natural or scientific interest, National Wildlife Areas, World Biosphere Reserves or UNESCO Natural World Heritage Sites;	■ The information requested will be provided in the IS / EA Report.	■ Section 9
30	TISG Section 08.10, page 58	■ The Impact Statement must describe the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbits, marten, muskrat, and otter);	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 4; ■ Land and Resource Use Study Plan
31	TISG Section 08.10, page 58	■ The Impact Statement must describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural importance;	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 4; ■ Land and Resource Use Study Plan
32	TISG Section 08.10, page 58	■ The Impact Statement must describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use.	■ The IS / EA will describe the levels of disturbance affecting wildlife and wildlife habitat and will incorporate the disturbance thresholds described in the federal Recovery Strategy for Boreal Caribou in the description.	■ Section 8, Section 9
33	TISG Section 08.10, page 58	■ The Impact Statement must identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity for terrestrial wildlife and discuss the rationale for their selection;	■ Indicators have been identified based on background information, consultation with regulatory agencies, public and indigenous consultation.	■ Section 9
34	TISG Section 08.10, page 58	■ The Impact Statement must identify wildlife species, other than avian species, of ecological, economic or human importance (particularly to Indigenous peoples), within the study area (including moose, rabbit, beavers, otters, muskrat, and frogs), that are likely to be directly or indirectly effected and describe each species:· biodiversity, distribution, and location.· abundance and population status.· life cycle.· seasonal ranges, migration, and movements.· habitat requirements; and· sensitive periods (e.g., seasonal, diurnal, and nocturnal).For the species identified above, describe and quantify the habitat type, including its:	■ The IA / EA will identify ungulate species (moose and caribou) that are likely to be directly or indirectly effected and will describe each species':·biodiversity, distribution, and location.· abundance and population status.· life cycle.· seasonal ranges, migration, and movements.· habitat requirements; and· sensitive periods (e.g., seasonal, diurnal, and nocturnal).In addition, moose and	■ Section 4, Section 7

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		function;location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and abundance as it existed before project construction.· describe the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbits, marten, muskrat, and otter);	caribou habitat type, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and abundance as it existed before project construction will be described.The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	
35	TISG Section 08.10, page 58	■ The Impact Statement must provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;	■ The information requested will be provided in the IS / EA Report.	■ Section 9
36	TISG Section 08.10, page 58	■ The Ministry of Environment, Conservation and Parks may be able to provide information on specific data sources and survey methodologies. Collect wildlife data to represent the following temporal sources of variation: – among years – Within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and – Within the 24-hour daily cycle. Rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys.	■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e., among years, among seasons and within 24 periods).	■ Section 7
37	TISG Section 08.10, page 59	■ The Impact Statement must provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation);	■ The information requested will be provided in the IS / EA Report.	■ Section 7 ■ Section 8
38	TISG Section 08.10, page 59	■ The Impact Statement must submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards;	■ Data provided will meet ISO 19115 standards.	■ Section 8
39	TISG Section 08.11, page 60	■ Collect species at risk data to represent the following temporal sources of variation: – among years; – within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and – within the 24 hour daily cycle.	■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e., among years, among seasons and within 24 periods).	■ Section 7
40	TISG Section 08.11, page 60	■ The Impact Statement must provide a list of all provincially listed protected species at risk and species assessed by the COSEWIC that have the status of extirpated, endangered, threatened or of special concern and that may be directly or indirectly effected by the Project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability;	■ The information requested will be provided in the IS / EA Report. Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e., among years, among seasons and within 24 periods).	■ Section 7
41	TISG Section 08.11, page 60	■ The Impact Statement must [identify] key habitat associated with species at risk should be considered valued components, including eskers and similar geologic features, wetlands and peatlands;	■ The information requested will be provided in the IS / EA Report.	■ Section 7 ■ Section 8
42	TISG Section 08.11, page 60	■ The Impact Statement must provide a list of all species at risk listed under Schedule 1 of the federal Species at Risk Act that may be directly or indirectly effected by the Project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability of each species. Species at risk which may inhabit the project area include: – Lake sturgeon (Acipenser fulvescens); – Northern Myotis (Myotis septentrionali); – Little Brown Myotis (Myotis lucifugus); – Caribou (Rangifer tarandus; Provincial: Missisa, Nipigon, and Pagwachuan ranges; Federal: Far North range); – Rusty Blackbird (Euphagus carolinus); – Bank Swallow (Riparia riparia); – Barn Swallow (Hirundo rustica); – Canada Warbler (Cardellina canadensi); – Chimney Swift (Chaetura pelagica);	■ The information requested will be provided in the IS / EA Report. ■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e., among years, among seasons and within 24 periods).	■ Section 7

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		– Common Nighthawk (Chordeiles mino); – Eastern Whip-poor-will (Antrostomus vociferu); – Evening Grosbeak (Coccothraustes vespertinus); – Olive-sided fly-catcher (Contopus cooperi); – Peregrine Falcon (Falco peregrinus); – Short-eared Owl (Asio flammeus); – Yellow Rail (Coturnicops noveboracensis); and – Wolverine (Gulo gulo);		
43	TISG Section 08.11, page 61	■ Account for the fact that rare species will require more survey effort to detect, which should be reflected in survey design by increasing the number and duration of surveys: – collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is being suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability; – Sample size must be planned to support a robust evaluation of the project study area within the context of the local study area and regional study area; – Design of surveys will need to consider multiple number of survey locations in order to represent the habitat heterogeneity of the regional study area, and to plan the number of survey locations per land cover or habitat class so that aggregation of habitat classes post-hoc is not required; – In terms of sampling effort per unit area, field survey effort should be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area but should be scaled to the likelihood that project effects will impact species at risk within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing and across the project study area, local study area and regional study area are unbiased and precise; – A habitat-stratified random sampling approach should be used. Sample sites should be selected with a randomization procedure such as a GIS grid overlay; and – Where Critical Habitat has not been defined or has been partially identified, a Schedule of Studies may have been created to identify gaps in information for these species. The Schedule of Studies information should be referred to when implementing or assessing survey protocols, in order to provide necessary information for these species.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan. ■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 3 ■ Section 7 ■ Section 8
44	TISG Section 08.11, page 61	■ Contain complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards;	■ The information requested will be provided in the IS / EA Report. Data provided will meet ISO 19115 standards.	■ Section 8
45	TISG Section 08.11, page 61	■ Ensure that, at minimum, the combined information from existing data and field surveys must be able to describe the distribution and abundance of species at risk in relation to the study areas;	■ The combined information from existing data and field surveys will describe the distribution and abundance of SAR in relation to the study areas.	■ Section 7 ■ Section 8
46	TISG Section 08.11, page 61	■ provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation);	■ The information requested will be provided in the IS / EA Report.	■ No reference
47	TISG Section 08.11, pages 63-64	■ Follow the survey requirements specific to Caribou: – provide the best available information from the relevant jurisdiction concerning baseline range population size and trend; – consult with experts of the relevant jurisdiction on appropriate survey methodologies for caribou. – Provide a justification for the selected methodologies; – in designing surveys for caribou, the following information sources should be consulted: • Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (IAP) (request from MECP);	■ The IS / EA will follow the requested survey requirements specific to caribou. The survey approach and methodology has been discussed in detail with provincial and federal regulators following their review of the draft Study Plan.	■ Section 7 ■ Section 8 ■ Section 9

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		• general Habitat Description for the forest-dwelling Woodland Caribou (Rangifer tarandus caribou) (GHD); • Ontario's Woodland Caribou Conservation Plan (CCP); • Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP); • Integrated Range Assessment for Woodland Caribou and their Habitat: The Far North of Ontario 2013 (Far North IRAR); • Far North Technical Report (FNTR) (request from Ontario Ministry of Environment Conservation and Parks); and • Indigenous knowledge holders from across all the potentially impacted Indigenous groups identified by the Agency.		
48	TISG Section 08.11, page 64	■ For the species identified: – provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans;" – consult relevant published studies that describe suitable survey methodologies for caribou and wolverine based on winter track observations including but not limited to: • caribou resource selection probability functions describing the probability of resource use at the range scale (see Hornseth & Rempel 2016); • caribou, moose, and wolf occupancy models describing their distribution in the far north (see Poley et al. 2014); and • wolverine occupancy models describing the distribution of wolverine in the far north (see Ray et al. 2018). – provide data and summary lists for each species at risk ranked according to: • abundance; • distribution across survey sites (i.e., percentage of survey stations at which they were recorded); • abundance in each habitat type; and • map showing areas of highest concentrations or areas of use by species. – data must be supplemented by surveys, as required; – survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g., survey breeding habitat during breeding season, stopover habitat during migration); – survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation; and – where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g., federal/provincial wildlife experts, specialists and local Indigenous groups).	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 ■ Appendix A
49	TISG Section 08.11, page 65	■ Identify and map all species at risk, critical habitat, and residences on federal land within the project study area and local study area (provincial and/or local government authorities should be contacted to determine any additional data sources and survey methodologies)	■ The information requested will be provided in the IS / EA Report.	■ No reference
50	TISG Section 08.11, page 65	■ Provide information and/or mapping at an appropriate scale (The project study area and local study area, as defined above for each valued component, constitute the appropriate scale) for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed Critical Habitat and/or recovery habitat (where applicable). Describe the general life history of species at risk (e.g., breeding, foraging) that may occur in the project area, or be affected by the Project;	■ The information requested will be provided in the IS / EA Report.	■ No reference
51	TISG Section 08.11, page 65	■ The project study area and local study area, as defined above for each valued component, constitutes the appropriate scale.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
52	TISG Section 08.11, page 65	■ In relation to providing required information for caribou, the Impact Statement must – describe boreal caribou use of the study areas (e.g., distribution, movement) over time using surveys to complement existing data if data within the project study areas are insufficient or unavailable to be able to understand how caribou use the habitat. Involve province of Ontario for data and survey requirements. Consider Indigenous knowledge and community knowledge;	■ The IA / EA will, through the use of existing information sources and new data acquired by field programs (which were developed following extensive discussions with provincial and federal regulators): – describe boreal caribou use of the study areas (e.g., distribution, movement) over time;	■ Section 7 ■ Section 8 ■ Section 9

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		– provide a justification for the sensitive periods considered in the assessment. Sensitive periods are associated with caribou life-stages such as calving, wintering, and travel. Ontario has specific sensitive time periods for caribou that are used in the identification, delineation, and consideration of habitat features; – describe the type and spatial extent of biophysical attributes, as defined in Appendix H of the 2019 proposed amended boreal caribou Recovery Strategy present in the study areas; – conduct surveys to complement existing data if data within the project study areas are insufficient or unavailable, to be able to understand where the biophysical attributes occur. Note that identification of biophysical attributes is not dependent on boreal caribou currently being present in the area; and – provide the best available information from the Ontario Ministry of Environment, Conservation and Parks on the level of disturbance (anthropogenic vs fire) in the range, consistent with the methodology developed by Environment Canada (2011).	– provide a justification for the sensitive periods considered in the assessment; – describe the type and spatial extent of biophysical attributes present in the study areas; and – provide the best available information on the level of disturbance (anthropogenic vs fire) in the range, consistent with the methodology developed by Environment Canada (2011).	
53	TISG Section 13, pages 80-83	■ This section of the TISG describes the methodology for the effects assessment, including definitions of scope, severity, and irreversibility.	■ The IS / EA Report will include a description of the methodology of the effects assessment and definition of magnitude, some of which is also summarized in this Study Plan.	■ Section 9
54	TISG Section 15.4, page 100	– provide an account of how the project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species.	■ The recovery strategy, action plan, or management plan for species at risk, with potential to be impacted by the project, will be reviewed and referenced as part of the IA / EA, where applicable.	■ Section 9
55	TISG Section 15.4, page 95	■ The Impact Statement must: – describe the potential direct, incidental and cumulative adverse effects of the project on species at risk listed under Schedule 1 of the Species at Risk Act and, where applicable, its critical habitat (including its extent, availability and presence of biophysical attributes); – analyses predicted effects for each species at risk. To fully understand the effects and/or benefits of one alternative versus another, all relevant metrics and evaluators for species at risk should be considered; – include separate analyses for each project activity, component, and phase; – consider potential effects to species at risk from bioaccumulation and biomagnification of contaminants of dust and other pollutants resulting from the project; and conduct post-construction surveys to verify predicted effects. – conduct post-construction surveys to verify predicted effects.	■ Effects to SAR will consider potential direct, incidental and cumulative adverse effects of the Project on SAR and, where applicable, its critical habitat. A thorough list of impact management measures including offsetting and compensation as necessary that will be employed by the Project will be included in the IA / EA.	■ Section 9
56	TISG Section 15.4, page 98	■ the sources of information that should be consulted are: – documents provided by Ontario: • IAP, CCP, RMP, and GHD (defined in section 8.11); • draft Selected Wildlife and Habitat Features: Inventory Manual for use in Forest Management Planning v1.0 (1997); – Indigenous knowledge; and – science-based evidence from the relevant jurisdiction that is consistent with the Recovery Strategy, including spatially explicit Population Viability Analysis.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A
57	TISG Section 15.4, page 99	■ clearly identify the locations of federal lands/non-federal lands within the study area and differentiate between these land tenures in the presentation of information regarding all species at risk. For example, total habitat disturbance for boreal caribou should be presented at the range scale, but it should also be presented in a way that clearly indicates habitat disturbance specifically within federal lands;	■ The information requested will be provided in the IS / EA Report.	■ No reference
58	TISG Section 15.4, page 99	■ clearings created for the Project may create new habitat types thereby attracting Species at Risk which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how new habitat types will impact species at risk in the project area	■ The IA / EA will assess the potential negative, neutral and positive residual effects of the project.	■ Section 8 ■ Section 9
59	TISG Section 15.4, page 99	■ describe all feasible measures that will be taken to avoid or lessen the impact of the Project on the species and its critical habitat;	■ Mitigation measures will be informed by best management practices, applicable resource management and/or recovery plan, Indigenous input, and industry standards.	■ Section 9.5

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
60	TISG Section 15.4, page 99	■ describe all reasonable alternatives to the Project that would avoid the potential effects on species and their habitat, with particular attention to critical habitat, and important habitats such as upland habitat which is used as movement corridors by caribou, breeding areas for birds, and which contains roosting habitat for bats;	■ The information requested will be provided in the IS / EA Report.	■ No reference
61	TISG Section 15.4, page 99	■ Describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted); describe all feasible measures that would be taken to eliminate the effects of the work or activity on species and their habitats, including critical habitat; and	■ Potential direct or indirect effects, if any, as a result of changes to fish habitat (including aquatic SAR) will be considered in the IA / EA. If this potential for residual effect is identified, a qualitative discussion will be included.	■ Section 7 ■ Section 8 ■ Section 9
62	TISG Section 15.4, page 99	■ describe the effects of construction pits and quarries on or near esker deposits on species at risk;	■ Study Plan Section 6.2 indicates that the Project Development Area (PDA) encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report.	■ Section 6.2
63	TISG Section 15.4, page 99	■ describe the potential adverse effects of the Project on species protected by provincial statutes and assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat that are not currently listed under the Species at Risk Act;	■ The information requested will be provided in the IS / EA Report.	■ No reference
64	TISG Section 15.4, page 99	■ identify critical timing windows (e.g., denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;	■ Critical timing windows (e.g., spawning and in-water work, denning, breeding, roosting), setback distances, or other restrictions that will be imposed or followed will be considered in assessing predicted effects.	■ Section 9
65	TISG Section 15.4, page 99	■ identify provincial, territorial or federal permits or authorizations that may be required in relation to the species at risk;	■ The information requested will be provided in the IS / EA Report.	■ No reference
66	TISG Section 15.4, page 99	■ provide survey results and detailed mapping of each species at risk and their habitat, including important habitat features, for all federal lands;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ No reference
67	TISG Section 15.4, page 99	■ describe the residual effects that are likely to result from the project after avoidance and minimization measures have been applied, including the extent, duration and magnitude of the effects on: – the number of individuals killed, harmed, harassed; and – the number of residences damaged or destroyed.	■ Potential direct or indirect effects, if any, that result in changes in population density and habitat, will be considered in the IA / EA. If this potential for residual effect is identified, a qualitative discussion will be included.	■ Section 9
68	TISG Section 15.4, page 99	■ demonstrate that avoidance and minimization measures will be applied for species at risk. Recovery Strategies will provide information such as Population and Distribution Objectives, and Strategic Direction for Recovery;	■ Mitigation measures will be informed by best management practices, applicable resource management and/or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
69	TISG Section 15.4, pages 95-98	■ In relation to describing effects on caribou, the Impact Statement must:· – provide an assessment of the potential adverse effects on boreal caribou habitat (i.e., at the range and sub-range scales) considering the direction provided in the RMP and GHD (see section 8.11) and informed by NHIC information layers and the General Habitat Description Mapping Product (available through the MECP); – assess the effects of all linear disturbances (e.g., new road access or rights of way) on caribou, including movements between seasonal habitats to account for functional habitat loss and effects of increased predation; • use population-level modelling to assess the effects of proposed disturbance on caribou at the scale of federal range boundaries and provincial range boundaries. Increases in predation caused mortality rates need to be considered as do the anticipated exacerbating effects of climate change; • with respect to effects on undisturbed habitat at the scale of the range:	■ The IA / EA will provide an assessment for potential adverse effects on boreal caribou population and habitat as outlined in the TISG Section 15.4.	■ Section 7 ■ Section 8 ■ Section 9

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		▪ provide an account (and GIS file if available) of added project disturbance using a 500- metre buffer, using the following formula: (Project footprint + 500-metre buffer) - overlapping area(s) already considered disturbed habitat (see glossary in the federalrecovery strategy); and ▪ determine whether the Project is expected to compromise the ability of ranges to be maintained at the disturbance management threshold and provide a rationale for the conclusion. – With respect to effects on biophysical attributes as defined in Appendix H of the boreal caribou Recovery Strategy: determine whether the Project is expected to remove or alter biophysical attributes necessary for boreal caribou recovery or survival and provide a rationale for the conclusion (provide GIS file if available); – With respect to effects on connectivity: • determine whether the Project is expected to result in a reduction of connectivity within or between the ranges and provide a rationale for the conclusion; • evaluate habitat and range connectivity at the local, regional and range scales using quantitative methods (e.g., habitat suitability analysis); and • in addition, where telemetry data are available, evaluate movements of collared individuals using quantitative methods (e.g., step analysis), to determine existing movement corridors, and how these may be affected by project development. – with respect to the effects of predation: determine whether the Project is expected to result in an increase of predator and/or alternate prey access to undisturbed areas and provide a rationale for the conclusion. – with respect to effects on individuals and population condition at the range scale: • provide best available information from the Ontario Ministry of the Environment, Conservation and Parks concerning baseline range population size and trend; • provide an assessment of the potential adverse effects of the Project on the population condition of the range (i.e., size and trend) at both the provincial range scale and the federal range scale; and • provide an assessment of the potential adverse effects on boreal caribou individuals (e.g., sensory disturbance, mortality, pollution) including legal harvest from indigenous groups.		
70	TISG Section 15.4, pages 97-98	• provide an evaluation of the following: ▪ caribou (Habitat Protection) – Range Condition; ▪ caribou (Habitat Protection) – Range Condition; ▪ caribou (Species Protection) – Population Size Estimates at the Range Level (e.g., minimum animal count based on available information); ▪ caribou (Species Protection) – Population Trend Estimates at the Range Levelo caribou (Habitat Protection) – Cumulative Disturbance at Range Level; ▪ quantify additional disturbance being added to the range (footprint and footprint + 500 metre buffer); ▪ alignment with existing disturbance; and ▪ length of new linear disturbances. – Caribou (Habitat Protection) – Habitat Amount and Arrangemento caribou (Habitat Protection) – Categorized Habitat at the Sub-range Level: • Category 1: High Use Area – Nursery Areas Habitat potentially impacted: ▪ number of Nursery Areas within the Range; ▪ number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres); • ▪ relevant information on that habitat, such as average age of forest, condition of forest, etc., for each Nursery Area potentially impacted by the Project; ▪ area (ha) of each Nursery Area potentially being impacted; and ▪ area (ha) of each Nursery Area removed by Project. • Category 1: High Use Area – Winter Use Areas potentially impacted:	■ The IA / EA will provide an assessment for potential adverse effects on boreal caribou population and habitat as outlined in the TISG Section 15.4.	■ Section 7 ■ Section 8 ■ Section 9

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
		▪ number of Winter Use Areas within the Range; ▪ number of Winter Use Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres); ▪ relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Winter Use Area potentially impacted by the Project; ▪ area (ha) of each Winter Use Area potentially being impacted; and ▪ area (ha) of each Winter Use Area removed by Project. • Category 1: High Use Area – Travel Corridors potentially impacted: ▪ number of Travel Corridors within the Range; ▪ number of Travel Corridors potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres); ▪ relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Travel Corridor potentially impacted by the Project; ▪ area (ha) of each Travel Corridor potentially being impacted; and ▪ area (ha) of each Travel Corridor removed by Project. • Category 2: Seasonal Ranges impacted: ▪ Area (ha) of Seasonal Ranges potentially being impacted; ▪ relevant information on that habitat, such as biophysical attributes for Seasonal Ranges potentially impacted by the Project; and ▪ Area (ha) of Seasonal Range removed by Project. • Category 3: Remaining Areas in the Range impacted: ▪ remaining Areas (ha) in the Ranges potentially being impacted; ▪ relevant information on that habitat, such as biophysical attributes for remaining Areas in the Range potentially impacted by the Project; and ▪ remaining Areas (ha) in the Range removed by Project. – caribou (Species Protection) – Incidental mortality due to anthropogenic effects (e.g., vehicular collisions, increased hunting pressure); – caribou (Species Protection) – Indirect mortality due to increase in alternate prey sources (moose and deer) leading to increased predation (wolves, bears, etc.) and increased potential for spread of disease (e.g., brainworm); – caribou (Species Protection) – Indirect effects due to sensory disturbance (e.g., light, sound, vibration, olfactory) within 10 kilometres of the Project;"		
71	TISG Section 20, page 119-128	■ Section 20 of the TISG describes the requirements around mitigation and enhancement measures that must be considered in the Impact Statement.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
72	TISG Section 21, pages 129-130	■ Section 21 of the TISG describes the requirements and guidance associated with determining residual effects.	■ Residual effects will be assessed in the IA / EA.	■ Section 9
73	TISG Section 22, page 132	■ in relation to caribou: assess cumulative effects to caribou at the scale of the three project study areas (defined above), as well as the implicated Ontario caribou ranges, and the federal Far North caribou range;	■ Cumulative effects assessment will be conducted as part of the IA / EA. The scale of effects assessment for caribou will be the PDA, LSA, RSA and with reference to/qualitatively at the scale of the federal Far North range.	■ No reference
74	TISG Section 22, pages 131-133	■ Section 22 of the TISG describes the guidance around conducting cumulative effects assessment for the project.	■ Cumulative effects assessment will be conducted as part of the IA / EA. The scale of effects assessment for caribou will be the PDA, LSA, RSA and with reference to/qualitatively at the scale of the federal Far North range.	■ No reference
75	TISG Section 26, Page 141	■ Section 26 of the TISG includes a description of the considerations for developing a follow-up program for environmental, health, social or economic effects, as applicable.	■ The IA / EA will include descriptions of follow-up programs, as required by VC.	■ Section 9

ID #	Federal TISG Reference[10]	Requirement / Comment / Concern	Response	Study Plan Reference
76	TISG Section 26.2, page 144	■ in relation to caribou: – monitor effects on boreal caribou and their critical habitat to verify impact assessment predictions, ensure that mitigation measures are effective, and determine whether any unanticipated effects are occurring within the Project area; – monitoring methods should follow standardized/established methods and include a robust before-after-control-impact design (or similar field-based approach) to allow for quantitative assessment of potential effects of the Project and identify any adaptive management that may be necessary; – the methodology provided should include the monitoring schedule; – the methodology should include a description of the performance indicators that will be used to evaluate the effectiveness of the mitigation measures; and – identify circumstances and mechanisms under which corrective/adaptive measures may be implemented to address any issue or problem identified through the follow-up programs or environmental monitoring. For example, if unanticipated effects occur or the effects are greater than anticipated;	■ Monitoring programs will be identified as part of the IA / EA.	■ No reference

Table 11-2: Study Plan Provincial Concordance – Conformance with Requirements

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
1	MECP	■ MECP Comments on Draft Terms of Reference Completeness Review (AECOM Memo dated 14-Nov-2019)	■ Study areas are missing and lack clarity – maps show study area for 4 routes even though only 2 (or 1?) routes are proposed to be assessed; no indication of local and regional study areas for each environmental component (e.g., groundwater, surface water, caribou, etc.).	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
2	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ All alternatives and rationales should consider provincially threatened or endangered species and their respective habitats. With respect to caribou, where different ranges are affected, the range condition will be used as a criteria in the comparative assessment.	■ The history of the Project and decision-making process that led to the identification of Alternative 1 and Alternative 4 as the alternative routes for the Project considered SAR, including caribou. The updated Section 8 of the Draft ToR identifies the requirement to undertake an assessment and evaluation of effects on all alternative routes. The list of criteria and indicators for Ungulates is provided in the updated Study Plan	■ Section 9
3	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ In the identification of alternative methods, consideration should be given with appropriate documentation, to methods that may align with other planned, approved, or existing disturbances to minimize the overall disturbance footprint on the caribou range as well as other protected habitats.	■ The history of the Project and decision-making process that led to the identification of Alternative 1 and Alternative 4 as the alternative routes for the Project considered SAR, including caribou. The updated Section 8 of the Draft ToR identifies the requirement to undertake an assessment and evaluation of effects on all alternative routes. ■ The list of criteria and indicators for Ungulates is provided in the updated Study Plan	■ Section 9
4	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ General Habitat Description mapping can be used to conduct “constraint mapping” to identify alternatives to or alternative methods to help avoid and/or minimize potential impacts to species at risk habitat.	■ General Habitat Description mapping will be used in the IS / EA to conduct constraints mapping and help avoid and/or minimize potential impacts to caribou.	■ Section 7.1
5	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ The following criteria and indicators are recommended, at a minimum, for inclusion in the EA to address MECP’s legislative and policy framework with respect to caribou and its habitat. They will be considered in MECP’s review of the EA and may be required for any subsequent ESA permits/authorizations. Criteria and indicators must be applied consistently for the preferred option and all alternatives. The following table is a summary of criteria and indicators that should be applied for the project, recognizing that the relative importance and weighting of each will vary and should be considered in the context of the project. A detailed discussion of information sources, discussion and analysis is required, and rationale for inclusion of the criteria and indicators follow below.	■ The IS / EA will follow the recommended criteria and indicators suggested for the Project. Caribou has been included as a criterion, with indicators proposed based on those recommended by the MECP SAR Branch May 2019 letter. Habitat availability and distribution are identified as two of the indicators that will be used to measure cumulative range disturbance, relative tolerance of the range to alteration / risk, the relative significance of sub-range habitat features, and the spatial extent and distribution of category 1,2, and 3 habitats.	■ Section 9
6	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ In addition to the above-listed criteria for Caribou and their habitat, the following should also be considered when evaluating alternatives for other provincially threatened or endangered species and their respective protected habitats: · Criteria: Species Habitat Indicator: Impacts to Category 1, 2, and/or 3 habitats Information Sources: GHD, LIO Rationale: Category 1 habitats have the lowest tolerance to alternation, Category 2 habitats have a moderate tolerance to alternation, and Category 3 habitats have the highest tolerance to alternative. Both direct (e.g., habitat removal) and indirect (e.g., habitat fragmentation) impact should be assessed for each alternative. · Criteria: Species Individuals Indicator: Impacts to individuals of the species Information Sources: LIO Rationale: Both direct (e.g., unavoidable) and indirect (e.g., increased threats to mortality) impacts to individuals of the species should be assessed for each alternative.	■ Potential direct and indirect impacts on species habitat indicators (impacts to Category 1, 2, 3 habitats) and species individual indicators will be assessed for each alternative in the IS / EA.	■ Section 9

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
7	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ For each potential impact to species at risk or their habitat, measures will have to be identified to first avoid any adverse effects and in cases where there are no practical or feasible alternatives, identify measures that minimize or mitigate the adverse effects. Such measures may be general, site-specific, or activity-specific in nature. For caribou, the province has developed Best Management Practices (BMPs) for some sectors to provide guidance to avoid, minimize or mitigate adverse effects to the species and their habitat. Where possible, it is always preferential to avoid, given that if any adverse impacts exist, the associated activities would require authorization under the ESA.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
8	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ Proponents should describe the effect that is being addressed, the measures being proposed (what will be implemented, when, where and how actions will be applied), and the anticipated net effects after measures are applied to caribou and caribou habitat. Proponents should also describe how they plan to monitor effectiveness of the impact management measures and steps they plan to take should the impact management measures be found to be ineffective.	■ The proposed approach to assess effects of the Project are outlined in Section 9.0 of the Study Plan. The IS / EA will also include information on how the Proponent will evaluate the effectiveness of impact management measures during environmental monitoring for the Project.	■ Section 9
9	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ The advantages and disadvantages of each alternative method with respect to net effects to caribou and caribou habitat for the lifecycle of the project should be documented. The proponent should consider the potential need for ESA authorizations and associated costs when assessing advantages and disadvantages associated with each alternative. High costs associated with ESA permitting requirements may be disadvantageous to some proponents.	■ Targeted surveys, effects assessment and mitigation development are designed and implemented with the requirements of the ESA and future permitting requirements in mind.	■ Section 7
10	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ MECP recommends that the EA contain commitments to monitoring to verify the expected effects of the proposed undertaking on species at risk and their habitat and to determine if additional impact mitigation measures or adjustments to any measures are required. Monitoring methodology for these species and their habitat should be included in the monitoring plan developed as part of the EA. If impact management measures are proposed, monitoring of the effectiveness of these measures should be included in the monitoring plan. The monitoring plan should include steps the proponent will take if impact management measures are not effective (e.g., application of additional impact management measures, changing how and where the activity will be performed, etc.).	■ The IS / EA will include a monitoring framework for the Preferred Route to verify the prediction of effects and the effectiveness of the impact management measures implemented, including those related to SAR and their habitat. These plan(s) will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required.	■ Section 9.9
11	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ In addition to land use policy, any resource management direction for the study area including forest management plans and fisheries management plans/objectives should be reviewed and considered	■ The recovery strategy, action plan, or management plan for species at risk, with potential to be impacted by the project, will be reviewed and referenced as part of the IA / EA, where applicable.	■ Section 9
12	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ Project documentation will need to consider the direction within the Ogoki FMP regarding forestry activities, wildlife objectives and access, and address how the proposed project may impact those activities and objectives. There is also the need to consider the impacts to Kenogami Forest with respect to existing roads and the associated use management and responsibility.	■ The recovery strategy, action plan, or management plan for species at risk, with potential to be impacted by the project, will be reviewed and referenced as part of the IA / EA, where applicable.	■ Section 9
13	MECP	■ Provincial Review Comments on Approach to Alternatives in Terms of Reference (AECOM memo dated 14-Nov-2019)	■ The project proposal and other documentation will need to identify these natural heritage features and fully consider potential impacts to and mitigation for the respective features.	■ Vegetation and wildlife will consider natural heritage features (e.g., wetlands, significant wildlife habitat and areas of natural and scientific interest). Further information on these disciplines is provided in the Vegetation and Wildlife Study Plans. ■ The IS / EA will recommend impact management measures to avoid, eliminate or minimize potential effects of the Project	■ Section 9.5 ■ Vegetation Study Plan ■ Wildlife Study Plan

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
14	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Assessment Methods - For the most part, section 7.2 provides a description of potential environmental effects for each discipline. However this section also includes assessment methodologies for some subsections (7.2.1 and 7.2.2 AERMOD modelling, quantitative noise assessment) while the majority do not (7.2.3 – 12). The level of detail in the ToR about assessment methods should be consistent for all environmental components. ■ It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others. The work plans should include assessment methodology appropriate for each environmental component. The ToR could include a high level summary table for each environmental discipline listing data collection and assessment methods, with a commitment to develop the work plans at the outset of the EA phase to provide more details. Consider where the information about air and noise modelling is best placed.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.	■ Section 3
15	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Consultation on Assessment Methodology - MFFN acknowledges that the proposed methodology will be open to input during the draft ToR review, but also says a more detailed method will be presented in the EA. Page 47 indicates the effects assessment criteria will be developed during the EA. While it is appropriate to defer some detailed work planning to the EA phase, the ToR should include commitments for how technical reviewers, and other interested persons, will be consulted during the development of specific evaluation methodologies or technical work plans. It is strongly recommended that those opportunities for review occur prior to the completion of studies (e.g., prior to the submission of a draft or final EA document).It is not clear whether MFFN plans to consult on the more detailed methodology and criteria during the EA phase or if the ToR phase is the main opportunity to provide input.Please indicate how consultation on the ToR has informed the preliminary criteria and indicators. Please clarify when MFFN will consult and provide opportunity for input on the detailed assessment method, including criteria and indicators (and work plans as MECP has proposed), with agencies, communities and stakeholders during the EA phase in order to finalize the methodologies before EA studies get advanced.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available. A summary of technical discussions with agencies can be found in the Study Plan.	■ Section 3 ■ Section 4
16	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Work Plans - Section 8 describes the approach that will be taken to evaluate alternative methods during the EA, including proposed criteria and indicators (presented in Appendix A). The information presented is high level and does not provide an opportunity for technical review of the methodologies that will be applied to evaluate those specific criteria and indicators. It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.	■ Section 3
17	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Kitchenuhmaykoosib Inninuwug (KI) asked about mitigating impacts to a caribou route from KI territory to Marten Falls territory. Marten Falls' response is to study caribou and provide information on migration pathways and mitigation in the EA. It is not clear how this commitment is captured in the ToR. Section 7.1.4.9 (page 32) of the ToR states the need for and scope of additional caribou surveys is being determined in consultation with MECP and MNRF. While this is appropriate, the follow-up action to address KI's issue should also be noted somewhere in the ToR, such as a commitments list. As per previous advice from MECP documented on PDF pages 652 and 653 of the RoC, the ToR and RoC need to specifically indicate how the ToR has addressed issues and comments raised during consultation. Please capture this commitment from the RoC somewhere in the ToR, such as a commitments list and /or section 7.1.4.9 of the ToR. Please update the RoC to indicate which section of the ToR addresses the issue.	■ The information requested was updated in the latest Record of Consultation (RoC) and ToR. ■ Caribou movement patterns will be analyzed using historical and proposed collaring data. This would include any movement patterns associated with caribou moving between KI and Marten Falls territories.	■ Section 8

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
18	MECP	■ Email from Nikki Boucher, A/Species at Risk Specialist, Permissions and Compliance, Species at Risk Branch, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ We have carried out our review with a view to both the EA and future regulatory authorizations in order to provide you with information that will help enable an efficient approach to project planning and preparation of applications for any necessary Endangered Species Act (ESA) authorizations. Specifically, attention should be paid to the following requirements that form the basis of many of our ESA authorizations:· – Minimize adverse effects – you must take reasonable steps to minimize the adverse effects of your activity on the species at risk and their habitat that are likely to be affected by your activity. – Ways to minimize adverse effects of your activity on species at risk & their habitat may include modifying the:§ location of the activity§ geographic scale of the potential effects§ activity design (e.g., engineering and technological)§ timing of the activity§ duration and frequency of the effects§ approaches and timing for any site restoration or rehabilitation (such as doing progressive rehabilitation while other parts of the activity are still happening)§ general operational protocols· Consider reasonable alternatives – you will need to show the Ministry of the Environment, Conservation and Parks that you have considered reasonable alternatives to your activity. – Alternative approaches to your activity include:§ Changing the location of the activity§ Using alternative methods, equipment or technical designs§ Changing the timing of the activity to avoid times when the species is there or is most sensitive to disturbance§ Changing the geographic scale, duration and/or frequency of the potential adverse effects§ Adding or changing approaches and timing of site restoration or rehabilitation after the activity is done – When considering reasonable alternatives to your activity, you must:§ Consider at least one alternative that would completely avoid any adverse effects on species at risk§ Identify alternatives that you considered but did not think were reasonable because of biological, technical, social or economic limitations§ Explain why the approach you have chosen is the best alternative ■ In addition, should an Overall Benefit Permit be required for the project, as determined through MECP's review and assessment of all the project details, the following requirement would also need to be considered:· Achieve overall benefit – providing an overall benefit to a species means undertaking actions that contribute to improving the circumstances for the species. It must include more than steps to minimize adverse effects on the species or habitats. – Achieving an overall benefit to a species may involve providing the species with a range of benefits, such as:§ increasing the number of individuals of the species living in the wild and capable of reproducing§ increasing the distribution of the species within its natural range§ increasing the viability or resilience of existing populations of the species§ slowing or reversing population declines by addressing key threats to the species' survival§ increasing the quality or amount of habitat for the species – Activities such as filling information gaps, education and outreach may contribute to an overall benefit plan for a species at risk. However, alone they are unlikely to meet the overall benefit requirement. – Recovery strategies and government response statements, where available provide information that can be used to form plans to achieve an overall benefit for species at risk.	■ Targeted surveys, effects assessment and mitigation development are designed and implemented with therequirements of the ESA and future permitting requirements in mind.	■ Section 7

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
19	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Woodland Caribou has been renamed Caribou (Boreal population) in Ontario. Update the ToR to replace all references to “Woodland Caribou”, with the exception of reference document titles, with “Caribou (Boreal population)”.	■ ‘Woodland Caribou’ will be updated to ‘Caribou (Boreal Population)’ throughout the documentation.	■ No reference
20	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Recommendation to prevent delays should ESA authorization be required. It is strongly recommended that the project be planned, and the environmental assessment prepared, with the requirements of the Endangered Species Act, 2007 (ESA) in mind. This can potentially facilitate the authorization process under the ESA, where authorization is required. In order to inform any future ESA authorization requirements, reasonable route / project alternatives should be assessed for impacts to all species at risk and their respective habitats, and at least one avoidance alternative should be included. Please refer to the MECP “Avoidance Alternatives Form” for activities that may require an overall benefit permit under clause 17(2)(c) of the Endangered Species Act” and accompanying guide for reference. (http: /www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/MinistryResults?Openform&SRT=T&MAX=5&ENV=WWE&STR=1&TAB=PROFILE&MIN=018&BRN=21&PRG=31)	■ Targeted surveys, effects assessment and mitigation development are designed and implemented with the requirements of the ESA and future permitting requirements in mind.	■ Section 7
21	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ The draft ToR limits the Study Area to only a 5 km width (2.5 km on either side of the ROW). This limited extent is inappropriate to assess the impacts to SAR that use broad landscapes, specifically Caribou (Boreal population) and Wolverine. Multiple spatial extents need to be considered as part of the Study Area (e.g., Project Footprint, Local Study Area, Regional Study Area) to appropriately consider and assess impacts of the Project to SAR. It is recommended that 20 km (10 km on either side of the ROW) be used to define the Local Study Area to make sure all potential impacts to Caribou sub-range habitat features (e.g., category 1 habitat such as nursery areas and winter use areas) are considered. This aligns with provincial policy direction (i.e., General Habitat Description for the Forest-dwelling Woodland Caribou (Rangifer tarandus caribou) (2013) (GHD)) and best management practices for caribou. Further, the range-level direction provided in the GHD, Range Management Policy in Support of Woodland Caribou Conservation and Recovery (2014) (RMP) and Ontario’s Woodland Caribou Conservation Plan (CCP) needs to be considered, which acknowledges impacted range(s) be used to define the Regional Study Area. Update section 7.1.1 and Figure 6-1 in ToR to identify the Study Area at multiple spatial scales, including Project Footprint, Local Study Area and Regional Study Area. Update information provided in section 7 of ToR to reflect the updated Study Area in the Existing Environment and Potential Environmental Effects.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
22	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ File surveys conducted in Spring” – will the results from this be included in the ToR or in the EA? A Work plan should be committed to in the ToR for field work to be completed and where necessary should be designed to target specific Species at Risk. MECP would like to advise on survey methodology. This will make sure that the proponent does not apply efforts that are not required or likewise they will not miss aspects that will require repeated effort.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.	■ Section 3

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
23	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Additional information should be provided, in table format, for each SAR that have the potential to occurring the area of the Project, including, but not limited to: – Scientific name – Common name – Species Status under SARA (Federal) – Species Status under ESA (Provincial) – Conservation Ranking (i.e., N-Rank, S- Rank) – Information Source(s) used to identify potential occurrence within the area of the Project – Indication of whether a field survey(s) has been conducted already to identify species presence and, if so, whether or not it was observed – General list of habitat requirements – Indication of whether the required habitat exists within the Study Area (i.e., as per comment 5, should include Project Footprint, Local Study Area and Regional Study Area) – Update the draft ToR to include additional information for each SAR that have the potential to occur in the area of the Project.	■ The information requested will be provided in the IS / EA Report.	■ No reference
24	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Based on the information provided in this section, it is unclear what data collection has already been conducted versus what data collection will be conducted during the development of the EA for SAR. For example, it is unclear whether the information provided on page 32 for the Bat maternity Roost Monitoring and Bird Surveys have already occurred or are being planned. If they have already occurred, additional information on the methodology, survey extent, dates, etc. is required. Further, there is no mention of the 2018 Winter aerial caribou survey conducted by Zoetica, as mentioned in the Response to MFFN – Request for Information dated 2019-07-30, or any of the field work proposed in the Technical Memorandum provide to MECP on June 6, 2019 which outlined the planned breeding bird point count surveys, marsh bird call back surveys, bank swallow and barn swallow visual habitat assessments, Eastern Whip-poor-will surveys, Bat Maternity Roost Monitoring Surveys, Remote Camera Surveys, Vegetation Surveys, and Aerial Reconnaissance Survey. All previous field work related to SAR should be identified and summarized in the Draft ToR. This will assist in determining whether additional SAR surveys are required (i.e., to identify occupancy, distribution, etc.). Specifically for Caribou, Winter Aerial Surveys, Summer Calving Survey, Telemetry Studies and (to a more limited extent) Camera Trap Surveys each provide valuable information that can provide inform on baseline conditions and impacts. Refuge from predation is the ultimate factor influencing caribou distribution and habitat use in the Boreal forest. One of the key threats to caribou is habitat fragmentation due to development activities, particularly those that increase and / or introduce linear features to the landscape. These types of disturbances increase predator efficiency which may have a detrimental effect on caribou populations within the LSA and RSA. Understanding how caribou respond to habitat fragmentation and increased predator access will be an important aspect to assessing the impacts of the Project. Particularly, the deployment of radio satellite collars on caribou within proximity of the alternative corridors under consideration (e.g., LSA), that would enable tracking of caribou before / during / after construction, provides important baseline information and contributes towards assessing impacts of the Project on caribou habitat movement and habitat selection / use within proximity to new linear features. Update the draft ToR to clearly identify any data collection (i.e., surveys) for SAR that have already been conducted. In each case, provide survey methodology, dates, etc. Update the draft ToR to clearly identify any data collection that will be conducted for SAR during the development of the EA (i.e.,	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.The IA / EA will, through the use of existing information sources and new data acquired by field programs (which were developed following extensive discussions with provincial and federal regulators): – describe boreal caribou use of the study areas (e.g., distribution, movement) over time; – provide a justification for the sensitive periods considered in the assessment; – describe the type and spatial extent of biophysical attributes present in the study areas; and – provide the best available information on the level of disturbance (anthropogenic vs fire) in the range, consistent with the methodology developed by Environment Canada (2011).	■ Section 3 Section 7 ■ Section 8 ■ Section 9

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
			data collection and monitoring work plan). Include a brief description of the data collection methodology that will be used. This should include details for surveys and methods MFFN is committing to carry out during the EA, including, but not limited to, the following: – Caribou (e.g., aerial / ground surveys, telemetry study, camera traps, etc.) – Wolverine (e.g., telemetry study, hair traps, camera traps, etc.) – Northern Myotis and Little Brown Myotis (e.g., bat hibernaculum screening, bat maternity roost habitat assessments, bat acoustic surveys, etc.) – Bank Swallow (e.g., nesting surveys, etc.) – Barn Swallow (e.g., nesting surveys, etc.) – Eastern Whip-poor-will (e.g., habitat assessments, breeding surveys, etc.)		
25	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Initial surveys were completed in 2018" – there are no details of what these surveys were or what the outcome was, therefore it is difficult to advise on whether or not they were satisfactory and if they covered all the SAR that may be present. Submit the survey methodology and data collected for review and further advice.	■ The report prepared by Zoetica, based on their investigations in 2018, was shared with the agencies and a summary has been provided in the Study Plan.	■ Section 7.2
26	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Preliminary consideration of potential effects to SAR needs to be included, above and beyond those applicable to vegetation (s.7.2.6), wildlife (s.7.27) and fish and fish habitat (s.7.2.8).Both Table 7-4 and s.7.2.9 are lacking any information specific to SAR (e.g., increased mortality risk to caribou resulting from predator efficiencies related to additional linear features, increase in predator / prey populations, etc.).This should include a preliminary list of potential effects, in a table format, including, but not limited to, the following: – Project Component or Activity • Field surveys, staking, layout Vegetation clearing and grubbing • Construction of supportive infrastructure (e.g., storage and laydown yards, temporary access roads, construction camps, aggregate extraction areas) • Construction of the road • Aggregate extraction and production • Emissions, discharge and waste • Operations and maintenance – Potential Effects- Mitigation Measures Update the draft ToR to include additional information for preliminary potential effects of the Project components specific to SAR.	■ The information requested will be provided in the IS / EA Report and is summarized in the Study Plan.	■ Section 9.1
27	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ The Draft ToR indicates that MFFN provided MECP and MNRF work plans associated with field work planned during 2019 for review, but that the agencies indicated they will not be commenting on work plans until the ToR is finalized. As per comment ID#174, MECP SARB is seeking a data collection and monitoring work plan to be included in the ToR outlining the data collection methodology that will be conducted for SAR during the development of the EA to inform baseline and environmental effects to SAR. Update the draft ToR to clearly identify any data collection that will be conducted for SAR during the development of the EA (i.e., data collection and monitoring work plan). Include a brief description of the data collection methodology that will be used. This should include details for surveys and methods MFFN is committing to carry out during the EA, including, but not limited to, the following: – Caribou (e.g., aerial / ground surveys, telemetry study, camera traps, etc.)	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in Section 3 of the Study Plan.	■ Section 3

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
			– Wolverine (e.g., telemetry study, hair traps, camera traps, etc.) – Northern Myotis and Little Brown Myotis (e.g., bat hibernaculum screening, bat maternity roost habitat assessments, bat acoustic surveys, etc.) – Bank Swallow (e.g., nesting surveys, etc.) – Barn Swallow (e.g., nesting surveys, etc.) – Eastern Whip-poor-will (e.g., habitat assessments, breeding surveys, etc.)		
28	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Additional published sources of information should be included for all SAR: – Policy Guidance on Harm and Harass under the Endangered Species Act (2014) – Categorizing and Protecting Habitat under the Endangered Species Act (2012) – Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits (2012) – Wolverine Government Response Statement (2016) – Wolverine Recovery Strategy (2013) – Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario – Ontario Recovery Strategy Series (2019) ■ Update the draft ToR to include additional data sources.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A
29	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ This section speaks to some, but not all, indicators by which we assess the current status of a caribou range and impacts of a proposed development. As per MECP's response to a request for information dated November 1, 2019, and further discussed during the teleconference call on July 31, 2019, the following criterion & indicators should be included for evaluation:· – Caribou (Habitat Protection) – Range Condition· – Caribou (Species Protection) – Population Size Estimates at the Range Level • e.g., minimum animal count based on available information· • Caribou (Species Protection) – Population Trend Estimates at the Range Level· • Caribou (Habitat Protection) – Length of new linear disturbances· • Caribou (Habitat Protection) – Habitat Amount and Arrangement· • Caribou (Habitat Protection) – Categorized Habitat at the Sub-range Level • Category 1: High Use Area – Nursery Areas Habitat potentially impacted ▪ Number of Nursery Areas within the Range ▪ Number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 km, are within 10 km) ▪ Relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Nursery Area potentially impacted by the Project ▪ Area (ha) of each Nursery Area potentially being impacted Cumulative Disturbance at Range Level • Quantify additional disturbance being added to the range (footprint and footprint + 500 metre buffer) ▪ Alignment with existing disturbance Seasonal Ranges potentially impacted by the Project ▪ Area (ha) of Seasonal Range removed by Project • Category 3: Remaining Areas in the Range impacted ▪ Area (ha) of Seasonal Ranges potentially being impacted§ Relevant information on that habitat, such as average age of forest, condition of forest, etc. for Seasonal Ranges potentially impacted by the Project ▪ Area (ha) of Seasonal Range removed by Project	■ These criterion and indicators are being reviewed and discussed with MECP on an ongoing basis are presented in the Study Plan.	■ Section 9

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
			• Caribou (Species Protection) – Incidental mortality due to anthropogenic impacts (e.g., vehicular collisions, increased hunting pressure) • Caribou (Species Protection) – Indirect mortality due to increase in alternate prey sources (moose and deer) leading to increased predation (wolves, bears, etc.) and increased potential for spread of disease(e.g., brainworm)· • Caribou (Species Protection) – Indirect impacts due to sensory disturbance (e.g., light, sound, vibration, olfactory) within 10 km of the Project· • Other direct and indirect impacts to individuals of the species Update the Draft ToR to reflect the complete list of indicators that will be evaluated in the EA for impacts to caribou from each alternative route.		
30	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ This section speaks to some, but not all, potential data sources which can inform the assessment ofimpacts on each indicator. As per MECP's response to a request for information dated November 1,2019, and further discussed during the teleconference on December 18, 2019, the following informationsources should also be included in the ToR to evaluate caribou indicators: – Recovery Strategy for Woodland Caribou (Forest-dwelling, Boreal population) in Ontario (2008) – Ontario's Woodland Caribou Conservation Plan (CCP) – Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP) – Integrated Range Assessment for Woodland Caribou and their Habitat – Nipigon Range 2010 – Integrated Range Assessment for Woodland Caribou and their Habitat – Pagwachuan Range 2011 – Integrated Range Assessment for Woodland Caribou and their Habitat – The Far North of Ontario2013 – State of the Woodland Caribou Resource Report (2014) – Woodland Caribou (Rangifer tarandus caribou) in the Far North of Ontario: Background information insupport of land use planning (2014) – General Habitat Description for the Forest-dwelling Woodland Caribou (Rangifer tarandus caribou)(GHD) – General Habitat Mapping Product for Boreal Caribou (i.e., Categorized Habitat) – Best Management Practices for Aggregate Activities and Forest-dwelling Woodland Caribou – Best Management Practices for Tourism Activities and Woodland Caribou in Ontario – Best Management Practices for Mineral Exploration and Development Activities and WoodlandCaribou in Ontario – Best Management Practices for Renewable Energy, Energy Infrastructure and Energy TransmissionActivities and Woodland Caribou in Ontario – Natural Heritage Information Centre (NHIC), including: Species Search Areao Species Observation, Provincially Trackedo Species Monitored Subject Tracking Point ■ Update the Draft ToR to reflect the complete list of potential data sources that will be used to evaluateimpacts to caribou from each alternative route in the EA.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A

ID #	Comment from Regulatory Agency	Comment Type	Requirement / Comment / Concern	Response	Study Plan Reference
31	MECP	■ Email from Nikki Boucher, Species at Risk Specialist, Ministry of Environment, Conservation and Parks, Species at risk branch with information request	■ In addition, we had discussed the status of the Caribou Screening Tool (CST) during our December 18 conversation during which we had indicated that it was not operational at that time. Things have since changed and the CST is now operational again. As such we would like to request a shapefile of the project footprint for each alternative, which includes the centreline for the proposed corridor(s), the width of the ROW and, where available, any additional project infrastructure (e.g., aggregate sites, temporary access roads) in order to enable us to run the proposed alternatives through the CST and provide you with a report.	■ The requested information will be provided at a later date, as agreed to by MECP.	■ Section 7.1
32	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Appendix A ToR indicates that the study area is 2.5 km on each side of the centreline of each alternative route. Given the range of some of the wildlife species, the distance that some fish species will travel to spawn and the potential impacts on remote tourism operations. The study area described may not be adequate to assess the full range of impacts Please provide rationale for the study area. A data share agreement between the MFFN project team and the Crown is in place. This should be recognized in the ToR and included as a potential data source. Please describe how Crown provided data and data collected for the project will be used and shared amongst organizations. The ToR should recognize the Crown Data Share Agreement and include reference to it in the listing of potential data sources for the criteria and indicators alternatives evaluation.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6
33	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ It is recommended a more thorough review is conducted of species that have the potential to be impacted by the proposed undertaking that are listed as Special Concern on the Species at Risk list of Ontario as well as species that are currently only listed under the Species at Risk Act. For consideration in the EA.	■ The information requested will be provided in the IS / EA Report.	■ No reference
34	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ “Telemetry data shows that in the Missisa and James Bay ranges (which comprise part of the study area)….” It is unclear what portion of the project is located in the James Bay Range? A portion of this proposed CAR is however located within the Nipigon caribou range. Update the ToR to include the Nipigon Range, and the status of woodland caribou in both of these ranges should be evaluated in the EA.	■ The caribou LSA and RSA have been updated. The LSA is approximately 5,435 km2 and covers the extent of the two proposed Project routes (Alternatives 1 and 4) and a 10 km buffer on either side of the route alignments. The caribou regional study area (RSA) is approximately 192,500 km2 and covers the extent of four boreal caribou ranges (Missisa, Ozhiksi, Nipigon and Pagwachuan). The RSA was selected because the caribou LSA bisects a portion of each of the four ranges.	■ Section 6
35	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Draft Criteria and Indicators for Alternatives Evaluation Appendix A ■ Available resources to help inform the draft criteria and indicators include research publications and expert knowledge on topics such as stressor-effects pathways, cumulative effects, and associated environmental components and indicators. ■ Contacting researchers such as Rob Mackereth (MNRF) who has published research on these topics and related subjects is encouraged. ■ Rempel, R.S., et al. 2016. Support for development of a long term environmental monitoring strategy for the Ring of Fire area. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Information Report IR-08. 34 p. + append. Catalogue-natural-resource-scientific-and-technical-publications ■ While no specifics are provided in this submission, MNRF welcomes a discussion with MECP and ENDM to explore what (if any) role this project could play in advancing baseline information and long-term environmental monitoring for the Ring of Fire in partnership with First Nations communities.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA reports.	■ Section 7 ■ Appendix A

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Appendix A

Preliminary List of Data Sources

Data, background information, policies, and legislation relevant to the Ungulate assessment come from the following sources:

Data Sources:

- Baseline disturbance footprint spatial data (available upon request from MECP/MNRF).
- Caribou General Habitat Description (GHD) spatial data (available upon request from MECP/MNRF).
- Caribou observation data including collar locations, survey observations, and incidentals (MECP).
- Caribou occupancy models in the Far North (Poley *et al*. 2014) (available upon request from MECP/MNRF or authors).
- Caribou resource selection probability function (RSPF) within Ontario (Hornseth and Rempel 2016) (available upon request from MECP / MNRF).
- Caribou Screen Tool (CST) results (available upon request from MECP).
- Cliffs / Noront study field observation data (Golder Associates).
- Forest Resource Inventory (FRI) data (MNRF). Available at: https://www.ontario.ca/page/ontarios-open-data-directive.
- Indigenous Knowledge observations and data (MFFN)
- Integrated Range Assessment Reports for the Nipigon, Pagwachuan, and Missisa (Far North) Ranges. Available at https://www.ontario.ca/page/caribou-boreal-population.
- Landcover spatial data (MNRF). Available at: https://www.ontario.ca/page/ontarios-open-data-directive
- Moose Aerial Inventory (MAI) population data for Wildlife Management Units (WMUs) 17 (available upon request from MNRF).
- Moose Aquatic Feeding Areas (MAFA), mineral licks, and calving data (available upon request from MNRF).
- Natural Heritage Information Centre (NHIC - available upon request), including:
  - Species Monitored Subject Tracking Point
  - Species Observation, Provincially Tracked
  - Species Search Area
- Ogoki Forest-Forest Management Plan (2018-2020). Available from: https://www.efmp.lrc.gov.on.ca/eFMP/home.do.

- The Far North Biodiversity Project (MNRF) (available upon request from MNRF). Available at: http://sobr.ca/the-far-north-biodiversity-project/.
- Woodland Caribou in the Far North of Ontario: Background Information in Support of Land Use Planning (Berglund *et al*. 2014) (request from MECP).
- Zoetica 2018 field studies of moose and caribou-documented the winter distribution and population stability / demographics of both species across the landscape associated with road route options (Zoetica 2018).

Provincial Policy and Information Sources:

- Area-specific Crown land use policies can be found in the Crown Land Use Policy Atlas. Available at: https://www.ontario.ca/page/crown-land use-policy-atlas
- Best Management Practices for Aggregate Activities and Forest-dwelling Woodland Caribou. Available at https://www.ontario.ca/page/best-management-practices-aggregate-activities-and-forest-dwelling-woodland-caribou
- Best Management Practices for Mineral Exploration and Development Activities and Woodland Caribou in Ontario. Available at https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_bmp_min_dev_car_en.pdf
- Best Management Practices for Renewable Energy, Energy Infrastructure and Energy Transmission Activities and Woodland Caribou in Ontario. Available at https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_bmp_ener_car_en.pdf
- Best Management Practices for Tourism Activities and Woodland Caribou in Ontario. Available at https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_bmp_tour_car_en.pdf
- Cervid Ecological Framework (CEF). Available at: https:///www.ontario.ca/document/cervid-ecological-framework
- Delineation of Woodland Caribou Range in Ontario documents (available upon request from MECP).
- Far North Community Based Land Use Plans (CBLUPs). Available at: https://www.ontario.ca/page/land use-planning-process-far-north#section-2
- General Habitat Description for the Forest-dwelling Woodland Caribou (Rangifer tarandus caribou) (GHD). Available at https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_ghd_car_en.pdf

- General Habitat Mapping Product for Boreal Caribou (i.e., Categorized Habitat) (available upon request from MECP)
- https://www.ontario.ca/page/crown-land use-policy-atlas
- Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (available upon request from MECP).
- Ontario Species at Risk Guides and Resources (includes many best management practices). Available at: https://www.ontario.ca/page/species-risk-guides-and-resources.
- Provincial Park and Conservation Reserve direction. Available at: https://www.ontario.ca/page/provincial-parks-and-conservation-reserves-planning.
- Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP). Available at https://www.ontario.ca/document/range-management-policy-support-woodland-caribou-conservation-and-recovery.
- State of Woodland Caribou Resource Report. Available at https://www.ontario.ca/page/state-woodland-caribou-resource-report-part-1.
- Woodland Caribou Conservation Plan (CCP). Available at https://files.ontario.ca/environment-and-energy/species-at- risk/277783.pdf.

Federal Policy and Information Sources:

- COSEWIC Status Reports. Developed by the Committee on the Status of Endangered Wildlife in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html.
- Proposed Species at Risk Act Permitting Policy. Available at https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/policies-guidelines/proposed-policy-2016.html#_6.
- Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada. Available at: https://www.registrelep-raregistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf.
- Scientific Assessment to Inform the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada. Environment Canada. 2011. Available at: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/ri_boreal_caribou_science_0811_eng.pdf.
- Species at Risk Act, 2002 (SARA). Available at: https://laws.justice.gc.ca/eng/acts/S-15.3/.

- Woodland Caribou, Boral Population (Rangifer tarandus caribou): Amended Recovery Strategy 2019. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html.

Applicable Legislation and Associated Information:

- Ontario Endangered Species Act, 2007 (ESA). Available at: https://www.ontario.ca/laws/statute/07e06
- Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits. Available at https://files.ontario.ca/environment-and-energy/species-at-risk/stdprod_093115.pdf
- Species at Risk Public Registry. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Research Sources Highlighted in the TISG:

- Leblond, M., St-Laurent, M.-H., and Côté, S.D. 2016. Caribou, water, and ice - fine-scale movements of a migratory arctic ungulate in the context of climate change. Mov. Ecol. 4: 14. doi:10.1186/s40462-016-0079-4.

Appendix B

Agency Comments on the Draft Study Plan

Draft Study Plan Comments – Federal

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
GC	■ GC	■ Sections 5, 6, 7, 13, 19.2 and 25	■ In addition to the required actions detailed below, other required actions to be addressed in the update to this study plan are detailed in a separate table titled "2020-07-2 – IAAC to MFCAR - General Comments on MFCAR Draft Study Plans". The Agency has provided these other required actions to highlight common sections of the GUIDELINES where requirements were not met in the draft study plans submitted to the Agency. These additional actions must be addressed in the updated study plans.		■ We have reviewed the relevant comments and incorporated where appropriate. Please refer to the General Comments Table Response submitted separately to the Agency for specific responses.	■ Various Sections
Editorial Comment	■ Section 6.2.1 Moose Habitat Modelling – "Provincial forest fire data and fires from the Far North disturbance layer will be combined into a fire layer. The combined fire layer will be intersected with OLCC data to identify areas associated with burns. Areas intersecting with fires less than 10 years or greater 20 years in age will be overwritten and classified as young forest habitat (Error! Reference source not found.)."	■ N/A	■ An error message is shown rather then the appropriate reference. Additionally, Figure 6-1 is not provided in the study plan.	■ Update the study plan with the reference and Figure 6.1 that currently are missing (Figure 6.1 - Suitability Relationships of Moose for Young Forest, Mature Conifer and Mixed Wood Habitat Interpolated from Rempel (2008)).	■ The figure referenced in this comment has been removed from the Study Plan. Information on moose habitat will be provided at a later date.	■ No reference
UN-01	■ Section 3 Spatial Boundaries: Study Areas, Table 3-1: Ungulates (moose and caribou) Study Areas – "Caribou Ranges: Missisa Range, Nipigon Range, and Pagwachuan Range" ■ Section 7 Concordance with Federal and Provincial – Guidance "Assess Project effects in relation to provincial Range-level population state. Population will not be assessed at the federal Range-level because it was not previously assessed at a fine enough or meaningful scale by Environment and Climate Canada in the Amended Recovery Strategy"	■ Section 7.4.1 – "In addition to assessing project and cumulative effects at the scale of the three study areas defined above, also assess at the scale of the implicated Ontario caribou ranges (Missisa, Nipigon and Pagwachuan), and the federal Far North caribou range." ■ Section 15.4 – "use population-level modeling to assess the effects of proposed disturbance on caribou at the scale of federal range boundaries and provincial range boundaries. Increases in predation caused mortality rates need to be considered as do the anticipated exacerbating effects of climate change… provide an assessment of the potential adverse effects of the Project on the population condition of the range (i.e., size and trend) at both the provincial range scale and the federal range scale"	■ Disturbance and project effects to individuals will also need to be assessed at the scale of the federal Far North range. ECCC can provide further guidance to the proponent. This is required to evaluate federal critical habitat and impact to the federal disturbance threshold. ■ Based on Figure 3-1, it appears that the LSA overlaps with four caribou ranges (Missisa, Ozhiski, Nipigon, and Pagwachuan). Although the Guidelines do not specifically mention the Ozhiski range, it does indicate 'implicated' provincial ranges provincial range boundaries, and provincial range scale Since the provincial Ozhiski range is also intersected by the local study area, as shown on Figure 3-1, this range should also be included in the regional study area boundary described in Table 3-1 of the study plan and impacts should be assessed at the scale of this range in addition to Missisa, Ozhiski, Nipigon, and Pagwachuan, and the federal Far North range.	■ Provide details to demonstrate how project and cumulative effects will be assessed at the scale of the federal Far North range. ■ Include the Ozhiski range in Table 3-1 as part of the regional study area, and in the analyses discussed in Section 5.2 of the study plan.	■ As per technical discussion, the Federal Far North range will be considered in the assessment. The RSA will remain the same (Missisa, Nipigon, Ozhiski, Pagwachuan).	■ Section 3 ■ Section 6

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
UN-02	■ Section 4.3.2 Caribou ■ Section 6.2 Methods for Predicting Future Conditions	■ Section 8.11 – "describe the type and spatial extent of biophysical attributes, as defined in Appendix H of the 2019 proposed amended boreal caribou Recovery Strategy45 present in the study areas" ■ Section 15.4 – "With respect to effects on biophysical attributes as defined in Appendix H of the boreal caribou Recovery Strategy: determine whether the Project is expected to remove or alter biophysical attributes necessary for boreal caribou recovery or survival and provide a rationale for the conclusion (provide GIS file if available)"	■ It is unclear whether or how the Guidelines in Sections 8.11 and 15.4 related to biophysical attributes will be met.	■ Provide details to demonstrate how the requirements in Sections 8.11 and 15.4 related to biophysical attributes will be met. Provide details about the methods and approaches that will be used.	■ The proposed GPS collaring plan, aerial winter surveys and additional predator monitoring (through remote cameras) will meet the requirements in Section 8.11 and 15.4 of the TISG. ■ Caribou habitat mapping will be carried out as described in Section 7.1 of the Study Plan. ■ In addition, the Vegetation Study Plan includes a plan to delineate and classify vegetation ecosites, which we would use to describe the spatial extent and type of biophysical attributes.	■ Section 7
UN-03	■ Section 4.3.2.2 Caribou GPS Collaring – "Golder will register the Project under s.23.17 "Species protection, recovery activities" of O.Reg. 242 / 08 of the Ontario Endangered Species Act, 2007 (ESA) through a Notice of Activity (NoA) prior to commencement of collar deployment and prepare a mitigation plan. Safe handling procedures following MNRF protocol for this type of work will be followed"		■ ECCC notes that any collaring on federal land may also trigger the requirement for a SARA permit.	■ Indicate in the study plan intent to ensure all required regulatory requirements and approvals are obtained prior to conducting any activities that may affect individuals, residences or critical habitat of species at risk.	■ If works occurs on any federal lands, an authorization under Section 73 of the Species at Risk Act (SARA) would be required to engage in capturing and deploying radio collars on a species listed on Schedule 1 of SARA. However, the only federal lands in the caribou LSA are within the boundaries of the MFFN community, where collaring will not occur; as such, a SARA permit is not anticipated to be required for this work.	■ Section 7.3.2.1
UN-04	■ Section 4.3.2.2 Caribou GPS Collaring – "Between ten (10) and twenty (20) GPS collars will be deployed on female adult caribou over the course of up to seven days during February or early March 2021. Collars will be distributed throughout the LSA via helicopter by a professional capture crew (Figure 1, Section 3). Based on advice from MECP in the meeting on March 5, 2020, 20 collars were recommended as an appropriate number of collars to deploy in the study area."	■ Section 7.2 – "Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and	■ More detail is needed to determine if the requirements from Sections 7.2 and 8.11 of the Guidelines will be met. The rationale for the necessary sample size and intensity is needed for all surveys in Section 4.3 of the study plan. More information is needed about the survey design and how the information provided in Sections 7.2 and 8.11 was integrating into the methods proposed in the study plan.	■ Provide detail to demonstrate the rationale for the sample size and sample intensity for each type of survey that is proposed in the study plan. ■ Provide detail about how the requirements in Sections 7.2 and 8.11 of the Guidelines have been integrated into the survey design for all proposed surveys in the study plan.	■ Rationale to support the proposed sample size and intensity of surveys for each survey type proposed in the study plan and how the requirements in the Guidelines are integrated into our approach have been included in the Study Plan	■ Section 7

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
	■ Section 4.3.2.3 Summer Nursery Surveys – "Surveys will occur at up to 20 pre-determined ground survey locations within the LSA, 10 per year, during each survey year." ■ Section 7 Concordance with Federal and Provincial Guidance – "The information sources listed at left will be used to inform survey design."	simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options." ■ Section 8.11 – "sample size must be planned to support a robust evaluation of the project study area within the context of the local study area and regional study area… consult with experts of the relevant jurisdiction on appropriate survey methodologies for caribou. Provide a justification for the selected methodologies… survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation and where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g., federal/ provincial wildlife experts, specialists and local Indigenous groups) In designing surveys for caribou, the following information sources should be consulted …."				
UN-05	■ Section 5 Data Management and Analysis	■ Section 8.10 and Section 8.11 – "Submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards. Provide documentation and digital files for all results of analyses that allow for a clear understanding of the	■ It is unclear if data sets, documentation and digital files will be submitted, in the form that is required in Section 8.10 and 8.11 of the Guidelines.	■ Provide detail to demonstrate that data sets, documentation and digital files will be submitted, in the form that is required in Section 8.10 and 8.11 of the Guidelines.	■ Complete data sets from all survey sites will be provided. They will be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation / visit information and with observations and measurements in un-summarized form. Databases and GIS files will be accompanied by detailed metadata that meets ISO 19115 standards (or	■ Section 8

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
		methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation)."			equivalent). Documentation and digital files will be provided for all results of analyses that allow for a clear understanding of the methods and a replication of the results.	
UN-06	■ Section 5.1.1 Field Data – "Field data collected for the baseline program will be supplemented by existing moose data gathered from historic studies, agencies and online resources."	■ Section 7.2 – "The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected… If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads."	■ It is unclear what existing data will be used to supplement the field data. Section 7.2 of the Guidelines require that detailed descriptions of specific data sources are provided. Additionally, as per Section 7.2 of the Guidelines, the Impact Statement must provide justification to demonstrate the data sources are relevant to the project.	■ Provide detailed descriptions of specific data sources that will be used to identify baseline moose conditions proposed in Section 5.1.1 of the study plan. Sources should be listed and preferably correlated to the criteria and indicators that they will inform. Provide justifications to demonstrate that each data source is relevant in spatial and temporal coverage to the project.	■ Appendix A of the Study Plan was revised to include specific sources. The results of the desktop studies will be provided at a later date.	■ Section 7 ■ Appendix A
UN-07	■ Section 5.1.2 Indigenous Knowledge – "Indigenous knowledge collected through engagement with Marten Falls First Nation community members as well as other First Nation communities with traditional territories in the vicinity of the Project will be considered with the background data and field data collected for the project. These data will be used to further inform where key habitats for moose occur."	■ Section 6 – "The proponent must engage with all Indigenous groups that may be impacted by the Project. The Indigenous Engagement and Partnership Plan, issued by the Agency, is available to assist the proponent in further developing or refining their engagement strategy and supporting ongoing trust and relationship-building. In addition to the requirements set out in section 6.1, 6.2 and 6.3, the proponent must provide Indigenous groups with an opportunity to: provide Indigenous knowledge during baseline data collection; comment on the list of valued components and indicators…"	■ It is unclear which Indigenous communities are considered to have traditional territories in the vicinity of the project. As per Section 6 of the Guidelines, the Agency expects the proponent to engage with, at a minimum, the Indigenous groups listed in the Indigenous Engagement and Partnership Plan.	■ Provide details to demonstrate that all of the Indigenous groups listed in the Indigenous Engagement and Partnership Plan will be engaged with, including to inform where key habitats for moose, as well as other ungulates of importance to the groups, occur.	■ As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). ■ Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in Section 5 of the Study Plan.	■ Section 4.2 ■ Section 5

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
					Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program.	
UN-08	■ Section 5.2 Caribou Section 7 Concordance with Federal and Provincial Guidance – "Caribou: Indigenous Knowledge of caribou related to current and historical use as well as cultural importance"	■ Section 6 – "The proponent must engage with all Indigenous groups that may be impacted by the Project. The Indigenous Engagement and Partnership Plan, issued by the Agency, is available to assist the proponent in further developing or refining their engagement strategy and supporting ongoing trust and relationship-building. In addition to the requirements set out in section 6.1, 6.2 and 6.3, the proponent must provide Indigenous groups with an opportunity to: provide Indigenous knowledge during baseline data collection; comment on the list of valued components and indicators…" Section 8.10"describe the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbits, marten, muskrat, and otter);" Section 8.11"describe boreal caribou use of the study areas (e.g., distribution, movement) over time using surveys to complement existing data if data within the project study areas are insufficient or unavailable to be able to understand how caribou use the habitat. Involve province of Ontario for data and survey requirements. Consider Indigenous knowledge and community knowledge"	■ It is unclear how or if Indigenous communities will be engaged with to describe boreal caribou use of the study area. As per Section 6 of the Guidelines, the Agency expects the proponent to engage with, at a minimum, the Indigenous groups listed in the Indigenous Engagement and Partnership Plan.	■ Provide details to demonstrate that all of the Indigenous groups listed in the Indigenous Engagement and Partnership Plan will be engaged and provided opportunities to provide input on caribou use of the study areas and cultural importance. This includes incorporating into the plan where Indigenous groups will be provided with opportunities to: -provide Indigenous knowledge during baseline data collection; -comment on the list of valued components and indicators; -inform the effects assessment and review its conclusions; and -inform the development of mitigation measures and follow-up programs.	■ As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in Section 5 of the Study Plan. Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program.	■ Section 4.2 ■ Section 5

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
UN-09	■ Section 3 Spatial Boundaries: Study Areas Table 3-1 – "The proposed project routes and 35 km buffer on either side of the route alignments" ■ Section 5.2.7 Collaring Data – "GPS collaring data was acquired from the MECP (2019) for the Nipigon, Missisa, and Pagwachuan Ranges and will be spatially analyzed in relation to the EA route alternatives to determine number of collaring points in the vicinity of the Project (within 10 km) and the time of year the points occurred."	■ Section 7.4.1 – "For caribou, the local study area should be at a minimum: project study area plus a 10-40-kilometre buffer. Simulation modeling may indicate a larger buffer. In addition to assessing project and cumulative effects at the scale of the three study areas defined above, also assess at the scale of the implicated Ontario caribou ranges (Missisa, Nipigon and Pagwachuan), and the federal Far North caribou range."	■ More detail is required to determine if the requirement in Section 7.4.1 of the Guidelines will be met. ■ In Section 3 of the study plan, the LSA includes the proposed project routes and a 35 km buffer on either side of the route alignments. The rationale given for this buffer size is to be consistent with previous aerial ungulate surveys performed by Zoetica over the project route alternatives. ■ It is unclear why the 35 km buffer is scaled back to 10 km when discussing the data management and analysis of caribou collaring data.	■ Discuss why the data analysis of caribou collar data is scaled back to 10 km from the previously defined LSA spatial boundary of 35 km buffer on either side of the proposed project route and how consistency with previous ungulate surveys will be achieved.	■ The 10 km buffer was proposed because MNRF uses a 10 km buffer around nursery and winter ranges as standard practice in BMPs for mineral exploration and states that the ZOI is 10 km. Following discussions with regulators in September - November 2020, we have revised the size of the LSA to a 10 km buffer but will extend some of our aerial survey program to the larger 35 km extent for consistency with study coverage from the Zoetica report.	■ Section 7.3.2
UN-10	■ Section 6 Indicators and Expression of Change Table 6-1 – "Indicators: • Relative significance of sub-range habitat features • Relative tolerance of the range to alteration / risk"	■ Section 15.4 [content regarding effects on caribou]	■ More information is needed regarding how the indicators will be assessed to determine if the requirements in the Guidelines will be met.	■ Provide details about how these two indicators (relative significance of sub-range habitat features, relative tolerance of the range to alteration/ risk) will be assessed.	■ Relative significance of sub-range habitat features and relative tolerance of the range to alteration/ risk will be assessed through analysis and interpretation of provincial integrated range assessment reports and review of landscape changes in LSA and RSA at the Project and cumulative effects scales.	■ Section 9
UN-11	■ Section 6.1.2 Indicators – "Ideally, effect threshold values for adaptability and resilience limits of a VC are known, and changes in indicators can be quantified accurately with a high degree of confidence to evaluate whether a threshold has been exceeded. However, critical thresholds such as amount or distribution of habitat required to maintain a self-sustaining population, or the specific number of individuals required to maintain an ecologically effective population size, are rarely available for wildlife VCs…. …. Consequently, a detailed and transparent account of predicted effects associated with estimated cumulative changes to each		■ The study plan states that threshold values are rarely available for wildlife VCs and provides a description of an approach that will be used for the effects assessment. For Caribou, thresholds are used federally to define critical habitat and self-sustainability of local populations. It is unclear if the approach to the effects assessment will differ for caribou since these threshold values are known.	■ Provide details to demonstrate if the approach to the effects assessment will differ for caribou since threshold values are known and used to define critical habitat and self-sustainability of local populations.	■ The thresholds from the federal recovery strategy for caribou will be used for the effects assessment (65% undisturbed habitat within the range)	■ Section 9

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
	measurement indicator will be provided for each VC using available scientific literature, publicly available data, data collected during the baseline program, and logical reasoning (i.e., a weight of evidence, or reasoned narrative approach)."					
UN-12	■ Section 6.2 Methods for Predicting Future Conditions	■ Section 15.4 – "assess the effects of all linear disturbances (e.g., new road access or rights of way) on caribou, including movements between seasonal habitats to account for functional habitat loss and effects of increased predation; – Use population-level modeling to assess the effects of proposed disturbance on caribou at the scale of federal range boundaries and provincial range boundaries. Increases in predation caused mortality rates need to be considered as do the anticipated exacerbating effects of climate change; – With respect to effects on undisturbed habitat at the scale of the range: provide an account (and GIS file if available) of added project disturbance using a 500-metre buffer, using the following formula: (Project footprint + 500 metre buffer) - overlapping area(s) already considered disturbed habitat (see glossary in the federal recovery strategy); and determine whether the Project is expected to compromise the ability of ranges to be maintained at the disturbance management threshold and provide a rationale for the conclusion. – With respect to effects on biophysical attributes as defined in Appendix H of the boreal caribou Recovery Strategy: determine whether the Project is expected to remove or alter biophysical attributes necessary for	■ More detail is required to adequately assess whether these aspects of the Guidelines have been addressed.	■ Provide further detail to demonstrate how the requirements in Section 15.4 of the Guidelines specific to caribou will be met.	■ The information requested is provided in the updated Study Plan.	■ Section 9.4

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
		boreal caribou recovery or survival and provide a rationale for the conclusion (provide GIS file if available); – With respect to effects on connectivity: determine whether the Project is expected to result in a reduction of connectivity within or between the ranges and provide a rationale for the conclusion; evaluate habitat and range connectivity at the local, regional and range scales using quantitative methods (e.g., habitat suitability analysis etc.); and in addition, where telemetry data is available, evaluate movements of collared individuals using quantitative methods (e.g., step analysis), to determine existing movement corridors, and how these may be affected by project development. – with respect to the effects of predation: determine whether the Project is expected to result in an increase of predator and/or alternate prey access to undisturbed areas and provide a rationale for the conclusion”				
UN-13	■ Section 6.2.2 Caribou Habitat Modeling – “The spatial file of the caribou GHD provided by the MECP includes nursery and winter use areas (Category 1 habitats), seasonal ranges (Category 2 habitat), and remaining areas in the range (Category 3 habitat). GHD categorization was not mutually exclusive meaning that multiple habitat types sometimes overlapped. For ease of presentation and reporting, a conservative approach was applied by assigning the most sensitive category to areas of overlapping habitat types”	■ Section 15.4 – [See specific items related to Caribou (Habitat Protection) – Categorized Habitat at the Sub-range Level]	■ Section 15.4 of the Guidelines provides specific information that needs to be evaluated for each category of caribou habitat. It is not obvious from the information provided if all of these requirements will be met.	■ Provide further detail to demonstrate how the information required for each categorized habitat will be evaluated, as per the requirements in Section 15.4 of the Guidelines.	■ The information requested is provided in the updated Study Plan.	■ Section 9.4

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
UN-14	■ Section 7 Concordance with Federal and Provincial Guidance – "Moose: Spatial data and quantitative data will be used to describe the following for moose in the LSA: • biodiversity, distribution and location. • abundance and population status. • life cycle. • seasonal ranges, migration and movements. • habitat requirements; and • sensitive periods (e.g., seasonal, diurnal and nocturnal). • qualitative and quantitative aspects of habitat described at left…"	■ Section 8.10 – "Identify wildlife species, other than avian species, of ecological, economic or human importance (particularly to Indigenous peoples), within the study area (including moose, rabbit, beavers, otters, muskrat, and frogs), that are likely to be directly or indirectly effected and describe each species: biodiversity, distribution and location; abundance and population status; life cycle; seasonal ranges, migration and movements; habitat requirements; and o sensitive periods (e.g., seasonal, diurnal and nocturnal). For the species identified above, describe and quantify the habitat type, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction"	■ It is unclear how the life cycle, seasonal ranges, migration and movements, and sensitive periods will be described for moose based on the information provided in the study plan. It is unclear what spatial and quantitative data will be used to describe these aspects, which are identified in Section 8.10 of the Guidelines. It is also unclear how the habitat type will be described. The study plan states "qualitative and quantitative aspects of habitat described at left". There is not enough information presented in the concordance table and study plan to determine what data will be used to describe habitat type, as per Section 8.10 of the Guidelines.	■ Provide detail to demonstrate how all aspects of Section 8.10 of the Guidelines will be described for moose, including the methodology and data used to describe the life cycle, seasonal ranges, migration, movements and sensitive periods. Provide detail to demonstrate how habitat type including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction will be included in the Impact Statement. Specify which aspects will be studied using qualitative or quantitative methods.	■ Observations of moose and moose habitat will be recorded during field programs (including aerial transect surveys, remote camera deployment, vegetation surveys). Additional information on observations collected during field work is provided in the updated Vegetation Study Plan.	■ Section 7.3.1 ■ Vegetation Study Plan
UN-15	■ Section 7 Concordance with Federal and Provincial Guidance – "…Examine changes to predator-prey dynamics between wolves and caribou associated with the Project"	■ Section 15.4 – "assess the effects of all linear disturbances (e.g., new road access or rights of way) on caribou, including movements between seasonal habitats to account for functional habitat loss and effects of increased predation… – …Increases in predation caused mortality rates need to be considered… – …with respect to the effects of predation: determine whether the Project is expected to result in an increase of predator and/or alternate prey access to undisturbed areas and provide a rationale for the conclusion"	■ It is unclear how increased predation will be studied, as per Section 15.4 of the Guidelines. ■ More detail is needed on how changes to predator-prey dynamics will be examined.	■ Provide further detail to demonstrate how information on increased predation will be collected. Provide details about the methods and approaches that will be used.	■ We propose the addition of a remote camera monitoring program in the caribou LSA, which will monitor predators as well as other wildlife species year-round. A summary of the program was added to the study plan.	■ Section 7

Comment # / Ref #	DRAFT Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Reference
UN-16	■ Section 7 Concordance with Federal and Provincial Guidance – "Assess other effects on caribou as a result of the Project including sensory disturbance, mortality (directly related to the Project including collisions with vehicles) and change in harvest by Indigenous groups."	■ Section 15.4 – "provide an assessment of the potential adverse effects on boreal caribou individuals (e.g., sensory disturbance, mortality, pollution) including legal harvest from indigenous groups… – …caribou (Species Protection) – Incidental mortality due to anthropogenic effects (e.g., vehicular collisions, increased hunting pressure) caribou (Species Protection) – Indirect mortality due to increase in alternate prey sources (moose and deer) leading to increased predation (wolves, bears, etc.) and increased potential for spread of disease (e.g., brainworm) caribou (Species Protection) – Indirect effects due to sensory disturbance (e.g., light, sound, vibration, olfactory) within 10 kilometres of the Project;"	■ It is unclear how direct and indirect sensory disturbance, mortality, pollution, harvest from Indigenous groups, incidental mortality due to anthropogenic effects, increased predation from increase in alternative prey sources and increased potential for spread of disease will be described based on the information provided in the study plan. ■ There is not enough information presented in the concordance table and study plan to determine what data will be used to describe the requirements in Section 15.4 of the Guidelines.	■ Provide details, including methods and approaches, to demonstrate how the requirements of Section 15.4 will be integrated into the study plan.	■ The proposed approach to assess effects of the Project are outlined in Section 9.0 of the Study Plan.	■ Section 9

Draft Study Plan Comments – Provincial

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
1	■ Page 2, s. 2 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Key objectives of conducting an EA include the elements mentioned in the work plan and also describing the existing environment, describing potential effects (positive and negative) of the project and alternatives, and consult about the project.	■ Suggest the following revisions to add additional key objectives of the EA process: *The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative) of the project and alternatives on the environment, ~~on Ungulates (moose and woodland caribou) and~~ determine measures needed to avoid or minimize adverse Project effects and enhance beneficial Project effects where feasible, and undertake consultation.*	■ Changes made.	■ Section 2
2	■ Page 2, footnote – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The footnote is appreciated though requires clarification. Will the study plans be updated to reflect any other comments during the ToR review process or post-ToR, e.g., federal, Indigenous, public?	■ Please clarify if the study plans will be included with the ToR submission. ■ If not included in the ToR submission, please clarify if and when the project team intends to consult broadly on the work plans. The footnote should also be revised to state that the study plans will be updated to reflect the approved ToR if approval is obtained.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available.	■ Section 4
3	■ Page 4, Figure 3-1 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Figure 3-1 is missing locations for other project infrastructure – can this be added to the map? ■ Figure 3-1 displays local study areas for moose and caribou. The caribou and moose regional study areas are missing. ■ Also the legend appears to cut off “Alternative 1 and Alternative…” – is 4 missing?	■ Please add locations of other project infrastructure and associated study areas to Figure 3-1, or clarify when these locations will be known. ■ Please add the moose and caribou regional study areas to Figure 3-1 or in separate figure. ■ Please check if there is cut-off text in the legend of Figure 3-1.	■ Study Plan Section 6.2 indicates that the Project Development Area (PDA) encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report.	■ Section 6.2
4	■ Page 8, s. 4.3.2.3	■ MECP, Environmental Assessment Branch	■ It is stated that caribou summer calving surveys will be completed between mid June and late August 2020 and 2021. MECP understands from phone correspondence with the project team in late June 2020 that this field work has not begun.	■ Please update the proposed field work dates.	■ Summer nursery surveys will no longer be included in the scope of the ungulate study plan, as agreed upon with the MECP and the Agency given the more extensive collar program.	■ Section 3
5	■ Page 14, s. 6.2	■ MECP, Environmental Assessment Branch	■ The second paragraph on page 14 indicates that the route alternatives, along with permanent and temporary disturbances associated with the project route alternatives, will be mapped and overlaid with moose and caribou habitat to help describe effects. It is not clear if ‘permanent and temporary disturbances associated with the project route alternatives’ includes other supporting infrastructure (e.g., access roads, aggregate pits). These features should be mapped as well.	■ For clarity, please include in section 6.2 that all temporary and permanent supporting infrastructure will be part of the mapping described in section 6.2, in addition to mapping the route alternatives.	■ Study Plan Section 6.2 indicates that the Project Development Area (PDA) encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report.	■ Section 6.2

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
6	■ Page 15, s. 6.2.1	■ MECP, Environmental Assessment Branch	■ Page 15 states: “Areas intersecting with fires less than 10 years or greater 20 years in age will be overwritten and classified as young forest habitat (Error! Reference source not found.).” ■ However this seems to contradict the following on page 16, Table 6-2 for the “Young forest” row, “Provincial Wildlife Data” column: “Burn Age is ≥10 to ≤20 years old [since 2016], (i.e., Year of Burn is 2007 to 1997).” ■ [Underline added]	■ Please confirm if the two statements about young forest are correct, or revise as necessary.	■ The requested revision has been made.	■ Section 9.4
7	■ Page 15	■ MECP, Environmental Assessment Branch	■ Figure 6-1 has a caption on the page but the actual figure is missing. Figure 6-1 is titled “Suitability Relationships of Moose for Young Forest, Mature Conifer and Mixed Wood Habitat Interpolated from Rempel (2008).”	■ Please add missing figure.	■ The figure referenced in this comment has been removed from the Study Plan. Additional information on moose habitat will be provided at a later date.	■ no reference
8	■ Page 17, s. 6.3 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ A few comments on the first paragraph: – It is stated that project phases include construction and operation. It would be helpful if this section clarifies that the construction phase includes decommissioning of temporary infrastructure, per page 14 of the draft ToR. – Residual effects are mentioned but not explained. For clarity, there should be a statement that residual effects (net effects using provincial language) are the effects left over after application of impact management measures, per Ontario’s EA Code of Practice. – The paragraph states the residual effects will “be described in terms of the magnitude, geographic extent, timing, duration, frequency, social and ecological context, likelihood, and whether effects are reversible or irreversible.” These characteristics are not all the same as what was stated in the draft ToR: “direction, magnitude, geographic extent, direction [sic], frequency, reversibility and likelihood” (p. 54-55 of draft ToR). Bolded font added to show differences. The remainder of section 6.3 describes further effects assessment methodology. The work plan and final ToR should align in methodology.	■ - Please add to this section that the construction phase includes decommissioning of temporary infrastructure, using consistent language as the ToR. - Please add to this paragraph that ‘residual (net) effects are the effects remaining after the application of impact management measures.’ - Please align the work plan methodology with the final ToR methodology in terms of assessing effects and alternatives, or provide sufficient rationale if methodologies are different. Per Ontario’s EA Code of Practice, the evaluation method(s) chosen must be able to produce an assessment that is clear, logical and traceable.	■ Section 6.1 of the Study Plan states that "Decommissioning of construction works is included in the construction phase" and Section 9.1 of the Study Plan further defines the project activities included in "Construction Phase: Decommissioning" to be (1) Pits and Quarries and (2) Temporary Camps, Roads / Trails and Staging Areas. The suggested text was added to Section 9.6 of the Study Plan.The methodology to assess effects and alternatives is consistent in the updated Study Plans and Proposed ToR. The residual effects characteristics included in the updated Study Plans are consistent with the net effects characteristics in the Proposed ToR, with the exception that socio-economic context is not mentioned in the Proposed ToR. However, socio-economic context will be part of the qualitative discussion “to reach a conclusion on significance of the net effects taking into consideration professional judgement” as described in the Proposed ToR.	■ Section 6
9	■ Page 21, Table 7-1	■ MECP, Environmental Assessment Branch	■ The Response and Study Plan Reference columns for ID #9 on page 21 are blank. ID #9 is “Assessment and Evaluation of Alternatives for Caribou and its Habitat.”	■ Please fill in Response and Study Plan Reference columns for ID #9.	■ This table has been updated and is referenced as Table 11-1 in the updated Study Plan.	■ Table 11-1
10	■ Indigenous knowledge – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The work plan indicates that the EA will consider Indigenous knowledge to inform the effects assessment. The work plan does not provide a proposed methodology for how the proponent intends to seek Indigenous knowledge, from whom, and how it will be incorporated.	■ Please provide further details about how Indigenous knowledge will be collected and incorporated. Alternatively, it may be helpful to include a reference to the relevant components of the ToR and ToR consultation plan that provide further details.	■ The Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). Indigenous communities will be involved throughout the environmental assessment so	■ Section 4

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
					that the Proponent can consider and incorporate, where appropriate, Indigenous Knowledge and Indigenous land and resource use information into the Project as applicable. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP once available. A summary of the consultation plan has been provided in the Study Plan; further details can be found in the Draft ToR.	
11	■ Criteria and indicators table – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ For the tables containing criteria and indicators, some work plans include the three columns Valued Component, Indicators and Rationale for Selection. Other work plans include the columns Indicator, Expression of Change and Rationale for Selection. The table formats of criteria and indicators should be consistent across work plans. There are also differences between the criteria/indicators in the draft work plans vs. the criteria and indicators in the draft ToR.	■ Please review draft work plans to achieve consistent format in how criteria and indicators are presented in the tables. Where there are differences between the criteria/indicator tables in the draft work plans and the draft ToR Appendix A, please ensure the work plans and final ToR align so that the assessment methodology is consistent and to avoid confusion.	■ Study Plans have been updated to ensure consistent format in how criteria and indicators are presented. The criteria and indicators have evolved through input from Indigenous communities, government agencies and interested stakeholders and will continue to do so. The starting point for the criteria/indicator tables in the updated Study Plans was Appendix A of the Proposed ToR. However, there are a few circumstances where agency comments were provided on criteria/indicators following the finalization of the Proposed ToR and so there are a few circumstances where the criteria/indicators included in the updated Study Plans deviate slightly from that provided in Appendix A of the Proposed ToR.	■ Section 9
1	■ Pg. 4 / Table 3-1	■ MECP, Species at Risk Branch	■ The draft Work Plan identifies the Regional Study Area (RSA) for Caribou as including the Nipigon, Missisa and Pagwachuan Caribou Ranges. It should also include the Ozhiski Caribou Range. The Project footprint is within 10 km of the Ozhiski Range boundary. As such, project activities may impact Caribou within this range. All subsequent descriptions in the draft Work Plan related to field data collection, data management and analysis associated with the RSA should include the Ozhiski Caribou Range (e.g., s.5.21 – Landscape Composition, s.5.2.2 – Permanent and Temporary Project Features, etc.)	■ Update the draft Work Plan accordingly.	■ The Study Areas are defined and described in the Study Plan. The requested revision has been made.	■ Section 6
2	■ Pg. 4 / Figure 3-1	■ MECP, Species at Risk Branch	■ The figure presented in the draft Work Plan should show the full extent of the Caribou RSA, or a second figure included.	■ Update the draft Work Plan to illustrate the full extent of the RSA for Caribou.	■ The requested revision has been made.	■ Figure 6-2
3	■ Pg. 5. / s. 4.2.1 – 2018 Aerial Surveys	■ MECP, Species at Risk Branch	■ Insufficient details are provided on the methodology of the 2018 Winter Aerial Survey. Additional information is required on the transects flow, aircraft speed and altitude, survey crew(s), dates of flights, weather conditions, etc., and include maps of the flight transects (e.g., track logs). Furthermore, additional detail is also required describing the application of the infrared device (e.g., field-of-view, sensitivity, etc.), the length of time (e.g., days) between the	■ Update the draft Work Plan to include necessary detail to inform MECP's review of the previous aerial survey for Caribou, including maps of transects (e.g., track logs). Alternatively, provide the 2019 Zoetica report referenced in s.4.2.1	■ The report prepared by Zoetica, based on their investigations in 2018, was shared with the agencies and a summary has been provided in the Study Plan.	■ Section 7.2

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			original observation by infrared and the follow-up by rotary wing, analysis required to determine species, success of methodology in a treed landscape, etc. Additional details on methodology and results are required to inform the appropriateness of the 2018 Winter Aerial Survey. MECP has not been provided the Zoetica 2019 report referenced in s.4.2.1. Assuming this report contains the details required (above), the report should be provided as an appendix to the draft Work Plan.			
4	■ Pg. 5. / s. 4.2.1 – 2018 Aerial Surveys	■ MECP, Species at Risk Branch	■ The transect spacing of 10 km is insufficient to adequately sample the LSA for Caribou distribution. Caribou live at low densities and the dense vegetative cover typical of much of the LSA decreases the probability of encountering Caribou. As such, survey intensity is expected to be higher to appropriately inform baseline conditions (e.g., distribution, habitat use, etc.). ■ Recognizing the recommended survey methodology discussed with MECP Species at Risk Branch in Dec. 2019 (i.e., MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background) was designed for range level surveys, the guidance set out in the Select Wildlife and Habitat Features: Inventory Manual (Ranta 1997) should also be considered and incorporated into the proposed aerial winter survey. Specifically, transects should be spaced 2 km apart for winter aerial surveys. The reduced transect spacing (i.e., more transects) would increase the sampling area and the likelihood of observing target species (i.e., Caribou, Moose, Wolverine, Wolves). Planning of transect layout should be based on the hexagon grid referenced in MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background to ensure consistency with future monitoring for Caribou (and wolverine) that may be undertaken.	■ All future winter aerial surveys should incorporate 2 km spacing.	■ As determined through discussion at technical meetings, we will revise our approach by using a smaller caribou LSA (10 km buffer around route alternatives) and spacing transects 2 km apart. We will extend every 5th transect to the previous LSA (35 km buffer; "area of potential impact") and add additional transects in the NW and E side of the LSA to cover gaps.	■ Section 3 ■ Section 7
5	■ Pg. 5. / s. 4.2.1 – 2018 Aerial Surveys	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that sex ratios, cow-calf ratios, and % calves per 100 adults were calculated, but no results are included in the draft Work Plan and no initial conclusions are presented. Results are required to inform the appropriateness of the 2018 Zoetica survey.	■ Update draft Work Plan to include results of surveys conducted to date.	■ The report prepared by Zoetica, based on their investigations in 2018, was shared with the agencies and a summary has been provided in the Study Plan.	■ Section 7.2
6	■ Pg. 6 / s. 4.3.2.1 – Aerial Winter Survey	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that the proposed aerial winter survey for Caribou will occur between mid February to late March. As per Select Wildlife and Habitat Features: Inventory Manual (Ranta 1997), surveys should be planned to be undertaken between February 1 to March 15.	■ Update draft Work Plan accordingly.	■ The requested revision has been made.	■ Section 7

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
7	■ Pg. 6 / s. 4.3.2.1 – Aerial Winter Survey	■ MECP, Species at Risk Branch	■ The proposed transect spacing of 10.6 km is insufficient to adequately sample the LSA for Caribou distribution. Caribou live at low densities and the dense vegetative cover typical of much of the LSA decreases the probability of encountering Caribou. As such, survey intensity is expected to be higher to appropriate inform baseline conditions (e.g., distribution, etc.). ■ Recognizing the recommended survey methodology discussed with MECP Species at Risk Branch in Dec. 2019 (i.e., MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background) was designed for range level surveys, the guidance set out in the Select Wildlife and Habitat Features: Inventory Manual (Ranta 1997) should also be considered and incorporated into the proposed aerial winter survey. Specifically, transects should be spaced 2 km apart for winter aerial surveys. The reduced transect spacing (i.e., more transects) would increase the sampling area and the likelihood of observing target species (i.e., Caribou, Moose, Wolverine, Wolves). Planning of transect layout should be based on the hexagon grid referenced in MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background to ensure consistency with future monitoring for Caribou (and wolverine) that may be undertaken.	■ All future winter aerial surveys should incorporate 2 km spacing.	■ As determined through discussion at technical meetings, we will revise our approach by using a smaller caribou LSA (10 km buffer around route alternatives) and spacing transects 2 km apart. We will extend every 5th transect to the previous LSA (35 km buffer; "area of potential impact") and add additional transects in the NW and E side of the LSA to cover gaps.	■ Section 3 ■ Section 7
8	■ Pg. 6 / s. 4.3.2.1 – Aerial Winter Survey	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that both the fixed-wing and rotary-wing components of the proposed aerial winter survey will include a pilot, two terrestrial biologists and one Marten Falls observer, when available. MECP encourages the inclusion of Marten Falls observers in all surveys. When a community observer is not available, a fourth observer should be included on those flights to ensure each transect is consistently flown with a pilot and three observers. This will ensure, as much as possible, consistent search effort across the study area.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made.	■ Section 7
9	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that between 10 and 20 GPS collars will be deployed on female adult Caribou. As per previous conversations between MECP and the Proponent (March 5, 2020) and noted in the draft Work Plan, to ensure an appropriate sample size is obtained to inform the impact assessment of the proposed Project, MECP-SARB recommends a minimum of 20 collars be deployed to lower confidence intervals and appropriately inform baseline conditions for Caribou within the LSA. ■ The Integrated Range Assessment for Woodland Caribou and their Habitat – The Far North of Ontario 2013 (MNRF 2014) concluded that the Missisa Range is occupied by at least 745 Caribou during the winters of 2009-2011 and possibly substantially more. Consequently, deploying 20 collars would still only represent ~2.5% of the minimum number of animals within the Missisa Range.	■ Update the draft Work Plan to reflect an appropriate sample size for the proposed Caribou GPS Collaring (i.e., minimum of 20 collars).	■ The Study Plan has been updated to specify the number of collars.	■ Section 7

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
10	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan does not indicate whether the minimum sample size (e.g., 20 collared female Caribou) will be maintained. The minimum sample size should be maintained throughout the Caribou GPS Collaring program should mortalities (i.e., predation, harvest, natural causes) or collar failures occur (i.e., battery depletion, malfunction, etc.). Should the number of collared Caribou drop below the minimum sample size, additional collars should be deployed to maintain the minimum sample size to ensure a sufficient amount of information will be available to appropriately inform the VC indicators (e.g., impacts to Category 1 habitat extent and distribution, etc.). Furthermore, if the minimum sample size is not maintained throughout the Caribou GPS Collar program, there may not be sufficient information to satisfy the requirements of the ESA permitting process (e.g., impact assessment). Consequently, additional monitoring requirements may be necessary should an ESA authorization be required.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been updated to specify the number of collars.	■ Section 7
11	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that safe handling procedures following MNRF protocol for this type of work will be followed. To ensure this commitment is met, the Proponent will need to prepare an Animal Care and Handling Protocol approved by an Animal Care and Use Committee recognized by the Canadian Council on Animal Care (e.g., MNRF's Wildlife Animal Care Committee).	■ Update the draft Work Plan accordingly.	■ Study Plan updated to indicate an Animal Care and Handling Protocol application will be submitted for approval prior to any field work, and that all wildlife work will be conducted following processes approved by the Canadian Council on Animal Care, MNRF Capture Protocols, and MNRF Wildlife Animal Care Committee.	■ Section 7
12	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that it is expected that the collar data will also provide information on whether Caribou illicit a response (i.e., change in movement patterns) in relation to Project construction and operation of the road. The proposed 3-year Caribou GPS Collar program is sufficient to characterize baseline conditions. However, a 3-year collaring study will not be sufficient to inform Caribou response to Project construction and operation (i.e., effectiveness monitoring), which will likely be a component of any future ESA authorization that may be required. To appropriately monitor and assess the response of Caribou to the construction and operation of the Project using GPS collars, MECP strongly encourages the Proponent consider extending the Caribou GPS Collar program, deploying collars for 7-10 years (e.g., 2-3 years prior to construction, 2-3 during construction, 3-4 years post-construction) as part of the Environmental Monitoring referenced in the draft Terms of Reference (pg. 59 / section 9.2). In this way, the Proponent should be able to monitor Caribou response to Project construction and operation of the road. This should include a description of how sensory disturbance will be monitored during and after construction (e.g., traffic counters, noise monitoring equipment, etc.). The Ministry of Transportation has developed some protocols based on similar studies they have conducted.	■ Update the draft Work Plan to reflect that the proposed Caribou GPS Collaring program should be planned for a minimum of 3 years to appropriately characterize baseline conditions in the EA. However, as described in a letter provided to the proponent on January 24, 2020 [draft ToR comments SARB cover letter], to enable an efficient approach to project planning and preparation of applications for any necessary Endangered Species Act (ESA) authorizations, consideration should be given to structuring the proposed Caribou GPS Collaring program, including extending the program to 7-10 years in length, such that it could verify the potential environmental effects predicted in the EA and inform the effectiveness of mitigation actions taken to avoid or minimize adverse effects to Caribou. This may also provide for potential research opportunities that could be incorporated into an ESA authorization (e.g., beneficial actions) in combination with an appropriate approach to monitor sensory disturbance.	■ The number of collars and length of the collaring program has been specified in the Study Plan.	■ Section 7

Comment # / Ref #	DRAFT Study Plan Section	Agency / Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Reference
13	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that the collaring data can be used in the effects assessment, as well as the ESA permitting process and is anticipated to help satisfy any monitoring requirements outlined during that process. It is reasonable to expect that these data can inform the ESA permitting process. However, it may not be entirely sufficient to satisfy all monitoring requirements throughout that process (e.g., effectiveness monitoring) and there may be additional monitoring requirements necessary should an ESA authorization be required. Determination of necessary monitoring will be made during the ESA permitting process and the need for additional monitoring will depend on existing available information necessary to inform a determination of impacts as defined under the ESA; which will include consideration of all data collected through the EA (e.g., Caribou collaring data, winter aerial surveys, camera traps, etc.). If determined to be sufficient, additional monitoring may not be required at that time.	■ Update the draft Work Plan to provide clarity that this information is anticipated to support the ESA permitting process and contribute towards necessary monitoring requirements outlined during that process.	■ The IA / EA will include a monitoring framework to verify the prediction of effects and the effectiveness of the impact management measures implemented, including those related to SAR and their habitat.	■ Section 9
14	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that each collar will transmit multiple locations per day over the duration of their deployment. It also indicates that the Caribou GPS Collars are intended to identify births and mortalities of Caribou in the vicinity of the study area over several years. MECP-SARB recommends programming the collars for a minimum of six (6) locations per day to determine calving events and potential calf mortality.	■ Update the draft Work Plan to specify the number of locations per day the collars will be programmed to transmit.	■ The Study Plan has been updated to specify that collars will be programmed to take eight locations per day (i.e., one fix every three hours).	■ Section 7
15	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that it is recommended that should there be a mortality, an attempt be made to find out why or how the Caribou died. MECP-SARB strongly encourages the Proponent to incorporate this into the Work Plan and carry out mortality investigation as soon as possible following a mortality signal as part of the EA. As identified in the draft Work Plan, determining cause of mortality can contribute towards future calculations of population health (i.e., survival and lambda), but it will also enable an evaluation of baseline levels of mortality (e.g., predation, harvest, natural) and an assessment of impacts in the EA. ■ Should the Caribou GPS Collaring program be carried forward to inform effectiveness monitoring through the ESA process (if an authorization is required), mortality investigations will be an important component to inform effectiveness monitoring.	■ Update the draft Work Plan to clearly indicate whether mortality investigations will be undertaken as part of the EA. If so, include a description of how this will be undertaken (e.g., timelines from mortality signal to field crews arriving on site, etc.). ■ If mortality investigations will not be undertaken as part of the EA, update the draft Work Plan to provide sufficient justification and rationale describing why this is not necessary.	■ Mortality investigations will be conducted as part of the EA and following the approach of MNRF which is to collect collars once there is minimum of three collars signaling a mortality and only during non-snow conditions.	■ Section 7
16	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ It is recommended that collection of the following biological samples also be considered as part of the Caribou GPS Collar program: - blood samples be taken from each captured Caribou to assess pregnancy status by analyzing blood serum for pregnancy-specific protein B (PSPB); - pellet samples collected for assessment of parasites and/or genetic analysis; - hair samples collected for genetic analysis and/or assessment of chronic stress using cortisol levels; and/or - assessment of molar wear to	■ Update draft Work Plan accordingly.	■ Samples collected as part of the collaring program include blood, hair and fecal samples, based on technical discussions.	■ Section 3 ■ Section 7.3

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			determine approximate age. These details should be included in the Work Plan prior to finalization or be further refined through the development of a Caribou Collaring Strategy (or similar) in consultation with MECP, Environment and Climate Change Canada (ECCC) and other relevant agencies (e.g., MNRF).			
17	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan does not provide sufficient detail on the methods that will be used to identify likely capture locations/groups (e.g., aerial surveys in advance of collar deployment flights). ■ These details should be included in the Work Plan prior to finalization or be further refined through the development of a Caribou Collaring Strategy (or similar) in consultation with MECP, Environment and Climate Change Canada (ECCC) and other relevant agencies (e.g., MNRF).	■ Update the draft Work Plan to include detail on how Caribou will be efficiently located for capture and collar installation.	■ Capture personnel includes the pilot and netgunner. The operator will fly pre-established flight lines spaced approximately 5 km apart in the LSA (5,435 km2) to locate groups of caribou. If an insufficient number of caribou groups are located, then transects will be extended to a 35 km buffered area around the proposed route alternatives (18,000 km2). Should insufficient groups of caribou be observed in the LSA and surrounding area, the MECP and the MNRF will be contacted to discuss options for the Project.	■ Section 7
18	■ Pg. 7 / s.4.3.2.2 – Caribou GPS Collaring	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates the collaring data will collect robust data about seasonal movements, habitat preferences, and important locations, as well as births and mortalities of Caribou. Additional detail on the intended application and analysis of the collaring data are required (i.e., how will the Proponent use these data in the EA to inform impacts). MECP-SARB recommends the proponent use the collaring data to identify the following as it relates to the PSA, LSA and RSA: – annual home range sizes – habitat as per the General Habitat Description (GHD) for Caribou: • Category 1 Habitat (i.e., calving sites (where possible), nursery areas, winter use areas, travel corridors (where possible) • Category 2 Habitat (i.e., seasonal ranges) • Category 3 Habitat (i.e., remaining areas) – fidelity to high use areas – parturition dates and locations (where possible) – calf recruitment – seasonal movement timeframes – distance travelled between nursery and winter use areas – response to disturbance – etc. ■ These details should be included in the Work Plan prior to finalization or be further refined through the development of a Caribou Collaring Strategy (or similar) in consultation with MECP, Environment and Climate Change Canada (ECCC) and other relevant agencies (e.g., MNRF).	■ Update the draft Work Plan accordingly.	■ The GPS collar data will be used to identify the following as it relates to the PSA, LSA and RSA: annual home range size, habitat use (as per the GHD for caribou), fidelity to high use areas, parturition dates and locations (where possible), calf recruitment, seasonal movement timeframes, distance travelled between Category 1 habitat areas, and response to disturbance.	■ Section 8.2

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19	■ Pg. 8 / s.4.3.2.3 – Summer Nursery Surveys	■ MECP, Species at Risk Branch	■ Should Summer Nursery Surveys move forward, additional information is required justifying the proposed sample size of 20 pre-determined ground survey locations within the LSA. Recognizing the LSA covers a large area, 20 survey locations is insufficient to adequately assess baseline conditions for Caribou nursery use within the LSA.	■ Update the draft Work Plan accordingly.	■ Summer nursery surveys will no longer be included in the scope of the ungulate study plan, as agreed upon with the MECP and the Agency given the more extensive collar program.	■ No reference
20	■ Pg. 8 / s.4.3.2.3 – Summer Nursery Surveys	■ MECP, Species at Risk Branch	■ It is appropriate to conduct a desktop analysis of local knowledge, available landscape data, GHD and collaring data to identify target areas. This should also include existing observations and search areas (which identify search effort) available through Land Information Ontario (LIO) and, if available, predicted High Probability Areas defined using the Resource Selection Probability Function spring and summer models developed by MNRF (Hornseth and Rempel 2016). However, it is unclear if target areas will only be those where existing evidence (i.e., local knowledge, observations, collar data, etc.) already indicates nursery habitat is being used. Identification of ground survey locations should not target known nursery areas already identified within the GHD (with limited exception identified below). MECP-SARB recommends targeting areas where no or limited search effort has been made (i.e., search areas) in the past but the habitat is identified as suitable or modelled as high probability. MECP-SARB only recommends targeting areas already identified as nursery areas (within GHD) where the supporting observation and collaring evidence is greater than 20 years old. If the supporting evidence is less than 20 years old and the habitat has not changed (i.e., burned, harvested, forest succession, insect or weather damage, etc.), it is reasonable to assume the area still provides the function of nursery habitat.	■ Update the draft Work Plan accordingly.	■ Summer nursery surveys will no longer be included in the scope of the ungulate study plan, as agreed upon with the MECP and the Agency given the more extensive collar program.	■ No reference
21	■ Pg. 8 / s.4.3.2.3 – Summer Nursery Surveys	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that if, in the field, it is determined that a survey location is not accessible, the lead biologist will make a professional decision to survey a new location nearby, if appropriate. MECP-SARB supports this direction as aerial surveys for Caribou calving and/or nursery activity is not appropriate and the results would not be considered relevant.	■ No action required.	■ Comment noted.	■ No reference
22	■ Pg. 8 / s.4.3.2.3 – Summer Nursery Surveys	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that all Caribou and other species at risk (i.e., wolverine) observed during field surveys will be reported to the Natural Heritage Information Centre (NHIC). Given the position of this statement in section 4.3.2.3 of the draft Work Plan, it is unclear if this means all Caribou and other SAR data collected during the Summer Nursery Surveys, or all surveys including Summer Nursery Surveys, Caribou GPS Collaring program, and Aerial Winter Survey(s). ■ It is recommended that all Caribou and other SAR data collected during all field surveys be provided to NHIC and MECP-SARB, including observations, collaring data, track logs from aerial surveys, locations search during summer surveys, Project information, survey details (e.g., weather, surveys, dates, times, etc.), etc.	■ Update the draft Work Plan accordingly.	■ Study Plan has been updated to indicate that all SAR observations will be submitted to NHIC and MECP-SARB.	■ Section 7

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23	■ Pg. 9 / s.5.1.2 – Indigenous Knowledge Data	■ MECP, Species at Risk Branch	■ Insufficient information is provided regarding planned engagement with Marten Falls First Nation and other First Nation Communities. Communities should be engaged to seek Indigenous Traditional Knowledge related to the PSA, LSA and RSA, including but not limited to: – historical sightings of Caribou and other SAR (e.g., Wolverine, etc.); – the number and condition of Caribou harvested, where possible; – etc. ■ The draft Work Plan should include details outlining planned engagement (e.g., the format of engagement, number of engagement sessions, etc.) and a clear description of how this information will be incorporated into the EA/IA. Additional opportunity may exist, if possible, for community members to provide tissue and other biological samples collected from harvested animals for analysis.	■ Update the draft Work Plan to provide additional detail regarding Indigenous community engagement, the type of information that will be sought and how this information will be incorporated into the EA/IA. Alternatively, update the draft Work Plan to include a reference to the relevant section of the ToR and ensure the ToR (including ToR consultation plan) speaks to these details.	■ The Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). Indigenous communities will be involved throughout the environmental assessment so that the Proponent can consider and incorporate, where appropriate, Indigenous Knowledge and Indigenous land and resource use information into the Project as applicable. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP once available. A summary of the consultation plan has been provided in the Study Plan; further details can be found in the Draft ToR.	■ Section 4
24	■ Pg. 9 / s.5.2 – Caribou	■ MECP, Species at Risk Branch	■ Additional detail is required describing how the data collected through the existing and proposed field surveys will inform the analyses described in this section. For example, how will the Caribou collaring data be used to inform GHD analysis, occupancy models, etc. ■ Clarity is also required in describing how the proposed analyses will inform the assessment of impacts within the EA, as per the Range Management Policy for Woodland Caribou in Ontario (2014) (e.g., range condition, GHD, etc.)	■ Update the draft Work Plan accordingly.	■ The movement of collared caribou will be analyzed using step selection analysis to identify potential travel corridors (i.e., new Category 1 habitat) and distance travelled between nursery and winter use areas. Habitat suitability analysis will be conducted to evaluate connectivity within the LSA and between ranges at baseline conditions. In addition, radio collar data will be reviewed to assess seasonal movement timeframes, fidelity to high use areas and to quantify annual home range sizes. The amount (in hectares) of Category 1, 2 and 3 habitats in the LSA will be calculated to determine a baseline assessment of range condition and biophysical attributes (Appendix H in ECCC 2019). Biophysical attributes include calving, post-calving, rutting, winter, travel, and in general, habitats which reduce predation risk and have abundant lichen (ECCC 2019). Updates to GHD will be done in consultation with the MECP, and spatially displayed on maps using ArcGIS. ■ The assessment of disturbance levels at baseline conditions will be considered for the LSA at the scale of both the provincial ranges (Missisa, Ozhiski, Nipigon and Pagwachuan ranges; MNRF 2014a, b, c) and at the federal	■ Section 8.2 ■ Section 9.4

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					ranges (Far North, Pagwachuan ranges; ECCC 2019), where possible. Land cover layers and recent disturbance data will be acquired from MNRF and / or MECP to evaluate whether the ranges that overlap the LSA are nearing the federal disturbance threshold for a self-sustaining population (ECCC 2019) and the provincial risk threshold for a stable or increasing population (MNRF 2014a, b, c). ■ Recruitment rates for the ranges that overlap with the LSA will be cited from the IRAR (MNRF 2014), unless MNRF and / or MECP has a more recent estimate. Abundance and distribution of caribou predators (i.e., predation risk) will be qualitatively assessed based on photo rate of predators and observations during winter aerial surveys across the LSA. Occupancy models from Poley *et al.* (2014) will be reviewed and updated where possible to quantify the predation risk across the landscape.	
25	■ Pg. 10 / s.5.2.3 – Caribou Screening Tool	■ MECP, Species at Risk Branch	■ MECP and MNRF will run the CST in the future once the proponent adds supporting infrastructure along with the route alignments to the mapping and provides it to MECP so that all proposed development activities are considered.	■ No action required.	■ Comment noted.	■ No reference
26	■ Pg. 13 / Table 6-1	■ MECP, Species at Risk Branch	■ As per MECP's comments provided on the Draft ToR on January 24, 2020, MECP's response to a request for information dated November 1, 2019, and discussed during the teleconference call on July 31, 2019, the Indicators presented for Caribou in Table 6.1 are incomplete and should include the following: ■ Caribou (Habitat Protection) – Range Condition ■ Caribou (Species Protection) – Population Size Estimates at the Range Level – e.g., minimum animal count based on available information ■ Caribou (Species Protection) – Population Trend Estimates at the Range Level ■ Caribou (Habitat Protection) – Cumulative Disturbance at Range Level – Quantify additional disturbance being added to the range (footprint and footprint + 500 metre buffer) – Alignment with existing disturbance – Length of new linear disturbances ■ Caribou (Habitat Protection) – Habitat Amount and Arrangement ■ Caribou (Habitat Protection) – Categorized Habitat at the Sub-range Level	■ Update the Draft Work Plan to reflect the complete list of indicators that will be evaluated in the EA for impacts to Caribou from the Project, including each alternative route and supporting infrastructure.	■ The requested revision has been made.	■ Section 9

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			– Category 1: High Use Area – Nursery Areas Habitat potentially impacted • Number of Nursery Areas within the Range • Number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 km, are within 10 km) • Relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Nursery Area potentially impacted by the Project • Area (ha) of each Nursery Area potentially being impacted • Area (ha) of each Nursery Area removed by Project – Category 1: High Use Area – Winter Use Areas potentially impacted • Number of Nursery Areas within the Range • Number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 km, are within 10 km) • Relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Nursery Area potentially impacted by the Project • Area (ha) of each Nursery Area potentially being impacted • Area (ha) of each Nursery Area removed by Project – Category 1: High Use Area – Travel Corridors potentially impacted • Number of Nursery Areas within the Range • Number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 km, are within 10 km) • Relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Nursery Area potentially impacted by the Project • Area (ha) of each Nursery Area potentially being impacted • Area (ha) of each Nursery Area removed by Project – Category 2: Seasonal Ranges impacted • Area (ha) of Seasonal Ranges potentially being impacted • Relevant information on that habitat, such as average age of forest, condition of forest, etc. for Seasonal Ranges potentially impacted by the Project • Area (ha) of Seasonal Range removed by Project o Category 3: Remaining Areas in the Range impacted • Area (ha) of Seasonal Ranges potentially being impacted • Relevant information on that habitat, such as average age of forest, condition of forest, etc. for Seasonal Ranges potentially impacted by the Project			

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			• Area (ha) of Seasonal Range removed by Project – Caribou (Species Protection) – Incidental mortality due to anthropogenic impacts (e.g., vehicular collisions, increased hunting pressure) – Caribou (Species Protection) – Indirect mortality due to increase in alternate prey sources (moose and deer) leading to increased predation (wolves, bears, etc.) and increased potential for spread of disease (e.g., brainworm) – Caribou (Species Protection) – Indirect impacts due to sensory disturbance (e.g., light, sound, vibration, olfactory) within 10 km of the Project ■ Other direct and indirect impacts to individuals of the species			
27	■ Pg. 14 / s.6.2 – Methods for Predicting Future Conditions	■ MECP, Species at Risk Branch	■ As stated above, not all indicators are appropriately identified in the draft Work Plan. As such, additional detail is required describing how changes to these indicators will be predicted and include a description of how the data collected through existing and proposed field surveys will be used to inform this analysis. For example: – changes to range condition based on an evaluation of changes to: • population size and trend as a function of predicted changes to estimated recruitment and survival rates, • cumulative disturbance at the range scale • habitat amount and arrangement at the range scale – changes to sub-range habitat components (i.e., categorized habitat) – etc. ■ Additionally, the above evaluation should not be solely based on a quantification of area removed by the Project footprint. For example, impacts to the function of sub-range habitat features (e.g., Nursery areas) can be realized beyond the project footprint and will need to be assessed appropriately.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made.	■ Section 9
28	■ Pg. 16 / s.6.2.2 – Caribou Habitat Modelling	■ MECP, Species at Risk Branch	■ Additional detail is required to describe how the data collected during the existing and proposed field surveys will be used to augment and inform an analysis of habitat categorization provided by MECP (i.e., review and assess new information to update existing and/or delineate new Category 1 habitat features). This should be done in consultation with MECP.	■ Update the draft Work Plan accordingly.	■ As suggested in the comment from the MECP, this will require consultation with the MECP. We are waiting for information from the MECP about approach to and responsibilities for updating categorized habitat.	■ No reference
29	■ Pg. 16 / s.6.2.2 – Caribou Habitat Modelling	■ MECP, Species at Risk Branch	■ Insufficient information is provided for Caribou Habitat Modelling that will be undertaken to inform the assessment of impacts as part of the EA (e.g., cumulative disturbance modelling, etc.) Refer to comments #27, 28 and 29.	■ Update draft Work Plan accordingly.	■ As suggested in the comment from the MECP, this will require consultation with the MECP. We are waiting for information from the MECP about approach to and responsibilities for updating categorized habitat.	■ No reference

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30	■ Pg. 18 / s. 6.3 – Magnitude and Degree of Adverse Effects	■ MECP, Species at Risk Branch	■ The draft Work Plan defines 'scope' as the proportion of the VC's occurrence or population within the study areas that can reasonably be expected to be affected by the predicted effect within 10 years. This definition should include reference to not just proportion of occurrences or population affected, but also the proportion of habitat affected. ■ The Endangered Species Act, 2007 defines damaging habitat as "an activity that alters the habitat in ways that impair the function (usefulness) of the habitat for supporting one or more of the species' life processes" and destroying habitat as "an activity that alters the habitat in ways that eliminate the function (usefulness) of the habitat for supporting one or more of the species' life processes".	■ Update the draft Work Plan to provide clarity that 'scope' includes both the proportion of occurrence, population or habitat affected.	■ The revised Study Plan defines magnitude in the residual effects section. Scope has been removed.	■ Section 9.6
31	■ Pg. 18 / s. 6.3 – Magnitude and Degree of Adverse Effects	■ MECP, Species at Risk Branch	■ The draft Work Plan indicates that 'severity' is defined as the level of damage to the VC from the effect that can reasonably be expected. It is typically measured as the degree of destruction or degradation within the scope or the degree of reduction of the population within the scope. This definition should include reference to not just degree of destruction or degradation within the scope of the degree of reduction of the population, but also the function of their habitat. ■ The Endangered Species Act, 2007 defines damaging habitat as "an activity that alters the habitat in ways that impair the function (usefulness) of the habitat for supporting one or more of the species' life processes" and destroying habitat as "an activity that alters the habitat in ways that eliminate the function (usefulness) of the habitat for supporting one or more of the species' life processes".	■ Update the draft Work Plan to provide clarity that 'severity' includes both the degree of destruction or degradation within the scope or the degree of reduction of the population and function of habitat.	■ The revised Study Plan defines magnitude in the residual effects section. Severity has been removed.	■ Section 9.6
1	■ Comment on Wildlife, Ungulates and Vegetation work plans	■ MNRF, Nipigon District	■ MNRF staff have reviewed these draft field work plans. We found that they address the field work needs related to our mandates. However MNRF may have items/comments to contribute during the further development of the ToR and the EA.	■ N/A	■ Comment noted.	■ No reference

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