NATURAL HERITAGE ASSESSMENT GUIDE FOR RENEWABLE ENERGY PROJECTS

Third Edition

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Cette publication hautement spécialisée Natural Heritage Assesment Guide for Renewable Energy n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des Richesses naturelles au naturalheritage@ontario.ca.

Le présent guide d'évaluation du patrimoine naturel (le « Guide ») a été élaboré par le ministère des Richesses naturelles (MRN) à l'appui des articles 23.1, 24, 25, 26, 27, 28, 34, 37, 38, 41, 42 et 43 du *Règlement de l'Ontario 359/09* : *Renewable Energy Approvals* (le « Règlement ») adopté en vertu de la *Loi sur la protection de l'environnement*.

Le présent Guide fournit une orientation pour respecter les exigences suivantes conformément au Règlement :

- présentation d'une évaluation du patrimoine naturel (ÉPN);
- présentation d'une étude d'impact environnemental (ÉIE);
- présentation d'un plan de surveillance des répercussions environnementales (PSRE) sur les oiseaux et les chauves-souris.

Le présent Guide énonce également les critères que doit respecter une « personne qualifiée » au sens du Règlement.

Table of Contents

List of Tables

Part A: Introduction

A1 INTRODUCTION

A1.1 Purpose and Application of this Guide

This Natural Heritage Assessment Guide (the "Guide") was developed by the Ministry of Natural Resources (MNR) to support sections 23.1, 24, 25, 26, 27, 28, 34, 37, 38, 41, 42 and 43 of Ontario Regulation 359/09: Renewable Energy Approvals (the "Regulation") made under the *Environmental Protection Act*.

This Guide provides direction for completing the following as required by the Regulation:

- a Natural Heritage Assessment (NHA),
- an Environmental Impact Study (EIS) and
- an Environmental Effects Monitoring Plan (EEMP) with respect to birds and bats.

This Guide also establishes the requirements for a "qualified person" within the meaning of the Regulation.

A1.2 How to Read This Guide

In the event of any inconsistency or conflict between this Guide and the Regulation, the Regulation will govern.

Applicants should read this Guide in tandem with the Technical Guide to Renewable Energy Approvals developed by the Ministry of Environment, Conservation and Parks (MECP).

A1.3 Summary of Key Concepts

A Natural Heritage Assessment (NHA) is a 3-stage assessment of natural features at or within the vicinity of a renewable energy project location. An NHA includes (1) a Records Review, (2) a Site Investigation, and (3) an Evaluation of Significance.

In addition to the NHA, an Environmental Impact Study (EIS) Report and an Environmental Effects Monitoring Plan (EEMP) with respect to birds or bats may also need to be prepared.

The following classes of renewable energy generation facilities as described in the Regulation, are subject to this Guide:

- Class 3 and Class 4 wind facilities;
- Class 3 solar facilities; or
- Any class of bioenergy facility, including anaerobic digestion, biogas, biofuel and thermal treatment facilities.

A2. Organization of this Guide

This Guide has been organized into six distinct parts:

- Part A: Introduction
    - Includes background information about this Guide, an overview of key terms and concepts and links to documents referenced in this Guide.
- Part B: Qualified Persons and Attestation
    - Establishes the required qualifications and expertise of a qualified person within the meaning of the Regulation and provides recommendations for completing the required attestation that must accompany a renewable energy approval application.
- Part C: Renewable Energy Natural Heritage Assessments
    - Describes requirements, further to sections 24, 25, 26 and 27 of the Regulation, for conducting a Records Review, Site Investigation, and Evaluation of Significance.
- Part D: Assessment and Mitigation of Negative Environmental Effects
    - Describes Environmental Impact Study requirements and procedures further to subsections 37 (2), 38 (2), 41 (5), and 43 (2) of the Regulation and provides examples of negative environmental effects and mitigation actions.
- Part E: Birds and Bats and their Habitats
    - Describes requirements related to birds and bats for wind power projects under sections 23.1 and 38 (2) of the Regulation.
- Part F: Provincial Parks and Conservation Reserves

- Describes requirements, further to the Regulation, related to provincial parks or conservation reserves.

A3. Key Terms and Interpretations

For the purposes of this Guide, this section of this Guide includes definitions and information relating to terms used in this Guide. For definitions that are included in the Act or the Regulation, readers should consult the latest version of the Regulation.

A3.1 Natural Features Defined in the Regulation

Applicants should refer to the Regulation for definitions of the following natural features, which are referenced throughout this Guide:

- Alvar
- Area of Natural and Scientific Interest (Earth Science)
- Area of Natural and Scientific Interest (Life Science)
- Coastal Wetland
- Natural Feature
- Northern Wetland
- Sand Barrens
- Savannah
- Southern Wetland
- Tallgrass Prairie
- Wetland
- Wildlife Habitat
- Woodland

A3.2 Other Terms

Adjacent Lands

Lands contiguous to a specific natural feature where it is likely that development would have a negative environmental effect on the feature. Consistent with the Regulation, the width of the adjacent lands related to an earth science ANSI is 50 metres. The widths of adjacent lands related to other natural features are as follows:

(a) 50 metres from a natural feature (other than an earth science Area of Natural and Scientific Interest) if the project involves the:

- construction, installation or expansion of a transmission or distribution line,
- expansion of an existing transformer station, distribution station or transportation system, or
- construction, installation or expansion or any of the above with respect to a Class 3 solar facility; and

(b) 120 metres from a natural feature (other than an earth science ANSI) if the project involves any construction, installation or expansion other than that described in (a) above.

Development

The construction, installation or expansion of a renewable energy generation facility as part of a renewable energy project at a project location.

Ecological Function

The natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions.

Ecoregion Boundaries

An ecoregion is a large, geographically distinct area of land or water with relatively similar climate, geology, soil and natural ecosystems. In some cases, whether a natural feature is within one Ecoregion versus another can influence what Natural Heritage Assessment requirements apply. Where a natural feature crosses an Ecoregion boundary, it is to be considered as being within the Ecoregion in which the majority of the natural feature is located.

Natural Heritage Assessment

A three-staged assessment with respect to natural features. The stages of a Natural Heritage Assessment are: (1) Records Review, (2) Site Investigation, and (3) Evaluation of Significance.

Provincial Plan Area

The Oak Ridges Moraine Conservation Plan Area and the Protected Countryside (including the Natural Heritage System) of the Greenbelt Plan.

Note: While this Guide specifically refers to sand barrens, savannahs, tallgrass prairies and alvars located in provincial plan areas, it is important to understand that these natural features can also be located outside of provincial plan areas and, when that occurs, they (and other rare plant communities) must be assessed as wildlife habitat.

Required Activity

Any assessments, reviews, investigations, evaluations, reports, plans or determinations an applicant is required to undertake or prepare under sections 23.1, 24, 25, 26, 27, 28, 34, 37, 38, 41, 42 and 43 of the Regulation.

Significant and Provincially Significant Natural Feature

A natural feature is considered significant or provincially significant, as the case may be, when it is evaluated as such according to relevant evaluation criteria or procedures set out in this Guide. See also sections 27 (2), 27 (3) and 34 of the Regulation. In some cases applicants may be able to treat a natural feature as if it were significant without needing to evaluate its significance (see section C4.1 of this Guide).

Site Investigation Area

The entirety of the project location itself and lands surrounding the project location. The required extent of the Site Investigation area around the project location will vary between either 50 metres or 120 metres, based on the type of development proposed.

A4. Documents and Sources Referenced in this Guide

Ecological Land Classification or ELC

The Ecological Land Classification (ELC) is a system used to describe ecosystems using geology, climate, vegetation, terrain and soil. ELC is used to identify and

delineate natural features and can provide important baseline data. Manuals have been developed for the Southern, Great Lakes-St. Lawrence and Boreal ranges.

Greenbelt Technical Paper

The full title of this document is "Greenbelt Plan 2005 Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area". This technical paper was created to provide technical assistance in the identification and delineation of Key Natural Heritage Features located within the Natural Heritage System of the Protected Countryside. Key Natural Heritage Features in the Greenbelt Plan include wetlands, Areas of Natural and Scientific Interest (life science), significant woodlands, significant wildlife habitat, sand barrens, savannahs, tallgrass prairies and alvars.

For more information and to access the document visit Ontario.ca/Greenbelt Technical Paper

Oak Ridges Moraine Technical Papers

Refers to a series of technical papers developed to assist with the identification, delineation and assessment of impacts to key natural heritage features in the Oak Ridges Moraine Conservation Plan.

Ontario GeoHub

Many records related to natural features maintained by the Ontario government can be accessed via Geospatial Ontario, who manage the collection, maintenance and distribution of Ontario's geospatial data. Geospatial data, maps and tools can be found and accessed using Ontario GeoHub.

To request MNR geospatial data visit GeoHub/MNR Data Access Requests

Ontario Wetland Evaluation System (OWES) Manuals

A system used to identify wetlands that have value at a provincial scale. OWES provides a way of rating wetlands relative to each other. There are currently two OWES manuals: an OWES Southern Manual and an OWES Northern Manual.

For more information and to access the documents visit Ontario.ca/Wetlands Evaluation

Significant Wildlife Habitat Technical Guide (SWHTG) and Supporting Documents

The **Significant Wildlife Habitat Technical Guide** (SWHTG) includes criteria to assist

in determining the significance of wildlife habitat, including the extent of potential significant wildlife habitat (SWH) associated with critical habitat components. The SWHTG describes four broad categories of significant wildlife habitat:

1. Habitats of seasonal concentrations of animals
2. Rare vegetation communities or specialized habitat for wildlife (includes rare vegetation communities and specialized wildlife habitats)
3. Habitat of species of conservation concern
4. Animal movement corridors

The **Significant Wildlife Habitat Ecoregional Criteria Schedules** provide information on the description, criteria, information sources and assessment methods for significant wildlife habitat in ecoregions 3E, 5E, 6E and 7E. The schedules are not replacements, for the SWHTG, but companion documents which present the significance criteria for identifying potential significant wildlife habitat in a way which is reflective of the SWHTG, yet specific to the geographic area of each ecoregion. Applicants should refer to any eco-region criteria schedules approved for use by MNR. In ecoregions where schedules are not available, the SWHTG should be used.

The **Significant Wildlife Habitat Mitigation Support Tool** (MiST) is a guide to understand the functions of wildlife habitat, potential impacts and possibilities for mitigation to minimize and/or avoid impacts. It is intended to be used after a site and/or natural heritage feature is identified and confirmed as a significant wildlife habitat. For more information visit Ontario.ca/Significant Wildlife Technical Guide

A5. Project Changes

MECP's Technical Guide to Renewable Energy Projects provides information about the process and potential requirements if an applicant is seeking to make one or more changes to their renewable energy project after public consultation, after the issuance of a Renewable Energy Approval (REA) or when seeking to alter the terms and conditions of a REA.

PART B: QUALIFIED PERSONS AND ATTESTATION

B1. Qualified Persons

As per s.1 of the Regulation, Part B of this Guide sets out the qualifications of a qualified person for the purposes of those sections of the Regulation that require the qualified person to prepare, undertake or attest to an assessment, review, evaluation, investigation, plan, report, determination, or other thing.

A qualified person must have:

a) a post-secondary degree, diploma or certificate in a field of study that relates to aquatic or terrestrial ecosystems or the living organisms, habitat or processes of those ecosystems;

b) five or more years of work experience within the last 10 years related to a field of study described in (a); and

c) for the purpose of undertaking a specific required activity, the qualification requirements listed in Table B1 of this Guide.

Note: “Work experience” includes field work, survey design and methodology, data collection, analysis, and report writing conducted in a professional setting, regardless of whether that work was compensated.

For the purpose of undertaking a specific required activity related to provincial parks or conservation reserves, a qualified person shall meet the qualification requirements set out in Part F (Table F1 of this Guide) and is not required to meet the qualifications outlined above unless otherwise specified in Table F1 of Part F.

While one qualified person may have the adequate knowledge, skills or experience to discharge many of the requirements in this Guide and the Regulation, there may be cases where more than one qualified person is required to meet the qualified persons obligations for a required activity as identified above and in Table B1, Part B and Table F1, Part F of this Guide (for example, a botanist with advanced plant identification skills, an expert in bat or raptor species biology or a hydrologist with expertise in wetland hydrological processes may all be needed to complete the requirements).

A qualified person can be assisted by others who may not meet all required qualifications (e.g., assisting with field work or records searching), however, any

work conducted or prepared by such assistants must be directly supervised and their work reviewed by the qualified person(s). This means the qualified person must either be present during any field assessments or ensure that assistants are properly trained in order to carry out specific tasks.

Table B1: Additional Qualification Requirements

Required Activity	Additional Qualification Requirements
Records Review	When conducting a Records Review, a qualified person must have an understanding of and an ability to use geospatial tools and platforms (such as Geographic Information System software) and also have an understanding of how to query, access, request, analyze and interpret geospatial data and information from Ontario GeoHub and other geospatial data sources. This includes knowledge of publicly available data layers and how they relate to Ontario's natural features and wildlife. In some cases, qualified persons may need to complete training in order to access sensitive datasets (e.g., data sensitivity training).
Site Investigation	When conducting a Site Investigation, a qualified person must have relevant knowledge and be skilled in the use of Ecological Land Classification (ELC) in Ontario to identify and delineate any natural features that may be present at the project location or its adjacent lands. **Wildlife Habitat:** When undertaking a Site Investigation to identify candidate significant wildlife habitat, a qualified person must have relevant knowledge and be skilled in identifying Ontario's flora and fauna and their habitats. **Birds and Bats:** When undertaking a Site Investigation for applications involving wind power projects, a qualified person must be able to demonstrate they have relevant knowledge and skills regarding birds and bats and their habitats.
Evaluation of	**Wetlands:** When evaluating the significance of a wetland, a

Required Activity	Additional Qualification Requirements
Significance	qualified person must have successfully completed the Ontario Wetland Evaluation System training course recognized by MNR.
Environmental Impact Study (EIS)	When undertaking an EIS and preparing the report, a qualified person must have relevant knowledge and be skilled in assessing, developing and monitoring mitigation approaches related to natural features (including rare and/or sensitive habitats) and wildlife. **Earth Science ANSI:** When undertaking an EIS in relation to an Earth Science ANSI, a qualified person must have a post-secondary degree, diploma or certificate in a geological science discipline.
Environmental Effects Monitoring Plan (EEMP) with respect to birds or bats	When preparing an EEMP or when undertaking any required monitoring, a qualified person must have relevant knowledge and be skilled in developing and applying monitoring protocols, including statistical sampling design. A qualified person must also have knowledge of relevant literature on bird mortality monitoring at wind facilities and application of the best analytical approaches (including models) for calculating unbiased estimates of bird mortality at wind facilities.

In addition to demonstrating that the required qualifications are met, it is recommended that applicants, when obtaining the services of qualified persons, request information to confirm that the qualified person or persons have knowledge, skills, expertise in:

- environmental and natural heritage legislation, regulation, and policy in Ontario;
- identification and analysis of biotic and abiotic elements and associated ecological functions at various scales, including through the application of standard field methods;

- use of appropriate measures for mitigating (including avoiding) negative effects on natural features and functions;
- design of methods for monitoring effectiveness of mitigation measures; and
- use of geospatial systems to identify information related to biological or natural resources.

It is recommended that a resume or C.V. of the qualified person be included as an addendum to each report required to be prepared.

Applicants may also wish to request information when engaging qualified persons that indicates an adherence to a code of ethics to their professional work that demonstrates integrity, a focus on providing current and accurate information, and an ability to give unbiased professional advice that is not unduly influenced by others.

B2. Attestation

An applicant is required to submit a signed and dated attestation in accordance with subsection 28 (2) of the Regulation.

It is recommended that the attestation contain the following information:

- Name and position of person completing / signing the attestation on behalf of the applicant with confirmation they have authority to sign the attestation on behalf of the applicant. For example,
  "*I, the undersigned, hereby declare that I have the authority to act on behalf of [insert name of applicant]"*
- Legal name of applicant's company (if applicable)
- Description of the location of the proposed renewable energy project
- A list of each assessment, review, investigation, report and plan required to be prepared under the Regulation, the name of the qualified person(s) completing each, and the date that each was undertaken/completed. For example:
  "*Site Investigation undertaken May 3, 2026 to May 13, 2026 by John Doe, principal ecologist at XYZ Consulting*"
- An attached list of qualifications of each qualified person named in the attestation
- A clear and formal statement of attestation. For example:

"*I do hereby formally attest that the required activities specified here were completed by a qualified person(s) as set out in the Natural Heritage Assessment Guide and were undertaken according to requirements, criteria and procedures set out in O. Reg. 359/09 under the Environmental Protection Act and the Natural Heritage Assessment Guide for Renewable Energy Projects.*"

- An acknowledgment that the attestation may be made available to the public for consultation purposes as part of an application for a renewable energy application. For example:
  "*I acknowledge, on behalf of [insert legal name of applicant], that this attestation may be made available to the public for consultation purposes as part of an application for a renewable energy approval.*"

- An appendix including written confirmation from each qualified person that assessments, reviews, investigations, reports and plan have been prepared and/or completed in accordance with the Regulation and this Guide.

PART C: RENEWABLE ENERGY NATURAL HERITAGE ASSESSMENTS

C1. Overview of the Natural Heritage Assessment

The Natural Heritage Assessment includes three sequential stages that are required under the Regulation:

(a) a Records Review to determine if natural features, provincial parks or conservation reserves may exist in the vicinity of the project location,

(b) a Site Investigation of land and water within a specified distance of the project location to determine if additional natural features exist and to confirm the presence and location of natural features, provincial parks or conservation reserves identified in the Records Review, and

(c) an Evaluation of Significance of any identified natural features.

A report is required to summarize each of these three stages. This part of the Guide describes each stage of an NHA.

Development prohibitions and exceptions to prohibitions related to natural features are included in sections 37, 38, 41, and 43 of the Regulation.

In addition, an EIS (see Part D of this Guide) and/or an EEMP (see Part E of this Guide) may also be required.

C2. Records Review

The Records Review is the initial stage of an NHA and is required under section 24 of the Regulation. The purpose of the records review is for the applicant to gather information about the area in which a project location is proposed, identify natural features, provincial parks or conservation reserves, and make preliminary determinations about site feasibility.

Records reviews must be completed by qualified persons (see Part B of this Guide).

A Records Review involves a search and analysis of records that relate to natural features maintained by specified organizations to determine if the project location is in or within 50 or 120 metres, as the case may be, of a natural feature. Applicants must undertake a Records Review and prepare a Records Review Report as described in section 25 of the Regulation.

Table C1 of this Guide contains procedures for conducting a Records Review, for identifying natural features and for determining the boundaries of natural features.

While these records are to be searched and analyzed as part of a Records Review, this information can also inform other aspects of the NHA. In locations where little information about natural features is available, applicants can use the Records Review to assemble general information about the project location and potential natural features, before progressing to the Site Investigation stage.

As part of contacting any planning authorities (e.g., municipality, conservation authority) during a Records Review, applicants must determine if an ELC assessment for the area has already been conducted and if any ELC mapping for the area is available.

Applicants should also consider other available information and resources available for the area where the project is proposed to be located. For example, applicants can refer to the following for additional sources of information:

- Data sources provided in the SWHTG and the SWHTG Ecoregional Criteria Schedules.
- Sources of information listed in Appendix E2 related to birds and bats.
- Sources of information described in the OWES manuals.

Indigenous Knowledge, where voluntarily shared, may be considered to support natural heritage assessments.

Applicants may want to consider searching and reviewing records for an area wider than that required by regulation to accommodate any potential changes to project design or layout that may occur later in the project planning stages.

Wildlife habitat data collected during the Records Review may identify critical habitat components (e.g., potential hibernacula, raptor nest) which should be noted as points on a map. While these critical habitat components may originate further than 120 metres from the project location, they will often have associated candidate or confirmed significant wildlife habitat that can extend well beyond the area of the critical habitat component itself.

Table C1: Records Review Requirements related to Specific Natural Features

Natural Feature	Records Review Requirements
Wetlands	Geospatial information about Provincially Significant Wetlands across Ontario must be accessed through Ontario GeoHub. Where Ontario GeoHub identifies a wetland that has already been evaluated as provincially significant, the applicant may need to access paper or digital wetland evaluation data records to inform other requirements (e.g., for an Environmental Impact Study). Wetland evaluation data records may be available from: • MNR work centre offices (for wetland evaluations completed prior to 2023 and for wetland evaluations completed for wetlands located on public (Crown) lands); • Local municipal offices (Official Plans, wetland evaluations completed after 2023) within organized municipal boundaries. Ontario GeoHub must also be searched for geospatial information about wetlands that may be present at or in the vicinity of the project location which may not yet have been evaluated for significance. Wetlands in a provincial plan area can include any wetlands identified through the following processes: • wetlands evaluated and identified in accordance with the Ontario Wetland Evaluation System (OWES); and/or • wetlands identified in mapping provided by the province or a conservation authority; and/or • wetlands identified in a natural heritage evaluation or a hydrological evaluation required under a provincial plan. Where all or part of a project location is proposed within a provincial plan area, municipal records (e.g., mapping to support Official Plans) must be searched for information about wetlands.

Natural Feature	Records Review Requirements
	Where all or part of a project location is proposed within the jurisdiction of a conservation authority, the conservation authority must be contacted to identify any wetlands mapped within the area of their jurisdiction.
Woodlands in Ecoregions 6E and 7E	Municipal records (e.g., as part of Official Plans) must be searched to identify any significant woodlands that may have already been identified by the municipality.
Areas of Natural and Scientific Interest (ANSIs)	Ontario GeoHub must be searched for geospatial information about ANSIs. Boundaries and level of significance (i.e., provincially significant or regionally significant) of each confirmed ANSI are available in the ANSI data class. Where Ontario GeoHub identifies a provincially significant ANSI, the applicant may need to access paper or digital records (i.e., Site District reports, Ecodistrict reports or ANSI Checksheets/Checklists) to inform other requirements (e.g., for an Environmental Impact Study). When needed, such reports or documents must be requested from MNR work centre offices. When searching ANSI records, all provincially significant ANSIs must be identified and included in the Records Review Report. Also, in the context of provincial plan areas, regionally significant life science ANSIs must be included in the Records Review. Information related to regionally significant ANSIs located outside of provincial plan areas and candidate ANSIs must also be collected, and noted in the Records Review Report, as this information may aid in identifying other natural features (e.g., wetlands, woodlands, wildlife habitat) at or in the vicinity of the project location.

Natural Feature	Records Review Requirements
Wildlife Habitat (general)	Information about any known critical wildlife habitat components and any associated candidate or confirmed SWH that may extend to or within 120 metres of the project location must be searched and analyzed. Ontario GeoHub must be searched for information about wildlife habitat at or within the vicinity of the project location. For example, a search of Ontario GeoHub for the term 'wildlife' (and other related terms) will return various data sets and documents that may support the identification of candidate SWH). Municipal records (e.g., as part of Official Plan) must be searched to identify any SWH that may have already been identified by the municipality.
Wildlife Habitat for birds and bats	During the Records Review, records must be searched to identify and collect all available bird and bat information related to the project location and its vicinity. This will include information on: • the species present (or likely present) and their relevant life cycle/history characteristics, • any confirmed SWH, • features associated with candidate SWH (e.g., caves, talus, karsts, cliffs, woodlands, grasslands, wetlands, ridges), • habitat types (e.g., mapped ELC), • Important Bird Areas (IBAs), and • other relevant information (e.g., potential feeding, breeding, roosting/nesting, stopover, staging and migration areas not already included in IBAs).

Natural Feature	Records Review Requirements
	A list of information sources specific to birds and bats and their habitats that applicants may find helpful are provided in Appendix E2 of this Guide.
Sand Barrens, Savannahs, Tallgrass Prairies and Alvars in Provincial Plan Areas	Ontario GeoHub must be searched for information on any sand barrens, savannahs, tallgrass prairies and alvars that may have already been identified and mapped by the province. Open data can be accessed by searching for "Provincially tracked species (1 km grid)" or "SOLRIS (Southern Ontario Land Resource Information System (SOLRIS) 3.0 | Ontario GeoHub) in Ontario GeoHub. Precise boundaries are available through the Natural Heritage Information Centre. To request access to them follow the instructions for restricted natural resources datasets on Natural Resources Data Access Requests
Provincial Parks or Conservation Reserves	See Part F of this Guide

Records Review Report

Consistent with the Regulation, a report must be prepared setting out a summary of the records searched and the results of the analysis conducted.

Further to subsection 25 (3) of the Regulation, the following information must be included in the report:

(a) Description of all records reviewed. At a minimum, include the title of the record and a description of information contained in the record.

(b) Source and ownership of the record.

(c) Date(s) the records were searched, collected or accessed.

(d) List of all organizations contacted.

C3. Site Investigation

The Site Investigation is the second stage of an NHA and is required under section 24 of the Regulation. The purpose of the Site Investigation is to confirm the presence and boundaries of natural features and provincial parks or conservation reserves within the Site Investigation area for the project location, and identify any additional natural features not identified through the Records Review.

Site Investigations must be conducted by qualified persons (see Part B of this Guide).

Applicants must undertake a Site Investigation and prepare a Site Investigation Report in accordance with section 26 of the Regulation. Table C2 of this Guide describes additional requirements for conducting Site Investigations for each natural feature.

Applicants may wish to expand the Site Investigation area to an area large enough to accommodate any potential changes to project design or layout that may occur later in the project planning stages.

Applicants must conduct an ELC assessment as a component of a Site Investigation or Alternative Investigation. The ELC assessment can also be used as the basis for the creation of the Site Investigation map.

Classifying lands to the vegetation type level provides the finest scale of detail and is required for identification of rare plant communities. The ELC assessment must include an interpretation or orthorectified aerial or satellite imagery to delineate ELC units where possible. Verification of this interpretation to confirm accuracy must be undertaken during the Site Investigation. Where it is not reasonable to visit the site (see section C3.1 of this Guide), applicants are encouraged to use geospatial tools and platforms (such as Geographic Information System software) and/or analyze orthorectified aerial or satellite imagery to complete an ELC assessment as part of an Alternative Investigation.

Fieldwork to support the Site Investigation must be conducted at times which are seasonally appropriate for the natural features being studied.

Prior to conducting the Site Investigation, it may be helpful to have an understanding of the following so that the appropriate and relevant information can be collected:

- criteria for evaluating the significance of natural features (see section C4 of this Guide)
- alternative approaches to evaluating for significance (see section C4.1 of this Guide), and
- additional fieldwork which may be necessary to prepare an EIS Report (see Part D of this Guide).

Applicants should consider retaining supporting data files (e.g., shapefiles) related to the Site Investigation in case they are needed to support the application process.

Table C2: Site Investigation Requirements related to Specific Natural Features

Natural Feature	Site Investigation Requirements
Wetlands	Wetlands must be delineated using methods outlined in the OWES or the ELC. OWES methods to delineate wetlands must be used if the wetland must be evaluated to determine significance (see section C4 of this Guide). ELC methods to delineate wetlands must be used where OWES methods are not used. If all or part of the project location is within the Greenbelt Plan Area, the *Greenbelt Technical Paper* must be used to further identify wetlands during the Site Investigation. If all or part of the project location is within the Oak Ridges Moraine Conservation Plan Area, the *Oak Ridges Moraine Conservation Plan Technical Paper Series 1 – Identification of Key Natural Heritage Features* must be used to further identify wetlands during the Site Investigation.
Woodlands in Ecoregions 6E and 7E	Woodland boundaries must be delineated using the outer edge of the trees' drip line. ELC methods must be used to delineate treed areas which meet the

Natural Feature	Site Investigation Requirements
	definition for “woodland” in the Regulation. If all or part of the project location is within the Greenbelt Plan Area, the *Greenbelt Technical Paper* must be used to further identify woodlands during the Site Investigation. If all or part of the project location is within the Oak Ridges Moraine Conservation Plan Area, the *Oak Ridges Moraine Conservation Plan Technical Paper Series 1 – Identification of Key Natural Heritage Features* must be used to further identify woodlands during the Site Investigation.
Wildlife Habitat (general)	The Site Investigation must include the identification of any confirmed or candidate SWH identified through the Records Review. Identification and delineation of candidate SWH must be conducted using: • The applicable regional ELC manual to identify and delineate ecosites (note: the Southern ELC manual is to be used where identification of rare vegetation types and specialized habitats requires classification of vegetation type) • SWH Technical Guide (provides guidance for identifying the types and extent of habitat) • Where available, SWH Ecoregional Criteria Schedules (source of ELC Ecosite codes, habitat criteria and information sources) When conducting the Site Investigation, applicants must understand that critical wildlife habitat components (e.g., potential hibernacula, raptor nest) may originate further than 120 metres from the project location, however, they will often have associated candidate or confirmed SWH that can extend well beyond the area of the critical habitat component itself.

Natural Feature	Site Investigation Requirements

Wildlife Habitat for Birds and Bats	All candidate bird and bat SWH must be identified and delineated within 120 metres of any part of the project location.
	
	The SWHTG and SWHTG Ecoregional Criteria Schedules provide criteria to help in identifying candidate SWH, confirming SWH and defining an area that supports the form and function of SWH. Criteria schedules have been completed for ecoregions 3E, 5E, 6E and 7E in Ontario and provide more detailed guidance for habitats found within each ecoregion.
	
	Some examples of bird and bat SWH are provided in the list below. Other specialized SWH for birds and bats, not listed below, may also be present. The knowledge and expertise of the qualified person(s) during the wind project site assessment process (i.e., Records Review, Site Investigation, Evaluation of Significance) is critical for identifying and evaluating the significance of bird and bat habitats.
	
	• Bats: Seasonal concentration areas
	  ○ Bat hibernacula
	  ○ Bat maternity colonies
	  ○ Bat migratory stopover areas
	• Birds: Seasonal concentration areas
	  ○ Colonial bird nesting sites
	  ○ Waterfowl stopover and staging areas
	  ○ Waterfowl nesting sites
	  ○ Shorebird migratory stopover areas
	  ○ Landbird migratory stopover areas
	  ○ Raptor winter feeding and roosting areas
	  ○ Wild turkey winter range

Natural Feature	Site Investigation Requirements
	○ Turkey vulture summer roosting areas • Rare or specialized bird habitats, including: ○ Woodland area-sensitive bird breeding habitat ○ Raptor nesting habitat ○ Osprey and bald eagle foraging and perching habitat ○ Sharp-tailed grouse lek habitat • Habitat of bird species of conservation concern, including: ○ Shrub/early successional bird breeding habitat ○ Open country bird breeding habitat ○ Marsh bird breeding habitat
Sand Barrens, Savannahs, Tallgrass Prairies and Alvars in Provincial Plan Areas	The identification of sand barrens, savannahs, tallgrass prairies and alvars must be determined by using the ELC for Southern Ontario. Sand barrens, savannahs, tallgrass prairies and alvars, as defined in the Greenbelt Plan and the ORMCP, are comprised of the Alvar Community Class, Sand Barren and Tallgrass (Prairies, Thicket, Savannahs and Woodland) units of the ELC system. Given the sensitive and unique features of these natural features, qualified persons experienced in dealing with these special communities must be involved in a Site Investigation that might include these natural features. If all or part of the project location is within the Greenbelt Plan Area, the *Greenbelt Technical Paper* must be used to further identify these features during the Site Investigation. If all or part of the project location is within the Oak Ridges Moraine Conservation Plan Area, the *Oak Ridges Moraine Conservation Plan Technical Paper Series 1 – Identification of Key Natural Heritage*

Natural Feature	Site Investigation Requirements
	Features must be used to further identify these features during the Site Investigation.
Provincial Parks or Conservation Reserves	See Part F of this Guide

C3.1 Alternative Investigation

Under section 26 (1.1) of the Regulation, an Alternative Investigation may be conducted if the applicant determines that it is not reasonable to visit a site (a part of air, land or water within the Site Investigation area) to conduct a Site Investigation. An Alternative Investigation must verify the accuracy of the Records Review Report while identifying any additional natural features not identified through the Records Review. In the Site Investigation Report, the applicant must provide an explanation of the rationale for making the determination that it was not reasonable to visit the site.

In most cases, an alternative investigation will be best conducted through analysis of orthorectified aerial or satellite imagery or other forms of aerial survey (e.g., drones, helicopters) verified with observations, where possible, from the project location and fence line or roadside observations. The applicant may also undertake other forms of site visits to support the alternative investigation including, access via rights of way (e.g., roads, unopened municipal road allowances, hydro corridors), roadside checks, water access, using binoculars in leaf-off conditions to examine the interior of a site, and other means of making direct observations.

Some examples of situations where visiting a site for the purposes of conducting a Site Investigation would not be reasonable, as well as information which is required to be provided in the Site Investigation Report to support the determination are provided below. These examples are not exhaustive; however, they represent commonly encountered scenarios.

Examples of rationale for undertaking an alternative investigation include:

- when access to a site is not granted by an adjacent landowner,
- when visiting a site is unsafe (e.g., unstable soils).

Supporting information must be provided in the Site Investigation Report to demonstrate why the Alternative Investigation is the only feasible approach. For example:

- attaching a summary of results of requests to access site (e.g., a list of landowner(s) or occupier(s)/possessor(s) of land, as applicable, contacted, number and method of contact attempts, time/date of contact, summary of communications), and copies of any written correspondence and replies should be kept on file by the applicant),
- documentation confirming presence of unsafe conditions (e.g., conservation authority records and official plan schedules indicating hazard area),
- visual evidence depicting presence of unsafe conditions (e.g., photographs),
- rationale for proceeding or intending to proceed with the project despite unsafe conditions (e.g., description of how the project would be constructed if site is unsafe to access),
- description of efforts to overcome or mitigate unsafe conditions in order to visit the site to conduct a Site Investigation (e.g., use of aerial survey).

In all cases, applicants must be able to provide a rationale for determining that a site is not reasonable to visit, a description of efforts to access the site, and associated documentation.

The determinations required under the Regulation continue to apply to Alternative Investigations, as well as specific requirements of the Site Investigation Report. Likewise, the direction and resources identified in sections of this Guide related to natural feature specific Site Investigations remain relevant and should be consulted.

Site Investigation Report

Consistent with the Regulation, a report must be prepared containing all information specified in subsection 26 (3) of the Regulation.

When preparing a map(s), in addition to what is set out in in the Regulation, the following mapping procedures must be followed:

- Map(s) must be at a scale appropriate to the size of the project location and surrounding natural features and be based on the most recent information available. The operational map scale standard is 1:20,000, at a minimum. A finer scale may be required where more accuracy and detail is warranted.

- Include a unique identifier for each natural feature and reference consistently throughout the Site Investigation Report.

- Clearly depict all areas where an Alternative Investigation was conducted.

- Where several natural features are present, include multiple maps arranged by feature type.

- Where the project location extends over a large area, an overview map along with the operational map(s), at scales that appropriately reflect the geographic orientation of the project.

- Indicate the distance between each natural feature and the project location directly on maps, or include a table which references the distances.

- Illustrate the entirety of natural features on map(s), including portions which extend outside of the site investigation area.

- Clearly identify each natural feature by type on the legend.

- Any exported map(s) must be georeferenced.

Include an additional map of the project location and surrounding area showing high-resolution aerial or satellite imagery available from the Ontario Imagery Program.

Applicants may also refer to the document "Map Design Considerations for Accessibility" for recommendations on designing maps that are accessible.

C4. Evaluation of Significance

With some exceptions set out in the Regulation, paragraph 3 of subsection 24(1) of the Regulation requires applicants to determine if any natural features located

within the Site Investigation area are significant or provincially significant.

Prior to undertaking an Evaluation of Significance of a natural feature, applicants may wish to consider if the project could be relocated outside of the natural feature or its adjacent lands. If, after such a relocation, the project is no longer proposed to be located within a natural feature or its adjacent lands, an Evaluation of Significance is not required.

Previously Evaluated Natural Features

In some instances, the significance of a natural feature can be established solely through the information obtained during the Records Review (e.g., a previously evaluated wetland identified as provincially significant).

Where the applicant references a previous Evaluation of Significance, the Evaluation of Significance Report must note this and summarize information required in the report to the best extent possible.

In cases where a natural feature within the Site Investigation area has previously been evaluated as significant or provincially significant, the applicant is not required to re-evaluate the feature for significance.

Criteria and Procedures for Undertaking an Evaluation of Significance

Applicants must undertake an Evaluation of Significance and prepare an Evaluation of Significance Report as described in section 27 of the Regulation.

Evaluation criteria and procedures that must be used when conducting an Evaluation of Significance are listed in Table C3 of this Guide. All criteria and procedures identified in Table C3 may be amended from time to time, and where column 2 of Table C3 does not refer to the most recent version of the criteria or procedure, it is to be read as referring to the most recent version.

Evaluations of significance must be completed by qualified persons (see Part B of this Guide). In conducting an Evaluation of Significance, subsection 27 (1) of the Regulation requires that applicants make use of any available information related to the natural feature, including all information:

- obtained through the Records Review;
- obtained through the Site Investigation or Alternative Investigation and
- received from the public, Indigenous communities, municipalities, local road boards and Local Services Boards, until such time as the

Evaluation of Significance Report has been prepared.

For locations outside of provincial plan areas, if through evaluation, the natural feature is assessed to be not significant or not provincially significant, the feature is not subject to development prohibitions. However, applicants must document these findings in the Evaluation of Significance Report.

As with the Site Investigation stage, any fieldwork associated with an Evaluation of Significance must be conducted at seasonally appropriate times for the natural features being studied.

Table C3: Criteria and Procedures for Evaluating the Significance of Natural Features

Natural Feature	Criteria / Procedure to Evaluate Significance
Wetlands	For a wetland identified during the Records Review or Site Investigation that has not been previously evaluated for significance, applicants must use the most recent version of the Ontario Wetland Evaluation System Southern Manual (for wetlands located in Ecoregions 6 and 7) or the Ontario Wetland Evaluation System Southern Manual (for wetlands located in Ecoregions 2, 3, 4 and 5) to determine provincial significance. The OWES manuals are available on a website of the Government of Ontario. Wetlands determined to be provincially significant by an evaluation using a previous version or edition of the OWES manuals continue to be considered to be provincially significant.
Woodlands in Ecoregions 6E and 7E	For a woodland identified during the Records Review or Site Investigation that has not been previously evaluated for significance applicants must use: • For woodlands outside of provincial plan areas: o Criteria and procedures set out in Appendix

Natural Feature	Criteria / Procedure to Evaluate Significance
	C1 of this Guide. • For woodlands within provincial plan areas: o Criteria and procedures related to woodlands set out in Greenbelt & Oak Ridges Moraine Technical Papers (see section A4 of this Guide) Woodlands that are mapped and determined to be significant by a planning authority (e.g., municipality) are considered to be significant.
Wildlife Habitat	The entire area of an Important Bird Area is considered to be confirmed Significant Wildlife Habitat. For candidate SWH identified during the Records Review or Site Investigation applicants must use the following to evaluate for significance (i.e., to determine confirmed SWH): • The Significant Wildlife Habitat Technical Guide with the following modifications with respect to the criteria for habitat of species of conservation concern: o references to “species identified as nationally endangered or threatened by COSEWIC, which are not protected under Ontario’s Endangered Species Act” are replaced with “species listed in Schedule 1 under the federal Species at Risk Act” o references to “species identified as provincially vulnerable based on lists of VTEEE species of Ontario” are replaced with “species included in

Natural Feature	Criteria / Procedure to Evaluate Significance
	the Protected Species in Ontario List under the Species Conservation Act, plus any species currently classified as Special Concern by the Committee on the Status of Species at Risk in Ontario (COSSARO)." • Significant Wildlife Habitat Eco-regional Criteria Schedules (where available) The SWH Technical Guide and SWH Eco-regional Criteria Schedules are available on a website of the Government of Ontario.
Areas of Natural and Scientific Interest (ANSIs)	ANSIs are identified and confirmed as provincially significant using the "Identification and Confirmation Procedure for Areas of Natural and Scientific Interest (2011)". In accordance with this procedure, only MNR can determine the significance of an ANSI and thus applicants do not need to undertake evaluations of ANSIs. Note: ANSIs that have been identified but not confirmed through the accepted evaluation (confirmation) procedure are referred to as "candidate ANSIs". For the purposes of this Guide, an ANSI is not considered provincially significant until it has been confirmed by the MNR. While "candidate ANSIs" do not need to be considered under this framework, applicants are encouraged to gather information on candidate ANSIs during the Records Review, as information about such candidate ANSIs could support identification of other significant natural features (e.g., candidate significant wildlife habitat).
Sand Barrens, Savannahs, Tallgrass Prairies, Alvars in	An Evaluation of Significance regarding these natural features is not required if the project is located within a provincial plan area (see subsection 27 (6) of the

Natural Feature	Criteria / Procedure to Evaluate Significance
Provincial Plan Areas	Regulation).

C4.1 Alternative Approach to Evaluation of Significance

Although a full Evaluation of Significance is preferred, in some cases, the applicant has a choice as to whether they

(a) conduct an Evaluation of Significance according to procedures specified in Table C3 of this Guide, or

(b) treat the natural feature as if it were significant, complete an assessment (where required) and complete an EIS.

Note that the assessment under approach (b) will not be used to officially define the status of natural features (e.g., as significant or not significant).

Table C4 of this Guide describes situations where the applicant can choose to treat a natural feature as if it were significant or provincially significant instead of completing an Evaluation of Significance. Where all or part of renewable energy project is proposed to be located in or within the adjacent lands of a natural feature that is treated as if it were significant, an EIS must be conducted (and, in some cases, a wetland assessment). In these cases, the Evaluation of Significance Report for eligible natural features must note that an EIS (and a wetland assessment, if applicable) was completed instead.

Table C4: Eligible Situations for Alternative Approaches to an Evaluation of Significance

Eligible Situation	Requirement instead of Evaluation
All or part of a renewable energy project is proposed within candidate Significant Wildlife Habitat (SWH) or its adjacent lands	1. Treat the candidate SWH habitat as if it were significant; 2. Gather sufficient baseline information on any identified candidate SWH to assess key habitat characteristics and

Eligible Situation	Requirement instead of Evaluation
	ecological functions to inform preparation of the EIS; and 3. Prepare an EIS Report using the procedures set out in Part D of this Guide.
All or part of a renewable energy project is proposed • within the adjacent lands of a wetland that has not previously been evaluated for significance and the development is not proposed within the wetland itself, • to span a wetland, where structures would be located outside of the wetland (e.g., placement of a transmission pole adjacent to edges of a wetland with a transmission line mounted between poles), or • within a northern wetland that has not previously been evaluated for significance.	1. Treat the wetland as if it were provincially significant; 2. Conduct a wetland assessment using the procedures set out in Appendix D2 of this Guide); and 3. Prepare an EIS Report using the procedures set out in Part D of this Guide.
Development proposed within a woodland (located in Ecoregions 6E or 7E) or its adjacent lands, where the woodland has not been previously evaluated for significance.	1. Treat the woodland as if it were significant; 2. Gather sufficient baseline information to assess key habitat characteristics and ecological functions to inform preparation of

Eligible Situation	Requirement instead of Evaluation
	the EIS; and 3. Prepare an EIS Report using the procedures set out in Part D of this Guide.

All baseline information gathered, including information required for the wetland assessment, must be described and included in the EIS Report.

Note, for wetlands, a wetland cannot be “treated as if it were significant” instead of completing an Evaluation of Significance if any part of the project location is proposed within a southern wetland or a coastal wetland.

PART D – Assessment and Mitigation of Negative Environmental Effects

D1. Environmental Impact Study

The Regulation prohibits development in natural features and provincial parks or conservations reserves unless, in specific circumstances, and pursuant to subsections 37 (2), 38 (2), 41 (5) and 43 (3), an Environmental Impact Study (EIS) report is prepared in accordance with this Guide.

An EIS is an assessment that anticipates the implications of changes in land use and the interaction of these changes with natural features and their ecological functions. The ecological functions of the natural features related to the surrounding natural landscape are considered as well. An EIS is intended to identify the potential negative environmental effects of the proposed project on natural features, provincial parks or conservation reserves, and describe how those potential effects will be addressed through mitigation and monitoring. An EIS must assess negative environmental effects associated with the construction, installation, use, operation, changing and retiring of the renewable energy facility.

If applicants choose to locate renewable energy projects outside natural features or their adjacent lands, an EIS is not required.

D2. EIS Procedures

This section of the Guide sets out steps for preparing an EIS. The EIS must be prepared by a qualified person.

Part E and Part F of this Guide provide additional requirements and considerations for the preparation of an EIS related to bird or bat SWH (Part E) and for provincial parks or conservation reserves (Part F).

Step 1: Describe Existing Environmental Conditions

Information on the project location, the natural features present, and their associated ecological functions is required in order to identify and assess the potential negative environmental effects of the proposed renewable energy project and to determine mitigation measures for those negative environmental effects. This requires an inventory of abiotic conditions and flora and fauna; documentation of vegetation; analysis of the interrelationships among the biotic and abiotic elements of a site (i.e., its ecology); and determination of how effects

on natural features will change these existing environmental conditions.

Information on the existing environmental conditions for the proposed project may include:

- analysis of surface and subsurface soils;
- identification of local landform types;
- identification of catchment boundaries of any surface water features, including wetlands;
- description of the water balance, depending on the types of features present;
- description of the infiltration capabilities of the site; and
- description of natural features.

Step 2: Describe Natural Features

The EIS must identify and describe the natural features that may be affected by the proposed renewable energy project based on the work conducted during the Records Review, Site Investigation (or Alternative Investigation), Evaluation of Significance (or alternative approach, including a wetland assessment where applicable). Natural features must be depicted on a map (which can be an updated version of the maps prepared as part of the Natural Heritage Assessment). The map must clearly identify the location of natural features and/or adjacent lands for which an EIS is being conducted in relation to the project location. Natural features should be described in text accompanying the map and include:

- details on the status of the natural features (e.g., significant),
- identification of ecological linkages and natural processes,
- description of habitat requirements and relationships between natural features,
- description of any nearby features that contribute to the persistence of the natural features for which the EIS is being prepared (e.g., watercourse), and
- any other relevant information.

Step 3: Analyze Ecological Functions of Natural Features

Analysis of the ecological functions of the natural feature for which an EIS is being prepared is important for understanding potential negative environmental effects. This analysis should include:

- examination of the natural features and their functions and identification of those that are ecologically sensitive to potential development effects;
- any evidence that the functions of natural features are measurable or predictable (e.g. functional loss can be predicted using sampling, modeling or other accepted methods);
- assessment of habitat changes;
- identification of indicator, keystone or flagship species that could be considered in assessing habitat conditions; and
- identification of key features or functions that contribute significantly to the integrity or importance of the natural feature.

In some cases, the Evaluation of Significance for a natural feature may be sufficient to provide the applicant with the information required to conduct an accurate analysis of ecological functions (e.g. wetlands evaluated using the OWES). However, in many cases, the determination of significance will be based on criteria which do not provide an understanding of the full range of ecological functions associated with the natural feature (e.g. woodland determined to be significant based on size). Where ecological functions cannot be fully understood through Evaluation of Significance, the applicant will need to look at all available information and assess existing environmental conditions.

Appendix D3 of this Guide describes some of the key characteristics and ecological functions associated with natural features and can be used to address the potential negative environmental effects of specific development activities on natural features and ecological functions. It is important to note that not all of these features and functions are likely to occur for every natural feature and that some may be present but be relatively unimportant.

Step 4: Assess Potential Negative Environmental Effects

Although the assessment of potential negative environmental effects should be quantitative, in some situations this will not be possible. Effects may be short-

term (e.g., siltation arising from construction) or long-term (e.g., loss of habitat). Effects can also be classified as direct (e.g., woodland cutting/clearing) or indirect. Examples of indirect effects include reduction in forest interior habitat due to fragmentation or loss of forest edge; the potential for increased access because of road creation; human disturbance; invasion by non-native species; and the effects of construction noise on wildlife. The SWH Mitigation Support Tool (see section A4 of this Guide) provides descriptions of potential impacts on wildlife habitat.

A number of factors should be considered when assessing potential negative environmental effects on natural features and their ecological functions including:

- the possible spatial extent or area of the natural feature(s) that the renewable energy project will affect, directly or indirectly;
- the temporal context of effects (e.g. effects on wildlife may be magnified during seasons with drought conditions);
- the magnitude, frequency and duration of the effects;
- potential effects on the size, diversity, health, connectivity, functionality and resilience of the natural feature; and
- the effects of existing development or site alteration activities within the intervening lands between the natural feature and the project location.

Appendix D4 of this Guide provides examples of potential negative environmental effects associated with specific project activities, as well as some possible mitigation measures.

Step 5: Identify Mitigation Measures

The EIS must demonstrate that the mitigation measures identified address the negative environmental effects that may occur to the natural features and their ecological functions. Mitigation measures should generally be well established as being effective and be designed to:

- avoid or prevent negative environmental effects;
- minimize or alleviate negative environmental effects; and
- maintain the size, diversity, health, form and function of the natural feature.

Implementation of mitigation measures can be achieved through conditions of approval on a REA application. Applicants should also consider the ways in which the negative environmental effects relate to one another and where efficiencies might be achieved in mitigation.

Negative environmental effects should be mitigated to the extent possible; however, changes in land use will almost always result in some effects which cannot be mitigated. The EIS should clearly identify residual effects (i.e. those effects that would remain after mitigation measures have been implemented) and include discussion of their significance, severity and longevity.

D3. Approaches to Mitigation

For examples of possible mitigation measures associated with the potential negative environmental effects of specific project activities, see Appendix D4 of this Guide. This information is not meant to be exhaustive or representative of typical negative environmental effects encountered by a renewable energy project; there are many other potential effects and mitigation measures that an applicant may encounter.

D4. EIS Report

The EIS report must contain information as required in the Regulation. This includes identifying and assessing any negative environmental effect of the project on a natural feature or its adjacent lands and identifying mitigation measures for each negative environmental effect.

An EIS Report that is prepared for a natural feature that is being treated as if it were significant (see section C4.1 of this Guide), must provide a summary of information collected as part of a wetland assessment (Appendix D2 of this Guide) or baseline information gathered to assess key habitat characteristics and ecological functions of other natural features (e.g., candidate SWH, woodlands).

The Regulation requires that applicants prepare a Construction Plan Report to demonstrate how any negative environmental effects of construction or installation activities will be mitigated. When preparing an EIS Report, the applicant must provide a description of how the Construction Plan Report will address any negative environmental effects of the construction phase on a natural feature for which the EIS is being prepared.

For each negative environmental effect that might result during construction or installation, the EIS Report should provide sufficient detail to fully describe the

mitigation measures in the Construction Plan Report including:

- modifications to construction activities;
- use of treatment technologies (e.g. sediment containment structures); and
- scheduling and operational changes (including rationale for timing of activities).

Referencing the Environmental Effects Monitoring Plan in the EIS

When preparing an EIS Report, the applicant must provide a description of how the EEMP addresses any negative environmental effects of the project on a natural feature, provincial park or conservation reserve for which the EIS is being prepared. The EIS Report should summarize the approach detailed in the EEMP including:

- methodologies to be used;
- locations of monitoring;
- frequency of sample collection;
- how the results of the monitoring plan will be reported; and
- contingency measures that will be undertaken, including their timing, design and operational considerations.

Monitoring Methodology

A monitoring program should begin with a clear set of goals and objectives against which to measure the monitoring results, and should specify a repository for the information. Monitoring objectives will be identified through the EIS process, and should address the effectiveness of measures proposed to mitigate the negative environmental effects of the project. Also important are contingency measures that will be undertaken, should monitoring reveal that unanticipated negative environmental effects are occurring or if the negative effects identified through the EIS are greater than predicted. Remedial steps are undertaken where the results of monitoring indicate that actual effects are greater than predicted effects.

The level of monitoring required to demonstrate the effectiveness of mitigation or to properly assess baseline conditions will vary on a project-by-project basis. The type and magnitude of change that is to be detected should be considered when determining appropriate measures for such monitoring. If quantitative measures are

required, the number of samples and frequency of sampling should be determined and specified.

Periodic updates in imagery, especially if available in digital format, provide a “desktop” basis for updating quantitative measurements of the size and configuration of natural features within a monitoring area. Orthorectified aerial or satellite imagery can also be interpreted to indicate areas of natural succession and other natural disturbances, such as beaver activity within the monitoring area, as well as degradation. Methods for monitoring vegetation or wildlife should be based on published and widely accepted monitoring methods.

PART E – Birds and Bats and their Habitats

E1. Potential effects of wind power projects on birds and bats

Wildlife and their habitats are important to Ontario's biodiversity and the people of the province. Wind power has the potential to negatively impact wildlife species directly and indirectly by causing mortality and habitat impacts, including displacement and disruption of movement corridors. With significant efforts to monitor and evaluate these relationships, application of knowledge on proper siting and mitigation can reduce the risk of negative environmental effects significantly.

Research and monitoring indicate birds and bats may be disproportionately impacted by wind power.

The purpose of this Part E of this Guide is to outline requirements to reduce risks to birds and bats by promoting proper siting of wind power projects, or to support conservation of these species through operational mitigation and mortality monitoring when key habitats cannot be avoided.

E1.1 Potential effects on birds

Bird mortality at wind projects is generally lower than for bats and is lower than from other bird mortality sources (e.g., collisions with windows, collisions with power/transmission lines, cat predation). Monitoring at wind projects in Ontario indicates that relatively low numbers of bird fatalities occur at wind power facilities. Known current bird mortality levels at existing wind power projects are not considered a sustainability concern for most of Ontario's bird populations.

Turkey vulture is a species regularly killed by wind turbines in Ontario. This is related to their soaring and searching behaviour, lower maneuverability relative to other bird species and wind/thermal dynamics that may result in greater activity in the areas with turbines. Turkey vultures have increased in number and expanded their range in Ontario. They are relatively abundant in southern and central Ontario. While wind power impacts are not currently a concern for the population, mortality at turbines cannot be discounted due to their life history (i.e., long-lived species with low reproductive potential). Black vulture is a similar species whose range is naturally expanding into Ontario from the south. It is often found in association with turkey vultures and will be susceptible to mortality at wind facilities.

While mortality impacts are generally not significant, poorly sited wind power projects can have a significant impact on birds through collision mortality (e.g., with turbine blades, guy wires, meteorological towers) and indirectly through habitat disturbance and

behavioural changes (e.g., displacement from breeding or migration areas). In addition, increasing height and size of turbines may increase mortality risk for birds. The single most important factor to minimize negative impacts to birds is appropriate siting to avoid migration corridors and areas with high density of birds (e.g., feeding areas, colonial nesting sites and staging areas).

In cases where all or part of a project has been sited in an area that results or would result in significant bird displacement from habitat or mortality at the project or single turbine scale, there are limited options to mitigate impacts. Shutting down turbines during critical periods where mortality is known to be high may reduce risk but with potential for significant impacts to energy production. Alternative approaches and emerging or new technologies can also be considered in an effort to reduce bird mortality.

E1.2 Potential effects on bats

Data suggests that greater than 1 million bats die each year at wind power facilities across North America. Most of these bat fatalities are caused by bats colliding with moving turbine blades, and generally not with stationary structures (e.g. turbine towers, transmission structures, guy wires, etc.). Barotrauma (internal haemorrhaging), caused by rapid air pressure reduction near moving turbine blades, has also been found to be a source of bat mortality. Fatalities are highest during late summer high activity periods and autumn migration, particularly on nights with low wind speeds. Across North America, it is estimated that most bat fatalities occur from mid-July through September. Long-distance migratory bats (i.e., hoary bat, eastern red bat, silver-haired bat) typically comprise the majority of bat fatalities in Ontario, but other species are impacted.

Bats may also be indirectly affected by wind power projects through habitat loss or fragmentation during the construction and/or operation of a facility. Bat habitats may be affected by turbines placed near bat swarming and hibernation sites, breeding or roosting habitats, or migration stopover areas. Improper siting that affects bat habitat also increases mortality risk.

Mitigation establishing minimum cut-in speeds are known to be effective at reducing bat mortality, but the benefits may vary based on a range of factors. Additional work continues to evaluate smart mitigation methods that are engaged only when bats are detected in the area. Generally, operational mitigation can be implemented in a way that significantly reduces bat mortality, while minimizing loss of energy production.

E1.3 Cumulative effects

With proper siting and mitigation strategies, the risk of potential impacts from wind power on birds and bats can be reduced at the project scale. However, each additional wind power project may affect habitat availability and use and will result in increased mortality of birds and bats. In addition, migratory behaviour of many birds and some bat species may expose these species to multiple wind facilities over the course of a year. Cumulative effects of each additional project must be considered, along with implementing further restrictions when necessary to reduce or eliminate population level impacts, particularly for species like migratory bats whose numbers may have already been reduced by mortality at wind power projects.

E2. Natural Heritage Assessment for birds and bats

Part C of this Guide outlines requirements for completing the three stages of an NHA, which include a Records Review, a Site Investigation and an Evaluation of Significance. These requirements apply to bird and bat wildlife habitat present at the project location or within 50 or 120 metres of any part of the project location. See Part C for more information.

Selecting the proper location for the project is generally the most important consideration to minimize potential effects to birds and bats and their habitats. All applicants must undertake an NHA to consider bird, bat and their habitat-related information relevant to the proposed project location. It is also important to consider potential project location relative to landscape features in the area that may increase the risk associated with bird and bat mortality at a wind power project (e.g., forested island habitats, isolated habitats, peninsulas, shorelines).

Ideally, selection of a project area and individual turbine locations within a project site should be an iterative process. As bird and bat habitat within and adjacent to a potential project area are being reviewed, the applicant should consider adjusting the project footprint to avoid bird and bat habitats if possible. As discussed in section E3 of this Guide, this will have implications for mitigation and monitoring requirements.

In addition to specific nesting habitats identified as SWH, Ontario's *Fish and Wildlife Conservation Act, 1997* (FWCA) specifically protects the nests and eggs of bird species that aren't protected federally under the *Migratory Birds Convention Act, 1994* (MBCA). The only exceptions are the nests and eggs of American crow, brown-headed cowbird, common grackle, house sparrow, red-winged blackbird and starling. Section 133.1 of O. Reg. 665/98 (Hunting) made under the FWCA enables a person carrying out a renewable energy project to remove a known nest of provincially protected bird species

identified through the NHA process without additional authorization if it cannot be avoided during construction or operation of the wind project. In this case, a nest identified as part of the NHA in the application package can be removed once the project is approved, but not during the active nesting season when young are present. The person must also be carrying out the renewable energy project in accordance with a renewable energy approval under Part V.0.1 of the *Environmental Protection Act*. Authorization may be required from MNR to remove any nest that was not identified in the NHA process. These authorizations require review and approval and will not be granted during the active nesting season. Applicants should inquire with Environment and Climate Change Canada for guidance on the nests of migratory bird species protected under the MBCA, and with the MECP for the nests/eggs of species protected under the *Species Conservation Act* (SCA).

To further reduce risks to bats and birds, applicants should consider avoiding habitat areas not specifically defined as SWH that are important to birds and bats in siting decisions (e.g., foraging habitat, movement corridors, woodlands where bat roosts may be present). Some of these other habitat features may be identified by a qualified person through other aspects of the NHA.

E3. Wind power risk mitigation framework for birds and bats

Similar to other natural features, for wind power projects, if any bird or bat SWH was identified at or within 120 metres of any part of the project location following completion of the NHA, applicants have two options: (a) re-locate the project outside of the natural feature and its 120 metre adjacent lands, or (b) complete additional studies, plans and reports to identify, assess and mitigate negative environmental impacts.

This section describes requirements under section 23.1 of the Regulation and additional requirements specific to birds and bats regarding the EIS and EIS Report required under section 38(2)(a) of the Regulation. This includes bat and bird habitat related requirements and bird mortality mitigation requirements.

A Bird/Bat EEMP is required if the project is located within bird or bat SWH or the 120 metre adjacent lands to bird or bat SWH. As described in section C4 of this Guide, bird or bat SWH includes the boundary of an Important Bird Area. An applicant has the following options:

a) **Locate project outside of bird or bat SWH and its 120 metre adjacent lands:**

   - If the project is located more than 120 metres outside bird or bat SWH, the applicant does not need to prepare an EEMP with respect to bats, birds,

or their habitats (which means no habitat mitigation requirements and no post-construction mortality mitigation and monitoring).

- In this case, bird or bat SWH includes candidate bird or bat SWH that the applicant treats as significant (see section C4.1 of this Guide).
- This approach is based on information that indicates locating wind projects outside key habitat significantly reduces risks to birds, and for bats when combined with mortality mitigation requirements required under the SCA.
- SWH and IBAs boundaries may change over time and the decision by an applicant to take this approach will be based on boundaries at the time the NHA is completed.
- Applicants are encouraged but not required to consider implementing mortality monitoring at a sample of turbines and, depending on the results, to consider implementing operational mitigation measures as needed to reduce the risk of mortality.

b) **Locate project within bird or bat SWH and/or its 120 metre adjacent lands:**

- If the project is proposed within bird or bat SWH or within the adjacent lands to bird or bat SWH, the applicant must prepare a Bird/Bat EEMP in accordance with mitigation and monitoring requirements described in section E3.1 of this Guide.

Applicants are responsible for all applicable requirements related to bird and bat species at risk under the SCA and its regulations, which includes bat mortality mitigation and potential monitoring requirements.

E3.1 Requirements for Locating Project within Bird or Bat SWH and/or its 120 metre Adjacent Lands

If the project will proceed within 120 metres of bat or bird SWH, the applicant must follow an approach with greater requirements. While locating a project within significant bat and bird habitat is strongly discouraged, this approach recognizes it may be difficult to avoid bat and bird SWH in some cases. The general requirements for this approach are described in further detail in the sections of this Guide that follow.

E3.2.1 Environmental Impact Study (EIS)

An EIS must be prepared following the procedures outlined in Part D of this Guide. The EIS must address direct and indirect effects related to the affected bird and/or bat habitats, as the case may be, describing:

- any negative environmental effects of the project to the habitat,
- mitigation measures and specifically how the measures will address any negative environmental effects to SWH and IBAs, and
- additional habitat mitigation to be implemented if initial results are unsuccessful.

IBA boundaries may change over time. Mitigation for habitat within an IBA that may be affected should be based on habitat within the IBA at the time the EIS is being completed.

The Significant Wildlife Habitat Technical Guide together with the Significant Wildlife Habitat Mitigation Support Tool provide SWH mitigation considerations and options for renewable energy projects. General approaches to minimizing potential negative effects to bird and bat SWH include:

- careful consideration of project or specific turbine location to avoid SWH, IBA or other areas recognized as important,
- construction at less sensitive times of the year to avoid disturbing wildlife, their key life processes (e.g., nesting) and habitats,
- restoration of habitat disturbed during construction.

E3.2.2 Bird/Bat Environmental Effects Monitoring Plan

An Environmental Effects Monitoring Plan with respect to birds and bats (EEMP) must be prepared if the project is located within 120 metres of bat or bird SWH. The EEMP must include the following components:

- operational mitigation plan to reduce bird mortality risk,
- post construction bird mortality monitoring plan,
- additional specific operational mitigation measures that will be implemented to reduce bird mortality below thresholds exceeded (e.g., periodic shutdown of turbines causing significant mortality), and

- how bird and bat habitat mitigation will be monitored to measure the success of the mitigation actions identified in the EIS.

Bat mortality mitigation and monitoring is required under EEMP but these requirements are to be addressed by complying with the same obligations under the SCA.

E3.2.3 Post-construction operational mitigation to reduce bird mortality risk

The EEMP must describe post construction mitigation measures that will be implemented to reduce bird mortality risk and seek to prevent the project from exceeding bird mortality thresholds. The mitigation plan must include additional strategies that will be implemented if bird mortality thresholds at a project are exceeded (e.g., shutting-down specific turbines causing the greatest mortality during critical periods).

Mortality monitoring results must be compiled and estimates updated throughout the required monitoring period. If a project exceeds any mortality threshold, additional mitigation measures must be applied immediately. Further measures must be added until bird mortality falls below the threshold(s) exceeded. Measures in place at that time must be maintained.

E.3.2.4 Post-construction bird mortality monitoring

Effective post-construction mortality monitoring is critical to assessing the impacts of projects constructed within or adjacent to key habitats.

Monitoring must be conducted at all turbines for projects <10 turbines. For projects ≥10 turbines, initial bird mortality monitoring may use a probability-based design that draws from a representative sample of at least 30% of turbines (minimum of 10 turbines) from throughout the project area. Once a wind facility is fully operational, at least three consecutive years of post-construction bird mortality monitoring must be completed. If no bird mortality threshold is exceeded, no further mortality monitoring is required but periodic (e.g., once every three years) checks are recommended to ensure conditions haven’t changed resulting in an increase in bird mortality.

Any time a project exceeds any project-scale bird mortality threshold, monitoring of bird mortality must be conducted at an increased sample of turbines (i.e., increased sampling intensity) across the project area. If a turbine specific mortality threshold is exceeded, additional monitoring must be initiated to include all other turbines within the same natural feature (e.g., habitat, ridgeline). The increased monitoring must continue until further mitigation measures reduce bird mortality below all mortality thresholds for

three consecutive years. This helps ensure there aren't unknown impacts at un-monitored turbines and may allow a project to reduce mortality below thresholds by introducing operational mitigation at specific turbines or in specific parts of a wind facility area.

Once bird mortality has been reduced below all thresholds for three consecutive years, additional mitigation measures must be maintained, but no further monitoring is required. Periodic mortality monitoring checks are recommended to ensure conditions haven't changed resulting in an increase in bird mortality.

The qualified person is responsible for developing the specific bird mortality monitoring protocol building on the basic requirements outlined here. The complete monitoring plan and protocol must be described in the Bird/Bat EEMP. The EEMP should make note that bat mortality mitigation and monitoring requirements are being addressed through compliance with SCA. While some basic mortality monitoring methods may apply across all projects, other aspects must be tailored to turbine size, habitat type, etc. Over time, monitoring protocols and techniques have improved. The monitoring protocol should incorporate the latest advances in methodology.

Post-construction bird mortality monitoring must include the following plans and estimates:

- planned survey schedule at selected wind turbines,
- monitoring of scavenger/carcass removal rate,
- monitoring of searcher efficiency (i.e., number of bird fatalities present that are actually detected by surveyors),
- proportion of area searched, and
- disturbance effects monitoring within SWH or an IBA boundary.

Formulas for calculating variable estimates that can be used to produce a corrected mortality estimate are provided in Appendix E1 of this Guide. Corrected mortality estimates should be produced and reported related to each mortality threshold (e.g., birds/turbine/year, raptors/turbine/year). There are other acceptable calculation methods, including various modelling approaches that may use somewhat different monitoring variables, which can be used to produce corrected mortality estimates related to each threshold. In addition to mortalities/turbine/year, results should also be calculated and reported as mortalities/MW/year.

Other minimum requirements for post-construction monitoring effort and timing include:

- Post construction bird mortality monitoring must be conducted from May 1 through October 31, or through January 31 if the project is located in raptor wintering habitat.
- Post-construction monitoring must begin on May 1 of the year that the wind power project is fully operational, or as soon as any turbine is operational if within the required monitoring period.
- Monitoring should be considered beginning as early as April 1 in areas and in years where significant bird migration movements into or through the project area is expected prior to May 1.
- Mortality monitoring frequency should be twice per week from May 1 to October 31 and during any additional periods where monitoring is conducted to capture mitigation of birds in the area. However, the specific frequency used in the monitoring protocol can be adjusted based on a quantitative assessment of level of mortality and carcass removal/persistence for different seasons at the site (see Ravache et al. 2024).
- When applicable, surveys for raptor mortality after October 31 may be restricted to the project area found within raptor wintering habitat.
- The reporting period includes all monitoring within one calendar year (i.e., from January 1 to December 31).

E3.2.5 Mortality thresholds

Mortality thresholds provide a key indicator when a wind project may present a significant risk to birds. When thresholds are exceeded, projects must implement additional mitigation measures to further reduce risks. Relying on mortality thresholds requires effective monitoring of bird mortality to produce unbiased estimates, including capturing the variation in mortality that may occur under different conditions (e.g., weather, timing of migration and other movements). Lack of good information on population status of some birds, along with unknowns about future scale of wind power build-out and cumulative effects, makes it challenging to establish biologically relevant thresholds. While bird mortality from wind projects is generally not as significant a concern as bat mortality and of less concern than other bird mortality factors (i.e., collisions with windows, cat depredation), if poorly sited in key habitat and under certain weather conditions, bird mortality can be significant. Long-lived bird species with generally low reproductive rate (e.g., raptors) have the potential to be impacted by an

increase in mortality from wind turbines. The thresholds below are based on previous bird mortality thresholds for wind power mitigation in Ontario, modified based on considerations described above.

When the following levels of mortality are exceeded, projects must implement additional mitigation measures as described in the Bird/Bat EEMP.

- 14 birds per turbine per year at individual turbines or turbine groups, including turkey and black vultures
- 0.2 raptors per turbine per year across the wind power project, not including turkey and black vultures
- 2 raptors per wind power project (<10 turbines), not including turkey and black vultures, or
- a significant mortality event where a single mortality monitoring survey reveals:
    - 10 or more birds at any one turbine, or
    - 33 or more birds at multiple turbines.

PART F – Provincial Parks and Conservation Reserves

A “provincial park” and “conservation reserve” have the same meaning as is defined under the *Provincial Parks and Conservation Reserves Act, 2006* and are also referred to as a “protected area” in Part F of this Guide.

Renewable energy projects are generally prohibited within provincial parks or conservation reserves, although some exceptions are listed in section 19 of the *Provincial Parks and Conservation Reserves Act, 2006*. Projects meeting the requirements to locate within these areas are subject to a Natural Heritage Assessment (NHA); however, the EIS component is replaced by conditions under the *Provincial Parks and Conservation Reserves Act, 2006*.

Development is prohibited within the adjacent lands of a provincial park or conservation reserve unless an EIS Report is prepared in accordance with this Guide. Applicants wishing to develop within the adjacent lands to a protected area must undertake an EIS and prepare an EIS Report as described in Part D and must also incorporate EIS considerations and requirements outlined in this Part of this Guide.

F1. Qualified Persons

As identified in Part B of this Guide, for the purpose of undertaking a required activity (e.g. NHA and EIS work) related to provincial parks or conservation reserves, a qualified person shall meet the qualification requirements set out in Table F1 below.

Table F1: Qualification Requirements – Natural Heritage Assessment and Environmental Impact Study work related to Provincial Parks and Conservation Reserves

Assessment Component	Qualification Requirements
Records Review	A qualified person must satisfy the qualifications prescribed in Part B of this Guide, as well as the additional qualifications specified in the row corresponding to “Records Review” in Table B1 of Part B of this Guide.
Site Investigation	A qualified person must satisfy the qualifications prescribed in Part B of this Guide, as well as the additional qualifications specified in the row corresponding to “Site Investigation” in Table B1 of Part B

Assessment Component	Qualification Requirements
	of this Guide.
Determination as to whether a project location is situated within a provincial park or conservation reserve, and if so, whether engaging in the project is prohibited by or under the *Provincial Parks and Conservation Reserves Act, 2006*	For the purposes of determining whether the project location is within a provincial park or conservation reserve, a qualified person must have the qualification requirements set out in one or both of the two rows above. For the purpose of determining whether engaging in a project at a project location situated within a provincial park or conservation reserve is prohibited by or under the Provincial Parks and Conservation Reserves Act, 2006, a qualified person must have expertise interpreting environmental legislation, regulations, and policies, demonstrated through relevant work experience.
Environmental Impact Study (EIS)	When preparing an EIS, one or more qualified persons must have expertise in assessing negative environmental effects and identifying appropriate mitigation and monitoring measures for the applicable subject matter identified in Table F3 as demonstrated through relevant education and work experience. When preparing sections of an EIS that address subject matter related to natural heritage, the qualified person must also satisfy the qualifications prescribed in Part B of this Guide, as well as the additional qualifications specified in the row corresponding to “Environmental Impact Study (EIS)” in Table B1 of Part B of this Guide.

F2. Records Review

During the Records Review stage of an NHA, records that relate to provincial parks and conservation reserves maintained by the Ontario government must be searched and analyzed to determine protected area boundaries and to determine whether any part of the project location is proposed within the boundary or within 50 or 120 metres of the boundary, as applicable. Table F2 of this Guide describes sources of information related to protected areas.

Applicants should also collect information regarding the features, functions and values of provincial parks and conservation reserves during Records Review, as this information will be necessary if the project is proposed within the adjacent lands of these protected areas.

Table F2: Sources of Information related to Protected Areas

Source	More Information
Ontario Parks	Conservation Reserves • Ontario Parks is responsible for managing conservation reserves and can provide sources of information such as management plans or statements as well as life science, earth science, recreational and cultural inventories. • Some conditions may apply to working in conservation reserves. Ontario Parks should be contacted at op-concerns.comments@ontarioparks.com in advance of a Site Investigation or EIS to discuss any work to be conducted. • Visit Ontario.ca/Provincial Parks and Conservation Reserves Planning to view management plans. Provincial Parks • Ontario Parks staff can provide advice on survey methods, data collection protocols and management plans or statements, as well as life science, earth science, recreational and cultural inventories. • Some conditions may apply to working in provincial parks. Ontario Parks should be contacted at op-concerns.comments@ontarioparks.com in advance of a Site Investigation or EIS to discuss any work to be conducted. • Visit the Ontario Parks website • Visit Ontario.ca/Provincial Parks and Conservation Reserves Planning to view management plans.
Conservation Reserve Regulated Data Layer	• This data layer displays areas regulated as a conservation reserve under the *Provincial Parks and Conservation Reserves Act, 2006*. • Data can be used to locate and determine the boundaries of a

Source	More Information
	conservation reserve under the *Provincial Parks and Conservation Reserves Act, 2006.* • Geospatial data available through Ontario GeoHub • The official regulated boundaries of a conservation reserve are described in Ontario Regulation 315/07.
Provincial Park Regulated Data Layer	• This data layer displays areas regulated under the *Provincial Parks and Conservation Reserves Act, 2006* and managed by Ontario Parks. • Data can be used to locate and determine the boundaries of a provincial park under the *Provincial Parks and Conservation Reserves Act, 2006.* • Geospatial data available through Ontario GeoHub • The official regulated boundaries of a provincial park are described in Ontario Regulation 316/07.

F3. Site Investigation

Where any part of the project location is proposed within the adjacent lands of a natural feature which is inside a provincial park or conservation reserve, Ontario Parks should be contacted at op-concerns.comments@ontarioparks.com prior to undertaking Site Investigations, as a permit may be required. Applicants should work with staff to confirm provincial park or conservation reserve boundaries in relation to the project location.

Applicants proposing projects within the adjacent lands of a provincial park or conservation reserve will have to address the potential negative environmental effects to the provincial park or conservation reserve itself, through an EIS (see Part D of this Guide). Applicants should consider discussing the features, functions and values of the protected area, as well as any field work required to complete an EIS

during the Site Investigation stage.

Ontario Parks can be contacted as a Site Investigation resource. Visit Ontarioparks.ca

F4. Environmental Impact Study

In addition to information in Part D this Guide, Ontario Parks may have specific resources which should be consulted when conducting an EIS for protected areas.

An EIS must identify potential negative environmental effects on the features, functions, values, and ecological integrity of the provincial park or conservation reserve, address mitigation of those effects and develop associated monitoring strategies. Through the EIS, applicants must identify and assess the potential impacts of the project on the ability of the protected area to fulfil its role in the protected area system (i.e. representation), the integrity of protected area as a whole (e.g. intactness), and the features, functions, and values associated with the provincial park or conservation reserve.

Applicants should work with Ontario Parks when preparing an EIS for a project located on lands adjacent to a provincial park or conservation reserve. Consultation with Ontario Parks staff is required regarding any field work proposed within the regulated boundaries of a provincial park or conservation reserve and permits may be required before commencement.

Table F3 of this Guide outlines examples of features, functions and values which, depending on the unique characteristics of the protected area, may need to be considered during the EIS.

Table F3: Protected Areas EIS Considerations

Category	Considerations
Representation and Condition	• Critical landform-vegetation types (i.e. under-represented) • Provincially and regionally significant landform-vegetation types • Provincially and regionally significant earth science features • Significant assemblages of landform-vegetation types

Category	Considerations
Diversity	• Areas of high species diversity or landscape heterogeneity • Associations of like geological features (surficial) or in combination (bedrock and landform) • Efficient representation of geological features
Ecological Functions	• Hydrological functions (e.g. headwaters, lakes, streams, wetlands, groundwater recharge areas, flood buffering capacity) • Core areas • Contiguity of natural areas within the protected area • Connectivity with other natural areas outside the protected area • Interior habitat • Natural disturbances (e.g. fire, windthrow, insects and disease) • Old growth forest
Special Features	• Rare species and vegetation communities (S1-S3) • Specialized habitats- localized features that are necessary for sustaining flora or fauna with specialized needs (e.g. snake hibernacula, seeps/springs, migration routes) • Areas recognized through other initiatives (e.g. Important Bird Areas, provincially significant wetlands, provincially or regionally significant ANSIs) • Earth science type section, type locality, reference section, morphotype

Category	Considerations
	• Significant wildlife habitat • Species at risk and their habitats
Cultural Heritage Values	• Provincially significant cultural heritage features (e.g. archaeological sites) • Sites of interest to Indigenous communities • Historical values
Sustainable Recreational/ Traditional Use Values	• Areas supporting recreational uses (beaches, trails, scenic landforms, campgrounds, etc.) • Areas supporting traditional outdoor heritage uses (recreational camps, hunting areas, trails, etc.) • Protection of features, functions and values through control of access • Maintenance of wilderness through prohibition of travel by mechanized means
Natural and Cultural Heritage Appreciation	• Protected area infrastructure • Local educational/interpretive/destination site • Scenic vistas
Research	• Presence of long-term research or monitoring plots • Research contributing to identified protected area priorities

Appendices

Appendices Related to Part C of this Guide

Appendix C1: Woodland Evaluation of Significance Criteria

Upon completion of the records review and site investigation, applicants will have identified and mapped any areas which meet the definition of a woodland under the Regulation. Procedures for determining the significance of unevaluated woodlands identified in the records review and site investigation are outlined below.

Tree Cover

To be significant, a woodland must meet minimum standards for tree cover. For the purposes of determining tree cover, the tree amount is based on the average per hectare across the entire woodland. Temporary reductions in tree coverage below the required amounts from harvesting, blowdown or other causes would not be considered to affect the significance of a woodland. Woodlands which meet the minimum standards for tree cover have the potential to be significant and must be evaluated using the evaluation criteria in this section.

The following are minimum standards for tree cover:

(a) a tree crown cover of over 60% of the ground, determinable from aerial photography[24]; or

(b) a tree crown cover of over 10% of the ground, determinable from aerial photography, together with stem estimates[25] of:

- 1,000 trees of any size per hectare, or
- 750 trees measuring over five centimetres in diameter, per hectare, or
- 500 trees measuring over 12 centimetres in diameter, per hectare, or
- 250 trees measuring over 20 centimetres in diameter, per hectare.

Evaluation Criteria

This section provides direction for the criteria for evaluating the significance of woodlands. This direction provides flexibility to accommodate various levels of woodland cover across ecoregions 6E and 7E. These are the criteria as

established by the MNR in accordance with the definition of significant woodland in the PPS. Woodlands that meet a minimum standard for any one of the criteria listed below are considered significant. This evaluation approach will avoid overlooking sites that are outstanding in terms of only one criterion.

This approach involves first assessing the conditions in the planning area to determine whether division into sub-units is appropriate (i.e., certain parts of a municipality have a higher/lower percentage of woodland cover than other parts). The study would then consider the individual evaluation criteria and threshold values that are appropriate based on woodland cover to classify a woodland as significant.

In addition to the “woodland size” criterion shown below, it is important that the other criteria based on functions or characteristics in the identification of significant woodlands are also used. Such functions or characteristics assist in identifying significant woodlands that may not meet the simple size criterion. Some criteria information (e.g., composition, diversity, age) to support the identification of significant woodlands may be obtained only by site inspection. In the absence of more complete information, the size threshold is to be reduced to include woodlands that otherwise would be missed. For example, where woodland cover is between about 16 and 30 per cent of the land base, woodlands closer to 4 hectares, rather than 20 hectares, are to be considered significant. The size threshold and other criteria will need to be refined further with additional studies that may be undertaken during various stages of a planning process.

Each criteria contains a range of woodland size thresholds for significance based on the determination of the overall woodland cover. For example, the threshold for proximity to other woodlands or other habitats for a municipality with a woodland cover of less than 5% is 0.5 hectares. Woodlands that meet a minimum standard for any one of the criteria listed below are to be considered significant.

Note: The ELC definition for “forest” is based on 60% tree crown cover and includes first approximation codes FOD, FOM, FOC, CUP, SWD, SWM and SWC.

If undertaking on-ground stem estimates, all measurements of trees are to be taken at 1.37 metres from the ground. Trees regenerating on formerly non-treed fields should reach this height to be counted. Small trees in an area with some existing cover of larger trees (e.g. savannahs) do not need to reach this height to be counted.

Minimum Width

Further, to be considered significant, a woodland meeting a significance criterion must have an average minimum width of 40 metres measured to crown edges where the criterion size threshold is 0.5 to 4 hectares, and 60 metres where the criterion size threshold is 10 hectares or more.

Significant Woodland Evaluation Criteria

1. Woodland Size Criterion

Size refers to the areal (spatial) extent of the woodland (irrespective of ownership), continuous even if intersected by narrow gaps 20 m or less in width between crown edges.

Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of differences in woodland coverage among physical sub-units (e.g., watersheds, biophysical regions) and in landscape-level physiography (e.g., moraines, clay plains).

Woodland Cover Within Municipality	**Woodlands are considered significant if they encompass:**
<5%	2 ha
5-15%	4 ha
16-30%	20 ha
31-60%	50 ha
>60%	N/A

Note: The size threshold should be reduced in the absence of information for the other three criteria. As a consideration in addressing the potential loss of biodiversity, the largest woodland in each lower-tier or single-tier municipality is considered significant.

2. Ecological Functions Criteria

(a) Woodland interior

Interior habitat is within the woodland more than 100 m from the edge.

For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20 m and did not create a separate woodland.

Woodlands are considered significant if they have an amount of interior habitat more than 100 m from the edge:

Woodland Cover Within Municipality	**Interior habitat area threshold for significance:**
<5%	any
5-15%	any
16-30%	2 ha
31-60%	8 ha
>60%	20 ha

(b) Proximity to other significant woodlands or habitats

Patches close to each other are of greater mutual benefit and value to wildlife.

Woodlands that overlap, abut or are close to other significant natural heritage features and areas are considered more valuable or significant than those that are not.

Woodlands are considered significant if a portion of the woodland is located within 30 m from a significant natural feature or fish habitat and the entire woodland meets the area threshold:

Woodland Cover Within Municipality	**Area threshold for significance:**
<5%	0.5 ha
5-15%	1 ha
16-30%	4 ha
31-60%	10 ha
>60%	50 ha

(c) Linkages

Linkages are important connections providing for movement between habitats.

Woodlands that are located between other natural heritage features and areas can be important “stepping stones” for movement between habitats.

Woodlands are considered significant if they are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within 120 m, and the woodland meets the area threshold.

Woodland Cover Within Municipality	**Area threshold for significance:**
<5%	0.5 ha
5-15%	1 ha
16-30%	4 ha
31-60%	10 ha
>60%	50 ha

(d) Water protection

Source water protection is important. Natural hydrological processes should be maintained.

Woodlands are considered significant if they are located within 50 m (or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and the woodland within this distance meets the minimum area threshold.

Woodland Cover Within Municipality	Area threshold for significance:
<5%	0.5 ha
5-15%	0.5 ha
16-30%	2 ha
31-60%	4 ha
>60%	4 ha

(e) Woodland diversity representation (composition)

Certain representative native woodland species have had major reductions in their natural distribution on the landscape in Ecoregions 6E and 7E.

Woodlands are considered significant if they have:

- a naturally occurring (not planted) composition of native forest species (e.g., sugar maple, black maple, silver maple, red maple, yellow birch, hickory, beech, black ash, walnut, tamarack, spruce, pine, oak, basswood or hemlock) that have declined significantly in Ecoregions 6E and 7E and which meet the minimum area threshold.

- a high native diversity through a combination of composition and terrain (e.g., a woodland extending from hilltop to valley bottom to opposite slopes) and meets the minimum area threshold.

Woodland Cover Within Municipality	Area threshold for significance:
<5%	0.5 ha
5-15%	1 ha
16-30%	4 ha
31-60%	10 ha

Woodland Cover Within Municipality	Area threshold for significance:
>60%	20 ha

3. Uncommon Characteristics Criteria

Woodlands that are uncommon in terms of species composition, cover type, age or structure.

Older woodlands (i.e. woodlands greater than 100 years old) are particularly valuable for several reasons including their contributions to genetic, species and ecosystem diversity.

Woodlands are considered significant if they have:

- a plant community with a provincial ranking of S1, S2 or S3 (as ranked by the Natural Heritage Information Centre [NHIC]) and are 0.5 hectares or more in size.
- habitat (with 10 individual stems or 100 m^2 of leaf coverage) of a rare, uncommon or restricted woodland plant species (natural, not planted):
    - vascular plant species for which the Coefficient of Conservatism is 8, 9 or 10;
    - tree species of restricted distribution such as sassafras or rock elm; or
    - species existing in only a limited number of sites within the planning area, and are 0.5 hectares or more in size.
- characteristics of older woodlands or woodlands with larger tree size structure in native species:
    - older woodlands having 10 or more trees/ha greater than 100 years old; or
    - larger trees size structure: 10 or more trees/ha at least 50 cm in diameter, or a basal area of 8 or more m^2/ha in trees that are at least 40 cm in diameter:

Woodland Cover Within Municipality	**Area threshold for significance:**
<5%	0.5 ha
5-15%	1 ha
16-30%	2 ha
31-60%	4 ha
>60%	10 ha

Exceptions

Significant woodlands do not include:

(a) a plantation managed for production of nursery stock; or

(b) a plantation managed for tree products with an average rotation of less than 20 years (e.g. hybrid poplar or willow); or

(c) a plantation established and continuously managed for the sole purpose of complete removal at rotation, without a forest restoration objective; or

(d) a woodland dominated by the invasive non-native tree species buckthorn (*Rhamnus* species) or Norway maple (*Acer platanoides*); if native tree species cover less than 10% of the ground and are represented by less than 100 stems of any size per hectare.

Documentation and/or explanation must be included in the Evaluation of Significance Report to demonstrate use of any of the above exceptions.

Appendices Related to Part D of this Guide

Appendix D1: Wetland EIS Evidence of "Reasonableness"

Under the Regulation, applicants may seek an exception from the prohibition on development within a provincially significant southern wetland or a provincially significant coastal wetland for the construction, installation or expansion of a transmission or distribution line, or the expansion of an existing transformer station, distribution station or transportation system, provided the EIS Report requirements of Part V, subection 37 (2) are met, including subparagraph 37(2)(a)(v) which requires an explanation for why it is not reasonable for the project location to be entirely outside the wetland.

Note, in the case of the construction, installation or expansion of a transmission or distribution line, an applicant's explanation will be considered to be in accordance with this Guide where it is demonstrated that the wetland can be spanned, without the placement of infrastructure within the wetland boundary. In such cases, an assessment of alternatives to determine 'reasonableness' is not required.

Minor encroachments for specified development types, where the applicant has demonstrated that alternatives for avoiding encroachment into the wetland are unfeasible, may be allowed where the least impactful and most easily mitigated development approach has been selected. Wherever possible, renewable energy projects should be located entirely outside provincially significant southern and coastal wetlands.

The attestation required as part of the application for a REA must confirm the EIS Report required under subsection 37 (2) was prepared in accordance with this Guide. The EIS report must include the applicant's explanation for why it is not reasonable for the project location to be entirely outside provincially significant southern and coastal wetlands.

To be in accordance with this Guide, when providing an explanation in the EIS Report for why it is not reasonable for the project location to be entirely outside provincially significant southern or coastal wetlands, applicants must include:

a) an assessment of alternatives which contains evidence that alternatives to development within the wetland(s) are unfeasible; and

b) a description of how the proposed development approach meets the requirement to be the least impactful and most easily mitigated approach

Proposals for encroachments into provincially significant southern and coastal wetlands, even proposals which are minor in nature, have the potential to be controversial and generate considerable concern within the local community. Where such encroachments are proposed, applicants should expect that the rationale for encroachment into the wetland, and determination that alternatives are unfeasible, will be subject to considerable agency and public interest. Applicants proposing encroachment into provincially significant southern or coastal wetlands will need to place a particular emphasis on the evidence which demonstrates that alternatives are unfeasible.

The below tables outline requirements for alternatives which must be assessed, associated determinations of unfeasibility, and supporting evidence, as well as development approaches which must be considered for least impact, where alternatives are determined to be unfeasible. To establish an explanation in the EIS Report under section 37(2)(a)(v) of the Regulation for why it is not reasonable for the project location to be outside provincially significant southern or coastal wetlands, the applicant must meet these requirements. While the tables outline the most common alternatives to be assessed for each potential development type, they are not exhaustive and the applicant may identify additional alternatives.

Table App-D1: Requirements for an Assessment of Alternatives when proposing to construct, install or expand a transmission or distribution line.

Alternative	Determination that Alternative is Unfeasible	Supporting Evidence
Span the wetland	Landscape constraints prevent construction/installation of a line which spans the wetland (e.g. span is too wide)	Letter describing rationale for determination that spanning not feasible and qualifications of person making the determination (e.g. engineer)
Route line outside wetland boundaries	Permission not granted by landowner(s) to route line entirely outside wetlands; and Landscape constraints prevent	Description of efforts to gain access to routes on private land outside wetlands and

Alternative	Determination that Alternative is Unfeasible	Supporting Evidence
	routing line outside wetlands (i.e. high concentration of wetlands in the area); or Construction/installation of route outside wetlands would remove or significantly impact another significant natural feature; or Consideration and balancing of other land use and siting considerations	Map of identified wetlands and transmission/ distribution options, which shows location outside wetlands is not possible and Impact/benefit analysis which assesses and compares impact of each potential development alternative
Conduct horizontal directional drilling to bury line under wetland	Horizontal directional drilling is not possible due to distance or nature of substrate	Letter describing rationale for determination that drilling not feasible and qualifications of person making the determination (e.g. engineer)

Where the alternatives in Table App-D1 (above) are determined to be unfeasible, development approaches may include:

- Expansion within wetland boundary limited to upgrading existing transmission/ distribution line (without increasing disturbed area); or
- Construction/installation within wetland boundary limited to existing surveyed, developed, and maintained infrastructure corridor (e.g. municipal right of way, pipeline corridor, railway corridor) or existing transportation system as defined in the Guide; or
- Construction/installation of a new transmission or distribution line within

wetland boundary.

Table App-D2: Requirements for an Assessment of Alternatives when proposing to expand an existing transformer station or distribution station

Alternative	Determination that Alternative is Unfeasible	Supporting Evidence
Locate transformer/ distribution station outside wetland boundaries	Permission not granted by landowner(s) to use existing transformer/ distribution station outside wetlands; or Construction/installation of transformer/ distribution station outside wetlands would remove or significantly impact another significant natural feature; or Consideration and balancing of other land use and siting considerations	Description of efforts to gain access to existing transformer/ distribution station on private land outside wetlands Impact/benefit analysis which assesses and compares impact of each potential development alternative

Where the alternatives in Table App-D2 (above) are determined to be unfeasible, development approaches may include:

- Transformer/ distribution station proposed for expansion within wetland boundary meets the definition of "existing transformer station or distribution station" as outlined in the Guide; and
- The proposed expansion maintains a capacity and disturbed area similar to that for which the existing transformer/ distribution station was constructed

Table App-D3: Requirements for an Assessment of Alternatives when proposing to expand an existing transportation system

Alternative	Determination that Alternative is Unfeasible	Supporting Evidence
Route project access outside wetland boundaries	Permission not granted by landowner(s) to route project access entirely outside wetlands; and Landscape constraints prevent routing project access outside wetlands (i.e. high concentration of wetlands in the area); or Construction/installation of project access outside wetlands would remove or significantly impact another significant natural feature; or Consideration and balancing of other land use and siting considerations	Description of efforts to gain access to routes on private land outside wetlands Map of identified wetlands and project access options, which shows location outside wetlands is not possible Impact/benefit analysis which assesses and compares impact of each potential development alternative

Where the alternatives in Table App-D3 (above) are determined to be unfeasible, development approaches may include:

- Transportation system proposed for expansion within wetland boundary meets the definition of “existing transportation system” as outlined in the Guide; and
- The proposed expansion maintains a capacity similar to that for which the existing transportation system was constructed; and

The proposed expansion is scaled only to allow use of the existing transportation system in its current form (i.e. does not add length, create branches, parking areas, turn around areas, etc.)

Appendix D2: Alternative Wetland Assessment

See section C4.1 for information about when this assessment can be applied. This approach is intended to ensure that relevant wetland attributes are identified and sensitivity of wetland characteristics or functions to negative effects of development are documented to support EIS requirements. The applicant is required to gather sufficient information to assess key wetland characteristics and ecological functions to inform preparation of the EIS. Table App-D4 below is based on information contained within the OWES manuals and in some cases, the OWES manuals are to be consulted for additional explanation.

The assessment and EIS Report must be prepared as follows:

1.Collect data and perform analysis to obtain an understanding of the wetland characteristics and ecological functions outlined in the table below. Data collection will be mainly through desktop procedures (e.g. aerial photograph interpretation) or field visits as part of the Site Investigation.

2.Document the information collected and analyzed through the assessment and append to the EIS. For each wetland characteristic and ecological function in the table below the applicant must provide:

- a determination of presence or absence (where applicable) to inform the Site Investigation (column 3 in the table below);
- information required to inform the EIS (column 4 in the table below) including:
    - an in-depth analysis of the characteristic or ecological function and its role within the broader landscape; and
    - a description of the degree of sensitivity to potential negative environmental effects of development;
    - a description of methodology and rationale for arriving at determinations

Applicants should provide text descriptions for all analysis and determinations. The level of analysis should provide information sufficient to be used for preparation of an EIS.

3.Prepare an EIS Report according to procedures in section D2. When preparing

the EIS Report, the applicant must ensure that for each characteristic and ecological function in the table below, the information obtained during the assessment is addressed when identifying and assessing potential negative environmental effects as well as proposing mitigation and monitoring.

Table App-D4: Wetland Characteristics and Ecological Functions

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
Wetland Size (ha)	Wetland size can be a proxy for species abundance, ecosystem or biological diversity, and carbon storage potential (e.g., large areas are more likely to sustain higher levels of species abundance or diversity or store higher amounts of carbon).	Wetland size is baseline information about the wetland features at the project location.	Description of the relationship between wetland size, ecological functions or biodiversity values, and how these may be vulnerable to potential negative effects of the proposed developmen t.
Wetland Type	Indicator of rarity in the landscape (e.g., marshes are typically	Wetland type* is baseline information about wetland features at the project location.	Description of how wetland type influences

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	rare in northern Ontario, while bogs and fens are rare in southern Ontario). Indicator of carbon storage potential (e.g., peatlands actively accumulate peat and are considered a carbon sink).	*See OWES section 1.1.2 for descriptions.	hydrological characteristics, patterns, biodiversity, ecological functions and sensitivity to alteration.
Site Type	The position of a wetland in a landscape predicts certain ecological functions, such as flood attenuation and pollutant or sediment transfer (e.g., headwater wetlands are important for	Site type* is baseline information about the physiogeographic position of wetland(s) at the project location. *See OWES section 1.1.3 for descriptions.	Description of how site type influences hydrological characteristics, patterns, biodiversity, ecological functions and sensitivity to alteration.

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	sediment removal). Wildlife habitat may be adversely impacted by changes to vegetation cover and variety (e.g., introduction of invasive Phragmites).		
Habitat Diversity	The variety of different vegetated and non-vegetated (e.g., open water) habitats is a predictor of biodiversity. Vegetation types, density and variety may be impacted by changes in hydrology.	Description/characterization of the type of vegetated and non-vegetated (e.g., open water*) habitats present within the wetland. *See OWES section 1.2.6 for more details.	Description of vegetated and non-vegetated habitat diversity at the project location and sensitivity to potential negative effects from the proposed development.

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
Proximity to Other Wetlands	Provides an indicator of habitat connectivity and the potential for an activity to disrupt species movement patterns or access to resources or habitat.	Map and/or description of other wetland features within the catchment boundary. Note: this is a landscape-scale metric and not limited to the project location.	Description of hydrological and ecological connectivity of wetland(s) within project location to others within the study area, and sensitivity to potential negative effects of developmen t.
Species Rarity	Rare species and the habitats they depend on may be disproportiona tely impacted by an activity. Changes to vegetation cover, habitat	Provincially tracked plant or animal species known to depend directly or indirectly on the wetland(s) at the project location, based on Records Review or field studies conducted as part of the Site Investigation.	Assessment of vulnerability of the species to potential negative effects of developmen t.

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	diversity, or hydrology may be more difficult to mitigate for vulnerable species.		
Significant Features and Habitats	Wetland wildlife habitats may be more adversely impacted by an activity. Changes to vegetation cover, habitat diversity, or hydrology may be more difficult to mitigate if it affects sensitive or rare habitat.	Presence of significant wildlife habitats (e.g., colonial waterbirds, winter cover, waterfowl staging and/or moulting areas, waterfowl breeding, migratory passerine, shorebird, or raptor stopover area) or other significant habitat features provided by the wetland(s) at the project location, including fish habitat as defined under the *Fisheries Act*.	*A*ssessment of vulnerability of the habitats or habitat features to potential negative effects of developmen t.
Flood Attenuation	Provides an indicator of	Map and/or description of the other surface	Description of

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	potential negative impacts from changes in water levels and the duration, magnitude, and frequency of water level fluctuations.	water features within catchment boundary. Note: this is a landscape-scale metric and not limited to the project location.	hydrological characteristics of the catchment area, particularly related to flood hazards, the hydrological role(s) and function(s) provided by the wetland(s) at the project location, and sensitivity to development impacts.
Water Quality	Provides an indicator of potential negative impacts from changes in water chemistry (e.g., nutrients,	Map and/or description of land uses and potential pollution/contamination pathways within catchment boundary (e.g., discharge areas). Note: this is a landscape-scale metric and not limited to the	Description of land uses within the catchment area and the role and function(s) potentially provided by the

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	metals, sediments etc.).	project location.	wetland(s) at the project location in reducing adverse impacts to water quality.
Shoreline Erosion Control	Potential risk of flooding and sedimentation characteristics and functions for shoreline wetlands.	Note presence or absence of any shoreline wetlands. *See OWES section 3.4 (southern manual) or 3.5 (northern manual) for more details.	If shoreline wetlands are present, describe ecological values and functions provided by these wetlands, and vulnerability to potential negative effects of developmen t.
GroundwaterRech arge	Hydrological pathways and resilience of the wetland to changes in	Description of soil classes and topography within project location.	Description of groundwate r recharge potential of

Characteristic/ Function	What it indicates	Information required as part of the Site Investigation	Information required to Inform the EIS
	hydrology.		the wetland(s) based on soils, typography and hydrological characteristics, and sensitivity of this function to negative effects of development.

Appendix D3 – Common Characteristics and Ecological Functions of Natural Features

Below are the most common considerations for specific natural features. To ensure that an EIS takes into account all considerations necessary to address negative environmental effects, applicants will need to refer to field work undertaken during previous NHA stages and the determination of existing environmental conditions.

Table App-D5: Characteristics and Ecological Functions of Natural Features

Natural Feature	Common EIS Considerations
Wetlands	• water cover, or proximity to the water table; • hydric soils and hydrophytic or water tolerant vegetation communities; • other features identified using procedures established by the province • primary production; • watershed protection; • preservation of biodiversity; • maintenance of three dimensional vegetation systems; • maintenance of conditions essential for symbiosis; • natural cycles (carbon, nitrogen, water); • provision of species to support food chains; • wildlife habitat; • fish habitat
ANSIs	• those features and functions for which the ANSI has been identified by MNR
Significant Woodlands	• woodland size and boundary; • shape and potential for forest interior habitat; • linkages/connectivity to other natural features; • proximity to other habitat types,

Natural Feature	Common EIS Considerations
	• interior vs. edge habitat, • diversity including community types, soil types, species composition (e.g. overstory, understory, health/vigour), • uncommon characteristics with respect to composition (e.g. uncommon species and uncommon ages), vegetation type, quality or condition, age/size classes, structures as represented by diameter classes as well as presence of older portions (>100yrs.) • extent of landscape cover, species composition and age/structure • distribution, • presence of sensitive forest species (e.g. species that tend to diminish with development), • contribution to local and regional water quantity and quality, • site productivity, • amount of existing and potential riparian cover, • potential for nutrient cycling and food web, • amount and type of existing and potential wildlife habitat
Significant Wildlife Habitat	• the significant features, functions and attributes that define the area as a significant wildlife habitat according to the Significant Wildlife Habitat Mitigation Support Tool
Sand barrens, Tallgrass prairies, Savannahs	• plant communities including percent tree vs. herbaceous cover, plant species listings, soil types and depths, moisture regime, nitrogen levels, faunal species • presence of sensitive wildlife species, nutrient cycling/food webs, bio-mass production, wildlife habitat

Natural Feature	Common EIS Considerations
Alvars	• presence of sensitive plant and animal species, nutrient cycling / food webs, bio-mass production, wildlife habitat

Table App-D6: Common EIS Considerations

Natural Feature	Common EIS Considerations
Wetlands	• wildlife habitat function including upland habitat within adjacent lands • plant communities, topography, hydrological connectivity, groundwater recharge and discharge • vegetated areas that physically protect the wetland edge from sedimentation • overhanging trees that provide detritus to support food webs
Significant ANSIs	• life science ANSIs: considerations related to representative landform-vegetation types, riparian vegetation and wildlife habitats, as well as unusual and distinctive vegetation communities and geological formations for which the ANSI may be identified • earth science ANSIs: educational, scientific and interpretive value of the area and features in question; representative topography, stratigraphic exposures and other geologically defining features for which the area was identified
Significant Woodland	• potential changes to surface water hydrology; • survivability of trees located near a woodland edge • sensitivities of plant and animal species in the woodland

Natural Feature	Common EIS Considerations
s	• potential for direct and indirect disruption, and changes in soil moisture and compaction susceptibility to erosion
Significant Wildlife Habitat	• impacts during construction phase (e.g., vegetation removal, time of year) • sensitivity of the species using the significant wildlife habitat • potential impacts on wildlife species using the significant wildlife habitat after the project is completed (e.g. change in microclimate, increase in nutrients or contaminants, increased noise)
Sand barrens, Tallgrass prairies, Savannahs and Alvars	• potential impact of drainage to and from the feature, • disruption to ecological linkages, movement and distribution patterns and key life cycle patterns.

Appendix D4 – Summary of Potential Negative Environmental Effects and Mitigation

Table App-D7: Activity: Vegetation Removal – clearing/grubbing of shoreline/riparian areas

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
loss of shade, possibly resulting in increased water temperatures	increase in water temperatures beyond the tolerance of cold- and coolwater fish species; changes in fish species composition and abundance;	maintain as much riparian vegetation as possible to maximize shading; plant appropriate native species (of local stock if possible)

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
	drying up of refugia due to increased evaporation	
reduced inputs of leaves, twigs and insects to waterbodies	reduced food supply for aquatic life, including fish	maintain or restore as much riparian vegetation as possible to provide a food supply
reduced bank stability and ability to trap sediment from upland areas; increased erosion, sedimentation and turbidity	decreased photosynthesis, loss of productivity, loss of fish habitat (e.g. spawning areas), loss of food organisms, and avoidance of areas by fish; changes in fish species composition and abundance	maintain or restore riparian vegetation; develop and implement an erosion and sediment control plan before removing vegetation; stabilize banks where necessary
reduced stability of sensitive landforms; increased erosion of landforms	loss of all or part of earth science feature, valleyland, etc.	avoid removing vegetation on sensitive landforms
loss or disturbance of riparian wildlife species	reduced cover and food supply for species such as otter, mink, beaver and wintering deer; loss of habitat for species requiring both aquatic and terrestrial areas;	maintain or restore riparian vegetation and adjacent forests where they exist maintain important wildlife areas (e.g. cover, nesting habitat, movement corridors)

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
	interruption of riparian corridors	

Table App-D8: Activity: Vegetation Removal – clearing/grubbing of wetland areas

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increased erosion, sedimentation and turbidity; decreased shade, cover and diversity of vegetation	decreased photosynthesis, loss of productivity, loss of fish habitat, loss of food organisms, and avoidance of areas by fish; changes in fish species composition and abundance; smothering of upland and wetland vegetation	maintain or restore vegetative buffers; develop and implement an erosion and sediment control plan before removing vegetation

Table App-D9: Activity: Vegetation Removal – clearing/grubbing of upland areas

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
loss of vegetation and wildlife habitat or loss of significant portions of habitat; loss of successional habitat	direct loss of habitat (e.g. winter cover, vernal pools, nesting trees, important food sources); reduction in habitat (e.g. woodland habitat for area-sensitive birds) below a critical level; habitat fragmentation	identify and avoid or protect critical components of wildlife habitat (e.g. winter cover, vernal pools, grasslands that support indicator species, hibernation sites, migration staging areas, nesting trees); leave a buffer around

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
		significant features and habitats of significant species
loss of vegetation and wildlife habitat or loss of significant portions of habitat; loss of successional habitat	greater exposure of wildlife to predation and parasitism	design the project to avoid or, where that is not possible, minimize loss of vegetation, particularly in edge habitats
loss of vegetation and wildlife habitat or loss of significant portions of habitat; loss of successional habitat	increased vulnerability of the site to invasion by non-native species	revegetate with native species after development to enhance habitat
loss of vegetation and wildlife habitat or loss of significant portions of habitat; loss of successional habitat	decreased biodiversity	avoid fragmenting forests and severing linkages; consider restoration and planting projects to restore high edge-to-interior ratio
loss of natural linkages and corridors for animal movement	isolation of species; loss of biodiversity	leave a buffer around habitats of significant species; identify important animal movement corridors; avoid eliminating corridors

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
disturbance of wildlife species	disturbance of concentrations of wildlife (e.g. deer yards, bird nesting colonies) due to noise produced by clearing activities or other human activities	time activities to avoid wildlife disturbance; leave a buffer area around sensitive species
loss of rare plant species and communities	loss of species, specialized habitats and overall biodiversity	avoid disturbing habitats of rare plant species and communities; establish appropriate buffers
reduced stability of landforms composed of unconsolidated material (e.g. eskers, moraines, dunes)	reduced integrity of landform and loss of significance, or loss of earth science area of natural and scientific interest (ANSI)	minimize vegetation removal on slopes; do not allow roads or skidder tracks; no aggregate pits

Table App-D10: Activity: Grading

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increased erosion, sedimentation and turbidity; increased inputs of nutrients and contaminants to waterbodies and	decreased photosynthesis, loss of productivity, loss of fish habitat, loss of food organisms, avoidance of areas by fish, lethal or sublethal toxic effects on	maintain or restore vegetative buffers; develop and implement an erosion and sediment control plan; control access and movement of equipment

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
wetlands; increased soil compaction	aquatic life; changes in fish species composition and abundance; changes in wetland plant communities	and people; designate areas for equipment storage; time activities to avoid sensitive periods of habitat use (e.g. spawning); minimize the area and duration of soil exposure schedule grading to avoid times of high runoff volumes (spring and fall)
changes in natural drainage, including elimination of streams, and increased or decreased surface runoff; increased or decreased stream flows	loss of fish habitat (e.g. water, spawning areas) and food organisms; changes in fish species composition and abundance; changes in wetland plant communities; reduction in hydrologic functions of wetlands including impacts to flood attenuation and conveyance functions; channel erosion and changes in geomorphology	minimize changes in land contours and natural drainage; maintain streams (permanent and intermittent) and timing and quantity of flows
changes in soil moisture, tree cover and species composition of	loss of important wildlife species or habitat	minimize vegetation removal and changes in land contours and natural drainage; develop a tree conservation plan to

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
vegetation		encourage retention of trees where possible
disturbance of wildlife, particularly sensitive species	reduced numbers of species or abundance of a species	identify sensitive species before beginning the work; design grading to avoid disturbing sensitive species; conduct work at a time that is least disturbing to sensitive species
alteration or destruction of landforms composed of unconsolidated materials (e.g. kames, eskers, sand dunes)	loss of an earth science ANSI, valleyland, etc.	avoid grading areas containing significant landform features

Table App-D11: Activity: Installation of services and utilities (e.g. sewers, infrastructure, stormwater management facilities)

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increased erosion, sedimentation and turbidity; increased inputs of nutrients	decreased photosynthesis, loss of productivity, loss of fish habitat, loss of food organisms, avoidance of	maintain vegetative buffers; develop and implement an erosion and sediment control plan; time activities

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
and contaminants to waterbodies	areas by fish; changes in fish species composition and abundance	to avoid sensitive periods of habitat use; re-establish vegetation as soon as possible
disposal of large amounts of water required by dewatering activities	increased erosion, sedimentation and flooding of waterbodies or intolerant vegetation	install a temporary storage basin to allow water to infiltrate, or use permanent storm management facilities
disturbance of wildlife, particularly sensitive species	reduced abundance of species	identify sensitive species before beginning the work; conduct work at a time that is least disturbing to sensitive species
alteration of identified significant rock types, fossil assemblages or landforms by tunnelling or blasting	loss of significant earth science values	identify and avoid significant earth science features when planning and installing services minimize the amount of disturbance
hydrological changes (e.g. changes in water levels as a result of rerouted water flow)	changes in vegetative communities and fish and wildlife assemblages; reduction in groundwater recharge	conduct appropriate studies to determine how to maintain the existing hydrological regime; design underground facilities (e.g. seepage collars, trenches) to minimize effects on groundwater flows

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
fragmentation of natural areas	fragmentation of habitat by corridors through wetlands; reduction or elimination of area-sensitive species; increased nest predation and parasitism; introduction of non-native species	avoid forest fragmentation; if services must go through forests, route the corridor through edges instead of the interior

Table App-D12: Activity: Building construction (including accessory uses and amenities)

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increased erosion, sedimentation and turbidity; increased inputs of nutrients to waterbodies and wetlands	decreased photosynthesis, changes in productivity, loss of fish habitat, loss of food organisms, avoidance of areas by fish; changes in fish species composition and abundance; loss of stream channel stability; changes in plant communities	maintain or restore vegetative buffers; prevent erosion, sedimentation and nutrient inputs through use of best management practices
water contamination by oils, gasoline, grease and other materials	lethal or sub-lethal toxic effects on aquatic life and vegetation	prevent water contamination through good best management practices
increase in impervious surfaces;	loss of fish habitat (e.g., water, spawning areas for brook trout); changes in fish	maintain or provide vegetative buffers; control quantity and quality of

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increased surface runoff and reduced infiltration and groundwater discharge; reduced stream baseflows and upwelling; loss of vegetation resulting in increased water temperatures	species composition and abundance; changes in wetland vegetation communities; drying of wetlands	stormwater discharge using best management practices, implement infiltration techniques to the maximum extent possible
loss of vegetation, especially at forested edges barriers to animal and plant movement	loss or fragmentation of wildlife habitat; loss of biodiversity; introduction of non-native species of plants and wildlife; increased predation and parasitism on native wildlife interruption of functional connections	maintain a sufficient buffer between buildings and significant features such that trees do not present a hazard to buildings; ensure a threshold level of habitat is maintained for sensitive wildlife species (e.g., area-sensitive species) ensure that important animal movement corridors are not lost; develop alternate corridors, cover, etc. where possible
disturbance of wildlife loss of wildlife (e.g., mortality due to collisions with	avoidance of the area by wildlife species gradual attrition of certain wildlife populations	identify species sensitive to disturbance and time construction to avoid periods of habitat use appropriate building design

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
buildings)		to prevent/minimize mortality

Table App-D13: Activity: Roads — water crossings

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
realignment of stream channels; changes in water velocity	barriers to fish movement; downstream erosion or sediment deposition; separation of stream from floodplain	maintain existing stream channel if possible, or realign using natural channel design (accompanied by replanting plan using native vegetation); use bridges to span stream; time construction to avoid sensitive periods of habitat use (e.g., spawning)
increased erosion, sedimentation and turbidity	decreased photosynthesis, changes in productivity, loss of fish habitat, loss of food organisms, avoidance of areas by fish; changes in fish species composition and abundance; changes in wetland vegetation	minimize width of right-of-way; develop and implement an erosion and sediment control plan, revegetate as soon as possible

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
loss of riparian vegetation	loss of habitat for certain wildlife species (e.g., loons, ducks, reptiles and amphibians); increased water temperatures exceeding the tolerance of coldwater and coolwater fish species	minimize width of right-of-way; time construction to avoid sensitive periods of habitat use (e.g., nesting, spawning); re-plant vegetation
obstruction of lateral flows in wetlands	significant alterations in wetland vegetation communities; potential change of wetland type; changes in wildlife populations	install adequate culverts and gravel base to maintain flow of surfacewater and shallow groundwater
interruption of linkage along a watercourse	increased roadkill as animals cross roads to follow a watercourse	identify wildlife use of linkage and size passage under road accordingly (information on cryptic species that use linkage will likely not be obtainable, so knowledge of wildlife most likely present must be used)
attraction of nesting turtles and other wildlife to roadsides and roads	roadkill	build roadside wings to keep turtles off roads; build underpasses with funnel fencing to direct turtles and other wildlife; develop alternate egg laying sites.

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
pollutants from roads	introduction of heavy metals, oils and grease from vehicles increased levels of salt from de-icing	collect and treat road runoff in stormwater management facilities use of vegetated swales to capture pollutants
barriers to wildlife movement	interrupted wildlife movement along watercourse	extend bridges beyond watercourse shorelines to allow wildlife passage

Table App-D14: Activity: Roads — paving

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
increase in impervious surfaces; increased surface runoff and stream peak flows; reduced infiltration, baseflows and upwelling	loss of fish habitat (e.g., water upwelling/spawning areas for brook trout); changes in fish species composition and abundance; changes in wetland vegetation communities	minimize area of paved surfaces; design roads to promote infiltration; promote infiltration galleries and other infiltration devices, maintain or provide vegetative buffers; control quantity and quality of stormwater using best management practices
increased erosion, sedimentation and turbidity from increased peak flows; increased inputs of nutrients	loss of fish habitat; lethal or sub-lethal toxic effects on aquatic life; changes in wetland vegetation communities and productivity	minimize area of paved surfaces; design roads to promote infiltration; promote infiltration galleries and other infiltration devices, maintain or provide

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
and contaminants to waterbodies and wetlands		vegetative buffers; control quantity and quality of stormwater using best management practices
increased water temperatures	loss of coldwater and coolwater fish species where water temperatures exceed their tolerances	minimize area of paved surfaces; design roads to promote infiltration; promote infiltration galleries and other infiltration devices, maintain or provide vegetative buffers; control quantity and quality of stormwater using best management practices
loss of wildlife habitat	avoidance of the area by wildlife species loss or fragmentation of wildlife habitat; loss of biodiversity introduction of non-native species of plants and wildlife; interruption of functional connections	identify species sensitive to disturbance and time paving to avoid periods of nearby habitat use appropriate design to prevent/minimize mortality ensure that important animal movement corridors are not lost; develop alternate corridors, cover, etc. where possible
barriers to wildlife movement wildlife mortality	avoidance of paved surfaces by some small mammals high mortality where paved surfaces intersect with	avoid intersecting most likely wildlife migration routes wherever possible; funnel wildlife through culverts

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
on roads	movement corridors	provide overpasses for large wildlife species provide low barrier fencing or vertical walls to prevent amphibians from getting onto roadways (and to guide them to the wildlife passage culverts); and provide dry wildlife passage culverts under the roadway

Table App-D15: Activity: Groundwater and surface water taking

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
reduced groundwater discharge; reduced stream baseflows and upwelling; increased water temperatures	• loss of fish habitat (e.g., water, spawning areas for brook trout); changes in fish species composition and abundance; changes in wetland hydrology and vegetation communities • loss of moisture-sensitive vegetation communities and species that depend on them • decrease in water quality	• control rate and timing of water pumping; pump from deep wells to infiltration galleries adjacent to waterbodies or wetlands • restrict taking of groundwater and surfacewater during extreme low flow time periods

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
	due to loss of dilution capabilities anoxic stream environment	

Table App-D16: Activity: Application of herbicides

Potential Physical Effects	Potential Effects on Functions and Features	Some Possible Mitigation Measures
• loss of sensitive vegetation • loss of wildlife habitat • wildlife mortality • pollution of groundwater/surface water	• loss or fragmentation of wildlife habitat; loss of biodiversity • introduction of non-native species of plants and wildlife; increased predation and parasitism on native wildlife introduction of herbicides to hydrologic system	• apply only when wind speeds are low and no significant precipitation is expected • apply only herbicides approved for use adjacent to water bodies within riparian buffer areas • allow only hand spraying will be allowed within riparian buffer areas • use a dye solution in herbicide mix to visually detect uniform coverage of spray area

Buffers

The physical separation of a project from natural feature boundaries using vegetated protection areas is one of the most widely used mechanisms for reducing (i.e. buffering) negative effects on natural features. Lands to be set aside from development and kept in a vegetated state are commonly referred to

as “buffers.”

Buffers can contribute substantially to the protection of wetlands, woodlands, and other natural features. Appropriate widths for buffers vary depending on the sensitivity and functions of the natural features.

Buffers must be determined and rationalized on the basis of their ability to protect natural features and their associated functions. Whenever possible, buffers should be composed of species native to the geographic area (ecodistrict).

Buffers are not treated as extensions of the natural feature; therefore, if a buffer is allowed to become wooded, the natural feature boundary is not extended to include it. The buffer may serve a number of functions, some of which are not appropriate in a natural feature (e.g. site maintenance activities) and such management is allowed to occur.

Wetland Buffers

Buffers can be maintained or established to mitigate some potential negative environmental effects to natural features and their ecological functions. Vegetated buffers can be used to mitigate potential negative environmental effects to wetlands.

Wetland buffers can be critical for protection of wetland areas. Recommended widths may vary depending on the functions of the wetland and the nature of the project. Buffers must be determined and rationalized on the basis of their ability to protect the wetland and its associated functions.

Effective buffer widths may vary depending on the wetland functions, location and project design. For example, buffer widths of as little as 10 m have been shown to be effective for the attenuation of nitrates and phosphorus in runoff, as long as the buffer ground surface is relatively flat and composed of dense vegetation that can filter and attenuate runoff.

Adjacent to a mature forested wetland, buffers calculated on tree height can allow for trees at the edge of the wetland to fall without damaging adjacent structures. Thus, demand is less for removal of dying trees from the wetland edge, as is the consequent degradation. In this case a buffer distance of 30 m may be appropriate.

ANSI Buffers

Buffers can be maintained or established to mitigate some potential negative environmental effects to natural features and their ecological functions. Buffers

may be effective in relation to other natural features found within an ANSI, such as wetlands and woodlands.

Woodland Buffers

Buffers can be maintained or established to mitigate some potential negative environmental effects to natural features and their ecological functions.

Buffers are recommended around woodlands to protect the structural integrity of vegetation along the edge, as well as to minimize impacts on woodland functions. Appropriate buffers may vary with the location and character of a woodland and the nature of proposed project. Some of the services that buffers may provide include:

- protection of root zone of edge trees;
- reduction in the effects of hydrological changes from project construction;
- area where trees and limbs can fall without causing damage (tree fall zones);
- filtering of contaminants;
- extension of edge, thus increasing potential for woodland interior conditions to develop; and
- protection for wildlife use.

A minimum 30 m vegetated buffer zone around significant woodlands is recommended

Significant Wildlife Habitat Buffers

Effective buffers for significant wildlife habitat vary depending on the specific habitat being protected. Proposed buffers should be based on the potential negative environmental effects of the proposed project. Also applicable is the Significant Wildlife Habitat Mitigation Support Tool, a tool to describe wildlife habitat, identify potential negative environmental effects that may affect the habitat and provide mitigation measures for an applicant to consider when working in or within the adjacent lands from a significant wildlife habitat.

Appendices Related to Part E of this Guide

Appendix E1: Post-construction monitoring formulas

Scavenger correction factor

Proportions of carcasses remaining after each search interval are pooled to calculate an overall scavenger correction (S_c) factor:

$$S_c = \frac{n_{visit1} + n_{visit2} + n_{visit3}}{n_{visit0} + n_{visit1} + n_{visit2}}$$

S_c is the proportion of carcasses not removed by scavengers over the search period
n_{visit0} is the total number of carcasses placed
n_{visit1} – $n_{visit3...}$ are the numbers of carcasses remaining on visits 1 through 3

Searcher efficiency

Searcher efficiency (S_e) can be calculated for each searcher as follows:

$$S_e = \frac{\text{number of test carcasses found}}{\text{number of test carcasses placed} - \text{number of carcasses scavenged}}$$

The number of turbines that each individual searches will vary so it will be necessary to calculate a weighted average that reflects the proportion of turbines searched by each searcher. The weighted average or overall searcher efficiency can be calculated as follows:

$S_{eo} = S_{e1}(n_1/T) + S_{e2}(n_2/T) + S_{e3}(n_3/T)\ldots$

S_{eo} is the overall searcher efficiency
Se_1 and $_2$ and $_3$… are individual searcher efficiency ratings
N_1 and $_2$ and $_3$… are number of turbines searched by each searcher
T is the total number of turbines searched by all searchers

Proportion of area searched

Proportion of area searched (P_s) is calculated as follows:

$$P_s = \frac{\text{actual area searched}}{\pi r^2}$$

r = 50m

Corrected mortality estimates

The minimum estimated mortality (C) is calculated as follows:

$C = c / (S_{e0} \times S_c \times P_s)$

C is the corrected number of fatalities
c is the number of carcasses found
S_{e0} is the weighted proportion of carcasses expected to be found by searchers (overall searcher efficiency)
S_c is the proportion of carcasses not removed by scavengers over the search period
P_s is the proportion of the area searched.

Other notes and considerations

Should additional mortality be found based on supplemental monitoring (e.g. associated with SWH) and using the same standard protocols, this mortality should be included in the calculation of mortality rates.

Appendix E2: Sources of information on bats, birds, significant wildlife habitat, and wind power

The following sources of information may be useful in providing data to assist with Records Review (Section C2):

Audubon Bird Migration Explorer

Bat Conservation International (BCI)
Up-to-date information on bat conservation, management, workshops, research, and an online library of bat resources. BCI maintains a list of bat experts throughout North America who are knowledgeable about bat ecology and behaviour, and are willing to consult on bat conservation issues.

Bats and Wind Energy Cooperative (BWEC)

BirdCast

Bird migration forecast.

Canadian Renewable Energy Association (CanREA)

Canadian Wind Turbine Database (Government of Canada)

Important Bird Areas in Canada (IBAs)

Shapefiles available on request.

North American Bat Monitoring Program (NABat)

- A Plan for the North American Bat Monitoring Program

Ontario Ministry of Natural Resources – Natural Heritage Information Centre (NHIC)
Information on wildlife species (particularly rare, threatened and endangered species and spaces) in Ontario. NHIC acts as a provincial database for sensitive information for bats, including locations of significant hibernacula, maternity roosts, and migration corridors.

Ontario Ministry of Energy and Mines
Information on mining and geology in Ontario. Also home to the Ontario Geological Survey, which has information on provincial geology and landscapes.

- Geology Ontario
  Information on abandoned mines in Ontario and possibly some information on bats.

Ontario Nature (Nature Network)
140 community conservation groups across Ontario. Aid in locating potential information sources on bats.

Renewable Energy Wildlife Institute (REWI)

Royal Ontario Museum

Wind Atlas (Environment and Climate Change Canada)

Appendix E3: Bird and Bat References

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