# Environmental Impact Assessment (EIA) Guidelines

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County of Essex, Ontario

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# ACKNOWLEDGEMENTS

This document was prepared based on the Essex Region Conservation Authority's Guideline for Environmental Impact Assessment, (Michael Nelson and Dan Lebedyk, 2019). We appreciate ERCA's authorization for the County of Essex to adapt and update this document for technical use.

We also acknowledge the contributions of the County of Essex, Planning Services division.

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# Environmental Impact Assessment (EIA) Guidelines

The purpose of the **Environmental Impact Assessment (EIA) Guidelines** document is to provide guidance relating to the preparation and review of EIAs in support of planning, infrastructure and development applications.

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| **Purpose** | The purpose of the Environmental Impact Assessment (EIA) Guidelines is to:<br>• **explain** the various policies that trigger the need for an EIA;<br>• **provide** methodologies and data standards for conducting an EIA and to identify the level of detail required for an EIA;<br>• **identify** ways to avoid or minimize potential impacts to natural heritage features and ecological functions; and,<br>• **enable** municipal decision-making on development proposals which have the potential to impact a natural heritage feature or the identified natural heritage system |
| **Application & Use** | To maintain a healthy balance between settlement areas, the agricultural operations and the natural heritage system, when development is proposed within or adjacent to a natural heritage feature or area, an EIA may be required. Development proposals include those development applications approved under the *Planning Act*. The guidelines should be used to understand the implementation of these requirements and are applicable to a variety of users, including:<br>• Municipal, local and external agency staff: as a resource when reviewing development applications that may require an EIA;<br>• The development industry and agricultural community: for clarity on the application of Official Plan policies regarding EIAs; and,<br>• The public: to understand how the protection and conservation of our region's natural heritage system occurs through the development process. |
| **Supporting Documents** | In addition to the policy direction provided by Official Plans, the following documents should be considered alongside this Guideline, as appropriate:<br>Provincial Planning Statement (PPS), 2024<br>Ontario Ministry of Natural Resources and Forestry (MNRF) – Natural Heritage Reference Manual, 2010<br>Endangered Species Act (ESA) and Ministry of Environment |

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| | Conservation and Parks (MECP) Technical Bulletin on the *Endangered Species Act* screening process.<br>*Migratory Birds Convention Act* (MBCA)<br>*Ontario Fish and Wildlife Conservation Act* (FWCA)<br>Significant Wildlife Habitat Technical Guide: https://www.ontario.ca/document/significant-wildlife-habitat-technical-guide<br>Significant Woodlands Guideline: https://view.publitas.com/on-nature/identification-of-significant-woodlands/page/1<br>Local Official Plans and associated policies<br>Essex Region Natural Heritage System Strategy (ERHNSS) Report |
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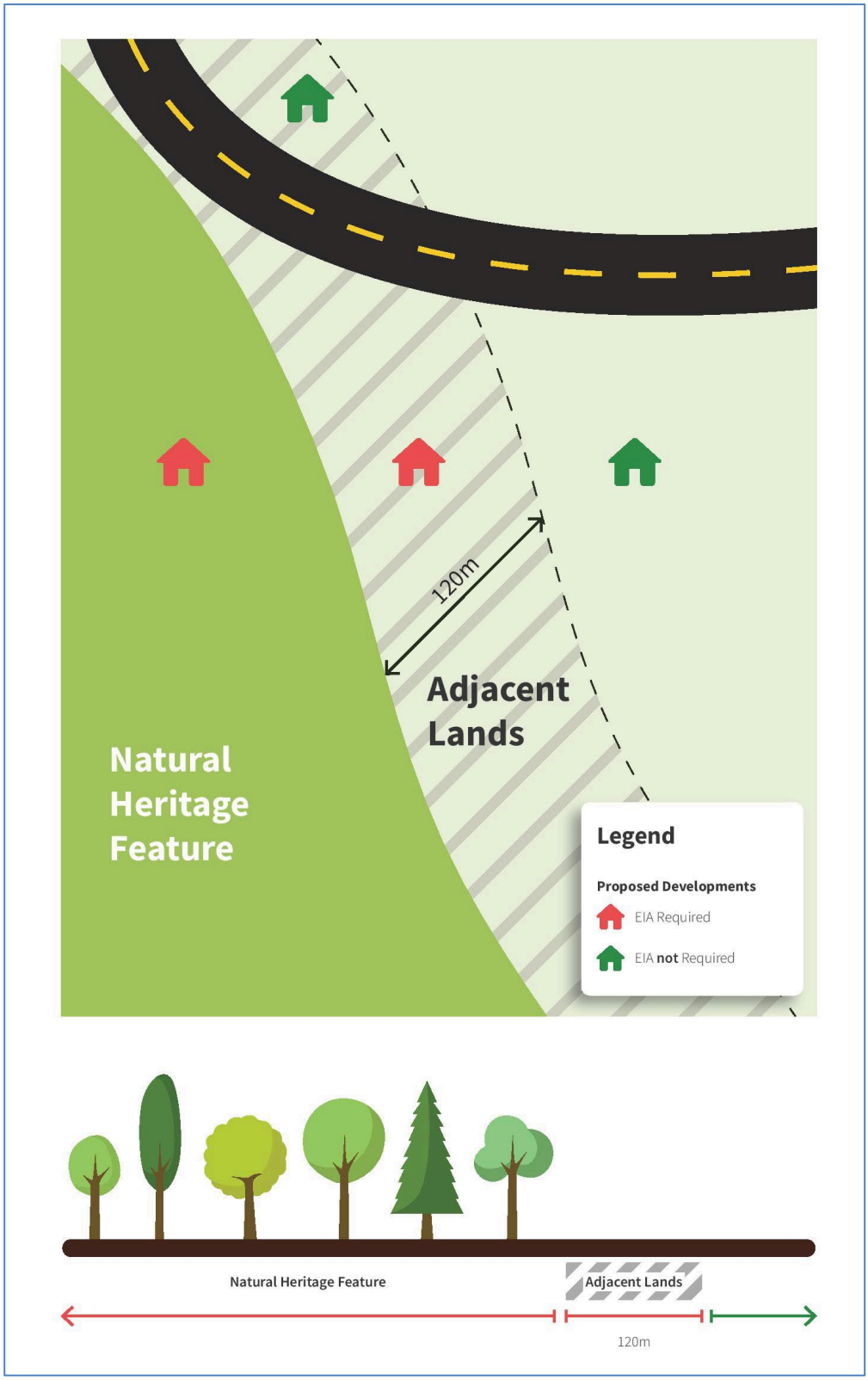
# 1.0 INTRODUCTION

The purpose of an Environmental Impact Assessment (EIA) is to demonstrate how a proposed development will result in no negative impacts to the natural features or their ecological functions of a significant natural heritage feature as defined in the Provincial Planning Statement 2024 (PPS, 2024). This is completed by identifying and evaluating natural features, ecological functions and values and assessing the potential environmental impacts, requirements for impact avoidance and mitigation measures, and opportunities for enhancement or restoration. The Essex Region Natural Heritage System Strategy (ERNHSS) (ERCA, 2013) is a document that informed the establishment of the NHS in municipal planning documents. The County of Essex Official Plan 2024, has included updates to the NHS policies to obtain a goal of 15 percent natural area coverage. In order to obtain this 15 percent objective the County of Essex and Local Municipalities have accepted a "no net loss" approach to natural heritage planning and stewardship. It is anticipated that the use of tree preservation plans, and utilization of regional compensation guidelines will support this objective for "no-net loss" and promote a "net-gain" result.

## 1.1 When is an EIA required?

An EIA study may be required to support a development application under the *Planning Act*. The purpose and intent of these EIA Guidelines is to assist in the interpretation of the specific steps to be taken during the implementation of natural heritage policies of the Provincial Planning Statement. In addition, the Natural Heritage Reference Manual (MNR, 2010) is used to provide interpretation and assist in the implementation of natural heritage policies of the PPS. The ERNHSS report informed the development of natural heritage system policies in the upper-tier and lower-tier municipal Official Plans. Official Plan policies may also inform the requirements for completing an EIA.

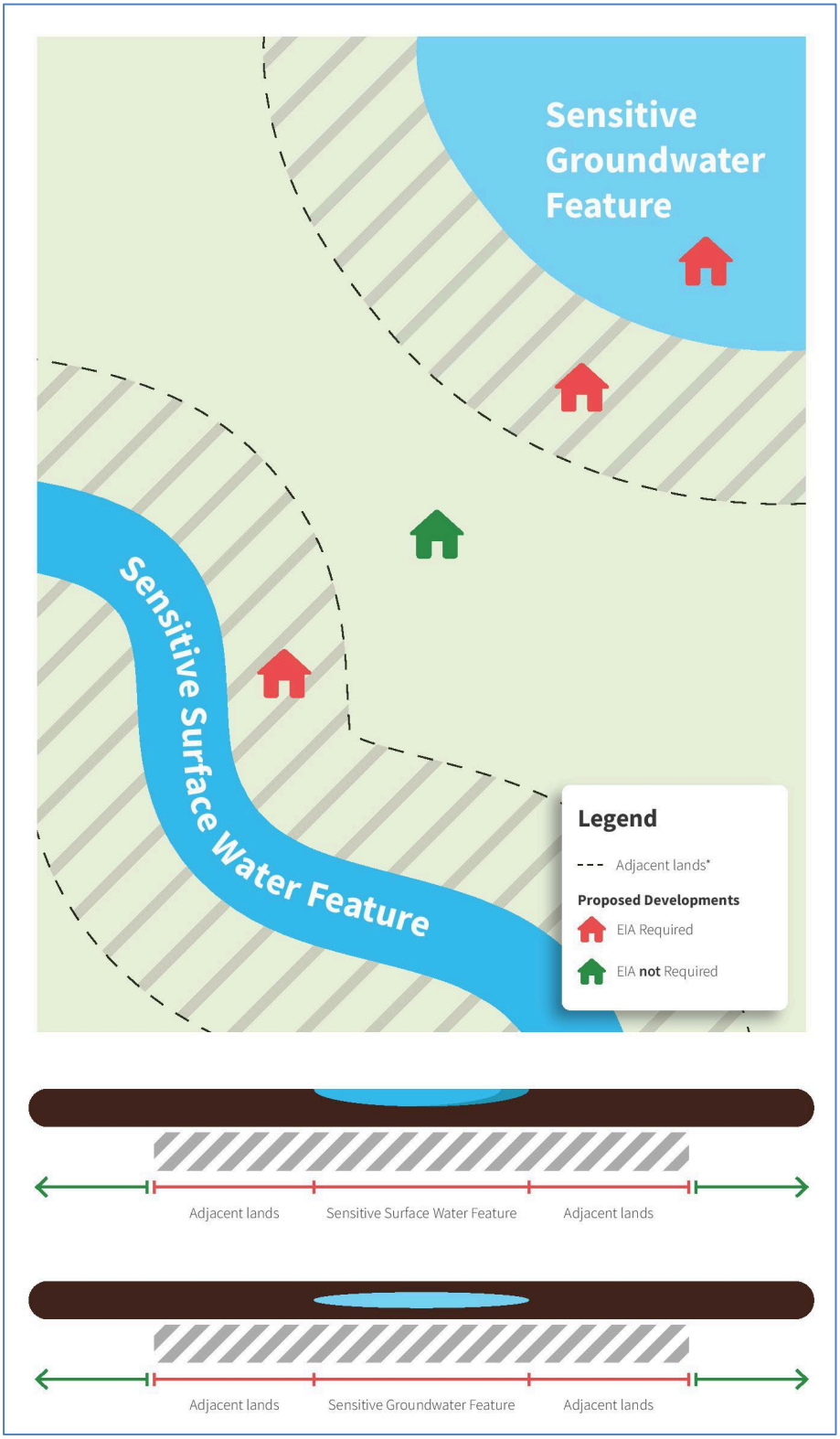
The need for an EIA and the scope of work to be undertaken will be determined by the County or local planning approval authority in consultation with the proponent, and any other relevant agencies. As part of the pre-consultation phase (see section 2.1 below), a coordinated site visit may be necessary to confirm the requirement for an EIA. In accordance with the policy direction in the respective Official Plan, the County of Essex, or relevant planning approval authority may require an EIA for any *development*, including public works that are located wholly or partially inside or within 120 metres of any natural heritage feature as identified through interpretation of relevant aerial photography, applicable Official Plan policies, and review of any relevant past site information. The 120 metre adjacent lands trigger distance comes from the provincial Natural Heritage Reference Manual (MNR, 2010). Tree assessments, preservation plans, monitoring and restoration plans, can be typical components of EIA's dependent on the scope of work.




The illustration in Figure 1 illustrates a graphical representation of how the 120 metre trigger distance from an existing natural heritage feature is applied. Proposed developments within an existing natural heritage feature or within 120 metres of the feature would require an EIA.

If an existing intervening use, for example an existing road, was located between the proposed development and the natural heritage feature, no EIA would be required because the potential for impacts would be most likely negated by the presence of the roadway.

Figure 1 Adjacent lands trigger distance in relation to natural heritage features.




The illustration in Figure 2 illustrates a graphical representation of how the 120 metre trigger distance from identified sensitive groundwater and surface water features. Proposed developments within an existing sensitive surface water or groundwater feature or within 120 metres of the feature would require an EIA.

If an existing intervening use, for example an existing road, was located between the proposed development and the natural heritage feature, no EIA would be required because the potential for impacts would be most likely negated by the presence of the roadway.

Figure 2 Adjacent lands trigger distance in relation to surface and groundwater features.

## 1.2 Planning Approval Authority and Agency Roles

A *development* application must conform to the applicable planning and regulatory requirements established by planning approval authorities and agencies (provincial, County, and local municipalities) for conducting an assessment of the impact of *development* on natural features and functions. The completion and approval of an EIA may be part of the requirement for granting of *development* approvals. If it is determined that an EIA is required, an application can only be considered complete following the submission of the EIA in accordance with the approved Terms of Reference established in consultation with the County of Essex or relevant planning approval authority, the proponent, and other applicable agencies.

The planning approval authority, in consultation with other relevant authorities and agencies, should coordinate pre-consultation and scoping and development of the Terms of Reference for the EIA. The planning approval authority will ensure draft EIAs will be completed under the 'one study' process and will demonstrate conformity with policies of respective planning approval authorities and agencies before being considered appropriate for final submission.

It is not the intent of an EIA to duplicate similar studies either recently completed or required by other agencies. It is anticipated that an EIA will be coordinated amongst all agencies such as the County of Essex, and local Municipalities to avoid duplication of effort and to ensure that all agency requirements can be addressed through a 'one study' process. To facilitate this, the EIA will be coordinated by the relevant planning approval authority. Further, it is important to conduct pre-consultation on applications to ensure proponents' consultants are appropriately addressing all appropriate matters of interest in a coordinated fashion.

Where species at risk (federally or provincially listed), Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), and/or other natural heritage features identified in the PPS are present, there may be a need for proponents of a development to consult with the provincial government, County of Essex and/or DFO during the EIA process. It is the proponent's responsibility to facilitate consultation with these agencies.

## 1.3 Role of the Proponent

The proponent should become familiar with the planning process associated with the submission of a *development* application. Communication between the proponent and planning approval authority and/or agency staff at all stages in the EIA process will enable a proponent to meet EIA requirements in a cost effective and timely manner.

Proponents should understand that completing/preparing an EIA is an iterative process involving several steps; potentially involving the collection of comprehensive field data

collected at different times of the year. In some cases, proponents may need to wait for the appropriate season to collect important field data, for example:

- Amphibian breeding surveys must be completed during the amphibian breeding window generally between March and June,
- Breeding bird survey window ranges from May to July
- Vegetation surveys must be conducted to capture the wide range of flowering periods (April through October); therefore, several surveys may be required to adequately document all floral species present.

The timing for the completion of an EIA will therefore be tied, in part, to required field data collection and the appropriate time of year for such field data collection.

In order to complete an EIA, the proponent needs to engage science experts from disciplines specific to areas to be studied and this may include wildlife biologists, fisheries biologists, botanists, hydrogeologists, and ecologists. Depending on the nature and the scope of the EIA study proponents should seek qualified professionals who have appropriate educational qualifications, experience, and certifications (e.g. Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES), Ontario Stream Assessment Protocol (OSAP), specific SAR expertise, electro-fishing, etc.). Proponents should also be aware that research permits may be required from provincial and federal government ministries prior to conducting certain studies (e.g., MNRF License to collect fish for scientific purposes, MNRF Wildlife Scientific Collector's Authorization, SAR Permit under clause 17(2)(b) of the *Endangered Species Act*, 2007 (ESA), Animal Care Protocols, etc.), and that these permits may take several months to obtain. All qualified professional consultants required to complete an EIA in accordance with these guidelines shall be retained at the expense of the proponent. Completed EIA's will contain evidence of the consultant's qualifications. Contact information for qualified consultants and/or consulting firms who have experience with the completion of EIAs within the Essex region is provided in Appendix B.

# 2.0 RECOMMENDED PROCEDURES

The following procedures outline the recommended steps to confirm the requirement to conduct an EIA, determine specific study requirements and obtain approval of the EIA document. Typical steps for the completion of an EIA are outlined in Appendix C. However, each EIA is specific to the type of development and the landscape context and therefore will require scoping.

## 2.1 Pre-consultation

Prior to the submission of an application for *development*, the proponent is encouraged to consult with the planning approval authority. Pre-consultation with the planning approval authority is intended to achieve the following:

a) Confirm that the requirement to complete an EIA is triggered by applicable policies as summarized in Section 2.2 (Screening).
b) Begin the process of identifying sources of existing information, the nature of the information required, and the data collection and analysis methods expected to complete an EIA.
c) Establish, typically through preparation of an approved Terms of Reference, all planning approval authority and agency requirements as summarized in Section 2.3 (Scoping).

## 2.2 Screening

Screening is the process by which the planning approval authority/agency reviews a proposal to determine if an EIA is required. To determine if an EIA is required, the planning approval authority will apply the policies summarized in Section 1.1 "When is an EIA required?" including a potential site visit.

For any *Planning Act* approval process, if a natural heritage feature has been significantly altered or removed, consultation with the planning authority and other relevant approval agencies will be required to seek resolution. The following County of Essex Official Plan policy is provided as an example for context:

**7.A.5.1** "Unauthorized removal of a natural heritage feature will not result in a reduction or elimination of constraints on development or site alteration otherwise required by this Plan."

In situations where all or portions of a natural heritage feature have been removed, this policy will be applied and the applicant is required to initiate discussions with the planning approval authority to discuss potential next steps.

## 2.3 Scoping

Scoping is an important step in the EIA process. It refers to the exercise by which the proposed development is evaluated to establish the extent of work required for an EIA study, if any. The scale and scope of the EIA study is dependent on the scale and scope of the proposal, landscape context, its relationship to adjacent land uses, and the type of approvals required, and will generally be determined by the planning approval authority in consultation with the proponent's consultant, other agencies, and the planning approval authority's retained peer review consultant.

The EIA study requirements established in subsequent sections of this guideline will be applied when appropriate as established through the scoping exercise, where a study is warranted. A summary of potential data collection methods and references is provided in Appendix D. The following will be considered on a case-by-case basis and in consultation with the proponent's consultant, and other relevant authorities:

a) The likely significance of the NHS features and functions in the area of the proposed development;
b) The boundary of the area(s) to be included in the EIA;
c) The scale of the development and the magnitude of potential negative impacts;
d) The availability of detailed natural heritage studies and/or other field work reflecting current conditions. This will help to avoid unnecessary duplication of effort where inventories and studies have been completed within the past five years or where studies are currently underway and their completion satisfies the requirements of the EIA process;
e) The presence of areas with special designation, such as ANSI or Environmentally Significant Areas, noting the specific attributes and rationale for the designation;
f) The presence or potential presence of provincially designated SAR and/or their habitat including Endangered, Threatened and Special Concern species listed under the Ontario *Endangered Species Act*, 2007 (ESA). Refer to the current direction provided by the MECP website: https://www.ontario.ca/page/species-risk ;
g) The presence of provincially, regionally and locally rare species listed on the Natural Heritage Information Centre (NHIC) website: https://www.ontario.ca/page/natural-heritage-information-centre. (Consultants can contact the MECP at the following email contact: SAROntario@ontario.ca to obtain direction on whether their development proposal is affected by ESA regulations and requires registration and permit approval.)
h) Where appropriate, the presence of federally designated SAR and their critical habitat, protected under the federal *Species At Risk Act* (SARA), where protection applies (in accordance with the requirements of SARA); https://www.ontario.ca/page/policy-guidance-harm-and-harass-under-endangered-species-act
i) The presence of wetlands, including PSWs, evaluated wetlands and unevaluated wetlands;
j) The presence or potential presence of Significant Wildlife Habitat (as defined by the provincial Significant Wildlife Habitat Technical Guide (MNR, 2000), Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015);
k) The presence of Significant Woodlands and Significant Valleylands (per criteria from the Natural Heritage Reference Manual (MNR, 2010), mapping prepared by ERCA and in the

ERNHSS report;

l) The presence of potential restoration opportunities as identified by the ERNHSS and other associated municipal NHS; and,

m) Specific data collection methods and data analysis protocols required, including the need for a multi-season biophysical inventory.

n) A detailed tree inventory in addition to requirements noted above, particularly in any areas proposed for development. The EIA will need to follow the principle of avoidance followed by minimization of potential impacts to natural heritage features and ecological functions. Any proposed tree removal that is deemed acceptable by the approval authority through a detailed tree inventory and preservation plan will follow guidelines established in the County of Essex Natural Heritage Compensation Guidelines.

During the completion of the EIA, features and/or functions unanticipated during the scoping exercise may be discovered. If this occurs, the proponent should contact the relevant planning approval authority or agency as soon as possible to determine if additional studies may be required.

Based on pre-consultation, scoping and the resulting direction on the required content of the EIA, the planning approval authority will issue the Terms of Reference. At this time the proponent may proceed to undertake the necessary studies. In some cases, season-specific field studies are likely to be required (e.g. amphibian calling or breeding bird surveys). In these instances, and to avoid waiting for the next appropriate study season, the proponent may conduct these studies adhering to accepted field methods prior to receiving final approval of the Terms of Reference.

## 2.4 EIA Report

When all data collection and analysis is completed, an EIA report will be prepared by the proponent in accordance with the approved Terms of Reference and submitted for review. The following are considered to be required components of an EIA submission:

a) Confirmation that the study has been completed in accordance with the approved Terms of Reference included as an appendix;

b) Principal author and all associated field staff contributing to the report and their affiliations, and qualifications of any personnel.

c) A list of all agencies and individuals contacted during report preparation;

d) Digital copy of the EIA;

e) Bibliography of literature cited;

f) All data compiled and collected in approved digital format; ELC mapping is to be provided in digital GIS shapefile format; complete floral inventories are to be submitted utilizing the Southern Ontario Floral Inventory Analysis (SOFIA) Microsoft Excel spreadsheet and all species records are to be submitted to the NHIC in accordance with NHIC data submission standards including a copy to the County of Essex;

g) Digital GIS files used in the preparation of figures showing the natural features and functions, boundary survey, which where appropriate, have been confirmed by a

Municipal or County of Essex staff person or other representative if required;

h) Copies of all field survey data sheets (e.g., ELC);
i) The appropriate review fee, as per the current planning approval authority's council approved User Fee By-law;
j) Documentation of other provincial and/or federal authorizations where required.

Based on a review of the initial EIA submission, the proponent may be required to address comments issued by the relevant planning approval authority, County of Essex and other agencies when applicable (e.g., the MNRF/MECP), and will prepare a final EIA. This may include addenda to the initial EIA and if appropriate a revised development proposal and/or appropriate conditions of approval, which incorporate the final EIA recommendations. The relevant planning approval authority or County of Essex staff will provide a review to the EIA to the proponent, the appropriate municipal staff contact, and, if appropriate, the MNRF/MECP.

# 3.0 CONTENTS OF AN EIA

The following sections provide direction regarding the recommended content of a typical EIA. The actual studies and information required for completion of an EIA will be determined on a case-by-case basis through scoping and establishment of the Terms of Reference.

## 3.1 Introduction

a) Describe briefly the site location, existing land use and the *development* proposed (these are described in detail in subsequent sections);
b) Outline the study area boundary and the rationale for the extent of the study;
c) Identify the reason for conducting the EIA (i.e. the policy or legislative requirement triggering the EIA); and,
d) Refer to and describe the agreed list of scoped issues and tasks based on the established Terms of Reference and reference in an appendix.

## 3.2 Approach

a) Summarize existing information and identify data gaps;
b) Provide a detailed description of all field study and data analysis methods used;
c) Provide date and time (including start and stop time), purpose/target species, weather conditions and personnel involved for all field work conducted;
d) Outline what policy review was undertaken; and,
e) Document (including dates and names) consultations undertaken with agencies and the public (if any).

## 3.3 Biophysical Inventory

Prepare a biophysical inventory which reflects current conditions based on existing information sources and/or field inventory by following the recommended methods and protocols outlined in Appendix D. The biophysical inventory should include all natural heritage areas, features and functions present on-site, present on adjacent lands (within 120 metres of the boundary of the natural heritage feature) and present within areas as defined by the study area(s), determined through scoping of the EIA during pre-consultation. The EIA should clearly distinguish between data used from existing studies from data collected by the proponent. The extent of inventory work required will be based on the Terms of Reference. However, when new information is collected during the inventory process, this may require expansion of the original scope of the EIA. For example, if the inventory determined that there was a high level of wetland indicator species present, therefore an OWES evaluation would be required regardless of whether a wetland evaluation was included in the original Terms of Reference.

The proponent should prepare report figures that clearly and accurately show the location of natural features and natural functions, overlaid on geographically corrected, most up to date aerial photography (orthoimagery) of the subject property. Information compiled on natural features and functions to be overlaid on report figures may include the following:

a) Conservation Authority related information such as the Limit of Regulated Area, 1:100 year floodplain, and hazard lands, etc.;
b) Areas of Natural and Scientific Interest (ANSI);
c) Provincially Significant Wetland, Evaluated Wetlands, Unevaluated Wetlands and Coastal Wetlands;
d) Habitat of species at risk in Ontario including Endangered and Threatened species;
e) Significant Wildlife Habitat, including Special Concern species, and Provincially rare species and vegetation communities, staging areas for seasonal migration of birds, amphibian breeding habitat, etc.;
f) Significant Woodlands;
g) Significant Valleylands;
h) Fish species present and fish habitat including relevant watercourse flow, thermal regime, channel and riparian characteristics;
i) Landforms including, slope features (such as steep slopes, toe of slope, slope crest, etc.), soil type, karst features (such as sink holes, etc.), geological and topographical features (such as terraces, cliffs, outcrops, shorelines, glacial features, etc.) and contour lines;
j) Surface water features and functions including lakes, reservoirs, ponds (natural and dug ponds), catchment areas, seepages, drainage features (such as permanent, seasonal and intermittent streams and rivers, swales, dug drains, etc.), location of culverts and weirs, presence of dams and barriers to fish passage, and riparian wetlands;
k) Geomorphic features such as erosion and deposition areas, abandoned river and stream channels, oxbows, meander belt, bank-full channel widths, etc.); and,
l) Vegetation community types using ELC protocols as well as other smaller vegetation patches, including individual or groups of trees, that are not included in the ELC mapping; all vegetation types are to be categorized to the most recent version of the ELC vegetation community catalogue.

## 3.4 Biophysical Analysis

Complete a biophysical analysis which identifies the significance of natural features and functions present and outlines strategies necessary for their long-term protection and enhancement including recommendations for their inclusion in the NHS in order to sustain natural habitat and native species biodiversity. The biophysical analysis should:

a) Address current policy, guidelines, technical documents and legislation such as:

- Provincial Planning Statement (PPS 2024);
- Natural Heritage Reference Manual Second Edition (NHRM 2010);
- Significant Wildlife Habitat Technical Guide (OMNR 2000); Significant Wildlife Habitat Decision Support System (OMNR 2002); Significant Wildlife Habitat Ecoregion 7E Criteria Schedules (MNRF 2015);
- Ontario Wetland Evaluation System - Southern Manual (MNRF 2014);
- Ontario's *Endangered Species Act* (ESA 2007) and associated regulations, recovery strategies and Government Response Statements; and,
- *Fisheries Act* (R.S.C., 1985);

b) Determine the precise boundaries of natural features in consultation with the relevant planning authority or County of Essex staff. The limit of some features (i.e. wetlands, physical top of bank) may be required to be staked in the field by biologists that are certified wetland evaluators. For other features, agency staff may request site walkthroughs to review the final staked and surveyed boundaries of individual natural features which would then be used in geo-referenced mapping and overlaid on recent orthoimagery (aerial imagery);

c) Use conservation biology principles and review research that provides guidance for the identification and protection of the NHS, including key ecological features and functions, enhancements, linkages and buffers in environments where natural habitat may be impacted by proposed *development*;

d) Evaluate the *cumulative impact* of the proposed *development* on the NHS in the context of existing *development* and likely future *development*; and,

e) Prepare a figure showing constraints to *development* based on the results of a biophysical analysis that establishes the boundary of the NHS and identifies other areas for protection and restoration, buffering and other forms of mitigation, which collectively provide long term protection of natural habitats and native biodiversity. If any loss is proposed to a natural heritage feature resulting from the subject development, the County of Essex Natural Heritage Compensation Guidelines are to be utilized to guide restoration and compensation requirements.

## 3.5 Development Proposal Description

a) In the context of the study area, describe any alternative *development* proposals considered in the refinement of the final proposal (if any), rationale for the final *development* proposal chosen, proposed phasing of *development* (if any), and expected timing of *development*.

b) Provide a preliminary site plan showing the type(s) and location(s) of proposed *development* accurately overlaid on geographically corrected, most recent aerial photography (orthoimagery) of the subject property.

c) Site plans should clearly show proposed setbacks and mitigation measures (such as fencing and buffer areas), including notation that indicates distances from proposed *development* areas and proposed structures to lot lines and/or to environmental features and functions designated for protection.

d) Describe all relevant current and proposed Provincial, and Official Plan and Zoning By-law land use designations, policies and permitted uses affecting the subject property.
e) Describe all other relevant issues (e.g. servicing, stormwater management, municipal drainage, transportation, hazards, and setbacks, etc.) and provide an opinion as to the ability of the *development* proposal to conform to these policies, requirements and guidelines.

## 3.6 Impact Assessment

In regard to environmental impacts, the EIA must meet the intent of the PPS (2024) with regard to no *negative impacts* on significant natural features and *ecological functions*. Where statements such as "no negative impact" are used, these must be qualified with references and/or empirical data. Impact assessment should make recommendations to revise proposed *development* plans if necessary to avoid/minimize environmental impacts to the existing significant natural heritage features and their ecological functions.

An EIA should consider all aspects of the proposed *development*, including issues related to engineering requirements for servicing, storm water management, and transportation etc., and the form, type and density of proposed *development* in regard to proposed land uses. Appendix E provides a list of environmental impacts that should be considered in relation to the proposed *development*.

The EIA should include one or more figures which overlays the proposed *development* on the ecological constraints of the site. The analyses should determine the area(s) and type(s) of natural features and functions that may be directly and indirectly impacted by the proposed *development*. Proposed buffers and/or setbacks which will protect natural features and functions should be clearly shown on figures and the proposed land uses within setbacks, if any, including in-ground utilities, should be specified. The rationale for the proposed setbacks should be clearly outlined, including details on how proposed setbacks will achieve protection of environmental features and functions designated for protection; relevant scientific references should be cited.

Where hydrologically sensitive features (e.g. permanent and intermittent streams, wetlands, seepage areas and springs) may be impacted, a hydrological evaluation should be conducted to determine the pre-development and post-development changes to the water balance to ensure protection of these features through appropriate design of the proposed development including the potential use of low impact development approaches and appropriate stormwater management. It may be appropriate for this study to be completed concurrently with Stormwater Management Plan requirements.

The EIA should provide an explanation of the methods and approaches used to determine expected impacts. Where possible, the EIA should cite scientific literature supporting conclusions drawn regarding impacts. An EIA must evaluate the severity of environmental impacts in the context of the significance and sensitivity of natural features and functions

present by considering:

- Likelihood of occurrence of impact;
- Magnitude of impact;
- Geographic extent of impact;
- Timing and duration of impact;
- Frequency of impact;
- Reversibility of impact; and,
- Cumulative effect of multiple impacts.

## 3.7 Mitigation Strategies

Mitigation strategies are intended to lessen and avoid impacts to the significant natural feature and to increase the long-term protection of the natural heritage system. Mitigation is not intended to compensate for the impact of *development* on one area of the NHS by implementing mitigation measures in another area. Mitigation should be considered in the context of the overall intent of an EIA, which is to propose a *development* approach that both avoids impact to the significant natural feature and identifies areas for long-term protection of natural features and functions.

Describe all feasible mitigation measures and their anticipated effectiveness in maintaining the health, form and function of natural features and in reducing or eliminating potential impacts on the NHS. Wherever possible include figures and diagrams that illustrate proposed mitigation measures and detailed methods that provide direction for implementation. As new strategies and methods for the mitigation of *development* impacts can be expected to continuously emerge, proponents should refer to and cite recent scientific literature that supports proposed mitigation measures. A list of potential mitigation measures is provided in Appendix F; however, this is not to be considered exhaustive or prescriptive.

During the construction phase of site *development* direct impacts can occur as a result of construction activities within and adjacent to areas designated for protection. Indirect environmental impacts to surrounding natural features and functions can also result when mitigation measures for construction activities are not implemented and/or regularly inspected. The EIA should provide a detailed outline of mitigation measures intended to eliminate or reduce construction-related impacts to areas designated for protection including for example:

a) Impacts associated with construction traffic and construction activity including heavy equipment operation, re-fueling, and stockpiling of building materials;
b) Impacts resulting from wind and water erosion of exposed soils, particularly on slopes that are created as a part of site grading and road construction;
c) Impacts that may be associated with the timing of construction and periods of sensitive and/or high biological activity; and,

d) Impacts that may be associated with the construction of temporary or permanent road crossings of waterways.

New urban *development* generally results in more people living in close proximity to natural areas. This usually constitutes a fundamental change from current land uses, which are typically agricultural. Urban *development* generally reduces the ability of wildlife to move among natural features and for plants to disperse to new habitat. The purpose of the NHS is to mitigate this and preserve the existing ability of plants and animals to move throughout the landscape. Associated with new *development* is the potential for new and additional environmental impacts to areas designated for protection. Long term mitigation may include:

a) Appropriate development setbacks, fencing, signage, education pamphlets, restoration areas, etc. for residential development areas to address impacts of urban areas on the NHS such as informal walking and biking trails, dumping of refuse, encroachment, invasive plants, lighting, etc.;
b) Appropriate development setbacks, fencing, building lighting, window film treatments and new types of glass with environmentally friendly spectral qualities for new industrial and commercial development to prevent bird strikes, encroachment, improper storage of materials, noise, lighting, use of signage etc.; and,
c) Landscaping using locally native, non-invasive plant material suitable for the site's conditions in areas of new urban development to reduce invasion of non-native invasive plants within natural areas, and reduce maintenance costs.

Mitigation strategies should also include enhancement of the NHS within the area proposed for *development*. Enhancements should increase the ecological integrity and resilience of existing natural features and functions and in turn contribute to the long-term protection of the NHS. The ERNHSS report and associated policies within respective Official Plans and Environmental Impact Assessments may inform the location and function of restoration and enhancement opportunities. Enhancements may include, for example:

a) Protection and restoration of areas that link or join fragmented natural features to form larger core areas in order to create habitat for area demanding species;
b) Protection and restoration of areas that will reduce the edge–to-interior ratio of natural features and thus decrease the length of the interface between natural areas and areas of *development*;
c) Protection and restoration of areas that will increase the width of ecological corridors;
d) Protection and restoration of water catchment areas for *wetlands*.

The EIA shall provide details with respect to mitigation compliance (i.e., how implementation of mitigation measures is to be accomplished). This should include detailed plans for the period before construction, during construction (e.g. for sediment control, stream crossings, protection of features, etc.) and after construction. In addition, the EIA must include recommendations for conditions of approval which should be included in respective Subdivision or Development Agreement(s) which provide for

effective implementation of the recommended measures. Implementation measures will often include a period of monitoring when restoration or naturalization of an area is required.

## 3.8 Conclusions

Summarize the key findings of the report including biophysical inventory and analysis, assessment of impacts, impact avoidance measures, mitigation measures and opportunities for environmental enhancements. The conclusions should include a final recommendation to approve/not approve the development proposal based on the results of the study, and identify conditions of approval.

# 4.0 COMPENSATION

The purpose of this document was to outline the process and requirements to complete an EIA for Planning Act applications. This document does not specifically address situations where, through a Planning Act or Environmental Assessment Act process, a natural heritage feature has been authorized to be removed. In such cases, it may be appropriate to consider the use of suitable compensation to account for the specific natural heritage values of the feature removed from the landscape. This should only be enabled after the decision to compensate has been made through an established and finalized process. Supportive policies and procedures should be established through respective Official Plans and procedures that reflect the potential for appropriate compensation be used as an option.

An Appendix to this document titled “Natural Heritage Compensation Guideline” has been prepared in consultation with local municipalities and is applicable in accordance to the updated County of Essex Official Plan policies. The guideline will ensure that if and when compensation is applied in the region, it is evaluated in an appropriate fashion and satisfies all relevant local, provincial and federal policies and approaches. Please refer to the Natural Heritage Compensation Guideline located on the County of Essex website: or in Appendix G .

# APPENDIX A: DEFINITIONS

Terms used in this document that are also defined in the Provincial Policy Statement retain the definition used in the PPS– those definitions are followed by 'PPS 2014'.

AGRICULTURAL USES: means the growing of crops, including nursery, biomass, and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures, including, but not limited to livestock facilities, manure storages, value-retaining facilities, and accommodation for full-time farm labour when the size and nature of the operation requires additional employment. PPS 2014

AREA OF NATURAL AND SCIENTIFIC INTEREST (ANSI) means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. PPS 2014.

CONSERVATION AUTHORITY means Essex Region Conservation Authority (ERCA) or Lower Thames Valley Conservation Authority (LTVCA).

CUMULATIVE IMPACT means the effect on the physical, natural, visual and cultural heritage features of the environment resulting from the incremental activities of *development* over a period of time and over an area. All past, present and possible feature activities are to be considered in assessing cumulative impact.

DEVELOPMENT means the creation of a new lot, a change in land use, or the construction of buildings and structures, any of which requires approval under the *Planning Act*, but does not include:

a) activities that create or maintain infrastructure authorized under an environmental assessment process; and,
b) works subject to the *Drainage Act*.

ECOLOGICAL FUNCTION means 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. PPS 2024

ENDANGERED SPECIES means a species that is listed or categorized as an "Endangered Species" on the Ontario Ministry of Natural Resources and Forestry official Species at Risk in Ontario list, as updated and amended from time to time. PPS 2024.

ENVIRONMENTALLY SENSITIVE AREAS means land and water areas within the Essex Region containing natural features or *ecological functions* of such significance as to warrant their protection in the best long term interests of the people and environment of

Essex Region.

EVALUATED WETLAND means a *wetland* that has been evaluated using the criteria outlined in the Ontario Wetland Evaluation System (OWES).

FISH means fish, which as defined in the Fisheries Act, includes fish, shellfish, crustaceans, and marine animals, at all stages of their life cycles. PPS 2014.

FISH HABITAT as defined in the Fisheries Act, means spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. PPS 2014

FLOOD PLAIN for river, stream and small inland lake systems, means the area, usually low lands adjoining a watercourse, which has been or may be subject to flooding hazards. PPS 2024

GROUND WATER FEATURE: means water-related features in the earth's subsurface, including recharge/discharge areas, water tables, aquifers and unsaturated zones that can be defined by surface and subsurface hydrogeologic investigations. PPS 2024.

HYDROLOGIC FUNCTION means the functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things. PPS 2024.

NATURAL HERITAGE FEATURES AND AREAS means features and areas, including significant wetlands, significant coastal wetlands, other coastal wetlands in Ecoregions 5E, 6E and 7E, fish habitat, significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River), habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area. PPS 2024

NATURAL HERITAGE SYSTEM means a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. These systems can include natural heritage features and areas, federal and provincial parks and conservation reserves, other natural heritage features, lands that have been restored or have the potential to be restored to a natural state, areas that support hydrologic functions, and working landscapes that enable ecological functions to continue. The Province has a recommended approach for identifying natural heritage systems, but municipal approaches that achieve or exceed the same objective may also be used. PPS 2024.

NEGATIVE IMPACTS means:

a) in regard to policy 3.6.4 and 3.6.5, potential risks to human health and safety and degradation to the quality and quantity of water, sensitive surface water features and sensitive ground water features, and their related hydrologic functions, due to single, multiple or successive development. Negative impacts should be assessed through environmental studies including hydrogeological or water quality impact assessments, in accordance with provincial standards;
b) in regard to fish habitat, any harmful alteration, disruption or destruction of fish habitat, except where an exemption to the prohibition has been authorized under the Fisheries Act;
c) in regard to other natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities.
d) in regard to policy 4.2, degradation to the quality and quantity of water, sensitive surface water features and sensitive ground water features, and their related hydrologic functions, due to single, multiple or successive development or site alteration activities; and
e) in regard to policy 3.3.3, any development or site alteration that would compromise or conflict with the planned or existing function, capacity to accommodate future needs, and cost of implementation of the corridor.

NORMAL FARM PRACTICE means a practice, as defined in the *Farming and Food Production Protection Act*, 1998, that is conducted in a manner consistent with proper and acceptable customs and standards as established and followed by similar agricultural operations under similar circumstances; or makes use of innovative technology in a manner consistent with proper advanced farm management practices. Normal farm practices shall be consistent with the *Nutrient Management Act*, 2002 and regulations made under that Act. PPS 2014.

SENSITIVE: in regard to *surface water features* and *ground water features*, means areas that are particularly susceptible to impacts from activities or events including, but not limited to, water withdrawals, and additions of pollutants. PPS (2014)

SIGNIFICANT: means
a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources and Forestry using evaluation procedures established by the Province, as amended from time to time;
b) in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources and Forestry;

c) in regard to other features and areas in policy 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system;
d) in regard to mineral potential, an area identified as provincially significant through evaluation procedures developed by the Province, as amended from time to time, such as the Provincially Significant Mineral Potential Index; and,
e) in regard to cultural heritage and archaeology, resources that have been determined to have cultural heritage value or interest for the important contribution they make to our understanding of the history of a place, an event, or a people.

Criteria for determining significance for the resources identified in sections (c)-(e) are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used. While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation.

SITE ALTERATION: means activities, such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site. PPS 2014.

SPECIES OF SPECIAL CONCERN (SC): means a species that is listed or categorized as a "Species of Special Concern" on the Ontario Ministry of Environment Conservation and Parks (MECP) official Species at Risk in Ontario list, as updated and amended from time to time. This is a species with characteristics that make it sensitive to human activities or natural events. Special concern species should be considered for identifying significant wildlife habitat as per policy 4.1.5 (d) of the PPS.

SPECIES AT RISK IN ONTARIO
A "Species at Risk" is any naturally-occurring plant or animal in danger of extinction or of disappearing from the province. Once classified as "at risk", they are added to the Species at Risk in Ontario (SARO) List.

SRANK
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre to set protection priorities for rare species and natural vegetation communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated lists at least annually.

SX Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH Possibly Extirpated (Historical)—Species or vegetation community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered.

Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

Species or vegetation communities that are ranked S1, S2 and/or S3 are considered rare and should be considered for identifying significant wildlife habitat as per policy 2.1.5 (d) of the PPS 2014.

S1 Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 Secure—Common, widespread, and abundant in the nation or state/province. SNR Unranked—Nation or state/province conservation status not yet assessed.
SU Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SURFACE WATER FEATURE means water-related features on the earth's surface, including headwaters, rivers, stream channels, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands, and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics. PPS 2024.

SYSTEMS APPROACH means a comprehensive approach to natural heritage system planning that considers the importance of maintaining and protecting ecological features in the environment (such as *woodlands*, *wetlands* and watercourses) *ecological functions* of

the environment (such as water storage and water quality enhancement by wetlands, winter deer yards provided by cedar *woodlands*, amphibian breeding habitat in ephemeral forest ponds, etc.) and ecological interactions that occur over varying scales of time and space (such as animal predation and herbivory, the daily, seasonal and long term movement patterns of plants and animals, and the role of ecological disturbance mechanisms such as fire, wind, water and disease).

THREATENED SPECIES means a species that is listed or categorized as a "Threatened Species" on the Ontario Ministry of Natural Resources and Forestry official Species at Risk in Ontario list, as updated and amended from time to time. PPS 2024

UNEVALUATED WETLAND means a wetland that has not been evaluated using the criteria outlined in the Ontario Wetland Evaluation System.

WETLANDS means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition. PPS 2024

WILDLIFE HABITAT means areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species. PPS 2024

WOODLAND means treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels. Woodlands may be delineated according to the Forestry Act definition or the Province's Ecological Land Classification system definition for "forest." PPS 2024.

# APPENDIX B: CONTACT INFORMATION FOR CONSULTANTS

The following is a list of environmental consultants (arranged alphabetically by name of consulting firm) who have experience within the Essex Region.

Dave Hayman, M.Sc., *Principal*
**BioLogic - Aquatic and Terrestrial Ecosystem Planners**
110 Riverside Drive, Suite 201
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Phone: (519) 434-1516 ext. 106
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Doug Clark, B. Sc.
*Senior Biologist, Principal*
**EcoTec Environmental Consultants Inc.**
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Anthony G. Goodban, B.Sc., M.E.S. (Pl.), MCIP, RPP
*Consulting Ecologist and Natural Heritage Planner*
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Beverly Saunders, *Senior Land Use Planner*
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Barry Myler
**Myler Ecological Consulting**
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Stoney Creek ON  L8G 2T2
Phone: (289) 700-3038
E-mail:  bmyler@cogeco.ca

Sal Spitale, MES
*Project Manager/Ecologist, ISA Certified Arborist*
**North-South Environmental Inc.**
35 Crawford Crescent, P.O. Box 518, Suite U5
Campbellville ON  L0P 1B0
Phone: (905) 854-1112
Fax: (905) 854-0001
E-mail: sspitale@nsenvironmental.com

Dan Barcza, Hon. B.Sc., *Terrestrial and Restoration Ecologist*
**Sage Earth Environmental and Restoration Services**
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Palgrave ON  LON 1P0
Phone: (519) 200-8146
Cell: (905) 716-8878
Fax: (905) 729-2838
Email: danbarcza@hotmail.com

Dan Stuart, Senior Terrestrial Ecologist
**Azimuth Environmental Consulting Inc.**
642 Welham Road, Barrie, ON, L4N 9A1
Phone: (519) 705-721-8451 x 230
Website: www.azimuthenvironmental.com

**Larger scale:**

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Karl Tanner, *Senior Planner*
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E-mail: lrenzetti@lgl.com

# APPENDIX C: TYPICAL STEPS FOR AN ENVIRONMENTAL IMPACT ASSESSMENT

1) Pre-consultation. Initiate pre-consultation with:
   i) Planning Authority (confirmation that an EIA is required to support an application),
   ii) MECP (ESA process), and
2) Records Review. Conduct a review of the available background information on the subject natural heritage feature from a number of background sources, which may include, but are not limited to County of Essex Geocortex mapping, provincial Geospatial Ontario (former Land Information Ontario LIO), ERNHSS report and available natural heritage inventory reports, and NHIC data inquiry.
3) Pre-consultation with the County of Essex or relevant planning approval authority. Establish contact with the County of Essex or relevant planning approval authority. Staff will review the submitted information and review in conjunction with the municipal planner. A Terms of Reference will be established for the application in consultation with the proponent, and other relevant planning approval authorities and agencies. This Terms of Reference will outline the steps to take for the EIA to be considered complete. The Terms of Reference will outline the scope of the EIA and the associated fee. The Terms of Reference will be sent to the applicant and the municipality and, if SAR concerns are identified, the MECP: SAROntario@ontario.ca .
4) Completion of any required biological inventories.
   i) Field inventories required by the County of Essex, MECP, DFO including but not limited to Ecological Landscape Classification field documentation.
   ii) Mapping must be prepared and provided in digital format (AutoCAD or shapefile).
   iii) Confirmation of submission of rare species records and rare vegetation communities to the NHIC and MECP offices including a copy to the County of Essex.
5) Submission of EIA for review. The EIA submitted must meet all requirements of the Terms of Reference and include the full payment of all EIA review fees. EIA is to be submitted to the County of Essex office and copied to the Municipality.
6) County of Essex review of EIA. The County of Essex will provide formal EIA review correspondence indicating to the municipality if it is the position of the County of Essex or the relevant planning approval authority that the EIA is acceptable and is a satisfactory demonstration of no negative impact, etc. The recommendation of the EIA may be to undertake further work depending on the specific information collected. The EIA review will be provided to the applicant, with a copy provided to the Municipality/County of Essex and the MECP, if species at risk issues are identified under the ESA, 2007.

# APPENDIX D: METHODS AND REFERENCES

The following data sources, inventory protocols and reference manuals provide important direction and detailed methods for field data collection and data analysis necessary for the completion of an EIA.

Note that data collection requirements and protocols may be updated from time to time, and as such, the list provided below may not represent the most recent versions/editions. The proponent is encouraged to contact the County of Essex to ascertain the most current versions.

***General References/Guidelines for all EIA studies***

- Essex Region Natural Heritage System Strategy https://www.countyofessex.ca/en/doing-business/planning-and-development.aspx
- Natural Heritage Information Centre (NHIC) Website (click on species) https://www.ontario.ca/page/get-natural-heritage-information
- 
- Fish Habitat Management Plan http://www.ontario.ca/page/fisheries-management-zones
- The Physiography of Southern Ontario; Ontario. Chapman, L.J. and D.F. Putnam. 1984. Geological Survey, Special Volume 2, 270 pages.
- Ontario Wetland Evaluation System (OWES) for Southern Ontario www.ontario.ca/page/wetlands-evaluation (MNRF, 2014)
- Lee et al. (1998) Ecological Land Classification System for Southern Ontario, Ministry of Natural Resources (MNR) https://www.researchgate.net/publication/248626765_Ecological_Land_Classification_for_Southern_Ontario_First_Approximation_and_Its_Application
- Lee (2008) Ecological Land Classification System for Southern Ontario Vegetation Catalogue, Ministry of Natural Resources (MNR) http://geo1.scholarsportal.info/proxy.html?http:__maps.scholarsportal.info/files/PDFS/public/OGDE/ELC/SOnt_ELC_Ecosystem_Table_Dec_2008.pdf

***Important References for Significant Species/Regulations***

- Federal Species at Risk Act (SARA) 2002; COSEWIC status reports, species *Recovery Strategies*, and Government Response Statements www.sararegistry.gc.ca/sar/index/default_e.cfm
- Provincial Endangered Species Act (ESA) 2007; COSSARO lists, species *Recovery Strategies* and Government Response Statements www.ontario.ca/environment-and-energy/species-risk-ontario-list
- NHIC Database and Rarity Ranking Tables, MNRF (Note: MNRF/MECP offices should be contacted for the most up-to-date information)
- Significant Wildlife Habitat Technical Guide, MNRF, 2000

- Significant Wildlife Habitat Decision Support System, MNRF, 2002
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E, MNRF, 2015
- MNRF Municipal Species at Risk species lists (request from MNRF/MECP)
- MNRF Species at Risk Searchable Library of Resources www.ontario.ca/environment-and-energy/species-risk-guides-and-resources
- Natural Heritage Reference Manual. MNRF, 2010
- Migratory Birds Convention Act (1994) http://laws-lois.justice.gc.ca/eng/acts/m-7.01/
- Fisheries Act (1985) http://laws-lois.justice.gc.ca/eng/acts/f-14/

***Earth Sciences***

- The Physiography of Southern Ontario; Ontario. Chapman, L.J. and D.F. Putnam. 1984. Geological Survey, Special Volume 2, 270 pages.
- Ontario Institute of Pedology 1985 Field Manual to Describing Soils, 3rd ed.
- Soil Survey of Essex County: Report No. 11 of the Ontario Soil Survey. N.R. Richards and A.G. Caldwell and F.F. Morwick, Guelph, Ontario, 1949. http://sis.agr.gc.ca/cansis/publications/surveys/on/on11/index.html

***Flora and Plant Communities***

A survey of vegetation community types should be undertaken during the main growing season, preferably over three seasons (spring, summer and fall), but otherwise during the period late May to July. The County of Essex staff or relevant planning approval authority will advise through the pre-consultation process, the requirements for survey timing based upon the location and the significance of the potentially affected natural heritage feature. Vegetation community descriptions may be qualitative, but should follow the Ecological Land Classification for Southern Ontario (Lee et al., 1998) protocols to Vegetation Community Type (2008 ELC Catalogue). The report should present both a description of the communities and vegetation type polygon mapping superimposed preferably on an air photo or a base map of scale no greater than 1:10,000 that depicts landmarks (roads, watercourses, etc.) and the location of natural heritage features. All vegetation communities that are considered to be provincially rare (S1 to S3) by the MNRF should be highlighted on the mapping.

For each vegetation community type the following technical information should be included:

1. An assessment of soil type(s), drainage regime and moisture regime.
2. An identification of the Ecological Land Classification vegetation type utilizing the 2008 Catalogue.
3. The element ranking (Provincial S-Rank) for each ELC community type identified.
4. Other attributes of the community including condition, disturbance,

diversity, function, and presence of wildlife habitat features (e.g., snags, downed logs, cavity trees, hibernacula, nests, etc.).

***Vascular Plants Survey and Reporting***

As surveyors traverse each vegetation community polygon, a complete list of all vascular plants observed on the entire site should be compiled.

Locations of rare vascular plant species should be mapped and overlaid on an orthophoto base that also includes the ELC vegetation communities and their associated ELC codes. The extent of habitat for each rare species should be outlined. Annotations on the population size, condition, and the significance of the site for the rare species identified should be included in the EIA.

The location of rare floral species populations should be identified as points on mapping. The consultants are required to submit floral inventory data utilizing the Essex County Southern Ontario Floral Inventory Analysis (SOFIA) spreadsheet. The following information must be included in the report regarding floral surveys.

1. Names of surveyors and qualifications;
2. Date of the survey;
3. The global, national, provincial, regional, and local priority ranks for each species;
4. Species observed by scientific name or NHIC code. Reporting should cross-reference each plant species back to the appropriate vegetation communities as through ELC data collection (as outlined above);
5. Population size; and,
6. Geo-referenced digital data should be provided using UTM Zone 17 NAD83 ESRI Native File data (shapefiles).

- Flora Ontario Integrated Botanical Information System (FOIBIS) www.uoguelph.ca/foibis/
- Lebedyk, D. 2018. Southern Ontario Floral Inventory Analysis (SOFIA) https://drive.google.com/file/d/13eTnT-kce2UArLJZOXLLSwkx4bCZovaj/view?usp=sharing
- Lee et al. (1998) Ecological Land Classification System for Southern Ontario, Ministry of Natural Resources (MNR) https://www.researchgate.net/publication/248626765_Ecological_Land_Classification_for_Southern_Ontario_First_Approximation_and_Its_Application
- Lee (2008) Ecological Land Classification System for Southern Ontario Vegetation Catalogue, Ministry of Natural Resources (MNR) http://geo1.scholarsportal.info/proxy.html?http:__maps.scholarsportal.info/files/PDFS/public/OGDE/ELC/SOnt_ELC_Ecosystem_Table_Dec_2008.pdf
- MNRF Make a Map: Natural Heritage Areas https://www.ontario.ca/page/make-natural-heritage-area-map
- Natural Heritage Information Centre (NHIC) https://www.ontario.ca/page/natural-heritage-information-centre
- Oldham, M.J. 2016. Checklist of the Vascular Plants of Ontario's Carolinian Zone

(Draft).

### *Fauna*

For fieldwork undertaken in addition to required monitoring protocols, the methods used for mammals, reptiles, amphibians, odonates (dragonflies and damselflies), butterflies, etc., should describe fieldwork methods used and include date, time, location, weather, crewmembers, and other incidental information such as, transects followed, animal signs (e.g. scat, hair, burrows, nests, etc.).

- MNRF Wildlife Survey Methodology Guidelines
- Ontario Breeding Bird Atlas (Cadman et al. 2007) on-line summaries at www.birdsontario.org/atlas/index.jsp
- Ontario Benthos Bio-monitoring Network protocol https://open.canada.ca/data/en/dataset/d9f565a0-22df-4433-ae10-b27c7f20e6f3
- Ontario Stream Assessment Protocol for fisheries and benthos https://www.ontario.ca/document/ontario-stream-assessment-protocol-2010
- Natural Heritage Information Centre (NHIC) https://www.ontario.ca/page/get-natural-heritage-information
- Ontario Reptile and Amphibian Atlas Program https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/
- The Birds of North America, published by the Cornell Lab of Ornithology https://birdsna.org/Species-Account/bna/home
- Rowell, J.C. 2012. The snakes of Ontario: natural history, distribution, and status. 411 pp.
- Harding, J.H. 2006. Amphibians and reptiles of the Great Lakes region. University of Michigan Press. 378 pp.
- Pfingsten, R.A., J.G. Davis, T.O. Matson, G.J. Lipps, D. Wynn, and B.J. Armitage, eds. 2013. Amphibians of Ohio. Ohio Biological Survey Bulletin 17(1): 899 pp.
- Sandilands, A. 2005. Birds of Ontario: habitat requirements, limiting factors, and status. Volume 1: nonpasserines, waterfowl through cranes. UBC Press. 365 pp.
- Sandilands, A. 2010. Birds of Ontario: habitat requirements, limiting factors, and status. Volume 2: nonpasserines, shorebirds through woodpeckers. UBC Press. 387 pp.
- Toronto Entomologists' Association. 2017. Ontario Butterfly Atlas Online www.ontarioinsects.org/atlas_online.htm

# APPENDIX E: TYPICAL ENVIRONMENTAL IMPACTS

Environmental impacts associated with *development* may be characterized as irreversible, short term, construction related, long-term and cumulative. Impact analysis is to be based on the scientific literature available and should build on successful approaches that ensure long term protection of the NHS based on a *systems approach* in environments undergoing *development*. The second edition of the Natural Heritage Reference Manual (MNR, 2010) Chapter 13 and Table C-1 Addressing Impacts of Development and Site Alteration should also be consulted when considering environmental impacts.

Examples of potential impacts that may be considered include, but are not limited to the following:

- Fragmentation or reduction in the size of the NHS;
- Increase in the perimeter-to-area ratio of features within the NHS;
- Loss of ecological features and supporting functions of agricultural lands adjacent to the NHS;
- Alteration of natural disturbance cycles important to the ecological health and renewal of the NHS, such as flooding, erosion, deposition, disease, and fire, etc.;
- Loss or reduction in functional ecological linkage of the NHS among natural features important for daily, seasonal and/or long term movement patterns of plants and animals;
- Alteration of natural topography that results in impacts to the NHS;
- Ongoing or increased potential for human or domestic animal impacts on the NHS, especially area-sensitive species, ground-nesting birds, small mammals, reptiles and amphibians;
- Alteration of the quantity, quality, timing (hydroperiod) or direction of flow, of surface or groundwater resulting in impacts to the NHS;
- Alteration of the structure, functions or ecological interrelationships of natural habitat that sustains representative community associations or species populations;
- Reductions in the size and diversity of species populations, or the health and reproductive capacity of species;
- Removal of vegetation communities which are structural and/or functional element of the NHS;
- Erosion or compaction of soils, slope failure, or deposition of sediment;
- Increased potential for the introduction of non-native species;
- Occupancy of lands adjacent to the NHS resulting in increased access, pets, night lighting, escape of horticultural plants, noise, dumping of waste, air pollution, water pollution, encroachment, increased presence of humans, etc.; and,
- Harmful Alteration, Disruption or Destruction (HADD) of fish habitat.

In addition, potential impacts associated with aquatic environments may include:

- disruption or prevention of natural sediment transport regime;
- severing the connection of a watercourse from its floodplain;
- impairment or loss of fish passage through a watercourse;
- negative changes to the health, composition, density or type of riparian vegetation;
- negative changes to in-stream structure (e.g. overhanging banks, dynamic banks, hydraulic habitats that have formed over time, sand, gravel, and organic substrates);
- Enclosure of watercourses in underground pipes;
- excavation of on-line ponds or excavation of off-line pond that could be a source of thermal or water quality pollution with respect to surface and/or groundwater resources; and,
- lining of the banks or channel of any watercourse with hard materials.

# APPENDIX F: TYPICAL MITIGATION MEASURES

Mitigation measures are intended to maintain the health, form and function of the natural heritage system and contribute to reducing or eliminating potential short or long-term impacts from development. Examples of mitigation measures may include but are not limited to the following:

- Avoidance of natural features and functions;
- Modifying or redesigning the proposal to reduce or eliminate impacts;
- Dedication or transfer of natural areas to a public body;
- Buffers and/or setbacks adequate to reduce impacts and preserve *ecological functions* along edges of natural features;
- Installation of temporary and permanent exclusion fencing;
- Measures to restore or enhance natural areas, features or functions onsite;
- Salvaging strategies for plants and animals directly impacted by *development*;
- Installation of functional ecopassages for roads;
- Construction timing restrictions to avoid critical periods such as fish spawning, herpetofauna breeding and hibernation periods, or bird breeding and nesting (April 1 to August 31), animal migration and seasons when construction equipment operating on exposed soils is most likely to cause erosion;
- Effective temporary stormwater management and sediment control;
- Innovative infiltration measures suitable for the site such as infiltration trenches, porous pavements, catchment cisterns, etc.;
- Proper collection of groundwater elevation data that will allow proponents to design development in a way that will mitigate groundwater impacts;
- For waterways currently impacted by past alterations wherever possible make every effort to:
    - "daylight" and restore waterways that currently exist in underground pipes;
    - remove existing impoundments within watercourses;
    - rehabilitate hardened creek channels using natural channel design principles and techniques
- On-site permanent stormwater management including green roofs;
- Low impact development techniques;
- Urban design guidelines that consider factors such as window treatments to prevent bird strikes, lighting that does not impact adjacent natural areas, street and lot orientation that provides separation from natural features;
- Comprehensive ecological restoration plans;
- Promotion of stewardship initiatives;
- Detailed tree saving plans developed to maximize tree saving through careful adjustment of final *development* plans;
- Posting securities for environmental damage repair; and,
- Promotion of public awareness methods (e.g., homeowners' guides, signage).