Report to Planning and Environment Committee

To: **Chair and Members**
Planning & Environment Committee

From: **George Kostifas, P.Eng**
Deputy City Manager, Planning and Economic Development

Subject: **Environmental Management Guidelines Update**

Date: **October 18, 2021**

Recommendation

That, on the recommendation of the Director, Planning and Development, the following actions be taken with respect to the Environmental Management Guidelines Update:

(a) That this information report and the Environmental Management Guidelines (2021) attached as Appendix 'D', **BE CIRCULATED** for public review and comment in advance of a Public Participation Meeting to be held at a future date.

Executive Summary

The purpose of the report is to provide Council with final draft Environmental Management Guidelines (EMGs) that are to be circulated for public review in advance of a future public meeting. These EMGs are an update to the existing 2007 version and have been developed with substantial public participation. The EMGs are to be used as a guideline document to implement the policies of The London Plan by setting out in more detail the requirements of environmental studies for development and site alteration.

Linkage to the Corporate Strategic Plan

The preparation of revised Environmental Management Guidelines contributes to implementing the Strategic Plan through the Strengthening our Community and Building a Sustainable City areas of focus. The Guidelines outline measures to protect and enhance waterways, wetlands and natural areas, and to ensure that new development fits within and enhances the surrounding community.

Analysis

1.0 Background

Environmental Management Guidelines (EMGs) are identified by The London Plan as a guideline document that can be adopted by Council to implement the policies of The London Plan by setting out in more detail the requirements of environmental studies for development and site alteration. Environmental studies are used to establish the boundaries of natural features and areas and the ecological functions within them. They also are required prior to the approval of development to assess potential development impacts on the Natural Heritage System and demonstrate that there will be no negative impacts on natural heritage features and areas or their ecological functions.

The current EMGs were adopted by Council in 2007. Since that time, significant changes to the planning framework have occurred including two new Provincial Policy Statements and the approval of The London Plan. This update is intended to improve the EMGs so that they are current with respect to applicable policy and legislation, incorporate the latest best practises and scientific knowledge (as well as create space for available Traditional Knowledge), combine several existing separate guideline

documents (combined under the 2007 Environmental Management Guidelines cover) into one consolidated document for easier use, and provide a clearer understanding of City expectations for the completion of environmental studies.

1.1 Previous Documents/ Reports Pertinent to this Matter

October 5, 2020– Planning and Environment Committee – Draft Environmental Management Guidelines Update

August 26, 2014 – Planning and Environment Committee Report – Environmental Impact Study, Performance Evaluation for the City of London

January, 2007 – City of London – Environmental Management Guidelines

1.2 Planning Context

Provincial Policy Statement
In accordance with Section 3 of the *Planning Act*, all planning decisions shall be consistent with the Provincial Policy Statement.

The Provincial Policy Statement (PPS), 2020, provides policy direction on matters of provincial interest related to land use and development that support the wise use and management of resources, the conservation of biodiversity, and protection of natural heritage resources for their economic, environmental, and social benefits. The PPS requires that "natural features and areas shall be protected for the long term" (s. 2.1.1), and that "the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features" (s. 2.1.2). Additionally, the PPS directs development away from the natural heritage system. The PPS states that development and site alteration shall not be permitted in natural heritage system features "unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions" (s. 2.1.5).

The London Plan
The Environmental policies of the London Plan provide direction for the identification, protection, conservation, enhancement, and management of the Natural Heritage System (policy 1293_1). These policies also establish requirements for identification, delineation, protection and impact mitigation for natural heritage features and areas of the Natural Heritage System (policy 1303_).

To provide direction for the implementation of the policies of the Plan, the City may adopt guidelines documents to provide direction for the implementation of the policies of The London Plan (policy 1712_). EMGs are specifically identified as a guideline document in policy 1719_ that are intended to set out in more detail the requirements of environmental studies for development and site alteration (policy 1423). Environmental studies are how the City establishes the precise boundaries of natural features and areas and are used to assess potential development impacts on the natural heritage system. The EMGs are to be updated as required to reflect changes to provincial policy and technical documents, and to reflect improvements in scientific knowledge (policy 1424_).

1.3 Study Process

Pre-consultation for the EMG update was initiated in August 2019 by sending invitation letters to identified External Resource Groups and First Nations communities to ensure they could participate in shaping the direction of the update by providing initial comments to guide the preparation of the terms of reference. The pre-consultation initiation letter is included as **Appendix A**. This step in not the City's normal practice and indicates the City's efforts to ensure that the preparation of this important Guideline Document included very early participation in the process of updating these guidelines.

External Resource Groups and First Nations were also invited to shape the engagement and consultation process, with the understanding that not all groups have the capacity or desire to be included in the same way. The Terms of Reference for the update to the EMGs is included as **Appendix B**.

Staff initiated the procurement process to select a consultant to assist with the EMGs update process in October 2019 and AECOM was retained in November 2019.

Phase 1: Project Initiation, Background Review and Draft Preparation
Phase 1 began in November 2019. This Phase consisted of AECOM's review of the background information gathered in consultation with the External Resource Groups and First Nation communities during Pre-consultation. Workshops were completed with these groups to identify key concerns and relevant updates. Facilitator-lead workshops with External Resource Groups (ERGs) commenced in January 2020 and continued through February, 2020. Seven meetings were held with nine ERGs, including the Advisory Committee on the Environment, Environmental & Ecological Planning Advisory Committee, The London Development Institute, London Home Builders Association, Nature London, The Urban League of London, Upper Thames River Conservation Authority, Lower Thames Valley Conservation Authority, and Kettle Creek Conservation Authority, with most meetings consisting of multiple groups. In addition, five meetings were held with three First Nation communities including Chippewas of the Thames First Nation, Munsee-Delaware Nation, and Oneida Nation of the Thames during pre-consultation and Phase 1. **Appendix C** outlines the External Resource Groups and First Nations engagement and consultation process, including the dates of meetings and workshops.

Draft EMGs were circulated for review and comment in October 2020. Of the 235 comments received during this first phase of the project, 171 were incorporated, 18 were not incorporated, and 46 were not applicable due to being out of scope or for other reasons.

Phase 2: Draft Review/Completion of Environmental Management Guidelines (2021)
Following the circulation of the draft EMGs, additional meetings were held with each External Resource Group and First Nation community to discuss any comments identified through the review of the draft EMGs. These meetings reviewed and resolved comments where possible and explained previous comment responses as required. Comments received through this process were compiled and addressed as was done in Phase 1. The City and AECOM reviewed the comments and adjusted the EMGs document as appropriate. All feedback received throughout the process was considered, however all comments may not have been incorporated in these guidelines.

Also, on April 15, 2021, the Local Planning Appeal Tribunal (LPAT) issued an Order approving the Environmental policies of The London Plan. This approval included several additions, deletions and modifications to the policies as adopted by City Council and approved by the Ministry of Municipal Affairs and Housing in 2016. Staff have reviewed the approved policies and made further revisions and refinements to the draft EMGs where necessary to provide appropriate direction.

2.0 Environmental Management Guidelines Document

The attached EMG document in **Appendix D** was completed by AECOM and City Staff, with input from the External Resource Groups and First Nations, and reflects in-force municipal and provincial policies, guidance documents, current scientific literature and industry best practices. The document includes seven sections. An introduction describing the policy and consultation scope is followed by six complementary guidelines. In general, these guidelines are ordered to outline the processes sequentially. The sections found within the document include:

1. **Introduction** - Includes the updated policy basis for the guidelines as well as First Nations engagement and consultation requirements.

2. **Preparation of Environmental Studies** – Formerly Section 1.0, this guideline outlines pre-consultation, study scoping and reporting requirements for various environmental studies. An updated Environmental Study Scoping Checklist has been included, taking the place of the previous checklist and Terms of Reference. Updated study requirements for Environmental Assessments, Subject Land Status Reports and Environmental Impact Studies are also included to reflect industry best practice.

3. **Evaluation of Significance and Ecological Function –** This guideline combines portions of Sections 3.0 and 4.0 of the 2007 EMG and includes criteria for assessing the significance of natural heritage features. Significance evaluation is included for woodlands, Environmentally Significant Areas and other London-specific natural heritage assessments including valleylands, Significant Wildlife Habitat and wetlands. These evaluations have been revised to remove criteria that are no longer applicable and to refine London-specific evaluation requirements.

4. **Boundary Delineation** – Formerly Section 3.0, this guideline refines the protocols and requirements for delineating natural heritage features based on current best practice and updates to scientific literature. Updated figures depict the criteria of eight boundary delineation guidelines. Critical function zones have been introduced to assist in delineating wetlands, based on the understanding that ecological function is not limited to the extent of vegetation communities or soil composition.

5. **Buffer Determination** – Maintained from the 2007 EMGs as Section 5.0, this section outlines a consistent approach to establishing buffers for development projects. Mandatory minimums are included based on updated scientific literature quantifying buffer requirements to ensure natural heritage feature function.

6. **Ecological Compensation** – Newly added in the EMGs, this section incorporates updated best practices to attain net environmental benefit when negative impacts cannot be avoided. This revised section outlines the requirements to establish a compensation plan and identifies resources necessary to subsequently implement the plan. The former Section 6.0 – Guide to Plant Selection for Natural Heritage Areas and Buffers has been revised and included in this section for brevity, identifying appropriate resources when selecting plants.

   In accordance with now in-force policies 1334_ and 1342B_ of the London Plan, this section provides guidance on how proponents, in rare and exceptional cases, may establish, plan and execute compensation plans for feature removal. A framework and further guidance for establishing a cash-in-lieu formula will be introduced as a subsequent appendix to the EMGs for PEC and Council consideration in 2022.

7. **Environmental Monitoring –** Newly added in the EMGs, this section outlines the requirements for developing an environmental monitoring plan from project initiation through to post assumption. Guidance on the requirements for pre-construction, construction and post-construction monitoring are included.

As noted, six complementary guidelines have been incorporated into the updated EMGs. These include the Data Collection Standards for Ecological Inventory, Guide to Plant Selection for Natural Heritage Areas and Buffers, Environmentally Significant Areas Identification Evaluation and Boundary Delineation, Determining Setbacks and Ecological Buffers, Evaluation of Ecologically Significant Woodlands, and Preparation and Review of Environmental Impact Studies guideline documents as identified in policy 1719_ of The London Plan.

Next Steps

Comments received to date are identified in **Appendix E.** In accordance with policy 1714_ of The London Plan, before adopting or amending a guideline document, a public meeting is required to provide for public input from interested parties.

The circulation of this information report and attached EMGs in advance of scheduling a public meeting allows the public, External Resource Groups and First Nations Communities more time to review the attached EMGs. Staff are available for an additional meeting with each participant or group to review, and resolve where possible, any further comments that are received. Meetings will be scheduled between November 15 and November 26. A public participation meeting will be held later in 2021 to receive public comment prior to any Council consideration.

Following the Council adoption of the EMG's, a framework and further guidance for establishing a cash-in-lieu formula will be developed and introduced as a subsequent appendix to the EMGs for Council consideration in 2022.

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Recommended by:	**Gregg Barrett, AICP** **Director, Planning and Development**
Submitted by:	**George Kotsifas, P. Eng.** **Deputy City Manager, Planning and Economic Development**

October 8, 2021
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Appendices

Appendix A: Pre-Consultation Initiation and Invitation for the Update to the Environmental Management Guidelines (2007) for the City of London
Appendix B: Terms of Reference for the Environmental Management Guidelines (2007) Update
Appendix C: External Resource Group Engagement / Consultation
Appendix D: Draft Environmental Management Guidelines (AECOM, 2021)
Appendix E: External Resource Group and First Nation Comment Response Table

Appendix A – Pre-Consultation Initiation and Invitation for the Update to the Environmental Management Guidelines (2007) for the City of London

City Planning
206 Dundas Street
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RE: Pre-Consultation Initiation and Invitation for the Update to the Environmental Management Guidelines (2007) for the City of London

The City of London's Environmental Management Guidelines (EMG) provide direction regarding the policies, procedures and requirements for preparing environmental reports and studies that may be required to evaluate planning applications, municipal infrastructure projects, Secondary Plans, Conservation Master Plans, Subject Land Status Reports, Environmental Assessments or Environmental Impact Studies. The EMG update process will consider the recommendations of the EIS Performance Monitoring Study completed in 2014. A link to the Planning and Environment Committee staff report (August 26, 2014), and study can be found here. This review to the EMG is intended to update this document to connect standards and practices to reflect the policies of The London Plan and to align the Guidelines with other City planning initiatives.

The London Plan identifies the purpose of the Guidelines in Policy 1423_:

> The City may prepare environmental management guidelines setting out in more detail the requirements of environmental studies for development and site alteration. Environmental studies are the means by which the City establishes the precise boundaries of natural features and areas and the significant ecological functions within them. They also assess the potential impacts of development and site alteration on the Natural Heritage System and on their adjacent lands, and are required prior to the approval of development to prevent negative impacts on the Natural Heritage System, and to demonstrate that there will be no negative impacts on the natural heritage features and areas or their ecological functions.

The EMG are intended to be tools to implement existing policies and do not replace or supersede such policies. Approved Provincial or procedural policy will not be explored as part of this update. Whenever possible, reference will be made to these approved documents to focus the EMG update scope to London-specific items.

Consultation with external resources (stakeholders and community groups) and First Nations will be completed throughout this update process. This letter inviting groups to engage in the process is intended to initiate the resulting process. The Draft Terms of Reference (ToR) for the update project are attached, and you are encouraged to comment on both the ToR and the existing EMG (approved by Council in 2007) (link, also attached).

Next Steps & Invitation to Participate and Provide Comments:

August 15, 2019, 5:00pm: Presentation on EMG Update Process at the EEPAC Meeting in Committee Room 1 and 2, Second Floor, City Hall.

- We are intending to kick-off this pre-consultation process with a project presentation at EEPAC. All external resources and First Nations receiving this invitation are invited to attend, hear an overview of the project, ask questions and make initial comments related to the ToR. The slides from this presentation will be made available on the City's website.
- Meetings will be established for external resource groups that would prefer this mode of engagement.

September 19, 2019: Deadline to provide comments on the Draft Terms of Reference for the EMG Update and current version of the EMG.

- We are requesting any comments relating to the ToR and initial EMG comments by September 19 so that we can circulate the final ToR for consultant selection on September 27, 2019. In order to assist us in responding to your comments we have included a comment spreadsheet. All comments received will be considered and will help guide the revisions in order to effectively update the EMG. Initial EMG comment responses and a draft of the revised EMG will be circulated for comment in early 2020.

Improving the usability and effectiveness of the City's EMGs will ensure the City's Natural Heritage System is identified, the impacts of development are assessed, and that the identified natural heritage features and functions are protected over the long-term as required by the Provincial Policy Statement and the City's Official Plan.

We are appreciate your feedback on how we can best engage with you throughout this process and are open to scheduling meetings, corresponding via email or holding conference calls as appropriate.

We look forward to working with you on this initiative.

Best Regards,

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Please contact 519-661-CITY (2489) Ext. 2425 or accessibility@london.ca if you need information in an alternate format, or require the assistance of a communication support. Arrangements are made upon request by submitting a customer accommodation request form.

Appendix B – Terms of Reference for the Environmental Management Guidelines (2007) Update

The Corporation of the City of London

Invitation for Informal Quote to Undertake the Consultation and Preparation of the Environmental Management Guidelines (2007) Update for the City of London

1.0 Introduction – Goals and Objectives

Goal

The City of London (herein after referred to as the City) is seeking qualified consultants to design and complete an update to the current version of Environmental Management Guidelines (EMGs). The goal of the project is to update the existing Guideline Document to reflect current best practices, current scientific literature and Traditional Knowledge, and propose new science-based guidelines including Traditional Knowledge (if offered), improved guideline implementation processes, and to align the guideline with the Provincial Policy Statement (2014) and with London's new Official Plan, the London Plan (2016). Consideration should also be given to the draft 2019 Provincial Policy Statement, currently not in force.

> The Provincial Policy Statement (2014) in policy 4.14 and 4.15 encourages municipalities to; "*identify performance indicators for measuring the effectiveness of some or all of the policies. The Province shall monitor their implementation, including reviewing performance indicators concurrent with any review of this Provincial Policy Statement. Municipalities are encouraged to establish performance indicators to monitor the implementation of the policies in their official plans."*
>
> The London Plan states in policy 1423_ "*The City may prepare environmental management guidelines setting out in more detail the requirements of environmental studies for development and site alteration. Environmental studies are the means by which the City establishes the precise boundaries of natural features and areas and the significant ecological functions within them. They also assess the potential impacts of development and site alteration on the Natural Heritage System and on their adjacent lands, and are required prior to the approval of development to prevent negative impacts on the Natural Heritage System, and to demonstrate that there will be no negative impacts on the natural heritage features and areas or their ecological functions."*
>
> Additionally, London Plan policy 1424_ states "*These guidelines shall be updated as required to reflect changes to provincial policy and technical documents and to reflect improvements in scientific knowledge regarding natural features and ecological functions*."

The EMGs provide direction regarding the standards, procedures and requirements for preparing environmental reports and studies that may be required to evaluate planning applications, municipal infrastructure projects, Conservation Master Plans, Secondary Plans, Area Plans, Subject Land Status Reports, Environmental Assessments or Environmental Impact Studies.

Updating the EMGs will ensure that there is a consistent approach in the preparation of environmental studies that may be required to establish boundaries of natural heritage features, assess the potential impacts of development and site alteration on the Natural Heritage System,

and identify protection, mitigation, and compensation measures that may be needed to protect Natural Heritage Features and functions.

Objective
The objective of the study is to undertake a document review and update of the EMGs (2007) to identify relevant implementation processes and science-based reference documents, identify data gaps, and to improve stakeholder usability of the EMGs as a tool that sets out the requirements for the preparation of environmental studies that may be required to implement the London Plan and other approved provincial policies and legislation.

2.0 Background - Current Environmental Management Guidelines

Improving the usability and effectiveness of the City's EMGs for stakeholders and First Nation communities will ensure the City's Natural Heritage System is identified, the impacts of development are assessed, and the identified natural heritage features and functions are protected as required by the Provincial Policy Statement and the City's Official Plan. The EMGs are tools to implement existing policies and do not replace or supersede these policies. Revision of these approved policies will not be considered as part of this update.

The current version of the EMGs was approved by Council in 2007 and is available on the City's website in this link. The EMGs update process will consider the recommendations of the EIS Performance Monitoring Study that included engagement with the London Development Institute (LDI) and Environmental and Ecological Planning Advisory Committee (EEPAC). A link to the Planning and Environment Committee staff report (August 26, 2014), and study can be found here.

3.0 Scope of Work

3.1 Review Background Documents and Best Practices

The consultant will assemble a background review, taking into consideration all relevant background reference documents, and comments received on the current version of the EMGs: This review would include, but not be limited to, the following:

- Provincial Policy Statement (2014)
- Draft Provincial Policy Statement (2019)
- The London Plan (2016) – the City of London's new Official Plan has been Council adopted and approved by the Minister of Municipal Affairs and Housing. More than 80% of the plan is in force and effect. Portions of The London Plan are currently under appeal before the Local Planning Appeal Tribunal (formerly the Ontario Municipal Board), and until those appeals are resolved the previous Official Plan (1989) also remains in effect.
- The City of London Official Plan (1989) – portions of the 1989 Official Plan remain in effect until the appeals process is resolved.
- The City of London (2017). *London Invasive Plant Management Strategy*.
- Ontario Ministry of Natural Resources and Forestry (2010). *Natural Heritage Reference Manual 2nd edition (March 2010).*
- Environment Canada (2013). *How Much Habitat is Enough? Third Edition*. Environment Canada, Toronto, Ontario.
- Ontario Ministry of Natural Resources and Forestry (2015). *Significant Wildlife Habitat Ecoregional Criteria Schedules: Ecoregion 7E.*

- Ontario Ministry of Natural Resources and Forestry (2014). *Significant Wildlife Habitat Mitigation Support Tool.*
- Ontario Ministry of Natural Resources and Forestry (2014). *Significant Wildlife Habitat Mitigation Support Tool Version 2014*. Southern Region Resources Section, Peterborough, Ontario.
- Oldham, M. J., Carolinian Canada and Ontario Ministry of Natural Resources and Forestry (2017). *List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E).*
- Beacon Environmental Ltd. (2014). *Environmental Impact Study (EIS) Performance Evaluation for the City of London.*
- Environmental and Ecological Planning Advisory Committee (EEPAC) (2019). *A Wetland Conservation Strategy for London: A Discussion Paper on Best Practices.* EEPAC, London, Ontario.
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- Categorizing and Protecting Habitat under the Endangered Species Act, Feb 2012, Ontario.
- Forest Edge Management Plan Guidelines, Toronto and Region Conservation Authority, 2004.
- Conservation Halton Ecological Monitoring Protocols, version 1.0, February 2017.
- Ecological Buffer Guideline Review, Beacon Environmental for the Credit Ontario Ministry of Natural Resources and Forestry. 2012. Natural Heritage Assessment Guide for Renewable Energy Projects. Second Edition.
- Gartner Lee Ltd, Harold Thomas Lee. 2001. Ecological Land Classification for Southern Ontario: Training Manual. Ontario Ministry of Natural Resources.
- Upper Thames River Conservation Authority, Dec 2012. 2014. UTRCA's Environmental Planning Policy Document (June, 2006).
- Middlesex Natural Heritage Systems System Study using SWOOP imagery (2014).
- Ontario Ministry of Natural Resources and Forestry. July 2017. A Wetland Conservation Strategy for Ontario, 2017—2030.
- Existing references used in the Current EMG (2007) document.
- Similar guideline documents from other Ontario Municipalities and Conservation Authorities
- Other Secondary Source literature

3.2 Consultation

Consultation with the public, external resource groups (stakeholder and community groups) and First Nations will be completed throughout the update process.

As the EMGs are tools to implement existing policy and do not replace or supersede these policies, the specifics of the EMGs that are included in such policies will not be part of this consultation process.

External Resources

External resource groups that will be included as part of the consultation for this project include:

- Environmental and Ecological Planning Advisory Committee
- Advisory Committee on the Environment
- Upper Thames River Conservation Authority

- Lower Thames Valley Conservation Authority
- Kettle Creek Conservation Authority
- The Urban League of London
- The London Development Institute
- London Home Builders Association
- Nature London

First Nations Consultation

First Nation communities will be invited to engage in all stages of the EMGs update; Pre-consultation, Phase 1 and Phase 2. Pre-consultation will guide the project engagement process and establish the desired on-going consultation with First Nations communities. Community engagement requirements will be included in the revised EMGs at the direction and desire of the communities:

Oneida Nation of the Thames: *Elected Council* - Initial contact is made with Consultation Coordinator, who will coordinate a meeting with the Environment Committee, if required. *Clan Mothers* – Consultation Coordinator will coordinate a meeting, as required.

Chippewas of the Thames First Nation: Initial engagement to begin with Consultation Coordinator, as dictated by Wiindmaagewin Consultation Protocol. Wiindmaagewin will guide the consultation process

- Dialogue with the First Nation and mutual agreement is paramount

To foster consistent inclusion of First Nation communities related to environmental planning and approval initiatives the City of London proposes to develop engagement standards with the communities to include in the EMGs update. These standards could consist of consultation during the initial EIS project stages for development projects that have not involved prior consultation, as typically completed during the EA process. Inclusion throughout the study process and during post construction monitoring as appropriate will also be explored during the EMGs revision in collaboration with the communities.

> The Provincial Policy Statement (2014) in policy 1.2.2; '*Planning authorities are encouraged to coordinate planning matters with Aboriginal communities.*"

First Nations that will be included as part of the consultation for this project include:

- Chippewas of the Thames First Nation
- Munsee-Delaware Nation
- Oneida Nation of the Thames
- Other First Nations if applicable

Pre-consultation: The City of London

Initial project initiation with external resources and First Nations will be undertaken by the City of London to establish a clear engagement process.

A presentation at EEPAC will be completed by City staff during this stage to introduce the project and consultation process. All external resources and First Nations will be invited to attend this project initiation presentation and engage in the process from the outset.

The City of London will circulate the ToR to the external resource groups and First Nations for comment. Comments from this initial consultation stage will be considered in the revision of the ToR prior to retaining a consultant and will guide the consultation process throughout.

Phase 1: Project Initiation, Background Review and Draft Preparation

Phase 1 will begin with a project kickoff meeting between the consultant and the City of London. The consultant will be responsible for circulating meeting minutes.

Comments on the existing EMGs document and how this policy tool can be improved or revised will be invited and gathered during this initial stage. Given the potential for a high volume of responses, an excel spreadsheet matrix will be circulated to organize comments. Responses will be completed in subsequent project phases. These initial comments will be considered in the revision of the Terms of Reference and circulated to the retained consultant during Phase 1 of the project.

The City of London will circulate the comments gathered during the Pre-consultation Phase to the retained consultant as part of the background review. Comments will be addressed within the spreadsheet and circulated to the external resource groups and First Nations. Consolidated comments will be circulated to all engaged external resource groups and First Nations.

The consultant will be responsible for up to two meetings per external resource group or First Nation during Phase 1 of the consultation process. The consultant will be responsible for meeting minutes.

Based on the review of the background materials identified in Section 3.1 and in consultation with the City of London's Ecologist Planners, the consultant will complete the first revision of the EMGs, considering the initial comments provided by external resource groups and First Nations on suggested EMGs revisions.

A presentation at EEPAC will be completed by the consultant during this stage to present the initial draft of the revised EMGs. All external resource groups and First Nations will be invited to attend the EEPAC presentation and engage in the process. The revised EMGs document will be circulated to all external resource groups and First Nations in coordination with this presentation for review and comment.

Phase 2: Draft Review, Comment Resolution

The consultant will be responsible for up to two meetings per external resource group and First Nation during Phase 2 of the consultation process. These meetings will work to review and resolve comments provided by the external resource groups and First Nations and explain comment responses. The retained consultant will be responsible for circulating meeting minutes to the City of London and the involved external resource groups and First Nations for the meetings. The consultant will accept one round of comments from all external resource groups and First Nations within the EMGs comment spreadsheet in response to the draft EMGs.

Based on comment resolution completed within the EMGs comment spreadsheet and during the external resource groups and First Nations meetings, the consultant will revise the EMGs draft. The City of London and consultant will resolve any outstanding comments and finalize the EMGs

document for presentation at EEPAC and Planning and Environment Committee (PEC). The consultant will be responsible for presenting to EEPAC and PEC.

All external resource group and First Nation feedback will be considered throughout the process, however, all comments may not be incorporated in the final draft recommended to Council.

3.3 Revise the Environmental Management Guidelines

Specific updates will be completed as required based upon the review of current best practices, background documents, including scientific literature and Traditional Knowledge, and comments received. This update will confirm and update the existing EMGs sections, assessing if those sections are necessary and if any additional sections or deletions are warranted.

1. **Guidelines for the Preparation and Review of Environmental Impact Statements (EIS)**
2. **Data Collection Standards for Ecological Inventory**
3. **Guideline Documents for Environmentally Significant Areas Identification, Evaluation and Boundary Delineation**
4. **Guideline Document for the Evaluation of Ecologically Significant Woodlands**
5. **Guidelines for Determining Setbacks and Ecological Buffers**
6. **Guide to Plant Selection for Natural Heritage Areas and Buffers**

4.0 Summary of Deliverables

The process to update the EMGs for the City of London will include:

1. Development of updated draft EMGs and a "final" EMGs in consultation with the Ecologist Planners, external resource groups and First Nations based on municipal, provincial and federal policies. Use of secondary sources where appropriate to develop robust policies and procedures that foster the identification, protection and restoration of the Natural Heritage System in the City of London.
2. Responses to written comments.
3. Minutes of all meetings.
4. Attend, present (prepare slideshow) and answer questions on the updated EMGs at an EEPAC meeting
5. Attend, present (prepare slideshow) and answer questions on the updated EMGs to London City Council at a future Planning and Environment Committee Meeting.

5.0 Timeline

Pre-consultation *(August 1 – November 15, 2019)***:**

August 1, 2019 – Circulate Terms of Reference, EMGs initial comment matrix and EEPAC presentation invitation to external resource groups and First Nations
August 15, 2019 – City of London project initiation presentation at EEPAC
September 19, 2019 – External resource groups and First Nations response deadline for ToR and comments on the 2007 version of the EMGs
September 27, 2019 – City of London to revise the ToR for bid circulation

***October 11, 2019* – ToR circulated and invitation to bid sent out**
November 4, 2019 – **Deadline for Bid Submission**
November 15, 2019 – **Project Award to Successful Bidder**

Phase 1 – Background Review and Draft Development *(November 29, 2019 – May 21, 2020)*:

November 29, 2019 – Kick-off Meeting between successful bidder and the City of London
December 6, 2019 – Begin engaging external resource groups and First Nations (via email with up to two meetings per group)
December 20, 2019 – Background review and address initial EMGs comments. Circulate consolidated comments to engaged external resource groups and First Nations
***April 16, 2020* – EEPAC presentation and circulation of the updated Draft EMGs for comment**
May 21, 2020 – Deadline to receive comments on the Draft EMGs from external resource groups and First Nations

Phase 2 – Draft Revision and Planning and Environment Committee Presentation *(June 1 – July 27, 2020)*:

June 1, 2020 – Begin external resource group consultation on the Draft EMGs (up to two per group)
July 10, 2020 – Final Version of Revised EMGs circulated
July 27, 2020 – Consultant Presentation of Final EMGs at Planning and Environment Committee

Appendix C – External Resource Group Engagement / Consultation

EMG External Resource Group Engagement

The City's EMGs update process has provided a level of consultation that exceeds what is typically undertaken for updating guideline documents. The multi-phase, process has included presentations to Advisory Committees of Council, presentations to local community groups and collection of information from the External Resource Groups (ERGs) and First Nation Communities.

The ERGs and First Nations included representatives and alternates from each group and was facilitated by staff and AECOM. The ERGs and First Nations commented on the production of the Terms of Reference (ToR) and on the EMGs draft formation. A table outlining the EMG update process including the meetings with EMGs is outlined in **Table 1,** below.

External Resource Groups

Council Advisory and other community groups were invited to provide members to comment throughout the EMGs update and include:

- Advisory Committee on the Environment (ACE)
- Environmental & Ecological Planning Advisory Committee (EEPAC)
- The London Development Institute (LDI)
- London Home Builders Association (LHBA)
- Nature London (NL)
- The Urban League of London (UL)

Conservation Authorities:

- Upper Thames River Conservation Authority (UTRCA)
- Lower Thames Valley Conservation Authority (LTVCA)
- Kettle Creek Conservation Authority (KCCA)

First Nation Communities:

- Chippewas of the Thames First Nation (COTTFN)
- Munsee-Delaware Nation (MDN)
- Oneida Nation of the Thames (ONOTT)

Presentation of the EMGs Update at EEPAC

The project was initiated at EEPAC on August 15, 2019 with a presentation discussing the project and associated ToR.

The received feedback from ERGs and First Nations helped to guide the following:

- Development of the ToR
- Consultation objectives and preferences
- Priorities for the technical update
- Draft EMGs

Feedback was obtained through the circulation of a comment response table to ERG members to ensure comments and their corresponding responses were recorded for increased transparency.

ERGs and First Nations Comments and Responses

ERGs and First Nations completed pre-consultation in October 2019 and have submitted comments on how the EMG (2007) co be improved or revised. The review and compilation of comments was not done quantitatively or statistically as there were no limits on how many comments group members could include. The comments received during the engagement process from the ERGs to date were used to identify items for consideration in the EMGs.

Detailed, written responses to the ERGs and First Nations comments on the 2007 EMGs and the 2020 Phase I draft are included in **Appendix D**.

Workshop and External Resource Group Meetings

During Pre-consultation and Phase 1, 12 meetings were conducted with ERGs and First Nations members. These meetings utilized a facilitator to:

a) better understand the issues, concerns and value of the EMGs from each ERG perspective;
b) gather further insight and ideas about how to integrate ERG priority comments and suggestions and,
c) identify additional important comments for consideration.

During Phase 2, nine additional meetings were held, bringing the consultation total on this project to 21. Meeting were facilitated by AECOM and provided an opportunity for groups to explain and receive clarification on their comments and for Staff to hear the balance of questions, concerns and rationale for various suggestions and viewpoints.

Table 1. Outline of Steps Taken in the EMGs Update Process

Date	EMGs Update Process
Pre-consultation	
August 8, 2019	Invitations sent to ERGs and First Nations stakeholders to attend the Project Initiation Presentation at EEPAC. Draft ToR circulated
August 15, 2019	Project Initiation Presentation at EEPAC of Draft ToR to discuss the initial scope and request feedback and comments on the group's consultation and engagement preferences **Pre-consultation - launched**

Date	EMGs Update Process
August 22, 2019	Meeting with COTTFN
September 10, 2019	Meeting with the LDI
September 17, 2019	Meeting with ONOTT
October 10, 2019	Finalized ToR Circulated to Procurement
October 2019	Collection of EMGs (2007) comments
November 2019	Procurement finalized and AECOM retained **Phase 1 - launched**
Phase 1	
November 2019 – December 2019	Project Kickoff and background review of ERG Pre-consultation comments Workshop design development
January 6, 2020	ACE | EEPAC – Workshop with AECOM facilitator (Meeting 1)
January 8, 2020	COTTFN | ONOTT – Workshop with AECOM facilitator (Meeting 1) **MDN was invited to this workshop but a representative was unable to attend*
January 8, 2020	LDI | LHBA - Workshop with AECOM facilitator (Meeting 1)
January 13, 2020	UTRCA | LTVCA | KCCA - Workshop with AECOM facilitator (Meeting 1)
January 13, 2020	NL | UL - Workshop with AECOM facilitator (Meeting 1)
January 13, 2020	ACE | EEPAC – Workshop with AECOM facilitator (Meeting 2)
February 24, 2020	COTTFN (Meeting 2)
March 2, 2020	MDN (Meeting 1)
March 2020 – July 2020	AECOM Draft Production
August – September 2020	Staff Review and Revision

Date	EMGs Update Process
October 5, 2020	Planning and Environment Committee draft EMGs presentation and comment response circulation **Phase 2 - launched**
Phase 2	
November 13, 2020	Phase 1 Draft Comment Deadline
December 1, 2020	LDI (Meeting 3)
December 8, 2020	EEPAC/ Nature London /Urban League (Meeting 3)
December 9, 2020	COTTFN (Meeting 3)
December 10, 2020	UTRCA (Meeting 2)
December 15, 2020	LDI (Meeting 4)
December 15, 2020	UTRCA (Meeting 3)
February 2, 2021	MDN (Meeting 2)
February 3, 2021	COTTFN (Meeting 4)
February 16, 2021	ONOTT – Presentation to Environmental Council (Meeting 2)
April 15, 2021	London Plan Natural Heritage policies approved through decision of the Local Planning Appeal Tribunal
February – May 2021	AECOM Draft Production
May – August 2021	Staff Review and Revision
October 18, 2021	Planning and Environment Committee draft EMGs presentation and comment response circulation. *Additional time provided given substantive changes necessary to incorporate approved London Plan policies*
Next Steps	
November 12, 2021	Comment Deadline
November 15 – 26, 2021	Final Meeting Opportunities for external resource groups.

Date	EMGs Update Process
	Planning and Environment Committee EMGs Public Participation Meeting, presentation, and recommendation to Council.

Appendix D – Draft Environmental Management Guidelines (AECOM, 2021)

London
CANADA

City of London

Environmental Management Guidelines (2021)

Phase 2 - DRAFT FOR REVIEW

June, 2021

AECOM Imagine it. Delivered.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Acronyms and Abbreviations

ANSI .....Areas of Natural and Scientific Interest
CFZ.....Critical Function Zone
COSEWIC.....Committee on the Status of Endangered Wildlife in Canada
COSSARO .....Committee on the Status of Species at Risk in Ontario
COTTFN .....Chippewas of the Thames First Nation
EA.....Environmental Assessment
EEPAC.....Environmental and Ecological Planning Advisory Committee
ELC.....Ecological Land Classification
ESSC.....Environmental Study Scoping Checklist
EIS.....Environmental Impact Study
EMG.....Environmental Management Guidelines
ER.....Environmental Review
ESA.....Environmentally Significant Areas
GIS.....Geographic Information System
IPR.....Initial Proposal Report
LIO.....Land Information Ontario
MBCA.....Migratory Bird Convention Act
MCC.....Mean Coefficient of Conservatism
MDN.....Munsee-Delaware Nation
MECP.....Ministry of Environment, Conservation and Parks
MNRF.....Ministry of Natural Resources and Forestry
NHS .....Natural Heritage System
Oneida .....Oneida Nation of the Thames
OWES.....Ontario Wetland Evaluation System
PSW.....Provincially Significant Wetlands
SAR .....Species At Risk
SWH .....Significant Wildlife Habitat
SLSR .....Subject Land Status Report
TRT.....Technical Review Team

Please note these Environmental Management Guidelines (2021) incorporate updates to and supersede the former Environmental Management Guidelines (2007) in accordance with ***The London Plan*** (Policies 1432_ and 1424_). The specific locations and cross-references to the updated guidelines are summarized below.

Former Natural Heritage System Guideline (as listed in The London Plan Policy 1719)	**Superseded by the Section in these Environmental Management Guidelines (2021) (as listed below)**	**The London Plan Policy Cross-Reference**
4. Guide to Plant Selection for Natural Heritage Areas and Buffers	Key guidance included in Section 5 Determining Ecological Buffers.	1719_
5. Guideline Documents for Environmentally Significant Areas Identification, Evaluation and Boundary Delineation	Section 3 Evaluation of Significance and Ecological Function, Section 3.2 Environmentally Significant Areas (ESAs)	1367_, 1369_, 1719_
6. Guidelines for Determining Setbacks and Ecological Buffers	Section 5 Determining Ecological Buffers	1350_, 1414_, 1719_
7. Guidelines for the Evaluation of Ecologically Significant Woodlands	Section 3 Evaluation of Significance and Ecological Function, Section 3.1 Significant Woodlands and Woodlands	1340_, 1342_, 1719_
8. Guidelines for the Preparation and Review of Environmental Impact Studies	Section 2 Preparation of Environmental Studies, Section 2.6 Environmental Impact Studies	1413_, 1719_

Special thanks to Margot Ursic of Grounded Solutions Services Ltd. for her input into this guidance document.

1. Introduction

The following Environmental Management Guidelines (EMGs) are intended to provide technical guidance in implementing policies of ***The London Plan*** (2016a; hereafter ***The London Plan***) as they relate to the identification, delineation and protection of the natural heritage features and areas that form the City of London's Natural Heritage System (NHS). The Natural Heritage policies of ***The London Plan*** provide direction for the identification and protection of natural heritage features and areas and the ecological functions, processes, and linkages that they provide over the long term. These guidelines are aligned with federal and provincial policies, provincial and municipal planning processes, relevant data sources, current scientific knowledge and best management practices. As an integral part of the environmental planning process, these guidelines also include the provisions for stakeholder and First Nations engagement and consultation.

The City of London has prepared these EMGs for the effective, consistent, and streamlined implementation of policies and legislation related to the protection of the NHS. The preparation of these guidelines included consultation with external resource groups (including local nature groups, development organizations, conservation authorities, the Environmental and Ecological Planning Advisory Committee (EEPAC) and the First Nations communities within close proximity to the City of London, to include a wide range of knowledge-bases and perspectives.

Although these guidelines provide a framework for implementing policies related to the NHS, it remains the responsibility of the proponent to review the applicable policies and regulations, and be familiar with the current and relevant scientific and technical literature to ensure the most up-to-date information is used throughout the process.

This document replaces the previous Environmental Management Guidelines (2007).

1.1 The London Plan

The London Plan identifies these EMGs as a source of technical guidance to facilitate in the implementation of its Natural Heritage policies. These policies are based on the *Provincial Policy Statement* which represents minimum standards. "*Within the framework of the provincial policy-led planning system, planning authorities and decision-makers may go beyond these minimum standards to address matters of importance to a specific community, unless doing so would conflict with any policy of the Provincial Policy Statement* (MMAH, 2020). The requirement for the preparation and up-date of these guidelines is outlined in ***The London Plan***:

"These guidelines shall be updated as required to reflect changes to provincial policy and technical documents and to reflect
improvements in scientific knowledge regarding natural features and ecological functions" (Policy 1424).

These EMGs also identify related requirements from other policies and legislation (e.g., *Provincial Policy Statement*, *Endangered Species Act*, etc.) that must be considered, where appropriate. Additional related requirements and/or studies may be required as part of the approvals process under provincial, federal, or conservation authority's jurisdiction (e.g., Overall Benefits Permits for Species at Risk, additional hydrogeological studies under the *Conservation Authorities Act*, etc.) which will be idenfied by those agencies through the approvals process.

1.2 First Nations Engagement & Consultation

The City of London recognizes the importance of creating a working relationship with neighbouring First Nations communities and exploring opportunities for collaboration on common objectives, and has incorporated feedback from the following First Nation communities in to the EMG update process:

- Chippewas of the Thames First Nation (COTTFN);
- Munsee-Delaware Nation (MDN); and,
- Oneida Nation of the Thames (Oneida).

Early engagement and consultation with local First Nation communities within the vicinity of the Thames River provides important insight, and information, and is critical in protecting the NHS within and beyond the City of London's boundaries. Consultation is based on whether a proposed development will have a direct or indirect effect on the Thames River. COTTFN, MDN and Oneida have a deeply spiritual, cultural and practical reliance on the river that flows downstream of the City of London, through their communities. Early engagement and consultation will allow the communities sufficient time to assess, conduct early consultation with their respective advisory committees, and Chiefs and Councils (if required) and formulate a response back to the developer. Proponents are expected to plan and budget for First Nation engagement and consultation. It is expected that the applicable consultation protocols will be followed for each of the First Nations being engaged.

The following subsections, provided by each of the respective First Nations, outlines the background and distinctiveness of each Nation and provides links to information about how they can and should be contacted for engagement.

1.2.1 Chippewas of the Thames First Nation

Chippewas of the Thames First Nation (COTTFN) is an Anishinabek community also known as Deshkan Ziibiing (At/On/In Antlered [Thames] River in the Ojibway language). Their community is approximately 10,800 acres in size, and is located southwest of London, Ontario. There are roughly 3000 members, with nearly 1000 members living on-reserve. Their people and ancestors have lived and travelled throughout Turtle Island (North America) for countless generations. Traditions of hunting, fishing, and storytelling endure to this day, and will be passed on for countless generations to come.

COTTFN has developed its own consultation protocol called Wiindmaagewin (to talk through) — a document and a process that will guide the development of positive working relationships. The background to the consultation process, along with Wiindmaagewin can be reviewed at the following link: https://www.cottfn.com/consultation/.

1.2.2 Munsee-Delaware Nation

The traditional lands of the Munsee speaking peoples covered an area in what is now the United States, from the mouth of the Delaware River up to its source, then east to the Hudson River and then south to its mouth and including Manhattan and Staten Islands. Their language is one of the oldest of the Algonkian languages and is acknowledged by the Algonkian speaking peoples as Grandfather.

The ancestors of Munsee-Delaware Nation (MDN) moved to their present location in 1783 based on a promise from the Crown for land lost in the United States. MDN has developed its own policy for "receiving free, prior and informed consent from Munsee-Delaware Nation" outlined in the Munsee-Delaware First Nation Consultation and Accommodation Policy. General and contact information for MDN can be found at their website: http://munseedelaware.squarespace.com/.

1.2.3 Oneida Nation of the Thames

Established in 1840 as the 'Oneida Settlement', the Oneida people are known within the Iroquois Confederacy as Onyota'a:ka (People of the Standing Stone). Much like their ancestors, the Oneida peoples of today, maintain a deeply rooted connection to the land and to their Iroquois culture and traditions.

The Oneida Nation of the Thames (Oneida) is home to 2,172 residents and has a total membership of 6,270. Located in picturesque southwestern Ontario, the Oneida Nation Settlement borders lush and fertile agricultural lands and is nestled along the eastern shore of the Thames River 30 kilometres south of the City of London. General and contact information for the Oneida Nation can be found at their website: https://oneida.on.ca/

1.3 Guideline Document Organization

The Environmental Management Guidelines document is comprised of the following six separate, but complementary guidelines:

2. Preparation of Environmental Studies (superceded by *1.0 Guidelines for the Preparation and Review of Environmental Impact Statements (EIS)*);
3. Evaluation of Significance and Ecological Function (superceded by *2.0 Data Collection Standards for Ecological Inventory* and *4.0 Guidelines for the Evaluation of Ecologically Significant Woodlands*);
4. Boundary Delineation (superceded by *3.0 Guideline Documents for Environmentally Significant Areas Identification, Evaluation and Boundary Delineation*);
5. Buffer Determination (superceded by *5.0 Guidelines for Determining Setbacks and Ecological Buffers*);
6. Ecological Compensation; and,
7. Environmental Monitoring.

In general, these guidelines are organized in chronological order in which they are intended to be undertaken. However, there is considerable reference between and among sections to ensure that the processes are being completed efficiently and effectively. It is important to consider information from all of the guidelines outlined in this document, as well as external sources of information, as applicable.

2. Preparation of Environmental Studies

2.1 Preconsultation & Determination of Required Studies

The London Plan identifies various studies that may be required to ensure the protection of the City's NHS. The determination of the type of studies, plans and reports that are needed to support an application for development, or site alteration project requires pre-consultation with the City of London and conformance with these Environmental Management Guidelines (EMGs). In cases where the proponent or applicant is a party other than the City pre-consultation will involve the preparation of the study Terms of Reference (ToR) by the proponent/applicant through engagement with City staff, including the Ecologist Planner.

The City of London's Development Application Approval Process includes mandatory pre-consultation through the submission of an Initial Proposal Report (IPR) followed by a Proposal Review Meeting. A depiction of the Environmental and Development / Infrastructure Process Timeline including where IPR stage occurs in the process can be found in **Appendix A**.

One of the key components of the Proposal Review Meeting is the identification of the studies required for a complete application. The information and level of detail required for the IPR submission is outlined in the City of London's Initial Proposal Report Guidelines (2008) as updated from time to time.

An environmental study will often be coordinated with, and draw on information from, other inter-related technical studies that may or may not include: hydrogeological, hydrological/stormwater management, geotechnical, noise and vibration, air quality, etc.

2.2 Environmental Study Scoping

Following the determination of the type of environmental study required, scoping of the study requirements must be completed. Study scoping ensures that the proponent, the City of London, relevant agencies, and the applicable City Advisory Committees agree to the required investigations, assessments and documentation.

Environmental study scoping shall include the following:

- **Preconsultation** to determine the type of study required
- Completion of the **Environmental Study Scoping Checklist (ESSC) (See Appendix B)**
- An environmental study **scoping meeting**
- **Finalizing the environmental study scope** and ESSC Checlist**.**

The following outlines the general requirements for Environmental Study Scoping.

2.2.1 Environmental Study Scoping Checklist (EESC) / Terms of Reference

The completion of the ESSC is the first step in determining the scope of the environmental study, whether it is the Natural Environment component of an Environmental Assessment (EA) for an infrastructure project, Subject Land Status Report (SLSR) or an Environmental Impact Study (EIS) for a land development application. The ESSC constitutes the Terms of Reference (ToR) for the study and is referred to as the ESSC hereafter.

The proponent and/or their consultant is required to complete the ESSC as a draft for submission to the City of London.

Appendix B provides a template for the ESSC.

2.2.2 SLSR and EIS Study Scoping Meeting

The proponent for an environmental study must prepare and submit an environmental study scoping letter that that includes a brief summary of the project, identifies the study area, provides the draft ESSC and a request to the City of London to convene an environmental study scoping meeting (scoping meeting)The environmental study scoping letter should be circulated to the Technical Review Team (TRT) prior to the scoping meeting. The intent of the scoping meeting is to review, discuss and agree to the ESSC for the environmental study to the satisfaction of the City.

The scoping meeting should be held with the proponent and the Technical Review Team (TRT). Typically the TRT will include a City Ecologist Planner and the City's Planner or Project Manager for the file, a representative from the local conservation authority, a representative from the City's applicable City Advisory Committees , and, where applicable, a First Nations community representative. Other TRT members may include representatives from the Ministry of Natural Resources and Forestry (MNRF), the Ministry of Environment, Conservation and Parks (MECP), or other agencies.

During the scoping meeting the attendees will discuss comments and review the draft ESSC. The limits of the study area, the scope of the study investigations, the required evaluations and assessments, considerations for avoidance, mitigation and compensation, and required documentation and coordination with other studies/ disciplines, where required, shall be discussed and agreed to. The TRT is to provide comments on the draft ESSC.

The City of London may request a site visit, including TRT members, as part of the scoping process if it is determined that a site visit would inform the study scoping.

2.2.3 ESSC Approval

Once all comments regarding the draft ESSC have been received by the proponent, the ESSC shall be finalized and sent to the City of London for approval. The City of London will then send written (e-mail or letter) approval and finalized copy of the ESSC to the proponent and the scoping meeting attendees.

The final ESSC will form the basis for the Environmental Study scope. The proponent and their consultant(s) may then proceed to conduct the required investigations.

In cases where field investigations are time-sensitive, the proponent may choose to initiate investigations prior to finalization of the ESSC. However, conducting investigations prior to ESSC finalization is done at the proponent's risk should the investigations conducted not meet the finalized ESSC requirements.

2.3 Background Information Review & Field Investigations

While the level of effort required to undertake a SLSR and/or EIS may vary significantly in level of effort and detail, they both required a background information review and field investigations.

A comprehensive background review of existing reports, atlases, information centers, databases, etc. is an important first step in establishing an understanding of the environmental conditions of a project site. Agency, First Nations, stakeholder and environmental organization consultation and / or engagement is an integral part of the background review and should include information requests for the study. Further details regarding background review requirements are provided in the City of London's **Data Collection Standards** found in **Appendix C.**

In some cases, field investigations may not be required if recent investigations have been completed to an appropriate level of detail (as outlined in the City of London's **Data Collection Standards** found in **Appendix C**), or if there are no natural heritage features within or adjacent to the study area. In such cases a site visit to confirm the absence of features and other conditions requiring assessment should be completed. Further details regarding field investigation requirements are provided in the City of London's **Data Collection Standards** found in **Appendix C**.

2.4 Subject Lands Status Reports (SLSR)

Consistent with ***The London Plan*** policies 1425 to 1428, a SLSR shall provide an assessment of natural features and areas on the subject lands including, but not limited to:

- those areas included in the Green Space or Environmental Review (ER) Place Types on Map 1 (***The London Plan***)
- a component of the NHS identified or delineated on Map 5 (***The London Plan***), or,
- an unmapped feature identified through the scoping process.

The objective is to inventory, evaluate, assess the significance of, delineate boundaries of, and make recommendations for an appropriate land use designation of the natural heritage features and functions in question.

An SLSR must be scoped with the City and in consultation with relevant agencies. The SLSR shall address all of the items identified in the final site-specific ESSC.

Notably, the matters to be addressed in a SLSR may be addressed as part of the EIS. In these cases, a Draft EIS that addresses these items is to be submitted for review and confirmed by the City, in consultation with relevant agencies, prior to completing the balance of the EIS.

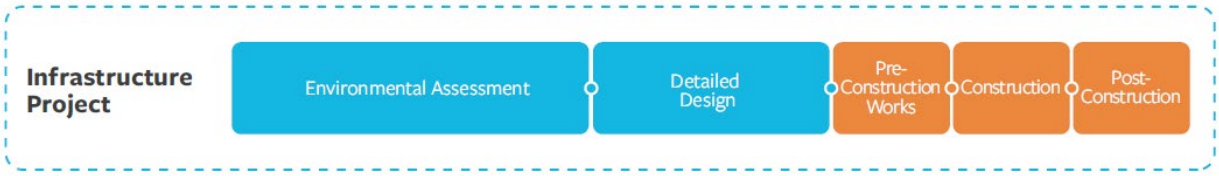
2.5 Environmental Assessment for Infrastructure Projects

As per policies set out in ***The London Plan***, new infrastructure should generally not be located within the NHS, butnew or infrastructure upgrades / expansions may be permitted within the NHS where it is clearly demonstrated through an EA process under the under the *Environmental Assessment Act*, that it is the preferred alternative for the location of the infrastructure.

In addition, as per policies set out in ***The London Plan***, where new or expansions to existing infrastructure is proosed, an EIS is required as part of the EA process. The EIS shall (a) confirm no significant features are anticipated to be impacted such they they lose their significance and (b) further assess other potential impacts, identify mitigation measures, and determine appropriate compensatory mitigation, if required. Any alternative where the impacts of the proposed works as identified in the EIS would result in the loss of the ecological features or functions of the component of the NHS affected by the proposed works, such that the natural heritage feature would no longer be determined to be significant, shall not be permitted.

The Natural Environment and EIS component of an EA are to be scoped and completed in accordance with these EMGs.

Figure 2.1: Environmental Process Stages for Infrastructure Projects



2.6 Environmental Impact Studies

2.6.1 The Purpose of an Environmental Impact Study (EIS)

EISs are required where development or site alteration is proposed within or adjacent to components of the City of London's NHS. The purpose of an EIS is to demonstrate that there will be no net negative impacts to the NHS' features and functions as a result of the proposed development or project works. This is to be achieved through environmental investigations of the NHS components and the adjacent lands, typically completed as part of the Draft Plan approval process. An EIS will contain recommendations for avoidance of impacts and mitigation of unavoidable impacts, (including environmental management strategies, monitoring requirements and / or other measures to protect NHS features and functions before, during and following construction). In many cases, an EIS will be completed in conjunction with complimentary studies (e.g., hydrogeological assessment), and the results of each report will inform the other.

An EIS must be completed to the City's satisfaction in accordance with ***The London Plan*** policies, provincial policies, and in consultation with the relevant public agencies prior to the approval of planning and development applications.

2.6.2 The Requirement for an EIS

When is an EIS Required?

EISs are typically required for development and infrastructure projects that are proposed wholly or partially within or adjacent to the NHS.

Table 2.1 identifies the NHS component types and the extent of adjacent lands to those components whose presence typically trigger an EIS. Most of these components are delineated on Map 5 and Map 1 of ***The London Plan***. However, the City may require the EIS to include additional lands if (a) environmental study scoping process (as outlined in Section 2.2) identifies one or more previously unmapped natural heritage features for assessment or (b) to ensure the protection of identified natural heritage features and / or functions based on site-specific conditions and / or the proposed land uses.

Table 2.1. Areas Requiring Environmental Study

Natural Heritage System (NHS) Components*	Trigger Distance Requiring an SLSR/EIS and Area of Adjacent Lands
• Fish Habitat • Habitat of Endangered and Threatened Species • Locations of Endangered and Threatened Species • Provincially Significant Wetlands (PSW)	Within 120 metres

Natural Heritage System (NHS) Components*	Trigger Distance Requiring an SLSR/EIS and Area of Adjacent Lands
• Unevaluated Wetlands • Significant Woodlands • Significant Valleylands and Valleylands • Significant Wildlife Habitat • Significant Areas of Natural and Scientific Interest (ANSI) • Environmentally Significant Areas (ESAs) • Upland Corridors	
• Woodlands • Significant groundwater recharge areas, wellhead protection areas and highly vulnerable aquifers • Special Concern Species • Upland Corridors • Wetlands	Within 30 metres
• Environmental Review (ER) lands	Within a distance appropriate to the specific components of the NHS contained on the lands

** London Plan 1434_. See Table 13.*

Opportunities to Minimize EIS Requirements

It is possible that an EIS may not be a development application requirement for lands that contain NHS components and / or Adjacent Lands. The conditions under which a full EIS (including, but not limited to, seasonal surveys and details site assessments) is waived, requires the implementation of an ecological buffer to a Natural Heritage Feature that meets or exceeds the City's minimum buffer requirements as shown in **Table 5.2** of these EMGs and any additional mitigation requirements as stipulated by the City (e.g. fencing without gates). A focused EIS that describes the site, outlines the limits of the feature(s) and function(s) and discusses restoration and enhancements and their implementation will continue to be a requirement of approval. Ultimately, the waiver of the EIS requirement will be at the discretion of the City of London.

2.6.3 Focused EIS

The Focused EIS process and report requirements offer a scope that meet the policy and application requirements in an abbreviated submission. The timing of a focused EIS will align with the approvals process, and would typically be submitted with focused design studies and/or engineering drawings. Ecological buffers to any natural heritage features must meet or exceed the City's minimum buffer requirements as shown in **Table 5.2** for the most sensitive natural heritage features (i.e. 30 m) and include any additional mitigation requirements as stipulated by the City (e.g. fencing without gates). The focused EIS submission will describe the site, outline the limits of the feature(s) and function(s) and provide discussion on the restoration and enhancements and their implementation. Mapping illustrating the site, featues and proposed buffers is a requirement. This plan and the associated mapping will be discussed during an EIS scoping meeting prior to waiving the requirements of the full-EIS and associated studies. All provincial and fereral legislative requirements are still applicable.

2.6.4 Overview of EIS Process

The EIS process is generally depicted in **Figure 2.2** below, and involves the following steps regardless of scope:

1. **EIS Scoping** – Study scoping should be completed before field investigations are initiated. EIS scoping shall follow the process and requirements as outlined in **Section 2.2** of these guidelines, including the completion of the ESSC (**Section 2.2.1**). If determined as a requirement during study scoping, a site visit may be included as part of this process.
2. **Background Review & Information Requests** - The proponent must complete a comprehensive review of background information to form the basis for a description of existing conditions, as outlined in **Section 2.3**. The background review should follow the City of London's Data Collection Standards found in **Appendix C**.
3. **Field Investigations** –Field investigations are to be completed at the appropriate times and frequencies, and include appropriate locations, in accordance with the approved ESSC. Field investigations must be completed in compliance with the City of London's Data Collection Standards found in **Appendix C.** Dates of investigations, names of investigators, conditions at the time of investigations, any variance of methods, data sheets, and photographs, should all be recorded at the time of investigations. Quality assurance and quality control measures to verify the accuracy of the data collected should be implemented as part of the proponent's (or their consultant's) internal EIS review process.
4. **Evaluation of Significance** – The evaluation of significance should be conducted for natural heritage features within the study area in accordance with the applicable federal, provincial and City of London policies. The City of London evaluation criteria, as outlined in **Section 3**, should be applied to unevaluated vegetation patches and other features not previously evaluated as appropriate. The evaluation criteria to be applied to a specific feature or subject lands should be identified in the ESSC. In instances where a Woodland Evaluation is appropriate, the evaluation shall be completed in the Woodland Evaluation Form found in **Appendix D.** However, if during the course of investigations it becomes evident that other evaluation criteria are appropriate, then they shall also be applied.
5. **Impact & Net Effects Assessment** – The impact assessment for any project should identify the potential impacts that may be generated from the design and layout, the construction, and the operations of the project and / or the post-construction conditions. The proponent should identify any existing impacts to study area natural heritage features prior to project initiation (as part of existing conditions), and the potential long-term and short-term impacts (e.g., construction related) of the project. For each potential impact, possible avoidance, mitigation and/or compensation measures shall be proposed and discussed. For any proposed development or works adjacent to a Natural Heritage Feature, ecological buffers (see **Section 5**) shall be applied where as required (see **Table 5.2**) as part of the mitigation measures. The net effects of the project should then be assessed based on the anticipated net impacts after avoidance, mitigation and or compensation measures are implemented as reccomended. If the project is assessed to result in a significant net negative effect, then the proponent should include additional mitigation and/or compensation measures, or re-work the proposed project plan and / or design to minimize or avoid such effects. The objective for any EIS is to achieve no net negative impact, or a net environmental benefit.

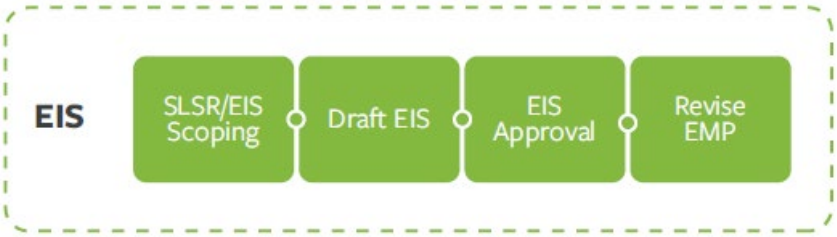
   The MNRF's **Natural Heritage Reference Manual (2010a)** provides a "Sample Checklist for Use in Assessing Impacts of Development" which can be referred to, however the proponent must consider of development activities and potential impacts on a site specific basis as outlined in the Net Effects Table Template is provided in **Appendix E**.
6. **Environmental Management Recommendations** – The environmental management recommendations for a proposed development or project is the primary "deliverable" of an EIS. Recommendations should be developed based on the avoidance, mitigation and compensation

measures identified in the impact assessment and net effects assessment. An important mitigation measure is recommending appropriate ecological buffers (**Section 5**). Another important mitigation measure is the identification of appropriate pre-, during and post-construction/ post-development monitoring. The recommendations for monitoring should outline the monitoring objectives, timeframe and protocols for each monitoring component. The EIS should also indicate if and how net environmental benefit will be achieved through the implementation of these reccomendations.

7. **EIS Report Submission** – The proponent, or their consultant, is to submit the EIS report to the City of London for review and comments. The EIS report and its appendices should be submitted in electronic format to the City's Project File Handler.
8. **EIS Report Review & Approval** – Once received the City of London will distribute copies of the EIS report to the TRT for their review and comments. All comments from the TRT will be sent to the City of London for consideration and forwarding to the proponent and their consultant. The City may decide to:
    - ***Approve the EIS*** – the City may approve the EIS with no required revisions, or with minor revisions
    - ***Return the EIS for revisions*** – the City may return the EIS report for revisions based on the comments received from the TRT
    - ***Reject the EIS*** – the City may reject the EIS based on non-conformance with ***The London Plan*** policies, or based on the inadequacies of the EIS report itself

    The final acceptance of an EIS report is to be provided in written correspondence (e-mail or letter) to the proponent.

Figure 2.2: The Subject Land Status Report and EIS Approval Process Steps.



Further details and the documentation requirements for the above steps are outlined in **Section 2.6.5.**

2.6.5 EIS Report Requirements

The following section outlines the required format and minimum standards for an EIS.

An EIS report for submission to the City of London shall include the following components and sections:

Title Page

Executive Summary

Authors' Signature Page

Table of Contents

1.0 Introduction

2.0 Physical Environment

3.0 Natural Environment

3.1 Aquatic Habitat & Species

3.2 Wetlands

3.3 Terrestrial Habitat & Species

4.0 Evaluation of Significance

5.0 Proposed Development or Works

6.0 Impact & Net Effects Assessment

7.0 Avoidance, Mitigation & Compensation

8.0 Environmental Management Recommendations

9.0 Conclusions

10.0 References

Appendices

Additional subsections to the above sections maybe required based on the scope and complexity of the site and / or the proposal. Further details regarding the required content for the above report components and sections provided below.

2.6.6 Report Content

2.6.6.1 Title Page & Pre-Report Body Components

Title Page - The EIS Title Page should provide basic information for the EIS report including the following:

- Project name and study type (i.e., EIS)
- Any relevant File Reference numbers
- The proponent's company name, address, and primary contact name
- The consultant's company name, address, and primary contact name
- The City of London department to which the report is being submitted
- The date of report submission

Executive Summary- The Executive Summary for the EIS report should provide a brief summary of the report including the purpose of the EIS, the study area location, study scoping information, field investigations completed, study findings, identification of significant natural heritage features, summary of potential impacts and net effects, and a summary of the environmental management recommendations. The Executive Summary should be 1-4 pages in length.

Authors' Signature Page - A page with the names, signatures and qualifications of the principal authors of the EIS report should be provided. The names, signatures and qualifications of the senior reviewers should also be provided.

Table of Contents - A Table of Contents with page references should be provided for the EIS report. This should also include a List of Figures, List of Tables, and List of Appendices.

2.6.6.2 Introduction

The Introduction of the EIS report may stand as one complete section or it may be separated into several sub-sections, at the author's discretion. Regardless, the Introduction should include the following information:

Introductory Statement – The Introduction should state the purpose of the EIS report, and identify the proponent. Since most EIS reports are technical documents supporting a larger study or an application, the Introduction should reference the study or application that the EIS is supporting.

Background – The Introduction should provide some background regarding the project and any planning or studies for the subject lands that preceded the EIS.

Study Area – The study area for the EIS should be clearly identified with the address (or other municipal reference numbers), the area of the subject lands, and identification of any pertinent reference points (e.g., watercourses, major streets or roads, railways, etc.). A Study Area Figure delineating the study area boundaries and showing local streets/roads, watercourses, buildings/structures over a recent aerial photograph base must be included. A secondary figure, should also delineate the natural heritage features from Map 5 of ***The London Plan***.

Policy Context – The policy context for the EIS should be identified in the Introduction. This should include the trigger for the EIS and the relevant policies in ***The London Plan*** that apply to the project/applications. Any relevant federal and or provincial legislation and policies should also be identified.

EIS Scope – A subsection or paragraph should be provided in the Introduction that summarizes the EIS scoping process and some of the key aspects of the study scope. The final ESSC should be referenced and should be provided in the Appendices of the report.

Agencies, First Nations and Stakeholders Consultation – Consultation with government agencies, conservation authorities, First Nations communities, and stakeholders should be identified and referenced as part of the Introduction. Any relevant correspondence and consultation documentation should be provided in the Appendices.

2.6.6.3 Physical Environment

The physical environment provides key context for the natural heritage features on the landscape and on a particular project site because of the direct interrelationship between the physical and natural environment. The description of the physical environment is, therefore, an important part of the EIS report. The physical environment section of the EIS should include information on the following:

Soils and geology – Soils and the underlying geology of the study area and surrounding landscape should be described in sufficient detail as to provide context for the ecological communities and ecosystems of the study area and adjacent lands. If a soils or geotechnical investigation has been undertaken for the project, its findings should be summarized in this section.

- The Canadian System of Soil Classification (1978) should be used to classify and describe the study area soils.
- Dreimanis (1964a; 1964b) “Pleistocene geology of the St. Thomas area (west half & east half respectively)”.
- Additional references for geology include: https://data.ontario.ca/dataset/surficial-geology-of-southern-ontario and for north London which is a map of surficial geology of southern Ontario that can be viewed in Google Earth; and,
- Sardo and Vagners (1975) which accompanies the Dreimanis reports, but is for north London.

Surface water and drainage – The surface water and drainage patterns within and adjacent to a study area determine the extent and characteristics of aquatic habitat features, wetlands and terrestrial vegetation communities. The watershed, sub watershed, surface water features (water bodies and watercourses) and drainage patterns for the study area and adjacent lands should be described in this section of the EIS report.

A Surface Water & Drainage Figure showing all watercourses, water bodies, wetlands, and drainage patterns should be provided for the study area, as applicable. If a surface water or storm water management investigation has been completed for the project the findings with regard to existing conditions should be summarized in this section of the report.

Hydrogeology – The hydrogeology of a study area and adjacent lands is often an important determinant of the area's aquatic, wetland and / or terrestrial features and their functions. The existing hydrogeology for the study area should be described in this section, particularly as it relates to natural heritage features that depend on groundwater discharge and the depth of the shallow water table. If a hydrogeological study has been conducted for the project or as part of previous works in the area, the findings related to existing conditions should be summarized in this section of the report.

2.6.6.4 Natural Environment

As noted above, the existing condition for the natural environment section of the EIS should be divided into four (4) main disciples: (1) aquatic habitat and species, (2) wetlands and species, and (3) terrestrial habitat and species, and (4) animal movement corridors and ecological linkages. Each of these sections may be further subdivided depending on the complexity of the study area features and the investigations required by the ESSC.

For each discipline within a subsection of the Natural Environment section the following should be included:

Background Information – a summary of information obtained from the background review and information requests should be included to provide a baseline understanding of the features. Previous studies and reports should be referenced and any data or information of particular interest to the study should be highlighted.

Methods – the methods used for the investigations for each discipline should be detailed with reference to standard protocols used. The City of London's **Data Collection Standards** found in **Appendix C** provide the recommended protocols for ecological investigations. The date and time of investigations should be provided, in Table format along with the names of field staff who conducted the surveys. Any variance with standard protocols should also be noted in this section.

Results and Discussion – the results of the field investigations should be presented in an organized manner by feature or area. The discussion should include a comparison of findings from previous relevant studies with those of the current study, where applicable. Summary tables with metrics relevant to the discipline should be used wherever possible. For large data sets, spreadsheets should be included in the **Appendices** with summary tables included in the text where needed.

The following provides an outline of the four main disciplines to be addressed in the EIS and the possible sub-disciplines to be included within each main discipline. For the main disciplines, if the feature is not present the heading should be retained in the report with a single sentence stating that no features are present within the study area or adjacent lands (e.g., No aquatic habitat is present within the study area or adjacent lands). For sub disciplines, only those for which investigations were conducted should be included.

Aquatic Habitat and Species	**Terrestrial Habitat and Species**
• Fish & Fish Habitat • Benthic Invertebrates • Mussels • Water Chemistry & Physical Attributes • Vegetation Communities & Plant Species • Breeding Birds • Other Birds including Waterfowl • Amphibians • Reptiles • Butterflies & Dragonflies / Damselflies	• Vegetation Communities & Plant Species • Breeding Birds • Raptors, Crepuscular Species, Colonial-Nesters and other Birds • Amphibians • Reptiles • Butterflies & Dragonflies/ Damselflies • Terrestrial Crayfish • Mammals (e.g., Bat Habitat & Bats, Deer Congregation Areas)

- Terrestrial Crayfish
- Mammals

Wetlands

- PSWs
- Wetlands
- Unevaluated Wetlands
- Seeps and Springs

Animal Movement Corridors and Ecological Linkages

- Aquatic / Lowland
- Terriestrial / Upland

At a minimum the following figures should be included in the EIS or Natural Environment section of the EA report:

- Field Investigations – showing the locations of the field investigations completed;
- Aquatic Habitat – showing watercourses, spawning habitat, habitat characteristics, barriers to fish passage, etc.; and,
- Vegetation Communities – showing the delineation of Ecological Land Classification (ELC; as per Lee *et al.*, 1998) communities.

Other figures may include:

- Breeding Bird and Raptor Habitat – showing suitable habitat, nest locations, etc.
- Amphibian and Reptile Habitat – showing breeding areas, hibernacula, etc.
- Plant species – showing location(s) of one or more rare species
- Notably, for species whose location data is considered sensitive, mapping should be provided to the City separately in a map clearly labelled as confidential and for internal use only.

2.6.6.5 Evaluation of Significance

The Evaluation of Significance section of the EIS should identify previously evaluated and recognized or identified features and species by jurisdiction: federal, provincial and local. For those features or species not previously evaluated or identified, this section should present the evaluation and the recommended designation. The following lists some of the potential features or categories that may apply for each jurisdiction:

- **Federal**
  - *Fish Habitat as defined under the Fisheries Act*
  - *Species at Risk (SAR) as listed under the Species at Risk Act*
- **Provincial**
  - *Provincially Significant Wetlands (PSWs)* – for wetland evaluations the Ontario Wetland Evaluation System (OWES) shall be used by a certified wetland evaluator. Once completed the wetland evaluation shall be submitted to the MNRF and the City of London. A summary of the evaluation should be included in this section of the EIS, and a copy of the evaluation should be provided in the Appendices. See ***The London Plan*** policies 1330_ to 1336_.
  - *Areas of Natural and Scientific Interest (ANSIs)* – as identified by the Province of Ontario (MNRF). See ***The London Plan*** policies 1356_ to 1360_.
  - *Significant Woodlands* – see ***The London Plan*** policies 1337_ to 1342_ and the City of London's Woodland Evaluation Criteria in **Section 3.1.2**
  - *Species at Risk (SAR) as listed under the Endangered Species Act*
- **City of London and local Conservation Authorities**
  - *Significant Woodlands* – see above

- *Woodlands (non-significant)* – see ***The London Plan*** policy 1343_.
- *ESAs and Potential ESAs*- See ***The London Plan*** *policies 1367_ to 1371_* and ***Section 3.1.2*** *for the City's Guidelines for the Evaluation of Environmentally Significant Areas*
- *Significant Wildlife Habitat* – for habitats not already evaluated, the proponent's Ecologist should complete a Significant Wildlife Habitat Assessment in accordance with the MNRF's Significant Wildlife Habitat Technical Guide (2000) and Criteria Schedules for Ecoregion 7E (2015), or subsequent updates to these documents. These are provincial critera that are approved at the municipal level. ***The London Plan*** policies 1352_ to 1355_ shall also be applied.
- *Significant Valleylands* – valleylands not already identified or evaluated should be evaluated in accordance with ***The London Plan*** policies 1347_ to 1350_
- *Wetlands and Unevaluated Wetlands* – see ***The London Plan*** policies 1330_ to 1336_.
- *Upland Corridors* see ***The London Plan*** policies 1372_ to 1377_.

Further details regarding the evaluation of significance is provided in **Section 3**.

2.6.6.6 Proposed Development or Works

In this section of the EIS report the proposed development or project works should be summarized in a manner that describes all aspects and stages of the project that may affect natural heritage features and their functions. The EIS should be based on, at a minimum, the Preliminary Design for the project. This enables the recommendations from the EIS to be incorporated into the Detailed Design for the project.

It is expected that the Preliminary Design presented in the EIS will be a product of an iterative process wherein the design has taken into consideration avoidance and mitigation recommendations provided by the proponent's Ecologists for the project. Documentation of this iterative process should be provided where applicable.

The following information should be included in the description of the proposed development or works:

- A description of the project layout and design
- Changes to surface water drainage and site grading which may include predevelopment, post-development and interim variations when works are adjacent to natural areas
- An outline of project staging and timing
- Details regarding construction relating to potential impacts to natural heritage, including any proposed de-watering plans that depict preferred zones where discharge should be directed and potential impacts from dewatering activities (e.g., cutting off groundwater baseflow from potential receptors).
- Proposed protection measures, including erosion and sediment control (ESC) measures in accordance with the City of London's *Design Specifications & Requirements Manual* (City of London, 2019)
- Any details regarding post-construction operations or maintenance

The proposed layout and design shall be shown on a figure as an overlay depicting the site and plan over a recent air photo, and include the natural heritage features and ELC communities delineated. This figure shall reccomend areas for protection with their associated recommended buffers and / or setbacks.

Further Preliminary Design and Detailed Design drawings and supporting documentation can be provided in the Appendices.

2.6.6.7 Impact and Net Effects Assessment

The Impact and Net Effects Assessment section of the report is critical in determining whether a project can meet the test of "no net negative impact" or "net environmental benefit". The following should be

documented in this section of the EIS and may each form a subsection in the Impact and Net Effects Assessment section:

Existing Impacts – The report should identify any impacts from previous or existing land uses or activities that have affected the natural heritage features of the study area. This provides a baseline for comparison with potential project related impacts.

Direct Impacts – The potential direct impacts of a project should be identified and described based on the proposed development plan. A figure showing the proposed project overlaid on the natural heritage features for the study area should be provided with an indication of any areas where direct impacts are anticipated.

Indirect Impacts – Many indirect impacts are associated with the during or post-construction stages of land development or an infrastructure project. Generally, during-construction impacts are temporary in nature and preventable / manageable through proper construction practices, site inspections, and other standard mitigation measures.

For each of the above categories of impact, the source of the impact, the feature that may be affected, possible avoidance, mitigation and / or compensation measures where appropriate, and the resulting net effects should be described in detail. A summary of the impact assessment and net effects should be provided in a Net Effects Assessment Table. **Appendix E** provides a table template for the assessment of net effects, to be used in any EIS submitted to the City of London.

Net environmental impacts are considered to be those impacts that remain or are residual after the recommended avoidance, mitigation and compensation measures, as applicable, have been implemented. The following criteria should be applied during the assignment of net effects.

- ***No Net Effect*** – Indicates no measurable impact to the identified natural heritage features and functions is anticipated.
- ***Low Net Effect*** – Indicates loss of habitat possessing limitedhabitat value, and/or loss of a portion of habitat, which will not result in long-term impact to the remaining habitat and/or reduction in associated key ecological functions is anticipated.
- ***Medium Net Effects*** – Indicates loss of habitat possessing moderate habitat value, and/or loss of a portion of habitat that may result in long-term impacts to the remaining habitat, and/or loss of associated key ecological functions is anticipated.
- ***High Net Effects*** – Indicates loss of habitat possessing significant habitat value, and/or loss of a portion of habitat that may result in long-term impacts to the remaining habitat, and/or significant loss of associated key ecological functions is anticipated.

In addition to the Net Effects Assessment, where feasible, the proponent should have consideration for effects of development that may increase or decrease in magnitude with a changing climate (e.g., increased flooding, drought, invasive species range shifts, etc.) as well as the development's contributions to greenhouse gas emissions. Any tools available from the City of London to assess climate change impacts should be used as part of the impact assessment process.

2.6.6.8 Avoidance, Mitigation & Compensation

While the Impact and Net Effects Assessment identifies avoidance, mitigation, and compensation measures that should be implemented, each of these will require development into detailed recommendations. This section of the EIS report should carry forward the avoidance, mitigation and compensation measures identified in the previous section and elaborate on each.

Avoidance – Avoidance of potential impacts should always be considered to be the preferred option where feasible. As noted in the Proposed Development (**Section 2.6.5.6**) avoidance of potential impacts should be considered iteratively through collaboration between the project planners, engineers and

ecologists prior to plan finalization. Consequently, this section may refer to the iterative process described in the Proposed Development Section, or it may propose additional avoidance measures for consideration.

Mitigation – Mitigation measures may take various forms and may apply to director to indirect impacts that are short-term (e.g., may occur only during the construction phase of the project) or long-term (e.g., may occur in the post development scenario). Each of these measure should be developed and described in this section of the report.

One of the most important mitigation measure that will apply to all NHFs is the implementation of ecological buffers. The identification of appropriate ecological buffers must follow the guidance provided in **Section 5** of these Environmental Management Guidelines. In this section the application of the guidelines to the project and site-specific rationale should be provided in as much detail as possible.

Compensation – Compensation for impacts to, or removal of, a NHF is only permitted under limited and very narrowly prescribed circumstances, but may be permitted in accordance with the applicable policies. Where alternatives for avoidance and mitigation have been considered and compensation has been determined to be required for a project, the details of the compensation must be described in this section. The development of compensation plans must comply with the applicable policies and follow the guidelines provided in **Section 6** of these Environmental Management Guidelines.

2.6.6.9 Environmental Management Recommendations

The Environmental Management Recommendations section is the primary deliverable of the EIS. The environmental management recommendations must be clearly articulated and must be specific enough to be translated into Conditions of Draft Approval, Development Agreement and/or Subdivision Agreement for a project. The recommendations should be organized by project phase, from planning & design, through construction, to post-construction and post-development. Depending on the size and complexity of the project, the environmental management recommendations may form an Environmental Management Plan (EMP).

The following are typical components of an EMP:

- Natural Heritage Protection Areas
- Ecological Buffers
- Restoration, Enhancement and Compensation Measures/Areas
- Construction Mitigation and Monitoring Plans
- Post-Construction Monitoring
- Post-Development Monitoring

Environmental management recommendations identified during Preliminary Design that should appear on the contract drawings must be explicitly stated. Text should provide direction to include the complete EIS with the tender documents for later project stages. In instances where a detailed Construction Monitoring Plan is anticipated, the EIS should include a draft field inspection form template in the Appendices.

To effectively develop a post construction monitoring program, baseline conditions must be established through the EIS process and stations for long-term / post-construction monitoring in the protected NHS should be identified along with the recommended type(s) and frequency of monitoring. Assessing the success of the avoidance, mitigation and compensation will be determined based on various metrics.

Section 7 outlines the context and specific requirements of the EMP, and should be carefully reviewed and referenced as appropriate.

2.6.6.10 Conclusions

The Conclusions section of the EIS report should provide the following elements:

Summary of Key Findings – A brief summary of the key findings of the EIS report should be provided to indicate the confirmed natural heritage features and NHS within the study area, with reference to adjacent lands as needed.

Key Recommendations – Either a summary of key recommendations should be provided, or a reference to the Environmental Management Recommendations section of the report must be made. Where applicable, direction regarding the implementation of the recommendations must be stated.

Conclusion Statement – A clear statement of the conclusions of the EIS must be made as to whether the proposal has met the test of "no negative impacts on the natural features or on their ecological function: (MMAH, 2020) which can be achieved with either a no net effect or a positive net effect assuming the recommended avoidance, mitigation and / or compensation measures are implemented (as per Section 2.6.6.1). The conclusions should also state whether the project meets the intent and requirements of the environmental policies of ***The London Plan***, the *Provincial Policy Statement* and any other relevant legislation or policies. A summary of the rationale for the conclusion statement must be provided to support the statement.

2.6.6.11 References, Appendices, and Figures

References – All relevant references used in the preparation of, or cited in the EIS report should be listed in a References section. References should be in alphabetical order by author. Each reference should indicate author(s), year of publication, title, and publisher. For journal articles the journal name, volume, and pages should be provided. For websites, the full website address should be provided.

Appendices – Supporting documentation as referenced in each section of the report should be provided in the Appendices section and separated by appendix title pages. The order of appendices should follow the order of reference in the sections of the report. Appendices will typically include many or all of the following:

- Environmental Study Scoping Checklist (ESSC)
- Resumes (two-page) of the study's authors, reviewers, and field staff
- Aquatic habitat field sheets and sketches
- Aquatic species list and life history information
- Ecological Land Classification (ELC) data sheets including soil characterization
- Plant species list by ELC community type with rarity rankings
- Bird species list by survey location with rarity rankings
- Amphibian survey data sheets and species list
- Additional wildlife lists by survey locations with rarity rankings, as applicable (e.g., mammals, herpetofauna)
- Significant Wildlife Habitat (SWH) data sheets
- Significant Wildlife Habitat Assessment
- Species at Risk (SAR) screening and habitat assessment
- Photographs

Figures – All figures for the EIS report should be either embedded in the body of the report and presented on the first full page following the first reference in the text to the figure, or compiled in the Appendices. All figures should be sequentially numbered and have the following:

- A recent colour aerial photograph base

- The study area boundary
- Roads/streets (labelled), utility corridors, and other “surface” infrastructure such as rail lines
- Watercourses and natural heritage features boundaries
- North arrow
- A scale
- A Legend will all symbols and shading labelled

Where appropriate, figures should be prepared at a consistent scale to facilitate comparison and cross-referencing.

3. Evaluation of Significance and Ecological Function

The City's NHS is a system 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 native species, and ecosystems (***The London Plan*** – Policy 1298). Evaluation of the significance and ecological functions of the various NHS components through the planning process informs the protection of the NHS and may lead to the addition, removal or refinement of NHS features included on City of London mapping (see Map 5 in ***The London Plan***).

While these components are all generally protected within the broader system, the process for evaluating these components and the jurisdictional responsibility confirming their significance and enforcing the policies for their protection are not the same for all features and areas. As outlined in the *Provincial Policy Statement* and in ***The London Plan***, the following applies to the City's NHS components:

- Fish habitat and the Habitat of Endangered and Threatened Species are to be assessed in accordance with the applicable federal and / or provincial regulations, policies and guidance in consultation with the appropriate federal and / or provincial agency (i.e., DFO, MECP), sometimes with technical support from the local Conservation Authority;
- Provincially Significant Wetlands (PSWs) and provincially significant Areas Of Natural And Scientific Interest (ANSIs) are identified and confirmed by the Province in accordance with provincial systems and criteria (developed by the MNRF);
- Significant Woodlands, SWH and Significant Valleylands are identified and confirmed by the City using locally-developed criteria aligned with the criteria and guidance established by the Province (i.e., MNRF), sometimes with support from the local Conservation Authority, particularly for valleylands which they typically regulate;
- As per ***The London Plan*** Policies 1361 and 1362, Water Resource Systems capture a range of surface and groundwater features and areas that are to be assessed in accordance with the applicable provincial regulations, policies and guidance in consultation with the appropriate provincial agency (i.e., DFO, MECP) and local Conservation Authority;
- Environmentally Significant Areas may be assessed by the proponent but are identified and confirmed by the City using locally-developed criteria, sometimes with support from the local Conservation Authority, particularly when the area overlaps with lands they regulate (e.g., wetlands, watercourses, valleylands and the related adjacent lands); and
- Upland Corridors and Naturalization Areas are identified and confirmed by the City using locally-developed criteria.

The Environmental Policies section of ***The London Plan*** defines and provides policy guidance for the evaluation of all the NHS components, including locally-developed criteria where applicable, and points to applicable sources of additional technical guidance at the federal, provincial and / or local (i.e., municipal and Conservation Authority) levels. This section of the EMGs provides additional guidance related to the evaluation of NHS components where the City of London and, where applicable, the local Conservation Authority, are responsible for confirming the evaluation of significance.

The specific NHS components addressed in this section of the EMGs are:

- Provincially Significant Wetlands, Wetlands and Unevaluated Wetlands
- Significant Woodlands and Woodlands
- Significant Valleylands and Valleylands

- Significant Wildlife Habitat (SWH), and
- Environmentally Significant Areas (ESAs)

with more detailed guidance for the criteria application provided for Significant Woodlands and ESAs based on the current science and natural heritage studies completed in the City.

The locally-developed criteria and the related guidance in this section have been developed in accordance with the *Provincial Policy Statement* with careful consideration for the local biophysical and land use planning context, and for the applicable technical and scientific literature. Notably, the *Provincial Policy Statement* states that: *"planning authorities and decision-makers may go beyond these minimum standards to address matters of importance to a specific community, unless doing so would conflict with any policy of the Provincial Policy Statement*". It further states that for NHS components that are to be locally confirmed that: "*Criteria for determining significance for the resources … are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used*" (MMAH 2020).

In all cases, the proponent is expected to comply with the most current applicable policies and guidelines related to the evaluation of significance and ecological functions of NHS components in the City, including any that may be adopted following the approval of these EMGS.

3.1 Significant Woodlands and Woodlands

The objective of these guidelines is to provide a standardized and scientifically-based approach for the evaluation of woodlands that is consistent with ***The London Plan*** policies, the *Provincial Policy Statement*, and the *Natural Heritage Reference Manual* (MNRF 2010b). This section describes the required methods for evaluating the ecological significance of all Unevaluated Vegetation Patches, woodlands and vegetation patches greater than 0.5 ha (as per ***The London Plan*** Policies 1337_ through 1343_, and 1383_ through 1386_).

3.1.1 Policy and Context

Policies outlined in the *Provincial Policy Statement* protect Significant Woodlands by not permitting development and site alteration within or in the lands adjacent to Significant Woodlands south and east of the Canadian Shield, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Also, development and site alteration are not permitted on adjacent lands to significant woodlands, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

According to the *Provicial Policy Statement,* woodlands are defined as: "*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*" and "*include treed areas, woodlots, or forested areas and vary in their level of significance at the local, regional, and provincial levels*".

Furthermore, the *Provincial Policy Statement,* considers woodlands significant when an area "*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 MNRF, with the most current guidance provided in the *Natural Hertiage Reference Manual* (MNRF 2010b).

The London Plan has built on the provincial guidance and incorporated local considerations to ensure the identification and evaluation of significance for woodland components of the City's NHS that is aligned

with local objectives and conditions. The policy framework for the identification and evaluation of Significant Woodlands and Woodlands are outlined in ***The London Plan*** – Significant Woodlands and Woodlands.

Most potential Woodlands are shown as Unevaluated Vegetation Patches on Map 5 – Natural Heritage and as Environmental Review Place Type on Map 1 in ***The London Plan***. However, as outlined in ***The London Plan*** – Policy 1216, the absence of vegetation patches from the aforementioned mapping, does not necessarily mean that additional unevaluated vegetation patches do not exist where none have been mapped. Therefore, proponents must assess the subject lands in question to screen for the presence of any additional Unevaluated Vegetation Patches and/or other vegetation patches larger than 0.5 ha.

As per the *Provincial Policy Statement* definition above, woodlands are "treed areas". Using the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.,* 1998), individual vegetation communities are typically delineated as discrete polygons. One or more ELC polygons can make up a woodland patch.

According to the Ecological Land Classification (ELC) System for southern Ontario (Lee *et al.,* 1998), a treed area is any community with tree cover >10%. As such, the following ELC Community Classes and Series are potential components of woodland patches:

- **FOREST** - deciduous forest (FOD), mixed forest (FOM) or coniferous forest (FOC);
- **SWAMP** - deciduous swamp (SWD), mixed swamp (SWM) or coniferous swamp (SWC);
- **BLUFF** - treed bluff (BLT);
- **TALLGRASS** - savannah (TPS), woodland (TPW);
- **CULTURAL** - cultural woodland (CUW), cultural savanna (CUS) or cultural plantation (CUP).; and
- **SHRUB / THICKET** - shrub bluff (BLS), cultural thicket (CUT), and swamp thicket (SWT).

Note: In the *Middlesex Natural Heritage Study* (UTRCA, 2014), communities with shrub cover >25% may also qualify as woodland. In the ELC system shrub and thincket communities are similarly defined. Therefore, shrub and thicket communities that are contiguous with other woodland Community Classes may also be included in a woodland patch.

Other communities that contribute to the biological diversity and ecological function of woodlands include old fields (CUM), open prairies (TPO) and wetland communities (MAM, MAS, SAF, OAO, FEO, and BOG) as defined by the ELC. While these communities will not comprise entire woodland patches, they are important components and contribute to the ecological significance of the vegetation patch. As such they are included in the evaluation of significance for applicable criteria.

Evaluation criteria for woodland significance are outlined in ***The London Plan***. The following sections outline the criteria with the measures to be used for the evaluation of significance and ecological function for woodlands in London.

Based on the above information, a vegetation patch is considered to have a woodland component within the City of London if tree cover is greater than 10% or shrub cover is greater than 25%. To determine if a vegetation patch meets this criteria, appropriate ecological inventory (as described in **Section 4.3**) and significant woodland evaluation (described in the following sections) methods shall be used.

The woodland evaluation review summary sheet shall be completed and included as an EIS Appendix, where appropriate. The blank summary sheet can found in **Appendix D**.

Consistent with ***The London Plan*** a woodland will be considered significant if it meets either of the following evaluation scores:

- If one or more criteria meet the standard for High; or
- If five or more criteria meet the standard for Medium.

3.1.2 Significant Woodland Evaluation Criteria

The London Plan – **Criterion 1341_1.**

The woodland contains natural features and ecological functions that are important to the environmental quality and integrity of the NHS. These include site protection (hydrology and erosion/ slope) and landscape integrity (richness, connectivity and distribution).

Criterion 1.1. – Site Protection

Ecological Function Measure

A) Presence of hydrological features within or contiguous with the patch.

This measure relates to *Hydrological and Related Values* as outlined in the *Natural Heritage Reference Manual* and the following concepts:

a) "*Waterbodies, including wetlands, often represent a relatively small percentage of the total land area, yet they can be disproportionately more valuable than other areas*", and

b) "*It is recommended that measures be taken to protect water features, wetlands and other areas of significant hydrological importance (e.g., headwaters, recharge areas, discharge areas) within natural heritage systems*" (MNRF 2010b).

Further, this measure relates to other concepts identified in subwatershed studies completed for the City of London to recognize the following:

a) the linkage between protection of groundwater and vegetation on the surface;

b) the interface between aquatic and terrestrial systems which have high biodiversity and are the focus of important ecological functions; and,

c) the important hydrological functions of wetlands that complement and enhance those provided by woodlands.

For the purposes of this evaluation, hydrological features include the following features and/or areas:

- Groundwater discharge and recharge areas or evidence of groundwater dependent species
- Headwaters and watercourses;
    - Flood plain (as regulated by the local Conservation Authority)
    - River, stream, and ravine corridors (Valleylands) outside of flood plain regulated lands, and
- Wetlands (evaluated and unevaluated).

Criterion Ranking:

- **HIGH –** One (1) or more hydrological features (as described above) located within or contiguous with the patch.
- **MEDIUM –** Within 50 m of a hydrological feature.
- **LOW –** No hydrological features present within 50 m of the patch.

B) Erosion and Slope Protection

Soil erosion may adversely affect a feature by removing nutrient rich soils, destroying vegetation, and the deposition of eroded soil material (MNRF, 1997b). As slopes increase, the erosion risk also increases; however, slopes less than 10% generally experience minimal erosion (MNRF, 1997b; MNRF, 2010b).

This measure relates to the need "*to protect runoff processes, ground stability, and aquatic habitat (erosion potential) for slopes > 10%" (*MNRF, 2010a).

Slopes are mapped in the Slope Stability Mapping Project (UTRCA, 1996) and can also be determined using Geographic Information System (GIS) applications such as ArcMap in combination with up-to-date contour mapping.

Additionally, this measure requires knowledge of the soil textures and types as described in the ELC Manual (Lee *et al.,* 1998) based on the Ontario Institute of Pedology (1985) and Canadian Soil Classification System (Soil Classification Working Group, 1998).

Criterion Ranking:

- **HIGH –** Patch present on steep slopes >25% of any soil type, OR on a remnant slope associated with other features such as moraines or remnant valley slopes no longer continuous with the river system OR on moderate to steep slopes >10% - 25% with erodible soils (silty loam, sandy loam and loam, fine to coarse sands).
- **MEDIUM –** Patch present on moderate to steep slopes > 10% - 25% with less erodible soils (heavy clay and clay, silty clay)
- **LOW –** Patch present on gentle slopes < 10% with any soil type.

Score for **Criterion 1.1** is based on the highest standard achieved between the two measures.

Criterion 1.2 – Landscape Integrity (Richness, Connectivity and Distribution)

Ecological Function Measures

A) Landscape Richness

The density of landscape fragmentation, or patchiness, as measured by the total area of all patches per unit area of land. Based on the demonstration that "*Native plant richness and flora quality are significantly related to local forest cover"* (UTRCA, 1997; Bowles and Bergsma, 1999). Further, the *Natural Heritage Reference Manual* outlines the following concepts:

a) *"Clusters of areas that span a range of topographic, soil, and moisture conditions contain a wider variety of plant species/communities, and may support a greater diversity of ecological processes"*; and,

b) *"Where large core areas do not exist, groupings of habitat patches with potential for restoration should be included to maintain ecological function at the landscape scale"* (MNRF 2010b).

For the purpose of this evaluation, local vegetation cover is defined as percent cover of vegetation (all habitat types) within a 2 km radius circle from patch centroid. Thresholds reflect cumulative frequency distribution of patches within London (Bergsma, 2004).

Criterion Ranking:

- **HIGH** > 10% local vegetation cover
- **MEDIUM** 7 – 10% local vegetation cover
- **LOW** < 7% local vegetation cover.

B) Landscape Connectivity (linkage and distance between patches not separated by permanent cultural barriers).

This measure relates to *Proximity, Connectedness, and Naturalness and Disturbance* outlined in the *Natural Heritage Reference Manual* and the following concepts:

a) Blocks of habitat that are arranged close together limit fragmentation and are usually better than those that are located farther apart; and,

b) Relatively undisturbed natural areas are generally more desirable than highly altered areas (MNRF 2010b).

Criterion Ranking:

- **HIGH –** patches directly connected by:
  i. waterways or riparian habitat (generally primary or secondary aquatic corridors and streams with bridges and/or underpasses: for example, Thames, Dingman, Medway, Stoney, Pottersburg, Kettle, Dodd, Sharon, Oxbow, Kelly, Stanton, Mud, Crumlin);
  ii. Contiguous or semi-contiguous habitat.
- **MEDIUM –** patches indirectly connected by:
  i. habitat gaps < 40 m;
  ii. areas identified as Anti-fragmentation, Terrestrial Corridor, Big Picture Corridor (https://caroliniancanada.ca/legacy/ConservationPrograms_BigPictureMaps.html) to enhance the viability of isolated woodlands by re-connection, buffering, expanding OR to infill disturbed areas or replace abandoned fields (Riley & Mohr, 1994);
  iii. abandoned rails, utility rights-of-way (hydro corridors, water/gas pipeline);
  iv. Open space greenways and golf courses;
  v. Active agriculture or pasture;
  vi. Watercourses connected by culverts; and,
  vii. First or second order streams that exhibit channelized morphology.
- **LOW –** patches not connected due to the presence of permanent cultural barriers:
  i. major roads and highways with no culverts;
  ii. urban or industrial development, large parking lots;
  iii. infrastructure;
  iv. dams, buried watercourses, channelized third or greater order watercourses; and,
  v. active recreational land-uses (campground, parks with major facilities – community centres, arenas).

C) Patch Distribution (isolation & arrangement of patches / patch clusters).

This measure relates to *Proximity, Connectedness, Size and Distribution* outlined in the *Natural Heritage Reference Manual* and the following concepts:

a) Blocks of habitat that are arranged close together limit fragmentation and are usually better than those that are located farther apart; and,

b) Large patches of natural area are more valuable than smaller patches (MNRF 2010b), although smaller habitat patches can also have value in supporting biodiversity, particularly when they are clustered (Fahrig 2020) .

Following a review of the empirical evidence in the literature, Fahrig (2020) concluded that;

The interaction or flow of organisms among patches appears to be influenced by the size of patches and the distance separating them. Patch clusters are defined as patches within 250 m of each other that are not separated by major roads, highways, or urban development.

Criterion Ranking:

- **HIGH –** patch clusters with total area > 40 ha OR identified as a Big Picture Meta Core (Carolinian Canada, 2000).
- **MEDIUM –** patch clusters with total area 20 – 40 ha.
- **LOW –** patch clusters with total area < 20 ha.

Score for **Criterion 1.2** based on the highest standard achieved for any one of the three standards.

The London Plan – Criterion 1341_2.

The woodland provides important ecological functions and has an age, size, site quality, and diversity of biological communities and associated species that is uncommon for the planning area.

Criterion 2.1 – Age and Site Quality

A) Community Successional Stage / Seral Age

This measure relates to *Uncommon Characteristics of Woodlands* as described in *Natural Heritage Reference Manual*, and the concept that: "*Older woodlands are particularly valuable for several reasons, including their contributions to genetic, species, and ecosystem diversity"* (MNRF 2010b).

For the purpose of this evaluation, community age is determined based on definitions in the provincial ELC for Southern Ontario (Lee *et. al.*, 1998). Seral age reflects the composition of the plant community (especially trees) with respect to light tolerance and moisture conditions). Generally, mature or advanced seral stage community types are under-represented in the London Subwatershed (Bowles, 1995), Middlesex County (UTRCA, 2003) and Oxford County (UTRCA, 1997).

Criterion Ranking:

- **HIGH –** patch contains one (1) or more mature or older growth communities
- **MEDIUM –** patch contains one (1) or more mid-aged communities
- **LOW –** patch contains only pioneer to young communities

B) Mean Coefficient of Conservatism (MCC) of communities or whole patch

This measure relates to *Species Rarity and Uncommon Characteristics of Woodlands* as outlined in the *Natural Heritage Reference Manual* and the following concepts:

a) In general, habitats that contain rare species are more valuable than those that do not; and,

b) Woodlands that are uncommon in terms of species composition should be protected (MNRF 2010b).

The MCC can provide useful information on the susceptibility of communities to adverse anthropogenic effects (Francis *et al.*, 2000; Catling, 2013). The MCC thresholds identified below have been based on the Floristic Quality Assessment System for Southern Ontario (Oldham *et al.*, 1995), analysis of distribution in the London subwatershed area (Bowles and Bergsma, 1999), results of the Middlesex Natural Heritage Study (UTRCA, 2014), and Oxford County Terrestrial Ecosystem Study (UTRCA, 1997).

Criterion Ranking:

- **HIGH –** one (1) or more vegetation community with an MCC ≥ 4.6; OR MCC of patch > 4.5
- **MEDIUM –** one (1) or more vegetation community with an MCC 4.2 – 4.5; OR MCC of patch ≥ 4.0 – 4.5
- **LOW –** all vegetation communities with an MCC < 4.2; OR MCC of patch < 4.0.

Score for **Criterion 2.1** based on the highest standard achieved for any one of the two standards.

Criterion 2.2 – Size and Shape

A) Patch Size

This measure relates to *Size* as described in Natural Heritage Reference Manual**,** and the concept that "*large patches of natural area are more valuable than smaller patches"* (MNRF 2010b).

Patch size is generally positively correlated with ecological function. Larger patches can provide functions that smaller patches cannot such as habitat for area-sensitive species, , reduced forest edge/increased forest interior, and increased resiliency from human disturbance (MNRF, 2010b).

The following thresholds have been derived from a cumulative frequency curve distribution for vegetation patches within the City of London (Bergsma, 2004).

Criterion Ranking:

- **HIGH** Patch > 9.0 ha in size OR patch contains a woodland >4 ha.
- **MEDIUM** Patch 2.0 – 9.0 ha in size OR patch contains a woodland 2-4 ha.
- **LOW** Patch < 2.0 ha in size.

B) Patch Shape and Presence of Interior

Patch shape influences the amount of edge and interior habitat, and thus can influence resilience, disturbance, and species-specific habitat requirements (as described above) (MNRF, 2010a). Edge habitat, specifically for woodlands, has increased across southern Ontario with increased fragmentation; and subsequently the area of forest interior has decreased.

This measure relates to *Shape* as described in *Natural Heritage Reference Manual***,** and the following concepts:

a) The shape of natural heritage areas affects their value as wildlife habitat and their resilience to disturbance effects; and,

b) Round or block-shaped patches contain less edge per unit of area than long, narrow patches.

As edge effects can extend into woodlands (Environment Canada, 2013), the interior area for a patch is calculated based on a 100 m distance from the interior of the edge habitat (MNRF, 2010b). The locally-specific thresholds for perimeter:area ratios listed below have been based on analysis of London subwatershed studies patches and calculation of perimeter to area ratios (Bergsma, 2004).

Criterion Ranking:

- **HIGH** Patch contains interior habitat that is more than 100 m from the edge OR has a Perimeter: Area ratio <1.5 m/m².
- **MEDIUM** Patch contains no interior habitat but has a Perimeter:Area ratio 1.5 – 3.0

m/m².

- **LOW** Patch contains no interior and has a Perimeter:Area ratio > 3.0 m/m²

C) Bird Species

This measure relates to *Species Diversity and Rarity* as described in *Natural Heritage Reference Manual*, and the following concepts:

a) Areas that contain a high diversity of native plant and animal species are generally more important than areas that contain a lower diversity of species; and,

b) In general, habitats that contain rare species are more valuable than habitats that do not (MNRF 2010b).

Birds can be indicators of habitat quality and the degree of forest fragmentation. The following criteria rankings have been developed based on the guidance from the: Significant Wildlife Habitat Ecoregion 7E Criteria Schedules (MNRF, 2015a) for "Habitat of Species of Conservation Concern, Special Concern and Rare Species" and the Avian Conservation Assessment Database (Partners in Flight, 2020) for "Regional Concern" species for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region.

Criterion Ranking:

- **HIGH** Patch provides breeding habitat for any three (3) or more bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).
- **MEDIUM** Patch provides breeding habitat for one (1) or two (2) bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).
- **LOW** Patch does not provide breeding habitat any bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).

Score for **Criterion 2.2** based on the highest standard achieved for any one of the three standards

Criterion 2.3 Diversity of Communities, Landforms and Associated Species

A) ELC Community Diversity

This measure relates to *Habitat Diversity*, *Complexity*, and *Uncommon Characteristics of Woodlands* as described in *Natural Heritage Reference Manual*, and the following concepts:

a) Natural areas (or clusters of areas) that span a range of topographic, soil and moisture conditions tend to contain a wider variety of plant species and plant communities, and may also support a greater diversity of ecological processes;

b) Older woodlands are particularly valuable for several reasons, including their contributions to genetic, species, and ecosystem diversity; and,

c) Woodlands that are uncommon in terms of species composition, cover type, age, or structure should be protected.

Native plant species diversity is related mainly to the number of communities in the patch, but also to patch area and landscape richness (UTRCA, 1997; MNRF, 2010b).

The following thresholds were developed based on an analysis of all vegetation communities (including cultural) identified at the Community Series level in the City of London digital GIS layer. Thresholds were derived from cumulative frequency distribution of London patches for a total of

23 Community Series categories (Bergsma, 2004). Assessments are to consider all Community Series types within a woodland patch, including cultural communities.

Criterion Ranking:

- **HIGH** – Patch contains 6 or more ELC Community Series
- **MEDIUM** – Patch contains 3-5 ELC Community Series
- **LOW** – Patch contains 1-2 ELC Community Series

B) Community and Topographic Diversity (variation and heterogeneity)

This measure relates to *Habitat Diversity* and *Complexity* as described in *Natural Heritage Reference Manual*, and the concept that: "*natural areas (or clusters of areas) that span a range of topographic, soil and moisture conditions tend to contain a wider variety of plant species and plant communities, and may also support a greater diversity of ecological processes"* (MNRF 2010b).

This is applied to all communities as defined by this study and based on ELC Community tables (Lee *et. al.,* 1998) and topographic feature description. The seven (7) topographic feature categories for the City of London are as follows: riverine, bottomland, terrace, valley slope, tableland, rolling upland, bluff.

Criterion Ranking:

- **HIGH** – Patch contains three (3) or more Ecosites in one (1) Community Series OR four (4) or more Vegetation Types OR three (3) or more topographic features (e.g. tableland, rolling upland, valley slope, terrace, bottomland).
- **MEDIUM** – Patch contains two (2) or more Ecosites in one Community Series OR by three (3) Vegetation Types OR two (2) topographic features, or one (1) Vegetation Type with inclusions or complexes.
- **LOW** – Patch relatively homogenous; one (1) Ecosite OR one (1) to two (2) Vegetation Types on one (1) topographic feature.

C) Diversity (species and individuals) and Critical Habitat Components for Amphibians

This measure relates to *Species Diversity* and *Rarity* as described in the N*atural Heritage Reference Manual***,** and the concept that: "*areas that contain a high diversity of plant and animal species are generally more important than areas that contain a lower diversity of species"*.

Amphibians are indicators of healthy woodlands with well-functioning processes (MNRF, 2000b; MNRF, 2010b).

This measure is applied at the patch level based on the presence of amphibians and/or important habitat components including the following:

1) shallow water that remains wet for the breeding season (presence of vernal pools);
2) emergent and submergent aquatic vegetation (presence of aquatic ELC community types);
3) presence of instream logs and shoreline shrubs (fish habitat);
4) closed canopy offering a shaded moist understory environment (presence of forest or treed swamp communities); and,
5) abundance of coarse woody debris (deadfall/logs, firm or decayed in the 10-24, 25-50 or >50 cm size classes).

Criterion Ranking:

- **HIGH** – three (3) or more species of amphibians present in the patch, OR one (1)

species of amphibian that is abundant* in one (1) or more communities; OR two (2) or more critical habitat components present in the patch.

- **MEDIUM** – 1-2 species of amphibians present in the patch; OR one (1) species of amphibian that is occasional* in one (1) or more communities; OR one (1) critical habitat components present in the patch.
- **LOW** – No species of amphibian present in the patch, OR no critical habitat components present in the patch.

** Abundance is based on call codes from the amphibian survey protocol as part of the Marsh Monitoring Program (Bird Studies Canada [BSC], 2009a). Presence is determined with a call code ≥1; occasional is defined as any species with a call code 2; abundant is defined as any species with a call code 3.*

D) Presence of Conifer Cover

This measure relates to *Representation* and *Habitat Diversity* and *Complexity* as described in *Natural Heritage Reference Manual*, and the following concepts:

a) The full range of natural features that occur in an area, including both rare and common features, should be protected as a fundamental step in NHS planning to preserve biodiversity at the species and community levels; and,

b) Natural areas (or clusters of areas) that span a range of topographic, soil and moisture conditions tend to contain a wider variety of plant species and plant communities, and may also support a greater diversity of ecological processes.

Important for providing winter food and shelter for a variety of wildlife species (MNRF, 2000a; MNRF, 2010b). For this measure, conifer communities are based on ELC (Lee *et al.*, 1998) and include FOC, FOM, SWC, SWM, and CUP.

Criterion Ranking:

- **HIGH** – Patch contains one or more conifer communities that are > 4.0 ha in size.
- **MEDIUM** – Patch contains one or more conifer communities that are between 2.0 and 4.0 ha in size.
- **LOW** – Patch contains conifer communities < 2.0 ha in size.

E) Fish Habitat Quality

This measure relates to *Hydrological and Related Values* and *Water Protection* as described in *Natural Heritage Reference Manual***,** and the following concepts:

a) Waterbodies, including wetlands, often represent a relatively small percentage of the total land area, yet they can be disproportionately more valuable than other area; and,

b) Source water protection is important and natural hydrologic processes should be maintained (MNRF 2010b).

The health of an aquatic habitat is determined by the health of the water body and surrounding land use practices. Both permanent and intermittent watercourses can provide critical habitat for many species**.**

Criterion Ranking:

- **HIGH** – Dissolved oxygen > 8.0 mg/L OR abundant instream woody debris and rocks and watercourse with a natural channel located within or contiguous with the patch.
- **MEDIUM –** Dissolved oxygen 5.0 – 8.0 mg/L OR moderate amount of instream woody debris and rocks and portions of channelized watercourses within or contiguous with the patch.
- **LOW** – Dissolved oxygen < 5.0 mg/L OR no instream woody debris and sparse

structure and entire watercourse channelized within or contiguous with the patch.

Score for **Criterion 2.3** based on the highest standard achieved for any one of the five standards.

The London Plan – Criterion 1341_4.

The Woodland provides significant habitat for endangered or threatened species.

Criterion 4.1 – Significant habitat for endangered or threatened species.

A) Species At Risk Habitat This measure relates to *Species Rarity* as described in the *Natural Heritage Reference Manual*, and the concept that in general*, "habitats that contain rare species are more valuable than habitats that do not"* (MNRF, 2010b).

Identification, evaluation, and listing of provincially endangered or threatened species is the responsibility of the MECP. Federally endangered or threatened species, as outlined in the *Species at Risk Act*, that are not covered under provincial legislation should be considered. Planning authorities may wish to have assessments of the significant portions of the habitat of SAR reviewed by the MECP.

SAR habitat present or previously identified: **YES** or **NO**

The presence of SAR habitat will add one **HIGH** score to the overall assessment

The London Plan – Criterion 1341_5.

The Woodland contains distinctive, unusual or high-quality natural communities or landforms.

Criterion 5.1 – Distinctive, unusual or high-quality communities.

This criterion relates to *Habitat Complexity and Diversity*, *Species Diversity and Rarity*, and *Uncommon Characteristics of Woodlands* as described in the *Natural Heritage Reference Manual*, and the following concepts:

a) Natural areas (or clusters of areas) that span a range of topographic, soil and moisture conditions tend to contain a wider variety of plant species and plant communities, and may also support a greater diversity of ecological processes;

b) Areas that contain a high diversity of plant and animal species are generally more important than areas that contain a lower diversity of species;

c) Woodlands that are uncommon in terms of species composition, cover type, age or structure should be protected (MNRF 2010b).

A) ELC Community SRANK

Conservation status ranks for the province (SRanks) are based on vegetation communities' risk of elimination. This measure should be evaluated based on the most up-to-date conservation status rank as applied by Natural Heritage Information Centre.

Criterion Ranking:

- **HIGH** – One (1) or more communities with an SRANK of S3 or lower.
- **MEDIUM** – No communities with an SRANK lower than S4.
- **LOW** – No communities with an SRANK lower than S5.

B) Significant Wildlife Habitat

Significant Wildlife Habitat (SWH; including habitat for species of conservation concern and rare species) occurrences within the patch as determined through the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015a). This criteria applies to any SWH that is not evaluated through any other criteria within these guidelines (e.g., Criteria 2.2c).

SWH habitat present or previously identified: **YES** or **NO**

The presence of SWH habitat will add one **HIGH** score to the overall assessment

C) Rare Plant Species Presence / Absence

This measure assesses the number of element occurrences of regionally uncommon or regionally rare vegetation (further outlined in the glossary) and the presence of S1-S3, SRank species (which are also identified as SWH) within a patch. Oldham (2017) identifies the regionally rare and regionally uncommon vascular plant species in Middlesex for this criterion. **Table 3.1** includes the Criterion Ranking.

Criterion Ranking:

- **HIGH** – One (1) Rare Plant (S1-S3) or 4 Regionally Rare plants.
- **MEDIUM** – One to three (1-3) Regionally Rare plants.
- **LOW** – One (1) Regionally Uncommon plant.

Table 3.1: Rare Plant Species Presence / Absence

Type and Status of Species	HIGH	MED	LOW
Rare Plant (S1-S3)	1		
Regionally Rare plant	4	1-3	
Regionally Uncommon plant			1

D) Size and distribution of trees

Criterion Ranking:

- **HIGH** – trees > 50 cm dbh abundant in one or more communities within the patch.
- **MEDIUM** – trees > 50 cm dbh rare or occasional in one or more communities within the patch.
- **LOW** – trees > 50 cm dbh not present in any communities within the patch.

Relative abundance, as it related to this criterion (i.e., rare, occasional, abundant), is described in **Section 8**.

E) Basal Area

This criterion aims to evaluate stand characteristics for total basal area, and basal area by tree species and size classes for each community. The post-logging provincial standard for tolerant hardwoods will be used as a measure of high-quality woodlands (MNRF, 2000a). It has been estimated that 45% (UTRCA, 2003) to 73% (Bowles, 2001) of forests in the City of London and surrounding area had basal areas lower than the recommended for optimal vegetation community resiliency and stability (MNRF, 2000a).

Criterion Ranking:

- **HIGH** – Average basal area of trees for any community in the patch ≥ 16m ²/ha for trees >25 cm DBH; OR > 24 m²/ha for trees > 10 cm DBH; OR all diameter class sizes are represented in the stand (saplings < 10 cm; polewood 10-24 cm; small sawlog 26-36; medium sawlog 38-48 cm; large sawlogs 50-60 cm; x-large or veteran trees > 62 cm.
- **MEDIUM** – Average basal area for any community in the patch 12 – 24 m²/ha of trees >10 cm DBH; OR missing one of polewood, small, medium, or large size classes.
- **LOW –** Average basal area for all communities in the patch < 12 m²/ha for trees > 10 cm DBH; OR missing two or more of polewood, small, medium, or large size classes.

Score for **Criterion 5.1** based on the highest standard achieved for any one of the five standards

NOTE: 5.1d and 5.1e may require field investigations to determine size, distribution, and basal areas of trees within a given vegetation community.

Criterion 5.2 – Distinctive, Unusual or High-Quality Landforms

This criterion relates to *Habitat Complexity and Diversity* as described in *Natural Heritage Reference Manual*, and the following concepts:

a) Natural areas (or clusters of areas) that span a range of topographic, soil and moisture conditions tend to contain a wider variety of plant species and plant communities, and may also support a greater diversity of ecological processes (MNRF 2010b).

A) Distinctive landform types

Analyses of the five broad landform types listed below that occur in the City were undertaken to assess landform-vegetation representational significance. This was derived by calculating the proportion of all vegetation patches overlapping with each of the five landforms areas that are considered protected (i.e., as Earth Science ANSIs, Environmentally Significant Areas, PSWs or river corridors) :

1. **Beach Ridge** landform is unusual and rare in the City with portions identified as Earth Science ANSI and PSW/ESA.
2. **Sand Plain** landform has very little protected areas present. It is considered high quality for the aggregate extraction industry.
3. **Spillway** is the 2nd largest landform unit with the greatest proportion of protected areas and contains most of the ESA's. It is the most distinctive landform unit including the Thames River, Stoney Creek, Medway Valley and Dingman Creek.
4. **Till Plain** is the largest landform unit with the least amount of protected areas and the highest amount of vegetation. Most of the land is considered high quality agricultural.
5. **Till Moraine** is the 3rd largest landform unit with fair amount of protected land. It accounts for the patches that fall on the upland landforms (Westminster Ponds – Pond Mills ESA / Meadowlily Woods).

Refer to **Figure 3.1** for glacial geomorphology mapping of landforms within the City of London.

Criterion Ranking:

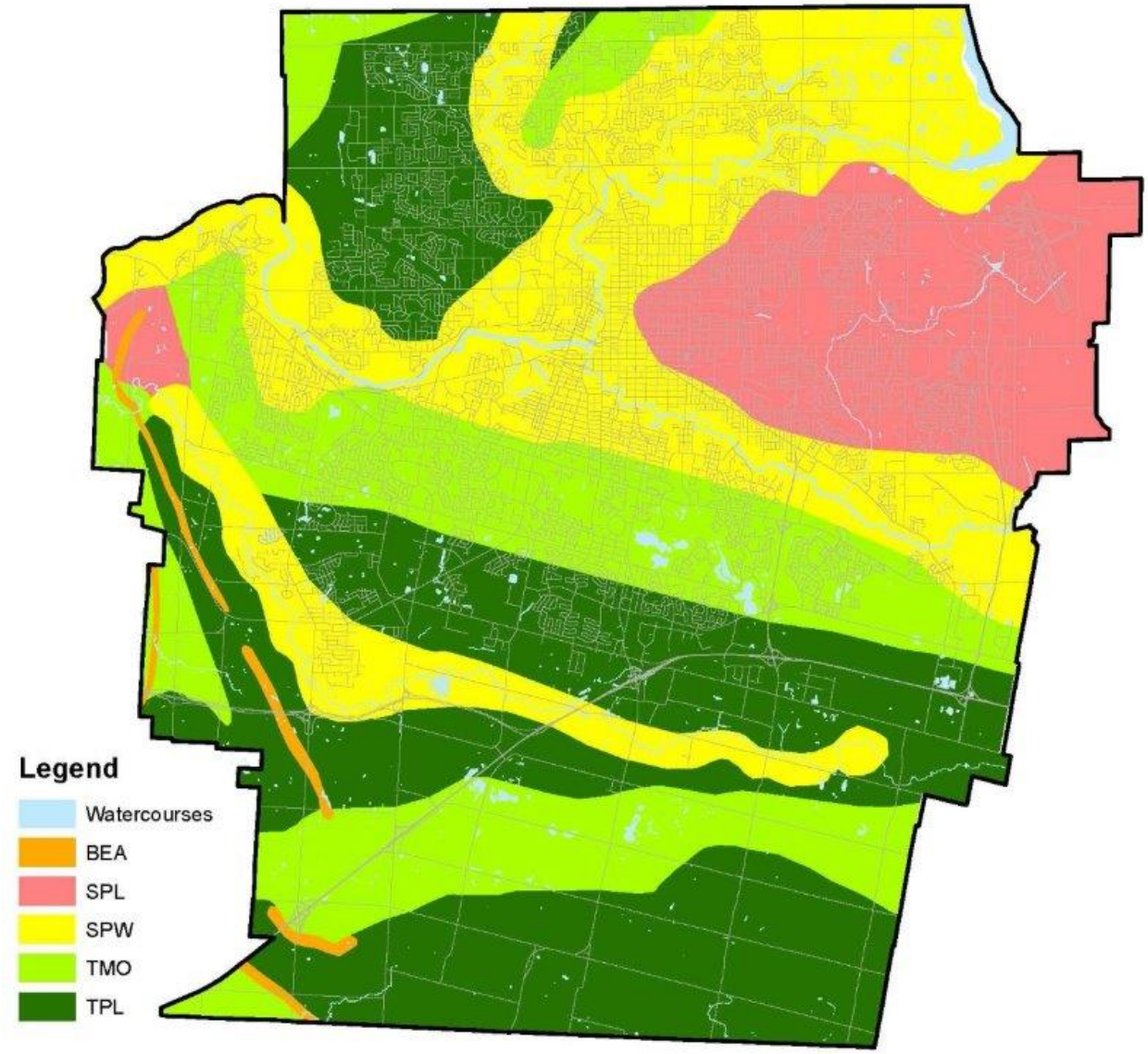
- **HIGH** – Patch located on an Earth Science ANSI OR on the Beach Ridge or Sand Plain physiographic landform units.
- **MEDIUM** – Patch located on the Till Plain or Till Moraine physiographic landform unit.

- **LOW** – Patch is located on the Spillway physiographic landform unit.

Score for **Criterion 5.2** (based on the highest standard achieved).

The woodland evaluation review summary sheet shall be completed and included as an EIS Appendix, where appropriate. The blank summary sheet can found in **Appendix D**.

Figure 3.1: City of London Glacial Geomorphology of the dominant physiographic units



3.2 Environmentally Significant Areas (ESAs)

As outlined in ***The London Plan***, ESAs are relatively large areas in the City that contain natural features and perform ecological functions that warrant their retention in a natural state. ESAs often capture a complex of wetlands, woodlands, SWH, and / or valleylands. The approach for delineation of wetlands, valleylands and SWH is described in **Section 4.2**.

In the City of London there are ESAs which have been confirmed as meeting the established criteria (which are included in the Green Space Place Type) and Potential ESAs that still require evaluation (which are included in the Environmental Review Place Type). ESAs that clearly satisfy two (2) or more of the criteria (as outlined in Section 3.1.2.2) will be considered for recognition as an ESA. These criteria are to be applied to to all potential ESAs delineated on Map 5 of ***The London Plan***.

3.2.1 City of London Subwatershed Regions Policy and Context

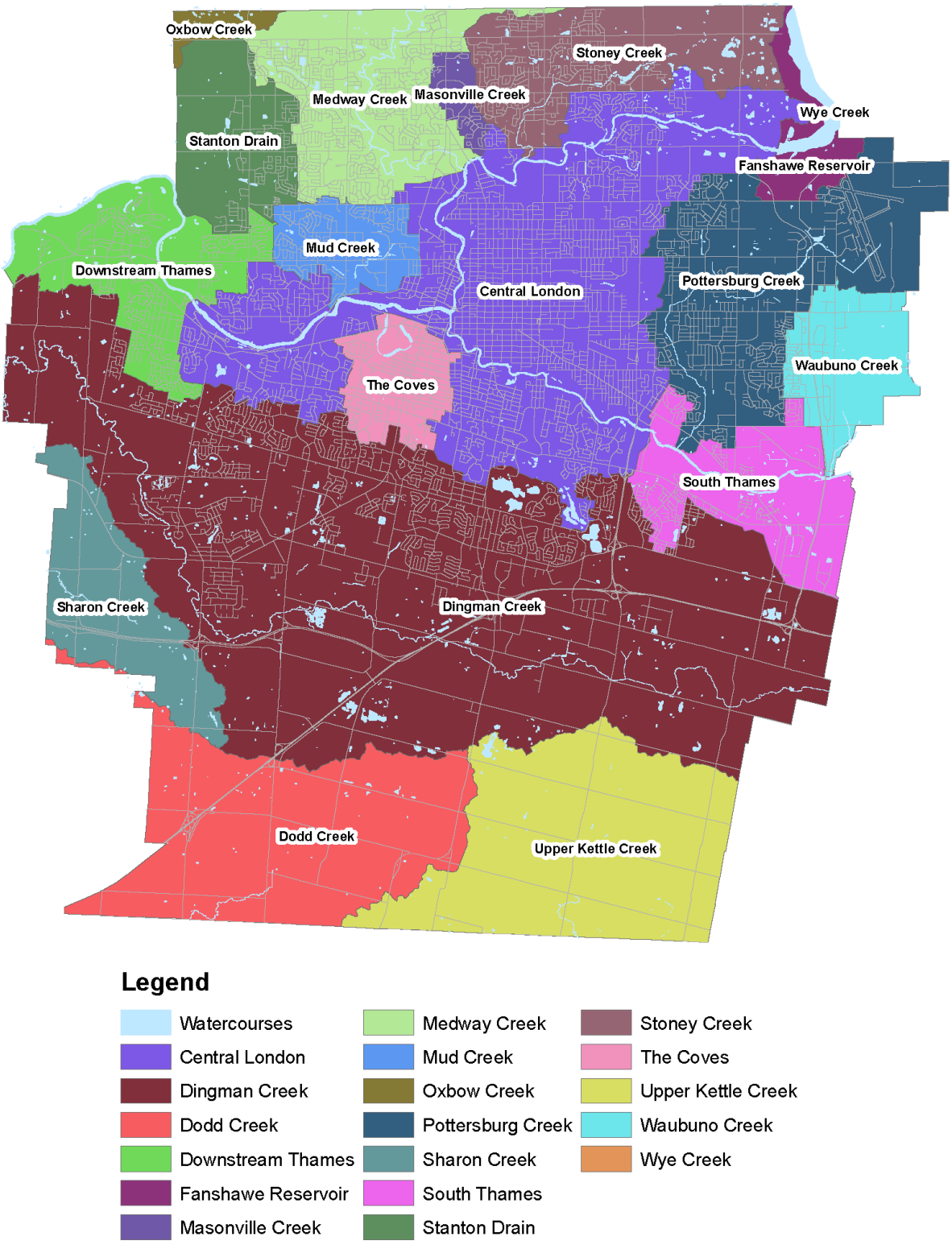
The policy framework for the identification and evaluation of ESAs is outlined in ***The London Plan*** – Policies 1367_ to 1371_. These policies provide the basis for the following guidelines and should be considered in conjunction with the Guidelines for Boundary Delineation as outlined in **Section 4.**

The following interpretations of the application guidelines should be noted:

- These ESA guidelines are to be applied to Potential ESAs. Please refer to **Section 4.6** related to boundary delineation to determine whether Potential ESA(s) form part of an ESA patch. If a Potential ESA is not included in an ESA patch boundary, it must be assessed as a separate patch.
- The same natural heritage feature cannot be counted to satisfy more than one criterion for a given area. However, each feature shall be evaluated and listed under the criterion that it meets.
    - For example, if a community is identified as rare or uncommon, it would meet Criterion 1 listed below. If this community also contained high-quality, natural landform-vegetation communities representative of typical pre-settlement conditions, it would also meet Criterion 2 listed below. The community would be listed under both criteria but would only be applied towards the evaluation of significance for one of the criteria.
    - However, if there were other high-quality, natural landform-vegetation communities representative of typical pre-settlement conditions identified within the Potential ESA, Criterion 2 could also be applied towards the evaluation of significance.
- "Regional level" refers to the lands covered by the City of London subwatershed studies, including Oxbow Creek Subwatershed, Dingman Creek Subwatershed and the Central Area Subwatershed. For mapping of subwatersheds, refer to **City of London Subwatersheds** mapping and/or submit a **GIS Data Request** to the City of London – Geomatics Department.
- The term "County" refers to Middlesex County.
- Appropriate expertise, provided by a qualified professional (as outlined in **Section 2.6.6.11**) may be required to apply certain elements of Criterion 1 (unusual landforms), Criterion 4 (significant hydrological processes), Criterion 5 (aspects of biodiversity), Criterion 6 (important wildlife habitat or linkage functions), and Criterion 7 (significant habitat). Each time a criterion is applied, the rationale and source of expertise should be documented.
- The minimum data requirements to apply certain measures of a criterion, such as diversity indices, are detailed in the guidelines below, as well as the **Data Collection Standards** outlined in **Appendix C**. A standardized approach to data collection will enable more consistent application of these indices, and can inform long term planning.

- For documentation of rare community and species status, the most up-to-date resources and authorities will be utilized. Lists of rare and unusual communities and species will be considered open-ended, since data collected from other natural areas inventories may result in additions and deletions.
- For vegetation communities, the ELC system for Southern Ontario (Lee *et al.*, 1998) will be the standard protocol used to differentiate natural vegetation communities within patches.
- The term "area" in this document refers to patches or patch clusters (i.e., the combined area of contiguous patches), which are defined during boundary delineation (as outlined in **Section 4**).
- The focus of each criterion is to identify features of significance for protection.

Figure 3.2: City of London Subwatershed Regions



3.2.3 Environmentally Significant Areas (ESAs) Evaluation Criteria

***The London Plan* 1371_- Criterion 1**:

The area contains unusual landforms and/or rare to uncommon natural communities within the country, province or London subwatershed region.

Background: Identification of landforms that reflect geological processes or features instrumental in forming London's landscape or communities that have limited occurrence, abundance or range (distribution) is important for the maintenance of biodiversity including ecosystem, landscape, species and genetic diversity.

Application: Unusual Landforms

National level: Areas identified by recognized experts as geologically significant (e.g. Ontario Geological Survey)

Provincial level: Provincially significant Earth Science ANSIs

Regional level: Expert opinion (e.g. Dreimanis 1964a, 1964b) and data obtained through the Subwatershed Studies

Rare to Uncommon Natural Communities

National/Provincial level: Significance as interpreted from the Carolinian Zone community Subnational (Ontario) S-Ranks outlined in the **Natural Heritage Information Centre** (MNRF, 2020) or subsequent updates and/or amendments. A natural community is considered rare to uncommon if the S-Rank is between *S1* and *S3*. Community identification can be determined through existing data and/or data obtained from the Subwatershed Studies. Rare vegetation communities can also be identified as evaluated through the SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015a).

Regional level: Regionally significant Earth Science ANSIs and vegetation communities identified as rare to uncommon based on an analysis of the London Subwatershed Studies Life Science Inventories (Bowles *et al.*, 1994) or the best available data. This list will be open-ended to incorporate any new data collected from the London subwatershed region. It will include communities or "species assemblages" that have limited distribution and occurrence within the region (e.g. fens, older growth forests, boreal species assemblages), or that are at the limits of their distributional ranges (e.g. bogs), or that are remnants of original habitat (e.g. prairie and oak savanna). Vegetation communities meeting the criteria for SWH as outlined in ***The London Plan*** **– Policy 1354** are also considered rare.

Source References: Bogs, fens (Riley, 1989), or prairie/savannas (Riley and Bakowsky, 1993) may be identified through the presence of assemblages of indicator species. Older growth forests are evaluated in the context of the London subwatershed region, the top five percent of the oldest stage forests (climax and sub-climax) that are relatively undisturbed. Boreal indicator species will be defined by a specific list based on information obtained through the London Subwatershed Life Science Inventories (Bowles *et al*., 1994).

There may be special cases where rare to uncommon vegetation communities are described by the presence of Nationally, Provincially, or Regionally rare plant species, if they are abundant or dominant (as described in **Section 8**) in one or more strata (i.e., canopy, understorey, etc as described in Lee *et al.,* 1998). In these situations, the presence of the rare plant would not be used to meet **Criterion 7** for rarity.

The London Plan 1371_ - Criterion 2:

The area contains high-quality natural landform-vegetation communities that are representative of typical pre-settlement conditions of the dominant physiographic units within the London subwatershed region, and/or that have been classified as distinctive in the Province of Ontario.

Background: The focus of this criterion is to identify representative examples of the full range of landform-vegetation types that occur on each of the five dominant physiographic units within the London subwatershed region (**Figure 3.1**). By representing all landform-vegetation associations in a protected areas system a significant portion of the biodiversity of an area will be maintained (Crins, 1996). By capturing representative native vegetation in the NHS, examples of pre-European settlement landscapes are also protected.

This Criterion differs from Criterion 1 with the emphasis on representation, size, and quality. The landform-vegetation communities do not have to be rare as long as they are the best examples of their type.

The dominant physiographic units are represented by the five glacial geomorphological features based on the Ontario Geological Survey Map P.2715 (Chapman and Putnam, 1984).

The presence of disturbance indicators does not necessarily disqualify a site from meeting this criterion if other factors relevant to this criterion are satisfied or if it is the only representative example. Similarly, lack of disturbance does not necessarily qualify a site. Disturbance indicators are used as a relative measure to rank sites.

Application: Sites representing the same landform-vegetation types will be ranked in a relative manner to select the best examples. Priority should be given to designating the best examples, with respect to size and quality. In addition, similar landform-vegetation community types will be compared only within the same physiographic unit (e.g. till moraine; till plain; sand plain; spillway; beach ridge)

Distinctive and natural landform-vegetation communities are defined at Provincial or Regional levels:

Provincial level: Presence of Provincially significant ANSIs as identified in MNRF Land Information Ontario (LIO). Presence of PSWs as defined by the **OWES** (MNRF, 2014a).

Regional level: All wetlands within the City of London are protected in accordance with ***The London Plan***.

Presence of regionally significant ANSIs identified in LIO.

Presence of Ecosite vegetation community types (as outlined in ELC; Lee *et al.*, 1998) of high quality on distinctive topographic, landform, or cultural features, applied through existing data and data obtained from the Subwatershed Studies.

The following community types are examples, and thus not an exhaustive list:

- Moist-Fresh Black Maple Deciduous Forest Type on bottomland;
- Fresh Hemlock Coniferous Forest Type on valley slope;
- Fresh Sugar Maple-Beech Deciduous Forest Type on tableland; and
- Fresh Sugar Maple-Beech Deciduous Forest Type on valley slope.

Comments: Ecosite vegetation communities, as classified through ELC (Lee *et al.,* 1998), can be considered high-quality and thus applicable for this criterion based on the following:

- Rare vegetation communities as evaluated through the SWH Criteria Schedules

for Ecoregion 7E (MNRF, 2015a);

- Vegetation communities meeting the criteria for SWH as outlined in ***The London Plan*** **– Policy 1354**; and,

  Vegetation communities with an SRank 1-3 as described by the Natural Heritage Information Centre.

The London Plan 1371 – Criterion 3:

The area, due to its large size, generally more than 40 hectares, provides habitat for species intolerant of disturbance or for species that require extensive blocks of suitable habitat.

Background: The focus of this criterion is to identify large contiguous blocks of natural habitat and/or combined "patches" or "patch clusters" that cover an extensive area.

The presence of large contiguous blocks of forested habitat are used as an indicator of forest-interior conditions which are required by certain forest-interior and area-sensitive species. The size, shape, and continuity of these forested areas are important factors for the identification of forest interior conditions

Large patches, or patch clusters are important for maintaining frequency of habitat across a landscape and genetic diversity of populations among interacting patches.

Application: This criterion can be met in any one (1) of two (2) ways:

1. The size of a patch is generally greater than 40 ha or the combined size of patches is generally greater than 40 ha and the patches are not interrupted by gaps wider than 20 m; or,
2. The area either a) contains some interior forest habitat which is at least 100 m from all forest edges and is not interrupted by gaps wider than 20 m, OR b) there is confirmed presence of one or more breeding birds which are either forest-interior species or area-sensitive species.

Source References: Freemark and Collins (1992) and Sandilands (1997) for forest interior species; Magee (1996) updated from (Hounsell, 1989) for area-sensitive species.

Comments: For patches or patch clusters straddling the City boundary, the area determination shall be based on the whole patch or patch cluster since this represents the ecological unit to which the criterion is applied.

The minimum size limit will result in the inclusion of only the largest areas in the London subwatershed region, as determined through available data and data from the subwatershed studies. [Note: Of 25 ESAs or Potential ESAs, four (4) fell within the range of 150 to 500 ha and two (2) were greater than 500 ha].

The London Plan 1371 - Criterion 4:

The area, due to its hydrologic characteristics, contributes significantly to the healthy maintenance (quality or quantity) of a natural system beyond its boundaries.

Background: The focus of this criterion is to identify natural areas that contribute significantly to the quantity and quality of groundwater and surface water resources in the region. Factors such as the magnitude of the area covered or volumes of water involved and the importance of the resource should be used to assess the significance.

Landscape position and terrain setting should also be used to evaluate the significance of recharge areas.

Application: Presence of indicators of hydrological processes noted during subwatershed studies include but are not limited to:

- water storage;
- water release (discharge);
- wetlands;
- water quality improvement;
- first order stream / headwater;
- groundwater recharge and discharge areas identified on subwatershed maps as high potential; and,
- water conveyance (i.e. floodplain and overland flow paths).

For wetlands, those that meet three or more of five key hydrologic functions as identified in the hydrology section of the **OWES** (MNRF, 2014a) would be considered significant by the City of London. [Threshold was determined based on a review of ten evaluated wetlands within the City of London].

For areas of significant groundwater recharge, where large areas have been identified as high potential, it is not expected that the entire area identified would qualify for this criterion. To be considered for inclusion as part of an ESA, the recharge or discharge area must also be part of a vegetation patch as identified in a subwatershed study or support naturally succeeding vegetation communities.

Permanent, non-channelized first-order streams containing Type I-II habitat (DFO, 1994) qualify for inclusion as part of the ESA.

Source References: Sources of information include but are not limited to wetland and hydrologic information presented by the UTRCA and by the Subwatershed Studies Aquatic Resources Management Reports for Vision '96 Subwatersheds (Beak Consultants 1995).

The London Plan 1371 – Criterion 5:

The area has a high biodiversity of biological communities and/or associated plant and animal species within the context of the London subwatershed region.

Background: The focus of this criterion is to identify areas that demonstrate high variability and variety of plants, animals, and communities or habitats. The primary attributes of "biodiversity" include "compositional", "structural", and "functional" diversity.

Application: For vegetation communities and species in the London subwatershed region, biodiversity can be measured in relative terms (e.g., based on analysis of the patches surveyed, the top percentage of patches that support the highest number of community types, or native species of plants, birds, mammals, herpetofauna, etc.).

Source Reference: Subwatershed Studies Life Science Inventories (Bowles *et al.*, 1994)

For native species, Species-Area Curves may also be used to measure diversity. Areas where the actual number of species exceeds the expected number are considered diverse. Only native species will be used in the calculation.

Habitat diversity may also be used as supporting evidence of diversity (e.g., for herpetofauna the presence of vernal pools, woodland-pond interface, downed woody debris).

Comments: Evaluation of biodiversity should consider the variability of data obtained through different

levels of field efforts.

Vegetation community classification will be based on *An Ecological Land Classification for Southern Ontario* (Lee *et al.*, 1998).

The London Plan 1371_– Criterion 6:

The area serves an important wildlife habitat or linkage function.

Background: The focus of this criterion is to identify significant wildlife habitats or linkages between significant natural features as identified in SWH Criteria Schedule for Ecoregion 7E. These habitats and linkages contribute to overall landscape richness and provides habitat for wildlife (MNRF, 2015a).

Application: Important wildlife habitat functions are outlined in depth in the SWH Criteria Schedule for Ecoregion 7E (MNRF, 2015a) and are grouped under the following four broad categories:

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities or Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and,
- Animal Movement Corridors.

The site fulfills an external linkage or corridor function between two or more significant habitats. The value of a linkage or corridor will be based upon characteristics such as habitat, shape, width, and length. Linkage function and attributes are described in the *Natural Heritage Reference Manual* (MNRF, 2010b). Linkages may include, but are not limited to, the following:

- early successional woodlands and plantations;
- water bodies, watercourses and valleylands;
- riparian zones;
- steep slopes and groundwater discharge areas;
- old fields;
- hydro and pipeline corridors;
- abandoned road and rail allowances; and,
- recreational greenway parks.

Source References: MNRF files and maps; subwatershed studies; other data obtained through site specific field investigations; MNRF (1997); Riley and Mohr (1994).

Comments: Linkages should connect significant habitat areas for native species that will benefit from the presence of this linkage. Linear habitats (such as fencerows) that may have intrinsic habitat value, but do not connect larger protected areas, and those that are human imposed with no regard for the natural landscape system (such as channelized watercourses) should not be considered linkages (Harris and Scheck, 1991). Linkages and corridors, while also providing habitat or wildlife value, are important because they connect more substantive patches of habitat.

The London Plan 1371_ – Criterion 7:

The Area provides significant habitat for rare, threatened, or endangered indigenous species of plants or animals that are rare within the country, province, or county.

Background: The focus of this criterion is to identify populations of rare, threatened or endangered species for protection. This criterion is focused on SAR and rare species not covered

under significant wildlife habitat under Criterion 6 (e.g., species of conservation concern).

Definitions of significant habitat are given under each of the categories of vascular plants and animals. The most current sources of rarity designations will be used. Lists of rare species are considered open-ended as new information will result in amendments over time. Data from the Subwatershed Studies Life Science Inventories (Bowles *et al.,* 1994) were used to update Middlesex County status for plants.

Application: Plant Species

Habitat for plant species should be indicated by the presence of a population. The presence of a single specimen of a rare plant will not qualify an area under this criterion.

Federal SAR : COSEWIC Status reports

NHIC Global Ranks (GRANK) for Rare Vascular Plants (Oldham, 1994a) and Mosses (Oldham, 1994b).

- Species listed with a global rank of G1 to G3
- SAR listed under the *Species at Risk Act*

Rare Vascular Plants in Canada (Argus and Pryer, 1990), Database of Vascular Plants of Canada (VASCAN; Canadensys, 2020)

Provincial SAR: NHIC Provincial Rank (SRANK) for Rare Vascular Plants (Oldham, 2009; Oldham, 2017) and for Mosses (Oldham, 1994b).

- Species listed with a provincial rank of S1 to S3
- MECP designated SAR in Ontario

Atlas of the Rare Vascular Plants of Ontario (Oldham & Brinker, 2009; Oldham, 2017) COSSARO Status reports

Middlesex County Rare Species: Status of the Vascular Plants for Ecoregion 7E (Oldham, 2017)

- Rare in SW Ontario

SWFLORA database for Subwatershed Life Science Inventories (Bowles *et al.,* 1994)

- Rare in Middlesex County

Species recorded that have 1-4 records (stations) in Middlesex County. Note: Plant records collected from the subwatershed studies were used to update the rare status at the county level.

Animal Species

Habitat for animal species should be interpreted to mean areas where one (1) or more rare species are resident or breeding in the area, and/or making use of the area for a key component of their life cycle (e.g. territory, nesting, critical feeding grounds or wintering concentrations). Documentation of repeated (multi-year) use of an area by a species adds to the significance of the habitat. For breeding birds, the presence of suitable habitat for territory, nesting and feeding; for butterflies, the presence of suitable habitat including the host plants upon which they feed; for mammals, the presence of signs of active use of an area (e.g. dens, bedding areas, well-used trails, scat, etc.); for herpetofauna, the presence of suitable habitat for breeding (e.g. vernal pools, downed woody debris) and hibernating (presence of hibernacula).

Federal SAR: COSEWIC Status reports

NHIC Global Ranks (GRANK) for Amphibians and Reptiles, Mammals, Birds, Insects (e.g.,

butterflies, moths, odonata, hymenoptera, etc.) and Fishes

- Species listed with a global rank of G1 to G3
- SAR listed under the *Species at Risk Act*

Provincial SAR: NHIC Provincial Rank (SRANK) for Amphibians and Reptiles, Mammals, Birds, Insects, and Fishes

- Species listed with a provincial rank of S1 to S3
- MECP SAR in Ontario
- COSSARO Status reports

Middlesex County Rare Species: Southwestern Ontario regional status based on records in provincial atlases:

- mammals – e.g., Atlas of the Mammals of Ontario (Dobbyn, 1994)
- breeding birds – e.g., Avian Conservation Assessment Database (Partners in Flight, 2020), Atlas of the Breeding Birds of Ontario (OBBA) 2001-2005 (OBBA, 2007)
- insects – e.g., Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association, 2020)
- herpetofauna – e.g., Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)

Middlesex County status of rarity is based upon the most recent existing county records:

- mammals - provincial mammal atlas and records from MNRF District office
- breeding birds - open ended lists from the provincial bird atlas (OBBA, 2007; Partners in Flight, 2020) and best available county information;
- insects - best available county information;
- herpetofauna - status of amphibians and reptiles in Middlesex County (Ontario Nature, 2019)

Comments: Other non-vascular plant (e.g. mosses) and faunal groups (e.g. Odonata) should be included where and when the information is available.

The following sections provide guidelines for the evaluation of significance and ecological function for the following natural heritage features as specifically outlined in ***The London Plan***:

- Wetlands;
- Significant Wildlife Habitat; and,
- Valleylands.

Although other natural heritage features may require evaluation and subsequent protection (e.g., fish habitat, wetlands, etc.), the guidelines for evaluating those natural heritage features are outlined in the applicable provincial, federal, or other technical documents. It is expected that all natural heritage features be evaluated in accordance with the appropriate and most up-to-date guidelines and/or policies.

3.3 Provincially Significant Wetlands, Wetlands and Unevaluated Wetlands

There are three (3) catgories of wetlands within the City of London protected as per ***The London Plan*** (Policies 1330_ to 1336_):

- Provincially Significant Wetlands (PSWs)
- Wetlands, and
- Unevaluated Wetlands.

PSWs (on the City's Map 5 and / or in the MNRF's mapping data layers), as identified and mapped by the MNRF, may be re-evaluated by proponents in accordance with the Ontario Wetland Evaluation System (OWES) (MNRF, 2014a) as outlined in the *Natural Heritage Reference Manual*. MNRF remains responsible for reviewing and approving any additions, deletions or refinements to identified PSWs.

Assessments under the OWES system must be done by a qualified professional who is certified and experienced in application of the system.

Unevaluated Wetlands mapped in the City of London (on the City's Map 5 and / or in the MNRF's mapping data layers) are also to be evaluated for significance using the OWES as outlined in the *Natural Heritage Reference Manual*. The evaluation is to be submitted to MNRF for their review and decisioning.

Unmapped wetlands identified through the vegetation community assessment process may need to be evaluated for significance using the OWES system. These include the following ELC Community Series:

- SWAMP - deciduous swamp (SWD), mixed swamp (SWM) or coniferous swamp (SWC);
- FEN – open fen (FEO), shrub fen (FES) and treed fen (FET)
- BOG – open bog (BOO), shrub bog (BOS) and treed bog (BOT)
- MARSH – meadow marsh (MAM), shallow marsh (MAS)
- SHALLOW WATER – submerged shallow aquatic (SAS), mixed shallow aquatic (SAM) and floating-leaved shallow aquatic (SAF), and
- OPEN WATER (OAO).

Guidance for boundary delineation of wetlands is provided in **Section 4**.

Wetlands evaluated for provincial significance that do not meet the criteria for designation as a PSW (per OWES), as confirmed by the MNRF, will be identified as "Wetlands" within the City of London, irrespective of size or condition.

PSWs, Unevaluated Wetlands and other Wetlands will be added, removed or refined to Map 5 – Natural Heritage in ***The London Plan*** as new information becomes available. PSWs and Wetlands are also mapped as Green Space Place Type on Map 1, while Unevaluated Wetlands are mapped as features for Environmental Review.

All wetlands (including PSWs) and their adjacent lands are also regulated by the local Conservation Authorities and may also require consideration under the applicable Conservation Authority policies, as well as the Natural and Human-made Hazards Policies in ***The London Plan***.

For more information related to the evaluation of significant wetlands using the OWES, and its application under the Provincial Policy Statement, refer to the *Natural Heritage Reference Manual* (MNRF, 2010b) as well as Ontario's Wetlands evaluation website.

3.4 Significant Wildlife Habitat (SWH)

Signficant Wildlife Habitat (SWH) should be assessed utilizing the process outlined in the *Natural Heritage Reference Manual*, specifically utilizing the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000), in conjunction with the supplementary *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015a). ***The London Plan*** – Policies 1352 – 1354 provide key considerations for the determination of significance for wildlife habitat within the City of London. With respect to Policy 1354_3, passive recreation opportunities include activities such as hiking, photography and eco-tourism.

Within the City of London SWH is designated as a natural feature/area within the Green Space Place Type, therefore Green Space Place Type policies outlined in ***The London Plan*** are applicable.

3.5 Significant Valleylands and Valleylands

Valleylands, as defined in the *Provincial Policy Statement*, refers to natural areas that occur in a valley or landform depression with standing or flowing water for a period of the year. Valleylands include features such as rivers, streams, other watercourses, and ravines. Valleylands provide many important ecological functions (e.g., wildlife habitat, water storage/transport), as well as linkages/connectivity between other natural heritage features and areas within the NHS.

Policies for the identification and protection of Significant Valleylands and Valleylands are provided in ***The London Plan*** (Policies 1344 to 1349) The policies provide considerations for the identification and determination of significance for valleylands based on the evaluation of landform-related functions and attributes, ecological features and restored ecological functions.

Table 8-1 in the *Natural Heritage Reference Manual* outlines specific standards on the evaluation of function criteria for valleylands (e.g., surfacewater functions, distinctive landforms, habitat value, etc.). These criteria should be referenced when determining the significance of valleylands in conjunction with the guidance provided in ***The London Plan***.

The London Plan also includes direction (Policy 1350) for the determination of valley corridor width. Supplemental guidance related to boundary delineation for valleylands is described in **Section 4.2.2** of the EMGs.

Within the City of London, Significant Valleylands are designated as a natural feature/area within the Green Space Place Type, therefore Green Space Place Type policies outlined in ***The London Plan*** are also applicable. Valleylands that have been identified but not yet assessed are identified within the Environmental Review Place Type, pending evaluation. Note that air photo interpretation and / or site investigations may identify additional valleyland features.

In consultation with the applicable Conservation Authority, the City of London may consider alterations to river or stream valleys and watercourses to enhance, rehabilitate, and/or restore the system (e.g., bank stabilization, riparian plantings, and barrier removal) in accordance with Policy 1351.

4. Boundary Delineation of Natural Heritage Features and Areas

Delineation of natural features and areas requires an understanding of both technical and policy elements related to the feature and / or area being considered. Ecological boundary delineation is an important part of the planning process as it determines what will be considered for further evaluation. The City of London recognizes that it is important for the approaches taken to be as transparent and consistent as possible both to preserve the integrity of the City's Natural Hertiage System (NHS) and ensure the planning process is being implemented aprpopriately.

Ecological boundary delineation is required before natural features and areas can be evaluated for significance, and may be reviewed when site alteration or development is proposed adjacent to natural heritage features and areas that have already been identified and confirmed. This section provides guidelines for delineating the ecological boundaries of natural heritage features and areas including currently mapped and unmapped features. It specifically includes:

- An overview of the jurisdictional responsibility and policy direction related to ecological boundary delineation for each NHS component in the City
- General guidance for delineation of unevaluated vegetation patches in the City of London, and
- Feature-specific boundary delineation guidance for: Wetlands, Woodlands and Significant Woodlands, Valleylands and Significant Valleylands, Significant Wildlife Habitat, Environmentally Significant Areas (ESAs) and other lands to be identified through an environmental study (such as critical Function Zones [CFZs] and linkages.

Notably, the boundaries delineated for natural heritage features do not include any setbacks, buffers, or adjacent lands. Guidance for Ecological Buffers is provided in ***The London Plan*** (Policies 1412_ to 1416_) and supplemented with the guidance in Section 5 of these EMGs.

In addition, these boundary guidelines are focused solely on ecological boundaries irrespective of property lines. However, it is understood that while natural heritage features and areas may cross property boundaries, that field verification of such boundaries may be limited to the subject property.

The purpose of these guidelines is:

1. To document and describe a repeatable process based strictly on ecological considerations, leading to credible mapping which can be used for planning, protection and monitoring;
2. To provide the basis for resolving variations between different scales and types of mapping; and,
3. To establish a common understanding and approach between planners, consultants, and the public regarding the ecological aspects of boundary delineation for natural features.

4.1 Policy Context and General Guidance

Some components of the City's NHS must have their boundaries confirmed by the appropriate federal or provincial agency, while the boundaries of other components are the City's responsibility to confirm, sometimes in consultation with the local Conservation Authority. An overview of the jurisdiction responsible for confirming boundaries for the various NHS components, as specified in ***The London Plan***, is summarized in **Table 2.1**.

The following applies to any natural heritage feature or area, including vegetation patches, mapped or unmapped, to be considered as part of an Environmental Study through the planning process.

1. The term “vegetation patch” refers to an area that contains natural vegetation, along with associated features and functions. Vegetation patches are considered as one unit and can be comprised of multiple “natural heritage features” inside the patch (e.g., woodland, wetland, etc.). The initial feature boundary will be drawn at the interface between naturalized vegetation and the adjacent lands, generally conforming to the patch outline.
2. The ecological boundary is determined based on ecological principles, refined through the application of these guidelines, and are irrespective of property lines. Boundary delineation guidelines shall not be used to separate a vegetation patch into specific parts that can be treated individually as having lesser or greater significance and/or contribution to ecological function.
3. Application of these guidelines should be illustrated at a map scale of 1:10,000, using aerial photography and other tools as necessary. Further refinements will be made at a smaller scale (e.g., 1:5,000 or 1:2,000 scale), and may require field investigations. For the completion of an Environmental Study, boundaries must be geo-referenced to the best accuracy possible.
4. The diagrams and examples that form part of the conditions for boundary delineation provided below are intended to convey the intent of the guidelines. While not drawn to scale, these diagrams do depict the relative sizes and distances of the areas shown. A legend has been included to aid in the interpretation of the diagrams.
5. In the application of these guidelines, the most recent map sources, current and historical aerial photographs, and ecological background studies/documents should be used to verify

4.2 Wetlands

The overarching policy framework for PSWs, Wetlands, and Unevaluated Wetlands is outlined in ***The London Plan*** – Policies 1330 to 1336. Wetlands of any size must be identified, delineated and screened in accordance with both City and Conservation Authority policies.

The first step in delineating wetland features is to define the wetland types and delineate these vegetation communities approximately utilizing the ELC System (Lee *et al.*, 1998). The second step, is to confirm and, if needed, refine the delineation of internal boundaries (e.g., between different types of wetlands, boundary between wetland and upland communities), external boundaries (e.g., between wetlands and non-natural land uses), and wetland complexes (if applicable) using the Ontario Wetland Evaluation System (OWES) (MNRF, 2014a). The OWES provides in-depth instructions on the delineation of internal and external boundaries and generally consists determining wetland boundaries within areas of gradual ecological change (i.e., transitional areas, eco-tones) utilizing a combination of the following information:

- Transition (i.e., a 50% split) between wetland and upland plant community (percent cover);
- Topography, such as elevation and slope; and,
- Soil substrate.

Wetland boundaries should be scaled to 1:10,000 for mapping purposes, with the width of the boundary line being scaled to cover the equivalent of 15 m in real world application (MNRF, 2014a).

The wetland boundary delineation must be conducted by a qualified professional (i.e., a person certified and experienced in the application of OWES), and is typically undertaken in the field with the applicable Conservation Authority. Existing boundaries of PSWs remain as mapped unless any proposed revisions are approved in writing by the MNRF.

Beyond the wetland community boundaries, the Critical Function Zone (CFZ) must also be included for constraints mapping and site planning. CFZs are non-wetland areas within which biophysical functions or attributes directly related to the wetland occur (Environment Canada, 2013). Effectively, the CFZ is a functional extension of the wetland into the upland. For example, this could include: upland grassland

nesting habitat for waterfowl (that use the wetland to raise their broods), upland foraging areas, overwintering and nesting habitat for reptiles and amphibians. Foraging areas for frogs and dragonflies, and / or nesting habitats for birds that straddle the wetland-upland ecozone could also be considered part of the CFZ.

CFZs do not replace the functions of a buffer. For more in-depth information on determining CFZs, refer to Environment Canada (2013).

4.3 Significant Woodlands and Woodlands

The overarching policy framework for the identification and evaluation of woodlands is outlined in ***The London Plan*** – Policies 1337 to 1343, 1383_ and 1386, and includes local criteria aligned with the *Natural Heritage Reference Manual.*

The *Provincial Policy Statement* protects Significant Woodlands by not permitting development and site alteration within these features or on adjacent lands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Most potential Woodlands are shown as Unevaluated Vegetation Patches on Map 5 – Natural Heritage and as Environmental Review Place Type on Map 1 in ***The London Plan***. However, as identified in ***The London Plan*** – Policy 1216, the absence of vegetation patches from the aforementioned mapping does not necessarily mean that additional unevaluated vegetation patches do not exist. Therefore, proponents must assess the subject lands in question to screen for the presence of any additional Unevaluated Vegetation Patches and/or other vegetation patches larger than 0.5 ha.

Significant Woodland and woodland boundary delineation shall be conducted by a qualified professionals with expertise in ecology, hydrology and geomorphology. All woodland boundaries are to be delineated in the field at the Drip Line of the feature.

Section 3.1 includes guidance related to the evaluation of woodlands.

4.4 Valleylands and Significant Valleylands

The overarching policy framework for the identification of Significant Valleylands is outlined in ***The London Plan*** – Policies 1347 to 1349, and includes local criteria aligned with the *Natural Heritage Reference Manual* guidance, but also refer to this guidance for additional criteria.

The *Provincial Policy Statement* defines valleylands as natural areas that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year, and includes rivers, streams, other watercourses and ravines) (MMAH, 2020). Significant valleylands also play an essential role in the NHS, such as providing connectivity (e.g., migration and dispersal corridors) (MNRF, 2010b).

Valleylands may be clearly defined (e.g., with steep ravines sloping down towards a permanent watercourse), or may not have a well-defined corridor or permanent flows (e.g., in areas of headwaters, seeps) (MNRF, 2010a).

Specific policies for the boundary (width) delineation of Significant Valleylands are outlined in ***The London Plan*** Policy 1350. Significant valleyland boundary delineation shall be conducted by a qualified professionals with expertise in ecology, hydrology and geomorphology.

Section 3.5 includes guidance related to the evaluation of valleylands.

4.5 Significant Wildlife Habitat

The overarching policy framework for the protection and determining the significance of Significant Wildlife Habitat (SWH) is outlined in ***The London Plan*** Policies 1352_ to 1355_. These policies point to the guidance in the SWHTG (MNRF 2000b) and the NHRM (MNRF 2010b), the Province's criteria schedules for Ecoregion 7E (MNRF 2015a) for determination of the significance and delineation of SWH and municipal criteria outlined in Policy 1354_.

SWH is the most complex habitat category in the City's NHS (and in the *Provincial Policy Statement*) as it seeks to capture ecologically important and somewhat specialized habitat types for a broad cross section of species and ecological functions. In Ecoregion 7E, the ecoregion in which London occurs, there are 35 categories of SWH. SWH often occurs as a subset of or within other natural heritage features or areas (such as wetlands or woodlands), but may also extend beyond or occur outside of such features or areas.

The applicable guidance, particularly for the ecoregional criteria, largely relies on vegetation community polygons delineated at the Ecosite level using the ELC system (Lee *et al.,* 1998) to determine the extent of habitat to be considered as SWH, although a few SWH categories are delineated using the presence or absence of other habitat features not linked to one or more specific Ecosite type. Nonetheless, in most cases, the presence of one or more of the specified Ecosite types in conjunction with the presence of one or more of the defining criteria within the applicable polygons is sufficient to warrant consideration of a feature or area as candidate SWH. The current and proposed land use context should, however, also be considered in conjunction with the habitat needs and sensitivities of the species / group of species in question, and the broader context of the NHS on a City-wide scale, in determining appropriate boundaries for the SWH type.

It is the City of London's responsibility to determine whether or not the candidate SWH should be confirmed, the extent of the habitat to be protected, and the mitigative measures required, if any. Depending on the nature and location of the SWH, SWH boundaries should also be determined in consultation with the other applicable agencies (e.g., Conservation Authority).

Further, delineation of SWH should be informed by information collected from aerial mapping and observations from site investigations, and should be confirmed in the field by a qualified professional.

Section 3 provides supplemental guidance on the evaluation of SWH.

4.6 Environmentally Significant Areas (ESAs)

The overarching policy framework for the evaluation of Environmentally Significant Areas is outlined in ***The London Plan*** – Policies 1367_ to 1371_, and includes local criteria unique to London. As outlined in ***The London Plan***, ESAs are relatively large areas in the City that contain natural features and perform ecological functions that warrant their retention in a natural state. ESAs often capture a complex of wetlands, woodlands, SWH, and/or valleylands and are delineated based on the features that they contain.

ESAs that have been evaluated are included as Green Space Place Type on Map 1 – Place Types and are mapped on Map 5 – Natural Heritage. However, Potential ESAs patches or other vegetation patches greater than 0.5 ha (as identified through subwatershed plans or other environmental studies) should be delineated and assessed for significance (as outlined in **Section 3**). It is important to note that mapping in ***The London Plan*** is dynamic in nature, and not all potential vegetation patches or those identified for protection may be included in the mapping at a given time. It is the responsibility of the proponent to determine potential vegetation patches for evaluation as part of the planning process and development application.

Appropriate expertise provided by a qualified professional is required to delineate ESA elements. For vegetation communities, the ELC system for Southern Ontario (Lee *et al.*, 1998) will be the standard protocol used to differentiate natural vegetation communities within patches. The term "area" in the context of an ESA refers to patches or patch clusters (i.e., the combined area of contiguous patches), which are defined during boundary delineation and included in the feature boundary).

Section 3.2 includes guidance related to the evaluation of ESAs.

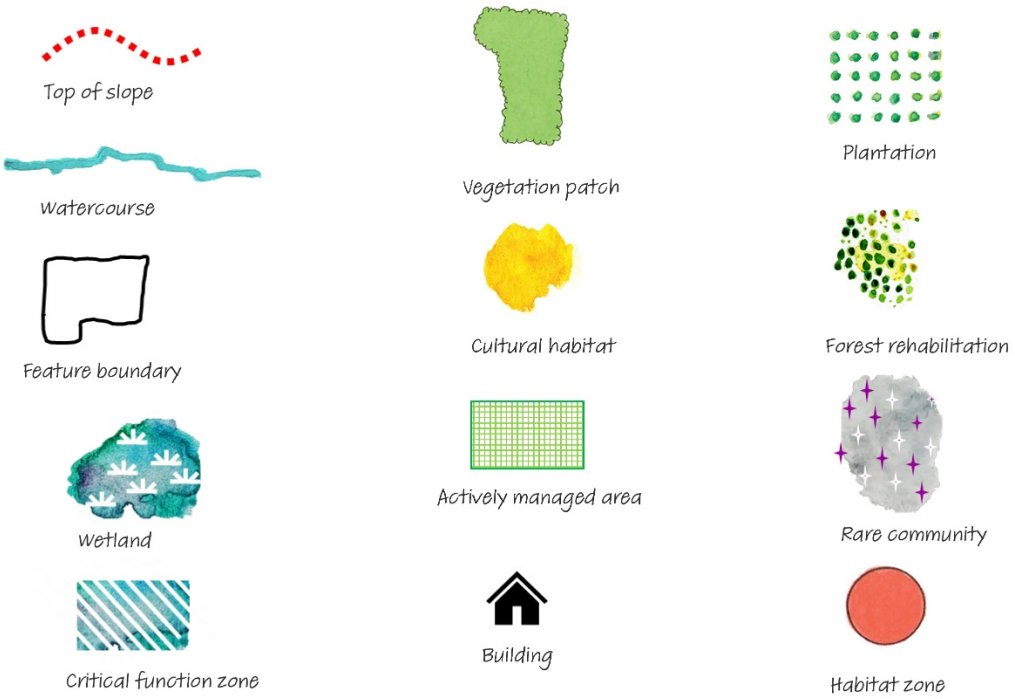
4.7 Boundary Delineation Guidelines

In general, vegetation patches have been identified through subwatershed plans or other environmental studies and have been mapped in ***The London Plan*** on Map 1 – Place Types and Map 5 – Natural Heritage. Vegetation patches that have been evaluated for significance may fall under the Woodland category or the ESA as a whole vegetation patch, or have specific components (features, e.g., wetlands) evaluated for significance.

As outlined in ***The London Plan***, vegetation patches that have been evaluated are included as Green Space Place Type on Map 1 – Place Types and mapped as the corresponding natural heritage feature (e.g., as Significant Woodlands and woodlands) on Map 5 – Natural Heritage. However, Unevaluated Vegetation Patches or other vegetation patches greater than 0.5 ha (identified through subwatershed plans or other environmental studies) should be delineated and assessed for significance (as outlined in **Section 3**). It is important to note that mapping in ***The London Plan*** is dynamic in nature, and not all potential vegetation patches or those identified for protection may be included in the mapping at a given time. It is the responsibility of the proponent to determine potential vegetation patches for evaluation as part of the planning process and development application.

Figure 4.1: Guideline Legend

LEGEND:



The following guidelines outline the process for determining the feature boundary of a vegetation patch.

GUIDELINE 1: Species at Risk (SAR) habitat and Significant Wildlife Habitat (SWH) **must be included within the feature boundary**.

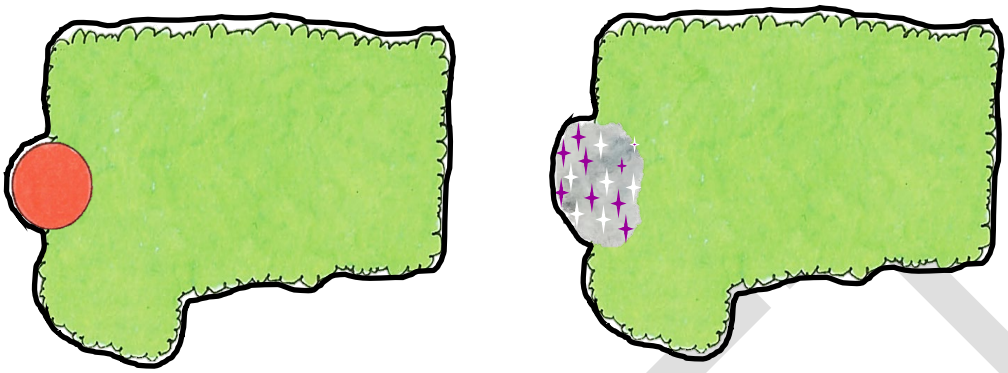


Figure 4.2: Guideline 1 Illustration

Conditions:

Confirmed SAR habitat (including associated habitat zones) is to be included within the feature boundary include habitat for Federal and Provincial SAR protected under the federal *Species at Risk Act* and provincial *Endangered Species Act*. For the City of London's policies related to SAR habitat, refer to ***The London Plan –*** Policies 1325-1327.

In addition to SAR habitat, all confirmed SWH is to be included as determined through ELC (Lee *et al.* 1998) and further assessed using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015a) and the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000b) and, for the City of London's policies related to SWH, refer to ***The London Plan*** – Policies 1352-1355.

Rationale:

SAR habitat and SWH are essential for maintaining critical life processes, biodiversity, and aiding in the protection and recovery of rare species/communities and SAR (MNRF, 2010a). Further, underrepresented or rare species and communities (i.e., SAR, SWH) are under pressure from habitat fragmentation and overall loss of habitat, therefore one important goal for ecological function when establishing/defining natural heritage features is to provide habitat to these rare species (MNRF, 2010a).

In regards to SAR habitat, a habitat zone is a feature or area used regularly for a key lifecycle requirement for a species or habitat that requires special protection. The vegetation in the habitat zone doesn't necessarily need to be of natural origins and could contain culturally influenced communities. The critical habitat of a plant species may extend to areas in the immediate vicinity of population that have similar soil, moisture, exposure, and community conditions.

Examples of habitat zones that may require special protection are:

- Old fields, hedgerows, and woodland edges that may be important habitat for American badger (*Taxidea taxus jacksoni*) maternal and other den sites, as well as migration corridors for the dispersal of young (Ontario American Badger Recovery Team, 2010); and,
- Sandy shorelines that provide critical nesting habitat for the Eastern Spiny Soft-shell Turtle (*Apalone spinifera*) often occuring along the Thames River.

GUIDELINE 2: Swamps, Marshes, Thicket Swamps, or other Untreed Wetland communities and their associated Critical Function Zones (CFZs) contiguous with a patch **must be included within the feature boundary** (inset d of **Figure 4.3**).

To be included in the patch boundary, the wetland communities must meet at least one of the following criteria:

a) The wetland strengthens a linkage between natural areas by filling in a bay or connecting two or more patches or is continguous with the patch;

b) The wetland is located above the top-of-slope of stream corridor or ravine;

c) The wetland connects a patch to a permanent, natural watercourse; or,

d) The wetland CFZ is included within the feature boundary.

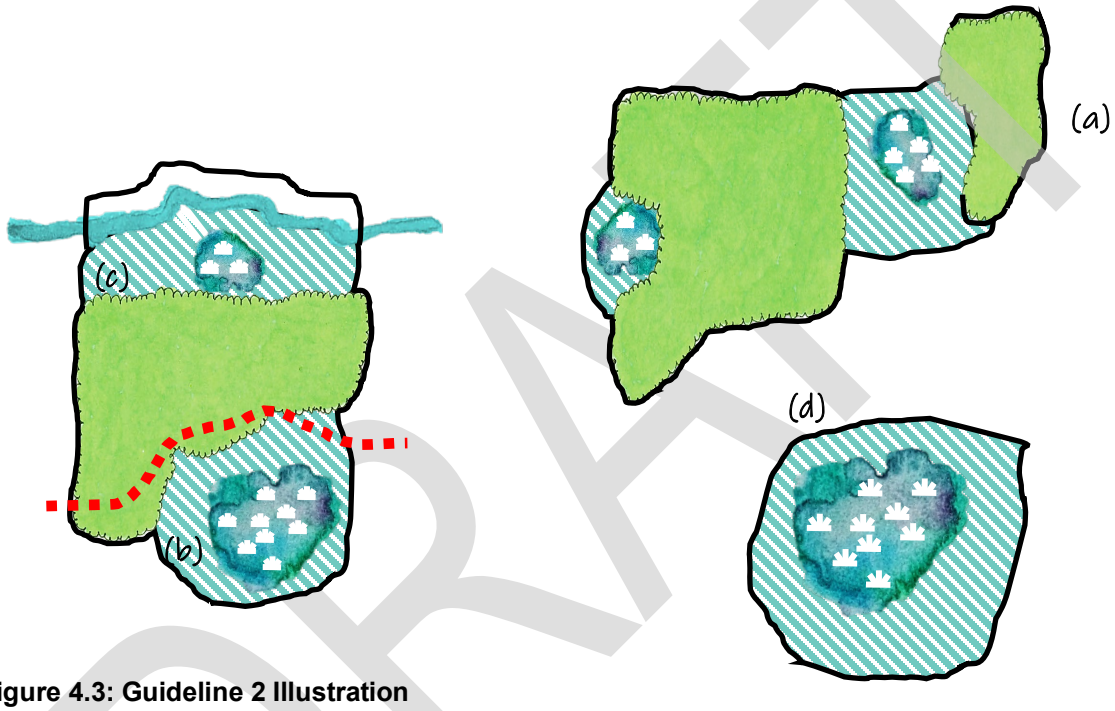


Figure 4.3: Guideline 2 Illustration

Conditions:

Although all wetlands are protected under the City of London's policies related to PSWs, Wetlands, and Unevaluated Wetlands (***The London Plan*** – Policies 1330-1336), marshes, thicket swamps, and other untreed wetlands (along with their associated CFZs) that meet the criteria above must be included within the overall vegetation patch boundary. All other wetlands, including PSWs, Wetlands, and Unevaluated Wetlands and their associated CFZs that do not meet the above criteria are to be delineated as their own vegetation patch. CFZs include non-wetland areas within which biophysical functions or attributes directly related to the wetland occur (Environment Canada, 2013). Reference to Environment Canada (2013) can be made for more information on determining specific CFZs, however review of the most up-to-date documents on CFZs should be conducted.

Rationale:

Wetlands provide important habitat for plants, fish and wildlife. Wetlands also influence the quality and temperature of water flowing through them and some wetlands provide storage capacity to offset peak flows associated with storm events.

CFZs are natural areas that surrounds wetlands can provide a suite of benefits to wetland function and to the species dependent on the wetland. In many cases, these natural areas, although they extend beyond the limits of the wetland, are inherently part of the wetland ecosystem and provide habitat for critical life processes to wetland species (Environment Canada, 2013).

GUIDELINE 3: Projections of naturalized vegetation **less than thirty meters (30 m) wide that extend from the main body of the patch:**

a) **must** be included within the boundary if the projection includes a wooded ravine or valley with untreed or successional habitat below the top-of-slope; and

b) **must** be included within the boundary if the projection provides linkage within the landscape.

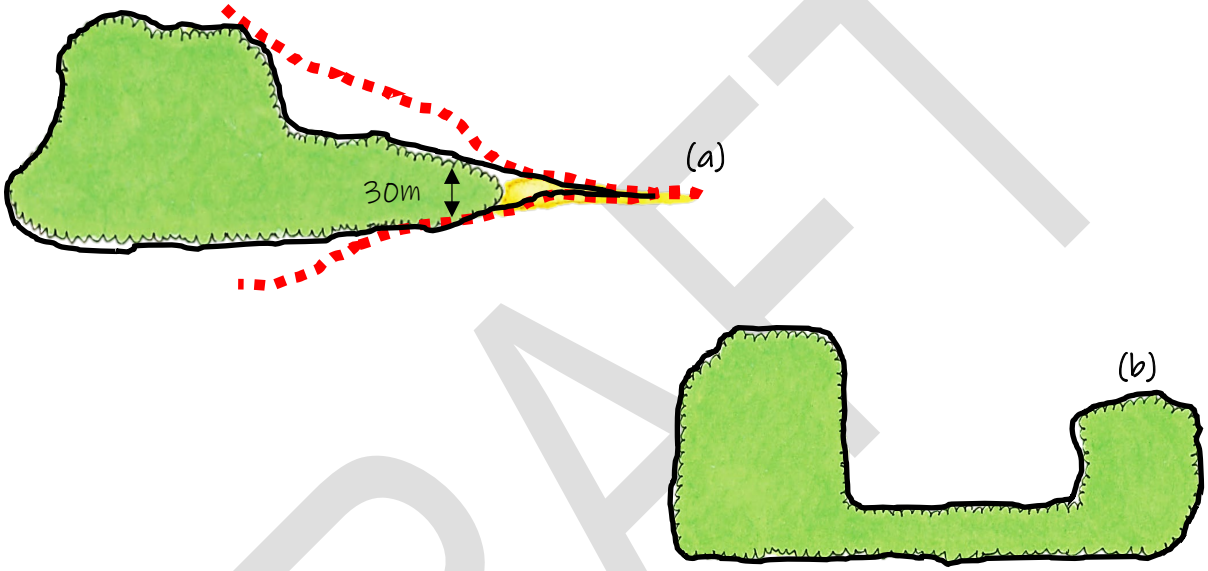


Figure 4.4: **Guideline 3 Illustration**

Rationale:

Ravine, valley, and upland corridors are important components of the NHS because they contain natural habitat, provide linkages, increase species richness and diversity, and facilitate movement and dispersion. Landscape connectivity (e.g., through linkages) is important in the maintenance of ecological function of patches and reduces landscape fragmentation that lead to smaller, more isolated features (MNRF, 2010a). For example, linkages can provide a dispersal route for species (i.e., connectivity) to complete different aspects of their life cycles, such as allowing reptiles and amphibians to travel between breeding and overwintering habitat (MNRF, 2010a).

GUIDELINE 4: All Watercourses **must be included within the feature boundary.**

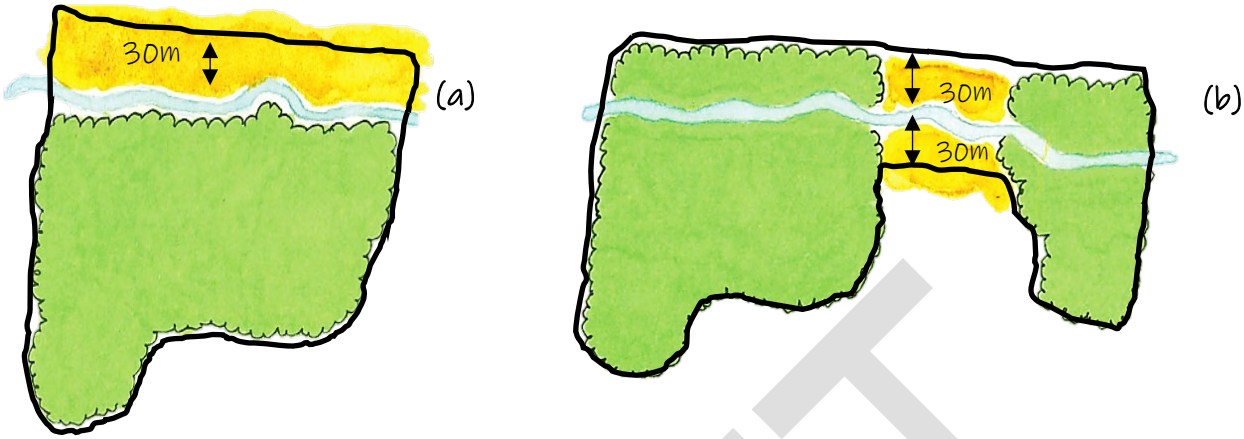


Figure 4.5: **Guideline 4 Illustration**

Figure 4.5 is an example of the inclusion of watercourses for defining vegetation feature boundaries, where a) depicts a watercourse at the edge of a vegetation patch and b) depicts a watercourse connecting two (2) patches.

Conditions:

The edges of the watercourse **must** be measured **from the high-water mark** and will include the following minimum corridor widths:

- 15 m on each side of small watercourses (valleylands);
- 30 m on each side of significant watercourses with a warm- or cool-water thermal regime (***The London Plan*** – Policy 1350);
- 50 m on each side of watercourses with a cold-water thermal regimestreams;; or,
- 100 m on the side(s) of large rivers (Thames River, Medway Creek, Stoney Creek, Dingman Creek) where the patch occurs (City of London, 2011).

The high-water mark is defined as the average **highest** level that a watercourse or waterbody rises to and remains at long enough to alter the riparian vegetation (DFO, 2007; DFO, 2019). In flowing watercourses, this is often referred to as the "active channel" or "bank-full level", usually reflecting the 1:2 year flood level (DFO, 2007).

Rationale:

Watercourses act as important habitat providing wildlife resources and functions as well as contributing substantially to connectivity within and between significant natural areas. Riparian areas adjacent to watercourses are important for protecting the water quality and ecological health of aquatic habitats. First order, headwater streams are recognized as indicators of hydrological processes. These hydrologic processes are important for ecological function and should be protected within NHS (MNRF, 2010a).

A watercourse is generally defined according to several federal and provincial Acts and Regulations and typically consists of a distinct (somewhat to well-defined) channel in which water naturally flows at some time of the year [i.e., permanent, intermittent, or ephemeral flow as defined by MNRF's Stream Permanency Handbook for South-Central Ontario (MNRF 2013)]. This includes anthropogenically created / maintained / altered features as well as natural features.

GUIDELINE 5: Satellite woodlands that are less than 2 ha and are located within 100 m of another woodland patch:

a) **must** be included within the boundary if the satellite contains Species at Risk or Significant Wildlife Habitat; and,

b) **must** be included within the boundary if they contribute to biological diversity and ecological function of the other patch and/or act as stepping stone linkages within the greater landscape

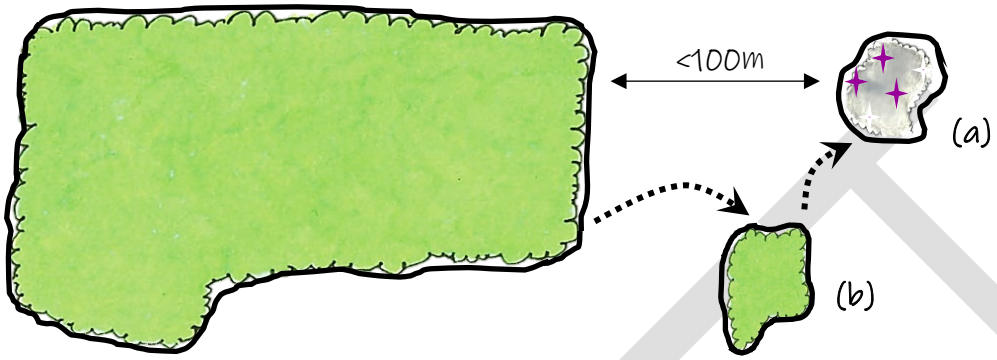


Figure 4.6: Guideline 5 Illustration

Conditions:

Contribution to biological diversity, ecological function, and connectivity may include, but is not limited to the following (MNRF 2010a):

- the satellite supports native tree cover;
- the satellite is located adjacent to or contains a wetland;
- the satellite is located between two (2) larger patches that are within 250 metres of each other, where the land between the patches is absent of permanent barrier;
- the satellite meets the habitat needs of one or more species that are not met by the larger patch;
- the satellite contains a natural vegetation community type that is not already represented in the larger patch;
- the satellite supports or is dependent upon a surface- or ground-water connection that maintains fish or aquatic habitat in either patch; and,
- the satellite provides a temporary refuge that facilitates movement between habitats.

Rationale:

There is limited evidence to support the principle that large contiguous patches contain more biodiversity than multiple small patches of the same total area (Fahrig, 2019). Woodlands ≥ 4 ha are important in Middlesex County, and have the potential to support habitat for disturbance sensitive species (UTRCA, 2014; NHRM, 2010). Smaller woodlands have the potential to deliver multiple ecological services at higher performance levels per unit area than larger woodlands in agricultural landscapes (Valdés *et al.,* 2020). Further, multiple small, connected patches can support higher species richness, are more likely to contain wide-ranging taxa (e.g. predators), and have fewer extinctions compared to single large patches (Hammill & Clements 2020).

The presence of native conifer cover is considered important for providing wildlife shelter. Further, the importance of a woodland increases if it is located adjacent to a wetland or it contains a wetland, as

wetlands can increase vegetation diversity, provide important wildlife habitat features, and contribute to hydrological functions (Hilditch, 1993; Riley and Mohr, 1994).

Small woodlands that are in close proximity to one another or interspersed amongst larger habitat patches, may have value for area-sensitive birds and species with low mobility (Riley & Mohr 1994). Further, small woodlands located between natural heritage features or areas can act as stepping stones for movement of species, thus functioning as a linkage (MNRF, 2010a)

Clusters of patches that collectively meet several of the habitat needs of one or more species are generally more valuable than clusters of patches that meet fewer habitat needs (MNRF, 2010a). Natural areas that consist of several patches containing a diversity of native vegetation community types can sometimes provide better representation of the range of habitats than a single larger habitat patch (MNRF, 2010a; Fahrig, 2020).

GUIDELINE 6: Cultural meadows **must** be included if they meet one (1) of the following criteria:

a) a portion of meadow habitat surrounds a feature on one or more sides, and provides improved ecological function to the patch by its inclusion;

b) strengthen internal linkages in the patch by filling in "bays";

c) connect a patch to a watercourse; or

d) connect two or more patches (inset d of **Figure 4.7**); or,

e) are below the top-of-stable-slope in a stream corridor or ravine.

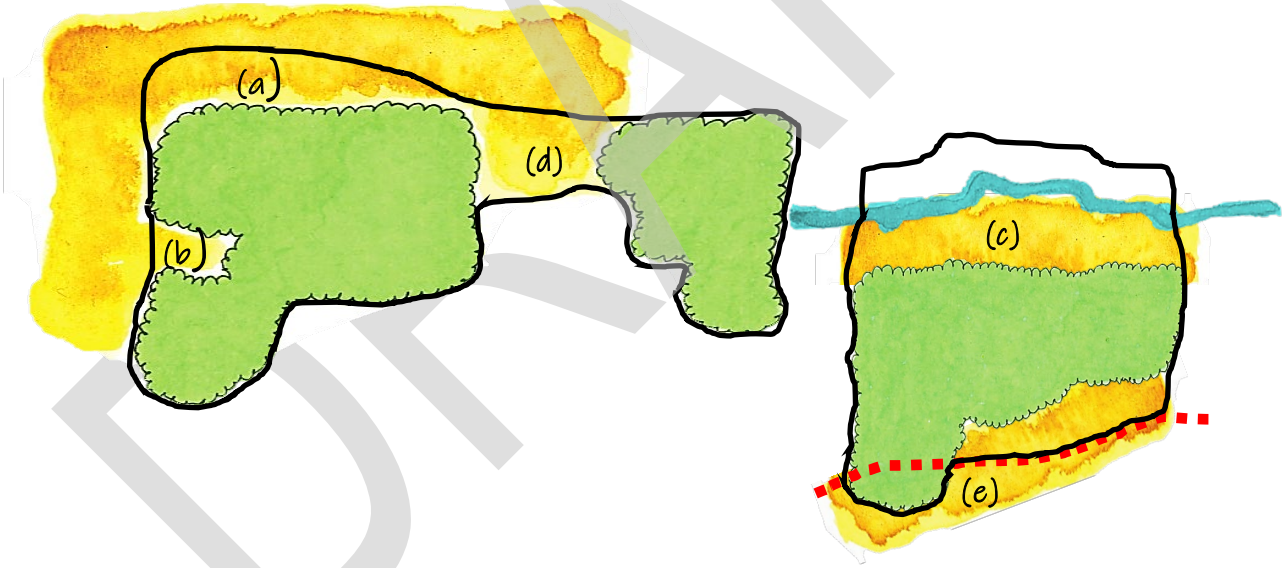


Figure 4.7: **Guideline 6 Illustration**

Condition:

A cultural habitat meeting any one of the above conditions is included in the vegetation patch boundary. However, it is not intended that the cultural habitat will occupy a large proportion of the total area of the patch being delineated.

Rationale:

Cultural habitats may act as significant supporting habitat to the patch, where the loss of such communities would result in loss of ecological integrity of the entire patch boundary. The inclusion of

cultural habitats may increase the biological diversity of the area if the other similar cultural habitat is not already present.

Cultural habitats may provide increased community and species diversity, important breeding and foraging wildlife habitat, landscape connections between naturalized areas, habitat for rare flora and fauna, and/or reduce negative effects from surrounding land-use. Cultural habitat adjacent to woodlands also has potential for rehabilitation and may contribute to a net environmental benefit in ecosystem health. Although cultural habitats are not pristine or unaffected by human activity, they have the potential to contribute natural values. This contribution is especially prevalent agriculturally-dominated landscapes, which are common southern Ontario (Geomatics International, 1995; Milne and Bennet, 2007).

Criteria and guidelines for evaluating the ecological significance of cultural habitat areas are provided in the Geomatics (1995) report "Management options for old-field sites in southern Ontario". These criteria address a range of issues including rare and endangered species, wildlife habitat, site productivity, successional stage, soil characteristics, site history and the relationship of a particular site to the surrounding landscape.

GUIDELINE 7: Plantations contiguous with patches of natural vegetation **must** be included in the feature boundary if the they meet one (1) of the following criteriaplantation:

a) was originally established for the purposes of forest rehabilitation or has been managed towards a natural forest or is developing/has developed characteristics of a natural forest, such as natural regeneration of native species.

b) strengthens internal linkages or reduces edge to area ratios by filling in bays;

c) connects a patch to a permanent watercourse;

d) it connects two or more patches; or,

e) it is below the top-of-slope in a stream corridor or ravine.

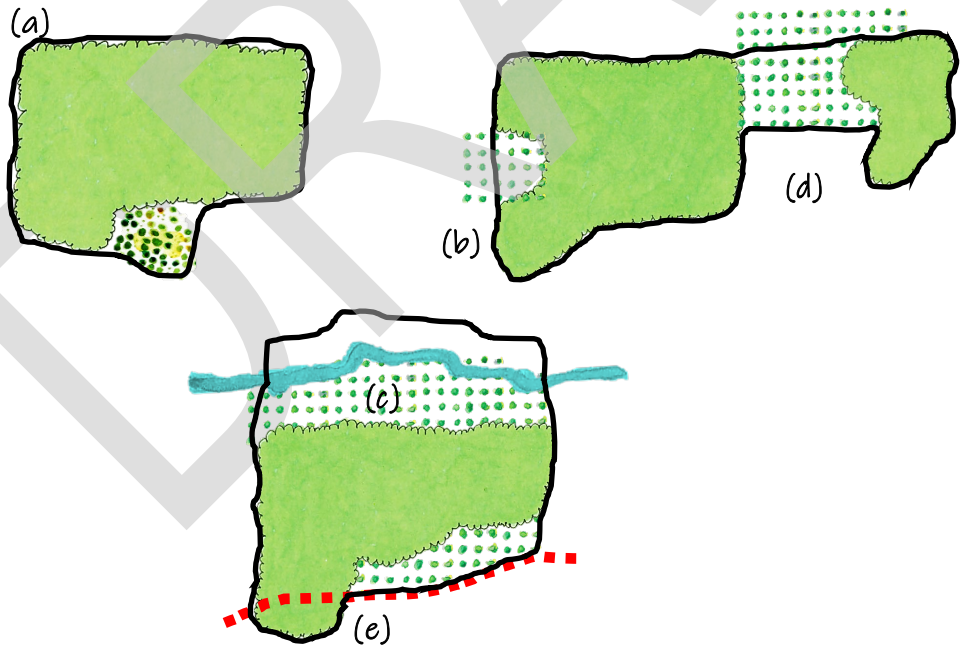


Figure 4.8: Guideline 7 Illustration

Example of the inclusion of plantations for defining feature boundaries where a) depicts a plantation providing protection for adverse effects, b) depicts a plantation filling in a 'bay', c) depicts a plantation connecting a vegetation patch to a watercourse, d) depicts a plantation connecting two (2) patches, and e) depicts a plantation below the top-of-slope of a stream corridor/ravine.

Rationale:

Cultural plantation communities may provide significant wildlife or supporting habitat for important wildlife processes (e.g., butterfly stopover areas, raptor nesting areas, etc.; MNRF, 2015a). Plantations form connections between naturalized areas, provide wildlife habitat, stabilize soils, and have the potential for regeneration to natural habitats.

GUIDELINE 8: Existing land uses within or adjacent to a patch are subject to the following boundary considerations:

a) Existing heavily managed or manicured features that are surrounded on at least three sides by a patch are included in the feature boundary if they are less than one hectare (1 ha) in total area (**Figure 4.9**). Such features include, but are not limited to agricultural croplands, active pasture, golf courses, lawns, ornamental treed lots, gardens, nurseries, orchards, and Christmas tree plantations. Subsequent abandonment or potential for rehabilitation of patches larger than one hectare (1 ha) may qualitfy such areas for inclusion in the patch.; and,

b) Existing residential building envelopes and institutional building envelopes surrounded on at least three sides by a patch are not affected by the protective designation. Building envelopes and access routes of existing structures within the patch must be determined on a site-specific basis.

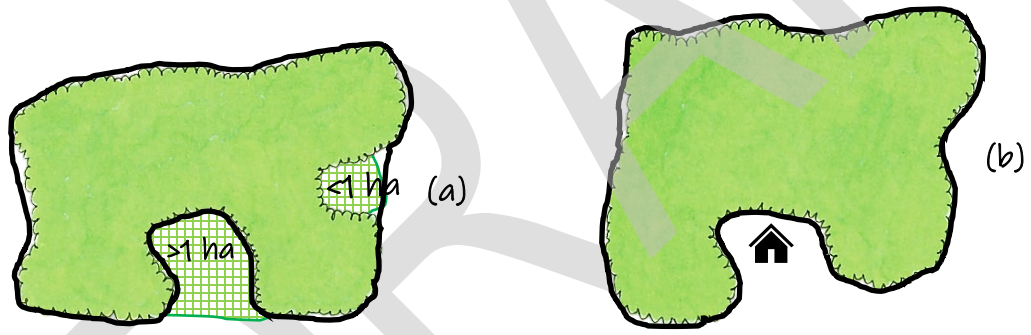


Figure 4.9: Guideline 8 Illustration

Rationale:

Existing heavily managed or manicured features (e.g., croplands, pastures, orchards, etc.) can provide a large number of ecological and environmental services. These services include providing wildlife habitat, carbon sequestration and climate change mitigation, protection from erosion, stormwater catchment, and protection from disturbance (Troy and Bagstad, 2009; FAO, 2013).

5. Determining Ecological Buffers

Ecological buffers are one of the primary planning tools that must generally be implemented to help ensure the protection of natural heritage features and their functions in accordance with ***The London Plan*** (see Environmental Policies 1412_to 1416). The following section provides guidance for: i) the determination of suitable site-specific buffer widths and ii) the implementation and management of site-specific buffer restoration and/or enhancement treatments.

This section defines a buffer (Section 5.1), outlines the approach to be taken in the City related to buffers (Section 5.2), and describes the process to be followed for buffer determination (Section 5.3) that must be followed in order for an EIS to be accepted by the City of London.

This process is best applied by professional Ecologists who have experience with, and an understanding of, the many interrelationships of the various natural heritage features and areas, and their ecological functions, that may be present and that are potentially affected by a development proposal.

5.1 Definition of a Buffer

Buffers are strips of land kept in a vegetated state that provide a physical separation between development and a protected natural heritage feature (MNRF, 2010b). The width of a buffer is to be determined based on the type of Natural Heritage Feature and its' functions as well as the potential impacts resulting from the proposed adjacent development. Buffers originate at the boundary of a Natural Heritage Feature and extend outwards to the limits of development (MNRF, 2010a; Carolinian Canada, 2000). In the case of wetlands, as described in **Section 4**, Critical Function Zones (CFZs) are included in the overall feature boundary. Therefore, for wetlands, the buffer is to originate at the external boundary of the CFZ. Buffers shall not be included within the limits of development, or within the boundary of the feature. Ecological buffers are not intended to contribute to feature-based compensation goals, should they be required. Buffers should not be treated as extensions of the natural feature to allow for management practices should they be required (MNRF, 2010a).

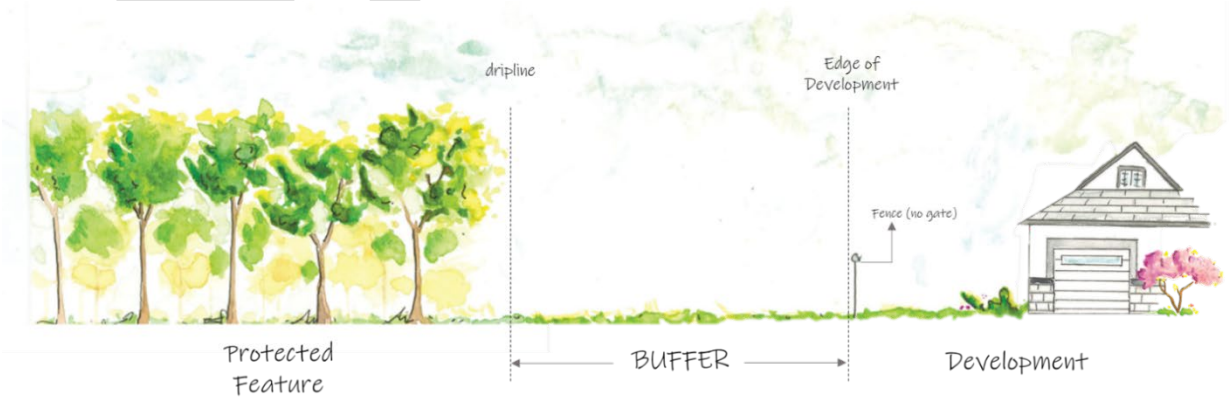


Figure 5.1: Illustration of a buffer implemented for the protection of a Natural Heritage Feature adjacent to a development.

Note that a setback is different from a buffer, although in some cases the natural feature buffer and setback may overlap in whole or in part. A natural feature setback is intended to account for physical constraints based on geotechnical assessments, identified hazards (Carolinian Canada, 2000), or other

physical constraints such as those related to flooding. For example, a property must be setback a certain distance from the stable top of slope for safety purposes and property protection. In cases where both physical setbacks and ecological buffers are required, the greater of the two will establish the development limit line.

Adjacent lands are also not synonymous with buffers, although buffers are often contained within the adjacent lands to natural heritage features and areas. As stated in the NHRM (MNRF 2010b), "*In contrast to adjacent lands, which are usually established before development is proposed (e.g., through official plan and or zoning by-law provisions), identified buffers should be determined once the nature of the development is known and the extent of potential impacts can be determined*".

5.2 Approach

The process of determining a site-specific buffer width requires the consideration of information about the sensitivities and functions of the natural heritage feature and area(s) being considered and the nature and scope of the proosed adjacent land uses. The science of buffer efficacy is ever evolving. Since the science is constantly changing, the process outlined below is intended to allow for flexibility and the inclusion of new scientific information as it becomes available.

In general, the precautionary principle is to be used when it comes to the protection of features, functions, and species given that impacts may be documented decades after a development has been completed and *in situ* buffer efficacy is not yet well studied. However, in certain cases, the City and the Proponent, in consultation with any other applicable agencies, may agree to a buffer width less than that which is required as determined through the process outlined in **Section 5.3**.

Other techniques, including those outlined in ***The London Plan*** Policy 1415_, may be required in addition toh the application of buffers to limit the impacts anticipated with proposed development.

At the City's discretion, in consultation with any other applicable agencies, pathways may be permitted within the buffer provided that the buffer is of sufficient size (i.e., meeting the minimum requirements), remains naturalized outside of the pathway, and is supported by the reccomendations of the approved EIS.

This approach is based on policies and guidance provided in ***The London Plan*** and the provincial *Natural Heritage Reference Manual* (MNRF, 2010b), with consideration for the policies of the Oak Ridges Moraine Conservation Plan (MMAH, 2017b) and Greenbelt Plan (MMAH, 2017a).

5.3 Buffer Determination Process

Table 5.1 below outlines the general step-by-step process to determine a site-specific buffer width for the protection of Natural Heritage Feature(s) within the City of London. Although ultimate buffer widths can only be confirmed at the site-specific EIS stage, where possible, preliminary buffers should be identified at the broader Subwatershed Study or Secondary Plan stage to provide an early and realistic determination of lands that may be suitable for development and so that opportunities for mitigation using buffers is available during the design of draft plans (MNRF, 2010b).

The following process has been developed primarily for application at the site-specific stage through an EIS, but many of the same steps and considerations could be applied at the broader Subwatershed Study or Secondary Plan stage with he understanding that refinements would need to be considered in the context of the EIS once once the details of the proposed development are known.

5.3.1 Step 1 – Determine feature to be protected, delineate boundaries and determine potential impacts

5.3.1.1 What is being protected and what are their boundaries?

Gaining an understanding of the protected Natural Heritage Feature(s) and its function(s) is the first step in the overall process of determining a site-specific buffer width. It is the responsibility of the professional undertaking the buffer width determination to complete a comprehensive background review and the appropriate field studies such that the various habitats, and the species that occupy those habitats, are well understood.

It should be noted that multi-disciplinary investigations may be required to understand the features, their functions and the interactions with different components of the environment. These may include, but are not limited to, ecological surveys (vegetation surveys, wetland evaluations, breeding bird surveys, amphibian call surveys, reptile surveys, bat habitat surveys, SWH surveys, etc.), hydrological studies, hydrogeological studies, geotechnical investigations, etc.

Direction related to boundary delineation and evaluation of the natural heritage features and areas that are part of the City's NHS is provided in ***The London Plan*** Environmental Policies and the supporting guidance as described in **Sections 3** and **4** of these EMGs.

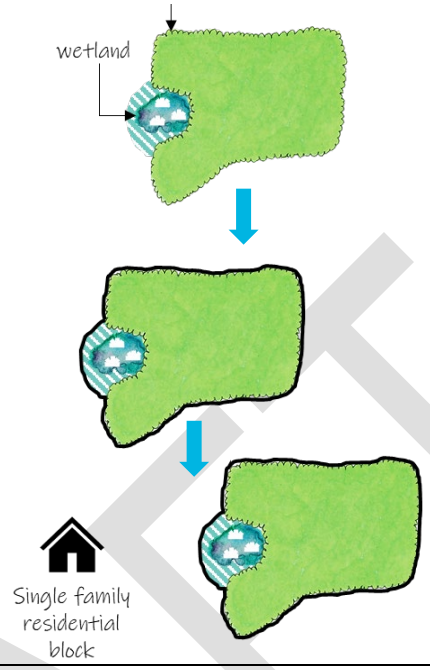
Table 5.1: Site-specific Buffer Width Determination Process

Step 1: Determine the feature to be protected, delineate feature boundaries and determine the potential impacts

a) Collect the necessary information from the EIS and other associated studies to gain an understanding of the Natural Heritage Feature(s) and function(s) that are to be protected,

b) delineate feature(s) boundaries, and

c) determine the potential impacts of the proposed site alteration or development..



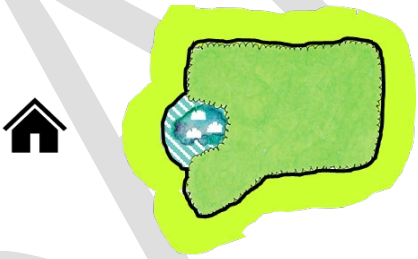
Example:
Studies determined the presence of a Significant Woodland with corresponding wetland (including Critical Function Zone) per **Section 2** and **3**.

Boundaries defined per **Section 4**.

Proposed development is a single family residential subdivision consisting of twenty lots located on the west side of the feature.

Step 2: Apply the Minimum Buffer Widths

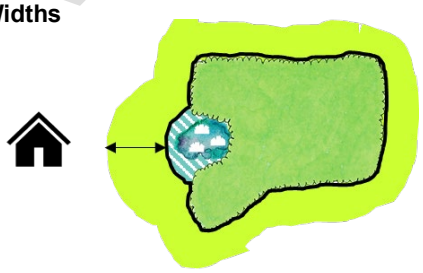
Apply the minimum widths for the type(s) of natural heritage features that are being protected. Identified minimum buffer widths are to start at the delineated boundary of the natural heritage feature.



Minimum buffer widths applied per **Table 5.2**.

Step 3: Determination of Site-specific Buffer Widths

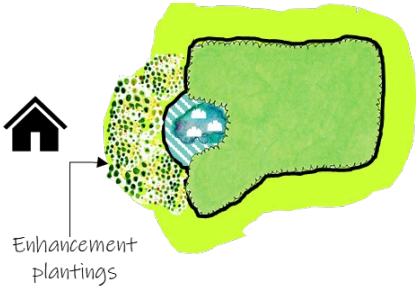
Determine if a greater than minimum buffer width is required for the protection of the identified Natural Heritage Feature(s) and functions. Greater than minimum buffer widths are to start at the same point as Step 2, the delineated boundary of the Natural Heritage Feature(s).



Wetland found to support Species at Risk habitat, buffer width increased in the wetland area per **Table 5.3**.

Step 4: Buffer Enhancement

Site-specific enhancement within the buffer area; the objective being to enhance the functioning of the buffer and to minimize overall potential negative effects to the protected feature(s) and functions.



Enhancement plantings per **Section 5.4** applied in area of Natural Feature that is most sensitive.

5.3.1.2 *What are the potential development-derived Impacts?*

Understanding the proposed development and the elements that may affect a Natural Heritage Feature(s) and its function(s) is the responsibility of the professional undertaking the Buffer Determination Process. Buffer width(s) should be based on the functions and sensitivities of the feature(s) and the type(s) and scope of development adjacent to a Natural Heritage Feature and the potential development-derived effects that can reasonably be anticipated. For example, studies have demonstrated significant impacts to forests with adjacent residential development including those associated with off-trail use leading to compaction and erosion of soils, changes to hydrological regimes, loss and damage to vegetation, reductions in the regeneration success of trees and the spread of exotic plants and animals (McWilliams et al., 2012).

When determining the potential effects of a proposed development, refer to **Section 2**.

5.3.2 Step 2 – Apply Minimum Buffer Widths

The ultimate width of the buffer will depend on the local conditions and sensitivities of the protected feature, the anticipated impacts associated with the change in adjacent land use, and the impacts that a buffer can, and cannot, reasonably be expected to mitigate (Beacon, 2012). As determined through a review of current policies and literature, **Table 5.2** outlines the required minimum buffer widths that are considered necessary to maintain the natural, physical and chemical characteristics of natural heritage features (MNRF, 2010b). Depending on the sensitivities of the natural heritage features(s) being considered and the type of development, these required minimum widths may not provide sufficient protection. Therefore, additional buffer width may be necessary to maintain the various biological components of natural heritage features (MNRF, 2010b), as outlined in **Section 5.3.3.**

Table 5.2[1]: Required Minimum Buffer Widths for Protected Natural Heritage Components

Natural Heritage Component	Required Minimum[2]
Coldwater and Cold-water Fish Habitat	30 metres
Warm-water Fish Habitat	15 metres
Provincially Significant Wetlands (PSW), Wetlands	30 metres
Wetlands less than 0.5 ha	less than 30 metres
Significant Woodlands	30 metres
Significant Woodlands less than 2 ha	less than 30 m
Woodlands	less than 10 metres
Woodlands less than 2 ha	less than 10 metres
Significant Valleylands and Valleylands	Required minimum for the component of the NHS

[1] *Table 5-2 provides a summary of literature and policy citations for minimum buffer widths. These do not represent the full compliment of literature/policy documents that are currently available. Table 5.2 should be updated every five (5) to 10 years incorporating, where applicable, updated and current research at the time.*

[2] *For natural heritage features, minimum buffers to be measured from the Feature Boundary (see **Section 4**).*

Natural Heritage Component	Required Minimum[2]
Environmentally Significant Areas	Required minimum for the component of the NHS
Upland Corridors and Meadows	5 metres

For unevaluated features a 30 m buffer is to be applied until it can be determined what the NHS component it falls under.

Minimum buffers for the Habitat of Endangered and Threatened Species, as well as Significant Wildlife Habitat, will vary on a case-by-case basis as the minimum width will depend on a range of factors including the species identified and their lifecycle processes. Buffers should be determined on a case-by-case basis with consideration for the applicable provincial guidance and, in the case of Endangered and Threatened Species, in consultation with the MECP.

5.3.3 Step 3 – Determination of Site-Specific Buffer Widths

Minimum buffers as outlined in **Section 5.3.2** should generally be sufficient for the protection of identified natural heritage features and their associated functions. However, an EIS may recommend a buffer width different from the minimum based on the sensitivity of the feature and the nature of the proposed adjacent development. Some key site factors drawn from the current and applicable literature that should be considered in relation to potential increases from the required minimums are provided below.

- Site-specific drainage patterns and flows, with sheet flows towards a feature more readily intercepted / slowed by a vegetated buffer than channelled flows (e.g., Castelle and Jghnson 2000; Sheldon *et al.,* 2005 as cited in Beacon 2012), with this factor being closely related to slope and soil type;
- Slope, with vegetated buffer effectiveness generally being reduced with increasing slope, particularly in excess of 15% (e.g., Schueler 1987, Norman 1998 as cited in Beacon 2012); and
- Soil type and related infiltration capacity, with soils with better drainage and more organic matter providing more effective

Other factors that can help improve buffer effectiveness and mitigate the need for potential increases from the required minimums are provided below.

- Vegetative composition of buffers, with well-vegetated buffers that mimic the composition of the feature being protected expected to be the most effective (Beacon 2012); and
- The presence of design features – such as a continuous fence, formal trails along the feature edge with some barriers, bioswales, berms– that effectively prevent encroachments into the protected feature (e.g., McWilliam et al. 2011 as cited in Beacon 2012, can also cite the Beacon 2014 paper based on local research).

As the impacts of adjacent development become better understood and more research is conducted on the ecology of various features, buffer requirements may change. Therefore, current literature may also be consulted to review the impacts relevant to the feature under consideration (MNRF, 2010b). Ideal sources include studies designed to determine the impacts of an anthropogenic activity on biological systems, and comprehensive reviews or meta-analyses related to natural resource management. Such studies can be located in peer-reviewed academic journals, statements and reports from reputable experts and / or expert bodies (such as Environment Canada and Climate Change (ECCC) and the MNRF), standard textbooks or handbooks and reference guides. City of London Ecologist Planners may recommend appropriate sources.

Table 5.3[3]: Criteria for the Determination of Variation from Required Minimum Buffer Widths

Criteria	Rationale	Literature
Landscape		
Connected within the Landscape	Greater than minimum buffer width required for natural heritage features that are well-connected within the overall landscape.	Lemieux *et al.*, 2021; Hilty *et al.,* 2020; Powney *et al.,* 2012
Ecological connectivity is the unimpeded movement of species and the flow of natural processes that sustain life on Earth. While important in its own right to maintain species interactions and gene flows, connectivity conservation is also vital to facilitate species movement and adaptation in response to climate-induced ecological changes (Lemieux *et al.,* 2021; Hilty *et al.,* 2020). The more well-connected populations are, the greater the opportunity for dispersal, colonization and re-colonisation of habitat patches, reducing the risk of extinction and maintaining biological diversity in systems that have been fragmented (Powney *et al.*, 2012; Hilty *et al.,* 2020). Natural heritage features that are considered well-connected are features where there are vegetated or natural corridors (e.g. strips of natural vegetation, hedgerows, and watercourses). In these cases, document any hedgerows or strips of natural vegetation that are located within and outside the feature boundaries, as defined per **Section 4**. When documenting these features, include species composition, as well as overall canopy height and width.		
Features and Functions		
Presence of Significant Wildlife Habitat	Greater than minimum buffer width may be required when Significant Wildlife Habitat in accordance with criteria schedules for ecoregion 7e are present (MNRF, 2015a).	MNRF, 2015a; Environment Canada, 2013; MNRF, 2010a;
The presence of Significant Wildlife Habitat (SWH) indicates specific conditions that are enabling that type of habitat to be present and therefore, a higher degree of protection may be required. Consultation with the City of London is required. Buffers for the protection of SWH must be based on evidence and include reference to: • Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015a) • COSEWIC Reports where applicable • COSSARO Reports where applicable • Environment Canada's *How much Habitat is Enough?* (Environment Canada, 2013) • Significant Wildlife Habitat Mitigation Support Tool (MNRF, 2014b) • Various independent academic journal articles		
Presence of Species at Risk	Greater than minimum buffer width may be required when species considered Endangered or Threatened per the Endangered Species Act are present.	Environment Canada, 2013; various COSEWIC and COSSARO reports; MNRF, 2010b
The presence of an Endangered or Threatened species indicates specific conditions that are enabling that species to survive and therefore, a higher degree of protection may be required. If it is determined that a SAR		

[3] *Table 5.3 will be updated every five 5 to 10 years to incorporate, where applicable, updated and current research.*

Criteria	Rationale	Literature
is negatively affected by a proposed development, a permit under the *Endangered Species Act* may be required. In the case of any SAR, consultation with both the City of London as well as MECP is required. Buffers for the protection of Endangered and Threatened species must be based on evidence and include reference to: • Ontario government's SAR database • COSEWIC Reports • COSSARO Reports • Environment Canada's "How much Habitat is Enough?" • Various independent academic journal articles Note that any habitat or species information for Endangered and Threatened species is sensitive information and should not be identified in public documents (MNRF, 2010b).		
Edge Conditions[4]		
Slope/Overland Flow	Greater than minimum buffer width is required where slope is greater than 5%.	Mitchell & Crook, 1996
Understanding the slope and direction of flow aids in predicting areas that may receive more water than others, help determine appropriate buffer plantings, as well as pre-construction conditions that need to remain the same post-construction. Measure slope using a geo-referencing tool or handheld clinometer. The following are buffer width requirements starting at the edge of a Natural Heritage Feature where slope is: 5-15% 30 m buffer 16-30% 50 m buffer 31-45% 70 m buffer >45% 90 m buffer		
Development Conditions		
Development Type	Greater than minimum buffer width may be required as addressed and identified by the EIS based on specific development conditions (e.g., stressors).	McWilliam et al., 2012; Sawatzky and Fahrig, 2019; Environment Canada, 2013
Encroachment into natural features is a common impact associated with residential development. Buffers provide some area for minor encroachment without affecting actual features (MNRF, 2010a). Stressors such as human disturbance (e.g., landscaping, dumping, urban wildlife, noise) shall be considered when establishing buffer width. The following has been adapted from Environment Canada's Recommended Buffer table in *How much Habitat is Enough.*		

[4] *An edge is the border, or transition zone between a natural heritage feature and adjacent land. The condition of an edge contributes to the resistance and resilience of a natural heritage feature, where ecological structure, function and connectivity contribute to a feature's ability to resist and recover from anthropogenic disturbance.*

5.3.4 Step 4 - Buffer Restoration and Enhancement

Once a site-specific buffer width is determined following Steps 1 through 3 as outlined in **Sections 5.3.1, 5.3.2** and **5.3.3**, the required buffer restoration and enhancement measures can be defined based on the characteristics of the adjacent natural heritage feature(s).

5.3.4.1 Buffer Enhancement Strategy

In most cases, the land set aside for the site-specific buffer will be comprised of farmed agricultural lands, mown grass or abandoned land with ruderal vegetation. In some redevelopment scenarios it may be open gravel or paved. It is the responsibility of the professional undertaking the buffer determination process to document and understand the edge conditions of an identified Natural Heritage Feature, including what is present within the adjacent lands so that appropriate enhancement strategies can be developed and implemented.

The intent of the strategy should be to reduce edge effects, improve buffer functions (e.g., through restoration or enhancement of site-appropriate native vegetation), and enhance habitat connectivity to build resilience of the Natural Heritage Feature(s) being protected.

When determining a buffer enhancement strategy, the following should be considered:

- Allocate a greater proportion of buffer enhancements in areas that reduce the total edge: area ratio of the feature (i.e., bays and projections);
- Allocate a greater proportion of buffer enhancements to areas which minimize climatic, structural or anticipated impact gradients (e.g., consider the orientation of the patch to flows in the landscape such as prevailing winds and sources of disturbance and encroachment such as urban cats, wind-dispersed seeds, noise, light and chemical pollution); and
- Allocate a greater proportion of buffer enhancements proximal to areas that contain sensitive feature(s) and functions.

Table 5.4 outlines buffer enhancement measures that shall be implemented to reduce of negative edge effects, protect features and their ecological functions, and improve habitat quality.

Table 5.4: Potential Buffer Enhancement Measures

Buffer Enhancement Measure
Native Plantings Plantings of native tree, shrub, seed mixes and individual herbaceous species within a site-specific buffer width increases the structural gradient and reduces increased exposure to light, moisture and wind conditions. Natural heritage features with a dense multi-layered edge structure are more likely to maintain interior conditions after experiencing anthropogenic disturbance (Fry and Sarlöv-Herlin, 1997; Powney et al., 2012). Further, the physical separation of development from a natural feature reduces the penetration of light and noise into the natural feature. This will be further reduced if the buffer supports dense vegetation (MNRF, 2010b). Increasing the structural gradient means having vegetation at various heights in various areas. This is especially important for treed natural heritage features with simple, open edges as well as features that are smaller in size with low connectivity. A multi-layered approach with respect to native plantings increases habitat suitability for resident species as well as landscape connectivity (Fry and Sarlöv-Herlin, 1997).

Buffer Enhancement Measure
Vegetated buffers slow down surface runoff and absorb nutrients and chemicals used for lawn care, agriculture and road maintenance, thus reducing impacts on natural features. If runoff is not controlled, impacts can include soil erosion/sedimentation, destruction of vegetation, and flushing of nests or eggs of amphibians and waterfowl. This is particularly important to adjacent wetlands and aquatic features where nutrients can enrich the system and lead to an abundance of nuisance weeds and/or algae (MNRF, 2010b). Recommended native plantings should: • enhance diversity with consideration for species shifts resulting from warming temperatures due to climate change; • enhance diversity with consideration for existing and future pest impacts to tree/ shrub species; • add complexity to both horizontal and vertical structure; • consider mosaics of different trees and shrub species; • consider light and noise impacts by creating a physical barrier; • use native pollinator friendly seed mixes to promote the establishment of pollinator and foraging habitat; and • select species appropriate to the species composition of the natural heritage feature(s) being protected as well as the local soil composition and structure.
Management of Invasive Plants Removal of invasive plants within the buffer area and within 10m of the edge of the identified Natural Heritage Feature will improve overall species diversity. Priority species that must be removed include: common buckthorn, glossy buckthorn, common reed (Phragmites), Japanese knotweed, dog strangling vine, and giant hogweed (City of London, 2017). Those on the watch list should also be removed in accordance with the City of London Invasive Plant Management Strategy. Where appropriate, targeted invasive species management and restoration extending into the feature itself should also be considered.
Other Structural Enhancements Creation and installation of site and feature-appropriate habitat enhancements such as: addition of woody debris piles, pits and mounds, bird and bat structures, reptile nesting areas and hibernacula. Note that dead wood is important habitat and food resources for many birds, insects and lower plant species where woody biomass should be retained.

5.4 Prohibited and Permitted Uses within a Buffer

Buffers are generally to be kept in a predominantly naturalized state and no permanent structure or part of a development is to occur within a buffer. The following exceptions that may be approved where buffers greater than the minimums have been recommended at the City's discretion, and in consultation with the appropriate agencies, where needed:

- Pedestrian pathways in the outer half of the buffer with the remaining buffer to be restored and naturalized; and
- Low impact development measures (such as bioswales, infiltration trenches) that are compatible with the buffer functiosn and the protection of the feature(s).

Buffers are not to count towards feature-based compensation measures that may be required. Amenities such as gazebos and other installations that do not provide environmental enhancement are not permitted

in buffers. At the City's discretion, and subject to the completion of an EIS wherein a site-specific buffer equal to, or greater than the minimum buffer (as described in **Table 5.2**) has been recommended, a pathway may be incorporated within the buffer provided the buffer remains, or is naturalized.

6. Ecological Replacement and Compensation

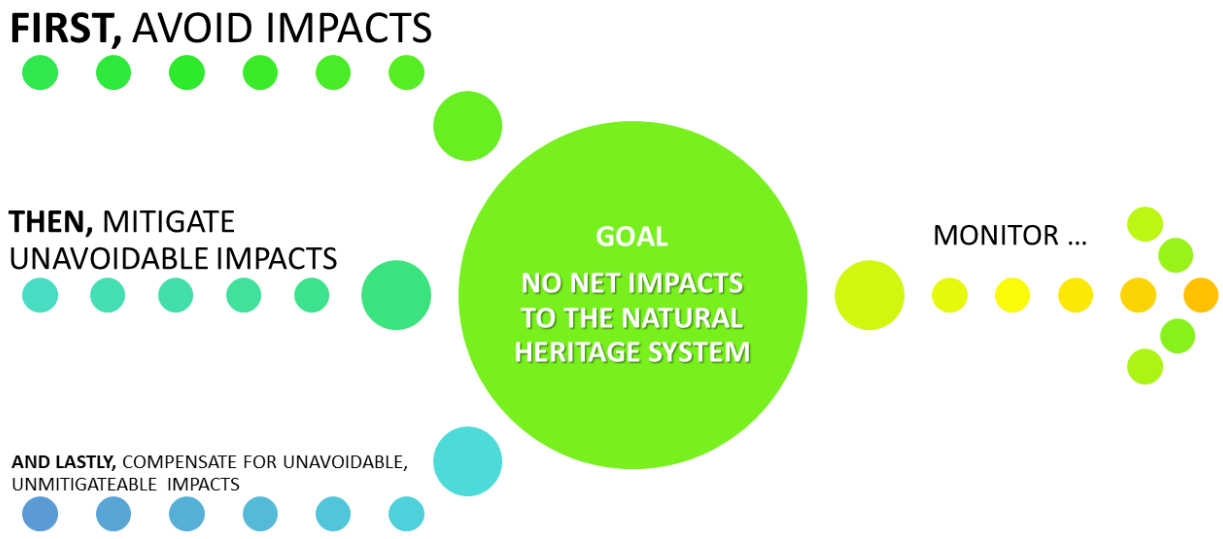
The City of London, like many urbanizing jurisdictions in southern Ontario, is expected to accommodate a certain amount of growth over the coming decades and beyond. While this presents opportunities for the City, it also means ever increasing pressures on the remaining natural heritage features and areas within its urban boundary.

The London Plan includes policies intended to help ensure what is significant and valued in London from a natural heritage perspective is sustained for the long term. The bulk of the Environmental Policies in ***The London Plan*** require the outright protection of natural heritage features and areas confirmed as components of the NHS (as per **Section 3** and **Section 4**), including buffers as appropriate (as per **Section 5**). However, there are some limited cases and contexts in which removal of part, or all, of a natural heritage feature or area may be contemplated through the planning process. In these cases, replacement and/or compensation for that feature and/or area is required in the City of London with the intent of achieving no net loss or, preferably, a net environmental benefit in natural heritage area and/or ecological functions (as per **Section 2.6**). This section of the guidelines is provided to facilitate the implementation of such requirements, where applicable.

Negative impacts to natural heritage features and areas identified for protection can generally be avoided, minimized, and mitigated at the site specific scale with adequate technical knowledge, compromise and collaboration applied through the planning process. However, under some circumstances, residual damage to natural heritage features and their functions is unavoidable. After first exhausting all options for avoidance (as illustrated in **Figure 6.1**), followed by minimization and mitigation of impacts, portions of (or entire) natural heritage features may be approved for removal under the condition that ecological compensation take place to ensure that there are “no net negative impacts.”

This section has drawn on the *Guideline for Determining Ecosystem Compensation* developed by Toronto and Region Conservation Authority (TRCA, 2018), as well as other relevant and current technical and scientific sources. Although the EMGs are well established and have been applied in the City since 2007 with this version representing an update, this particular chapter is new and is expected will be updated in response to emerging science and / or findings of monitoring applicable to the City of London.

Figure 6.1: Illustration of the required approach whereby all options for avoiding and / or mitigating impacts must be explored with he City before compensation can be considered



6.1 Context and Process

This section provides the policy context, the high-level scientific and technical context and the process for developing and implementing an Ecological Replacement and Compensation Plan in the City of London.

6.1.1 Policy Context

From a natural heritage perspective, the fundamental policy "test" used as a basis for approving – or rejecting – a development proposal in Ontario is what is referred to as the "no negative impacts" test based on ther language from the Provincial Policy Statement (MMAH 2020) which states: "Development and site alteration shall not be permitted in [insert the feature(s) in question] unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions". This language is carried forward into The London Plan for the various components of the NHS, and further defined through these guidelines as proposals that are demonstrated to be able to result in no net negative impacts (as per Section 2.6).

Ecological replacement and compensation will be approved on a case by case basis subject to all applicable Federal, Provincial and municipal policies.

Replacement and compensation of natural heritage feature(s), where permitted by the City, shall be implemented on at least a one-for-one (1:1) land-area basis (as per ***The London Plan*** Policies 1334, 1342B, 1401 and 1402) and, at a minimum, aim to replace any ecological functions associated with the removed feature. The only exception to these requirements is for small wetlands (i.e., less than 0.5 ha) when less than 1:1 may be considered if the proposed compensation will provide a net gain or net environmental benefit to the NHS (as per ***The London Plan*** Policies 1334_1 and 1334_2).

These guidelines do not supersede and are to be implemented in conjunction with other applicable restoration, rehabilitation and / or replacement compensation policies and regulations including:

- ***The London Plan*** Management, Restoration and Rehabilitation Priorities Policies (1417 a through j)
- ***The London Plan*** tree replacement Policies (399_4, a through e, 401_13) and
- Overall Benefit Permits issued under the *Endangered Species Act* and/or the *Fisheries Act.*

There may be cases where a portion of the impact to a feature or function is compensated through one mechanism while the remaining impact is compensated through a different mechanism. For example, compensation required through the *Endangered Species Act* may address impacts to one particular species but may not compensate for all of the ecological structures and functions that will be lost. In such cases, determining the additional compensation required can be accomplished through these guidelines and in consultation with the City.

Furthermore, in cases where replacement and compensation has been approved in principle by the City but cannot be fully accommodated on the subject lands, ***The London Plan*** Management, Restoration and Rehabilitation Priorities Policies 1418 through 1420 may help guide the identification of alternative areas for such works.

6.1.2 Scientific and Technical Context

Ecological replacement and compensation are approaches that can be adopted to achieve no net loss and net environmental benefit through the creation, restoration and / or enhancement of natural heritage features and functions to compensate for those which will be removed or disturbed elsewhere (Brown *et al.*, 2013; Morrison-Saunders and Pope, 2013). No net loss and net environmental benefit are outcomes of compensation for unavoidable losses of biodiversity and/or habitat which are considered neutral or positive, respectively (Bull and Brownlie, 2017). There has been an important shift in replacement and compensation policies away from focussing on replacement and towards focussing on net environmental benefit to improve the short and long-term outcomes of biodiversity offsetting (Bull and Brownlie, 2017; Maron *et al.*, 2018) and, also, to incorporate something of a safety net for situations where the proposed replacement takes longer than anticipated to function as planned.Thus, the goal of replacement and compensation in City of London is to obtain a net environmental benefit, wherever feasible.

Ecological features and systems are highly complex, and although some of the simpler feature types that occur in London and southern Ontario can be replicated reasonably well, it requires a good technical understanding of the feature's key requirements, applied experience implementing the habitat creation, enhancement or restoration works, and a commitment to post-installation management and monitoring (also see **Section 6.6.2**). Consequently, a lthough most ecological replacement and compensation projects have the objective of no net loss, in reality achieving no net loss of biodiversity and ecological functions can be very challenging (Bekessy *et al.*, 2010; Gibbons *et al.*, 2015; Simmonds *et al.*, 2019). Therefore, area compensation ratios of greater than 1:1 can be necessary to help ensure full replacement of ecological structure and functions (zu Ermgassen *et al.*, 2019). In addition, replacement and compensation projects require long-term monitoring to assess progress towards no net loss or net environmental benefit, and may require additional adaptive management actions to achieve the established ecological objectives.

6.2 Approval Process

Natural Heritage Features and Areas for Consideration

Through the planning and development process, certain natural features and areas confirmed for inclusion within the City's NHS that are not protected by other provincial or federal regulations may be permitted to be impacted by the planning approval authority (in this case, the City of London), but only in cases where avoidance of negative impacts is not possible and option for mitigation of negative unavoidable impacts are limited or not feasible. In all cases, compensation is to be explored as a last

resort, as illustrated in **Figure 6.1**, and will generally only be contemplated if the replacement or compensation is expected to fully replicate the extent and functions of the existing feature, or to provide an enhancement as compared to the existing feature.

As summarized in **Table 2.1**, the City is responsible for confirming the following natural heritage features and areas within its NHS:

- Wetlands (excluding Provincially Significant Wetlands)
- Environmentally Significant Areas
- Significant Woodlands and Woodlands
- Significant Valleylands and Valleylands
- Significant Wildlife Habitat (SWH)
- Environmentally Significant Areas (ESAs), and
- Upland Corridors.

The following guidance is intended to help implement ecological replacement and/or compensation, where the policies permit and where City agrees to consider it, for the above features.

Notably, these guidelines do **not** apply to or provide guidance related to replacement, compensation or rehabilitation of watercourses or Fish Habitat. Natural heritage features that are confirmed by other provincial or federal authorities (i.e., Fish Habitat, Habitat of Endangered Species and Threatened Species, Provincially Significant Wetland and Areas of Natural and Scientific Interest) may also be impacted in accordance with the applicable provincial or federal regulations, in part or in whole. In these cases, compensation or comparable activities may be permitted, with the specifics (not addressed in to be in conformance with the applicable provincial or federal regulations and in consultation with the applicable regulatory authority.

Approval Process for Feature Replacement / Compensation

Ecological compensation may be permitted and approved as part of an EIS under the *Planning Act*, or through an EIS or comparable Environmental Study completed in support of the installation or expansion of public infrastructure through the *Environmental Assessment* process. In all cases, ecological compensation for NHS components under the City's jurisdiction will not be approved as the 'default' and will only be considered if unavoidable loss remains once the protection hierarchy has been exhausted (as illustrated in **Figure 6.1**).

Prior to the approval of an application containing proposed ecological replacement and / or compensation, the proponent shall demonstrate the following:

- Compliance with all applicable policies and legislation;
- That the proposed compensation achieves "no negative impacts" as outlined in the *Provincial Policy Statement*;
- That all efforts to avoid, minimize, and mitigate have been taken and why impacts are unavoidable;
- No negative impacts, no net loss, and/or net environmental benefit;
- That the proposed ecological compensation is within the same subwatershed in close proximity to the original feature (preferred), or in an area that will provide a net environmental benefit to the NHS to maximize connectivity and linkages; and,
- That a proposed Ecological Replacement and Compensation Plan is included within or as an Appendix to an EMP (as described in **Section 2.6, 6.3,** and **7.2**).

In instances where ecosystem replacement or compensation has been approved in principle by City Staff (and the applicable conservation authority where the feature calls within their regulated areas), the proponent must retain a Consulting Ecologist, potentially with one or more experts from other related

disciplines (e.g., Landscape Architect, Arborist, Registered Professional Forester, Engineer, Hydrogeologist, Geotechnical Consultant) to develop and oversee the implementation and monitoring of the Replacement and Compensation Plan.

It is It is strongly recommended that once the City agrees in principle to replacement and compensation, that the proponent develop and get in principle approval of a Concept Plan before moving forward with any detailed plans or designs.

No removals of part of all of a natural heritage feature and / or area may proceed prior to approval of the Replacement and Compensation Plan. *This plan shall outline an approach and provide detailed plans that attempt to replicate, to the extent possible and without significant delay or lag time, the same ecosystem structure and associated level of ecosystem functions that are to be lost, in both the private land development process* (under the *Planning Act)* and the public infrastructure process (under the *Environmental Assessment Act*) (TRCA, 2018).

Ecological Buffers and Feature Replacement / Compensation

Ecological buffers required for NHS components identified and requiring protection on the subject lands (as per **Section 5**) are not to be counted towards fulfilling any agreed-to replacement or compensation of other NHS features, or parts of features approved for removal.

In addition, replacement and compensation features will require buffers wherever the feature is to be abutting a non-natural land use (e.g, road, parking lot, residential yard, etc.). Buffer widths are to be determined based on the guidance provided in **Section 5** and in consultation with the City. Notably, buffer width determinations are to be based on the NHS component for the replacement (restored) area.

6.3 Guiding Principles for Ecological Compensation

The following are objectives of replacement and ecological compensation:

- To restore, replace, and preferably, enhance the ecological structure and function of the affected NHS by achieving no net loss of ecological features or functions, and where possible, achieve a net environmental benefit (i.e., a net gain of ecological features and / or functions);
- To implement compensation within the same subwatershed, and preferably in as close proximity to the original feature as possible to ;
- To locate replacement and compensation works within or adjacent to the NHS so that system connectivity is maintained and, preferably, enhanced;
- To complete compensation projects promptly so that ecosystem functions are re-established as soon as possible after or even before losses occur;
- To ensure transparency and accountability throughout the process of planning, implementing, monitoring and evaluating the effectiveness of the replacement and / or compensation; and,
- To incorporate adaptive management and climate resiliency into compensation based on the scientific literature and the results of effectiveness monitoring.,

Furthermore, ecological replacement and compensation shall be informed by current knowledge of the City ecosystems, applicable watershed studies, relevant studies by related disciplines (e.g., hydrogeological, hydrological and / or geotechnical) and any applicable conservation authority and be carried out in a transparent and timely manner.

6.4 Ecological Replacement and Compensation Plan

The Ecological Replacement and Compensation Plan will be reviewed by City staff and in consultation with applicable agencies where required. The Plan is to be aligned with the principles outlined in **Section 6.3** and include, but may not be limited to, the following:

- Rationale for ecological compensation (i.e., explanation of why residual impacts are unavoidable) and feasibility of the compensation;
- Description of the feature type, ecological structure and function(s) of the natural heritage feature (or portion thereof) to be removed or disturbed, including the size of area proposed for removal;
- Specific ecological objectives for the replacement and compensation, with specific targets where appropriate;
- Rationale for the proposed compensation ratio (≥ 1:1 land-area basis) and the area of proposed compensation;
- Description of the proposed compensation location (refer to **Section 2.6.6.8** and **6.3**);
- Construction schedule (e.g., phasing) and completion timeline;
- Proposed native species for planting, with consideration for climate change resiliency;
- A Concept Plan, including the size and location of the replacement / compensation in relation to the NHS;
- Implementation plans and detailed design drawings, including any required grading plans (stamped by a Landscape Architect and / or Engineer), ESC plans to ensure protection of other NHS components, and planting plans;
- Plantings should specify native species appropriate for the site and feature type, with consideration for climate change resiliency (e.g., inclusion of a small proportion of species native to southern Ontario with ranges just south of London);
- Post-installation maintenance requirements, including provisions for supplemental invasive species removal and native plantings where appropriate, particularly for woodland features;
- A monitoring plan specific to the replacement / compensation that evaluates the extent to which the established objectives and targets are being met (refer to **Section 7.2.5.2**); and,
- Potential additional measures (e.g., adaptive management) to be undertaken by the proponent if the replacement / compensation objectives and targets are not being met.

6.5 Determining Appropriate Measures

The ability to successfully re-establish ecological structure and function is, in part, dependent on the type of natural heritage features and the specific type of vegetation community being restored. Some vegetation community types can be readily restored in a relatively short period of time (e.g., meadows), while others take longer (e.g., young woodlands) and still others are very difficult or impossible to replicate with the current knowledge and techniques (e.g., treed swamps, bogs).

For example, the functions of some vegetation community such as cultural meadows and some marshes can be established relatively quickly (e.g., within five years) as they are dominated by perennial grasses and forbs which can reach maturity over the course of a single season and with the right soils and hydrology can support habitats for a range of species within a few years (Solymar, 2005; TRCA, 2018).The functions of other features such as woodlands take much longer to re-establish due to their

long developmental periods (McLachlan and Bazely, 2003; MNRF, 2017a). As such, there can be a substantial time-lag between the removal of an established wooded feature and the time required for the compensated area to fully replace the ecological function and services provided by original feature (e.g., 20 to 50 years).

Feature compensation considerations should consider but not be limited to:

- Topography and drainage of the existing and proposed feature;
- Community type (based on ELC);
- Wildlife habitat types and structures to be replicated or added as enhancements;
- Soil type, structure and quality of the existing and proposed feature composition and processes;
- Surface water contributions and hydroperiod; and,
- Groundwater processes and interaction.

6.5.1 Wetlands

Once the replacement and compensation is approved in principle by the City, for wetlands, the quantification of the physical area of the proposed loss is to be based on the feature delineation using ELC, OWES (as described in **Section 3**) and Critical Function Zones (CFZs) and confirmed with the City and appropriate Conservaton Authority.

6.5.2 Significant Woodlands and Woodlands

Once the replacement and compensation is approved in principle by the City, for Significant Woodlands, the quantification of the physical area of the proposed loss is to be based on the feature delineation using ELC, OWES (as described in **Section 3**) and confirmed with the City and appropriate Conservaton Authority.

For Woodlands, trees approved for removal through the planning process are to be replaced in accordance with the Forest City Policies in ***the London Plan***.

6.5.3 Other Features

Where approved in principle by the City, other features within the City's jurisdiction may be considered for replacement compensation on a case by case basis at a minimum of 1:1 land-area basis, or greater as required through an approved EIS.

As with Wetlands and Significant Woodlands / Woodlands, a proposed replacement and compensation concept that is aligned with the policies, principles and guidelines above should be put forward to the City before work goes into developing detailed plans and designs.

Utimately, an approved Ecological Replacement and Compensation Plan, will guide the site preparation, construction / creation and post-construction maintenance and monitoring of the feature.

6.6 Implementating Replacement and Compensation

It is important to outline a clear implementation plan for each feature to be compensated for to maximize the likelihood of replacement or enhancement of ecological structure, function and services within the City of London's NHS.

6.6.1 Site Selection

In all cases, provision of on-site compensation is the preferred option as it will be in proximity to where the loss is proposed and avoids the logistical complexities of finding suitable lands elsewhere in the City, preferabely within the same subwatershed. However, in some cases where the subject lands cannot accommodate part or all of the replacement or compensation, proponents may explore directing compensation on alternate suitable lands. The details of such an arrangement will need to be confirmed and formalized in consultation with the City, however some additional guidance is provided here.

Ecological Considerations

Appropriate site selection for ecological replacement and compensation will increase the likelihood of achieving no net loss or net environmental benefit, specifically when considering landscape-scale conservation goals and improving ecological system connectivity (Koh *et al.*, 2014).

Potential naturalization sites have been identified by the City of London (as outlined in ***The London Plan***) which are generally good candidates for restoration, enhancement, and expansion of the NHS. Some potential naturalization sites are found on Map 5 – Natural Heritage in ***The London Plan***, however not all potential sites are mapped and thus, consultation with the City of London is recommended if other potential areas are identified. Further, not allsites arecreated equal and consultation with experts (e.g., Ecologists, Hydrogeologists, Engineers, etc.) is typically required to help identify appropriate locations for ecological compensation. Habitat creation and restoration is generally most successful when a project understands and works with the prevailing biophysical conditions on site (e.g., climate / exposure, topography, drainage / hydrology, soils).

The following should be considered in determining the site for ecological replacement and compensation within the City of London:

- Proposed sites must be able to support the size of the compensation, the associated buffer(s), as well as the function and services provided by the feature;
- Proposed sites for compensation of a feature should ideally be outside of the current NHS to ensure no net loss, and preferably net environmental benefit. Securing or purchasing land for compensation that is already identified as part of the NHS would result in a Net Loss to the overall area of the system.
- Compensation should be planned adjacent, or in close proximity, to the NHS to maximize connectivity and linkages. The guidelines outlined in **Section 3** and **4** can help inform site selection (e.g., bay areas, connectivity, ecological function) for compensation.
- The size, shape and structure of the proposed compensation should contribute to the City of London's goals for the NHS. In general, features that are circular or squarish will be preferred over long narrow extensions.
- Newly restored ecosystems must be buffered and should also be situated to help ensure they are protected from the effects of adjacent land uses.

Planning and Mangement Considerations

Compensation should generally be directed to lands that are already or will be transferred to a public or non-profit agency, or established as a conservation easement to ensure the long-term protection of ecological function and services being compensated.

If proposed sites for replacement, compensation or enhancement are not available within the Urban Growth Boundary, the City of London and any other applicable agencies may in exceptional cases, identify lands that are within the NHS but are in need of restoration or enhancement. However, this shall be the exception to the rule, given that this could result in a Net Loss in the amount of land within the

NHS. To ensure no net loss and long term protection of the NHS, lands secured for replacement and compensation should be appropriately zoned and mapped for the NHS component.

6.6.2 Replicating Ecosystem Structure and Functions

Ecosystems are complex and dynamic systems. Regardless of the approach to determining the level of compensation required, attempts to replace lost ecosystem structure and functions will fall short in many instances, at least in the short term. Understanding this limitation, the Guideline establishes an approach that attempts to replicate, to the extent possible and without significant delay or time-lag, the same ecosystem structure, and associated level of ecosystem functions that are to be lost.

To ensure that ecosystem structure and function is replaced, or preferably improved, consultation on the compensation plan and design must be undertaken with the City of London and any other applicable agencies. For robust examples of compensation project design and estimated costs, refer to **Guideline for Determining Ecosystem Compensation, Appendix A** (TRCA, 2018). Construction activities related to the implementation of compensation projects should refer to **Section B – Part 5 – Tree Planting and Protection Guidelines (TPP)** and **Part 6 – Parks and Open Spaces** in the City of London's **Standard Contract Documents for Municipal Construction** (City of London, 2020).

6.6.3 Plant Selection

Plant selection is critical in attempting to compensate for a loss of natural features. Thus, the rationale for plant selection, with consideration for the feature being replaced and the associated ecological functions and services, must be included in the Ecological Replacement and Compensation Plan.

Plant selection will require a case-by-case assessment and consultation with the City of London and other applicable agencies. Native species diversification must be considered with respect to climate change resilience, known and emerging pest impacts and overall longevity of ecological function.

CanPlant (Dougan and Associates, 2020) is a recommended resource that can be referenced to ensure plants selected meet the environmental conditions of the proposed site. Species selection considerations may include, but are not limited to: vegetation type (e.g., woody, herbaceous), species native to the Mixedwood Plains ecozone (preferably Ecoregion 7E), light and moisture requirements, soil requirements, tolderances (e.g., pH, drought, etc.), and natural habitat type.

6.7 Cash-in-Lieu

In exceptional cases, when a feature approved for removal cannot be compensated for on-site and another parcel of land cannot be identified and secured off-site, at the City's discretion, proponents may provide funds to the City in lieu of undertaking the compensation project themselves. The amount of cash-in-lieu will be based on the cost to restore the impacted ecosystem's structure and the cost of replacing its land base.

6.8 Tracking Compensation

Ecological replacement and compensation monitoring is needed to determine whether compensation has achieved no net loss (of area and ecological functions) or net environmental benefit (i.e.,enhancements as compared to original conditions) of the replicated feature and ecological function(s). For example, if a wetland has a core function of proving amphibian breeding habitat for at least two species, monitoring should assess amphibian breeding in the replicated / compensated feature to ensure no net loss (i.e., at least two species of amphibians still breeding), or net environmental benefit (more than two species of amphibians still breeding).

Further guidance related to monitoring requirements are outlined in **Section 7.2**.The results of monitoring must be provided to the City of London as outlined in **Section 7.2**, to allow for the implementation of adaptive management, and for any necessary adjustments to compensation strategies moving forward.

7. Environmental Monitoring

7.1 Policy and Context

A monitoring plan is one of the requirements of an Environmental Management Plan for any EIS developed for the City of London (as outlined in ***The London Plan*** **Policy 1436_4**) as part of the approval process for development or infrastructure projects adjacent to any components of the Natural Hertiage System. The monitoring plan and subsequent implementation, is critical to tracking any loss of natural heritage features or their associated functions over time (MNRF, 2010b), and to providing a basis for adaptive management or mitigative measures in the area being monitored and / or informing forthcoming developments.

Consideration for monitoring early-on in the planning process is highly recommended to ensure appropriate resources are allocated for the completion and implementation of an approved monitoring plan. In some cases it may be appropriate to establish locations and use methods for existing conditions data collection that can be replicated and also serve as baseline data for monitoring, and potentially for during and post-construction monitoring as well.

Monitoring plans must be approved by the City of London prior to the start of construction and are determined on a case-by-case basis considering the potential impacts of development and infrastructure, as well as the natural heritage features and functions identified (and evaluated) within or adjacent to the proposed development or infrastructure site. The detailed pre-construction and construction monitoring plan is to be included in the approved Environmental Monitoring Plan (EMP) (as described in **Section 2.6.6.9**) developed from the Environmental Reccomendations of an EIS.

Monitoring will enable planning authorities, through development and infrastructure agreements, to require subsequent changes to site conditions if the environmental effects are found to exceed predicted effects or targets, or if there are identifiable negative effects. Monitoring the environmental effects of development and infrastructure also provides well-documented, local examples of best management practices for particular types of development or infrastructure projects and particular types of features or functions. Monitoring may encompass a number of different measures as determined through the EIS process based on the potential impacts and mitigation measures that have been approved.

Common conditions and / or mitigation measures that may require monitoring include, but are not limited to:

- hydrogeological and hydrological processes (e.g., maintenance of pre-development groundwater levels and flows to watercourses, maintenance of water balance in wetlands)
- erosion and sediment control measures (e.g., spills and sediment releases)
- tree protection measures (e.g., machinery in identified tree protection zones)
- natural heritage feature encroachments (e.g., no grading or dumping within protected features)
- ecological functions of natural heritage features (e.g., continued presence of amphibian species and / or forest bird species documented pre-development)
- successful naturalization of buffersand
- plant survivorship from feature-based restoration and/or compensation.

Monitoring should be tailored to the local conditions and anticipated impacts, focused on measures that can be documented consistently and include indicators or triggers for adaptive management where appropriate, and indicate if the proponent, the City or another agency will be responsible for undertaking the adaptive management if required. Measures and responsibilities will ultimately be determined in consultation with the City and any other responsible agencies.

The definition of clear goals and objectives, as well as robust information on the proposed mitigation measures and potential impacts, are critical in determining which aspects of the natural heritage features (and functions) require monitoring. This will aid in ensuring that the monitoring program will not only be effective, but efficient and streamlined (e.g., targeted monitoring).

7.2 Environmental Management Plan (EMP) Requirements

As discussed in **Section 2.6.6.9** the primary deliverable of the EIS is the Environmental Management Recommendations section. The environmental management recommendations may form an Environmental Management Plan (EMP).

The typical components of an EMP include:

Natural Heritage Protection Areas – The NHS components present within and adjacent to the subject lands in which development is generally not permitted. This may include regulated features and hazard lands. These areas should be delineated on an EMP Figure(s) to be included in this section of the EIS. Recommendations regarding Natural Heritage Protection Areas must require that these areas are delineated on Site Plans and contract drawings with notes that identify the areas as "no development, and no entry" areas.

Ecological Buffers – Ecological buffers must be clearly delineated on the EMP Figure(s). Recommendations regarding ecological buffers must require that these areas are delineated on Site Plans and contract drawings with notes that identify the areas as "no development, and no entry" areas. Pathways identified in consultation with and approved by the City will be clearly delineated. Additionally, any management recommendations and planting recommendations for ecological buffers should be detailed such that the recommendations can be added to landscape drawings with clear specifications for seed mixtures, shrub and tree plantings and other measures.

Restoration, Enhancement and Compensation Measures / Areas – Areas that have been identified for restoration, enhancement or compensation should also be identified on the EMP Figure(s). Similar to the ecological buffers, management recommendations and planting recommendations for restoration, enhancement and compensation areas should be detailed such that the recommendations can be added to landscape drawings with clear specifications for seed mixtures, shrub and tree plantings and other measures.

Construction Monitoring and Inspection Plan – The requirements for mitigation measures during construction must be detailed in a Construction Monitoring and Inspection Plan. This plan must provide standard construction mitigation measures and mitigation measures specific to the project and subject lands. Components that may be included in a Construction Mitigation and Monitoring Plan include:

- *Delineation and specifications for protection fencing* – protection fencing to be delineated along Natural Heritage Protection Areas, ecological buffers or for isolated/individual trees or features should be identified on the EMP, Site Plans and contract drawings.
- *Delineation and specifications for ESC fencing* - ESC fencing to be delineated along Natural Heritage Protection Areas, ecological buffers or for isolated/individuals trees or features must be identified on the EMP, Site Plans and contract drawings.
- *Delineation and specifications for wildlife exclusionary fencing* – Wildlife exclusionary fencing designed to prevent wildlife from entering the construction areas of a site should be identified on the EMP, Site Plans and contract drawings. * *Note that this and the above noted fencing types may be considered the same if the specifications for each are met.*
- *Species at Risk and Wildlife Handling Protocols* – During construction, SAR and other wildlife may enter the site putting them at risk of injury or mortality from construction equipment, vehicles or construction crews working on the site. The preparation of a Species at Risk and

Wildlife Handling Protocol document can prevent or mitigate injury or mortality. This protocol document should be prepared specific to the project and the species present within the study area and adjacent lands.

- *Dewatering and temporary stormwater management* – Dewatering and temporary stormwater management measures may be required for a construction site. Mitigation measures for these measures should be detailed and specified on contract drawings for the project and clearly detailed in the EMP.
- *Dust suppression measures* – Dust suppression measures may be required for the construction works on the site. If required, dust suppression measures should be detailed and included in the specifications on contract drawings.
- *Construction Monitoring* – The monitoring of the above mitigation measures should be an integral part of the plan during construction. The frequency and details of the construction monitoring should be tailored to the specific project requirements as identified in the EMP. The environmental monitoring program should be specific to the EMP and should not be considered replication or replacement for regular site inspections for other purposes.

7.2.1 Environmental Management Plan Report Requirements

- **Goals** and **objectives** of the mitigation being monitored are clearly outlined to provide a baseline;
- A **timeline** of the monitoring requirements for each of the development stages (e.g., pre-, during, and post-construction) should be clearly outlined;
- **Mitigation measures** should be clearly defined (and geo-referenced), including the inclusion of measurable **thresholds** (as approved on a case-by-case basis as approved by the City of London through the EIS process) that may trigger remedial action;
- **Data collection methods**, which should be **standardized** to ensure the long-term sustainability of the monitoring program, need to be clearly defined and applicable to the goals and objectives;
    - To assess baseline conditions, monitoring should employ sampling methods that accurately assess ecological conditions using a standardized approach that can be replicated as outlined in **Appendix C**.
- Clear **monitoring programs** that include the following three types of monitoring:
    - **Baseline** to outline the existing conditions of natural heritage features and functions in accordance with established and accepted data collection standards;
    - **Compliance** with approved EIS requirements, ESC monitoring and applicable legislation; and,
    - **Post Construction** monitoring of measures implemented to mitigate potential impacts from development.
- Processes or mechanisms for **data storage / transfer**, **quality assurance**, and **analysis of results** for initiating responses to threshold triggers;
- **Roles** and **Responsibilities,** along with the required qualifications, of those undertaking the monitoring program;
- An outline of the **reporting** structure required for the development or infrastructure as determined through an approved EIS;
    - All **monitoring data** must be shared with the City of London as a part of each **monitoring report.**

- **Contingency** measures or strategies should mitigation not be effective in achieving no net impacts as per the approved EIS; and,
- **Amendments** may be necessary as the detailed design, proposed mitigation, or construction activities change throughout the planning process (following the approval of an EIS).
- Monitoring should be undertaken intervals appropriate to the feature. Typical intervals include the 1, 3, and 5-year points after construction and or planting is complete, in order to allow for early detection and correction of any planting or construction failures.
- Monitoring and maintenance will typically be the responsibility of those undertaking the compensation project. This responsibility will be confirmed and documented as part of the agreements outlined in **Section 6.3**. Monitoring reports will be written to document project results. Where projects are not functioning as designed and approved, investigations will be undertaken to understand why and securities may be utilized to correct and / or complete restoration works. Further, modifications may be required to ensure that the project is successful; the need for these can be stipulated in an agreement and assured through securities held by the public agencies (see also **Section 6.3**). Monitoring and maintenance often constitutes a learning process that can inform future compensation decisions and implementation plans.

City of London staff, with input from local conservation authorities and any other relevant review agencies, will use the details contained in the approved EIS to guide the review of proposed compensation projects to facilitate appropriate and comprehensive ecological compensation. As per the usual plan review process, all comments from the TRT will be conveyed to the proponent by the City of London staff on the file.

7.2.2 Monitoring Timeline and Responsibilities

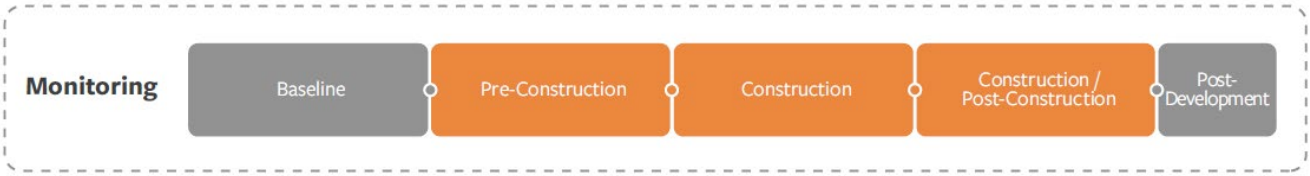
As development and infrastructure proposals, along with the subsequent implementation, can be highly dynamic, it is critical to define the roles and responsibilities of the monitoring component for the entirety of the project and into the post-development phase. It is the responsibility of the **proponent** to create a monitoring plan (to be approved through the EIS process) and to implement monitoring until the end of the Assumption Development Stage (i.e., when the developer has satisfied all parts of the development or infrastructure agreement and the assumption has been granted) or once the proponent has fulfilled the requirements outlined in the EIS.

For each project, the proponent is required to articulate timelines and responsibilities of monitoring, including that for pre-, during-, and post-construction, compensation, and up until assumption. If the feature is being transferred into City of London ownership post-assumption, long-term monitoring will be conducted by the City of London. However, if the feature is retained as private ownership, long-term monitoring will be the responsibility of the proponent.

In general, the monitoring plan should be developed with consideration for the following general phases, depicted in **Figure 7.1**, which are described in subsequent sections of these guidelines:

- **Pre-construction** – to be completed prior to the initiation of construction activities;
- **Construction** – to be conducted from initiation of construction activities until a specified build-out stage as determined in consultation with the City of London;
- **Post-construction** – to be conducted following construction monitoring until the end of the Assumption Development Stage;**Post-development** – to be completed as determined in consultation with the City of London; and,
    - **Compensation** – to be initiated upon completion of compensation project and continued until requirements have been met within the Ecological Replacement and Compensation Plan (as described separately in **Section 6.4**).

Figure 7.1: Environmental Monitoring Process Stages



The City of London will require EIS monitoring reports throughout the process. The reporting timeline and structure will be otherwise determined through the approval of an EIS.

7.2.3 Pre-Construction Monitoring

Pre-construction monitoring will be approved as part of the EIS process for development and infrastructure projects. These monitoring programs and activities should align with the recommendations provided in the EIS (see **Section 2.6.6.9**) and be used to inform the EMP. Some examples of variables to be monitored pre-construction (and thus through the entirety of the project or until monitoring is handed over to the City post-development) may include, but are not limited to, the following:

- Surface and groundwater quantity, quality, and shifts in hydrologic dynamics (e.g., water balance, drainage patterns) that may be influenced by development or infrastructure activities, including grading; and,
- Encroachments to protected NHS components, buffer implementation and establishment, and effectiveness of other NHS protection measures such as fencing.

7.2.4 Construction Monitoring

Upon initiation of construction activities, construction monitoring should be initiated to assess changes to site conditions, as well as the implementation of mitigation measures (as outlined in the approved EMP). In general, the bulk of the monitoring during this phase will be focused on *compliance*. Compliance monitoring is implemented to ensure that the approved conditions of the EIS, along with those outlined in applicable legislation, are met during the construction phase. This step is critical to ensure that the natural heritage features, and their associated function(s), are protected and that impacts are mitigated as outlined in the approved EIS. Some examples of compliance monitoring include the inspection of, but are not limited to, the following mitigation measures:

- ESC;
- Tree protection;
- Boundary delineation and setbacks;
- Buffer implementation;
- Area searches for wildlife;
- Protection of water quality and quantity;
- Maintenance of hydrogeological regimes, assessed in partnership with the applicable Conservation Authority; and,
- Respect for timing windows for approved works (e.g., related to bat overwintering, breeding birds and / or fish habitat restrictions).

Should the proposed development or infrastructure project be non-compliant with the approved EIS, immediate action shall be taken to ensure the correct implementation of mitigation measures in

accordance with the EMP (refer to **Section 7.2.1**). Activities that may result in negative impacts to the NHS shall be halted as soon as the issue is identified.

7.2.5 Post-Construction Monitoring

As outlined in **Section 2.6.6.9**, the development of a post-construction monitoring plan should be initiated well before construction starts. The baseline information/data with which the post-construction monitoring information/data will be compared should be collected (ideally) in the year or two years before the start of construction.

The post-construction monitoring program should include the monitoring of the recommendations of the EMP (i.e., ecological buffers, enhancement, restoration and compensation areas specifications) as well as the monitoring of potential impacts to the NHS. Monitoring of potential impacts should be simplified and repeatable to ensure replicability and program adherence.

In general, post-construction monitoring will take place at a build-out stage or after a percentage of the construction activities have been completed. The specific timeline for the transition from construction to post-construction monitoring will be determined as part of an approved EMP in consultation with the City of London. Typical intervals include 1-, 3- or 5-years. The City will take on monitoring post assumption in intervals appropriate to the feature. Reporting of monitoring data including those for compensation sites shall be provided annually by the proponent for the duration of their responsible term.

The main focus of this phase of monitoring is evaluate the performance and effectiveness of the mitigation implemented in the construction stage and to inform adaptive management and shifts in management and compensation strategies, if required.

Post-construction monitoring is critical to understanding if the mitigation and/or compensation measures are effective and/or if potential impacts are greater or lesser in magnitude than predicted during the impact assessment. Post-construction monitoring will also inform the need for adaptive management or amendments to the future monitoring plans based on the level of success of the mitigation measures.

Performance and effectiveness monitoring may be required based on mitigation measures for, but not limited to, the following:

- hydrogeological and hydrological processes (e.g., maintenance of pre-development groundwater levels and flows to watercourses, maintenance of water balance in wetlands)
- stormwater management measures (e.g., outlet water quality and erosion thresholds not exceeded)
- tree protection measures (e.g., protected trees remain in good health)
- natural heritage feature encroachments (e.g., no dumping or informal trail creation within protected features)
- ecological functions of natural heritage features (e.g., continued presence of amphibian species and / or forest bird species documented pre-development)
- successful naturalization of buffers, and
- successful establishment and diversification of feature-based restoration and/or compensation.

Post-construction monitoring requires the submittal of annual reports to the City of London outlining seasonal changes in the existing conditions of the NHS, as well as to show changes year-over-year. Any major issues identified during the monitoring periods (e.g., substantive die off of plantings) must be brought to the immediate attention of the City of London and the proponent. In general, the report may include, but is not limited to, the following:

- General methodology and description (e.g., vegetation communities, taxa specific) of monitoring;
- Outline of thresholds and the associated contingencies in place should they be exceeded;
- All data collected (i.e., baseline, during construction, and up-to-date post construction);

- Analysis and comparison of data; and,
- A plan for the maintenance, and if necessary, implementation of additional mitigation measures.

Post-construction monitoring should take place until end of the Assumption Development Stage and will shift to the Post-development monitoring, as described in **Section 7.2.5.1**.

7.2.5.1 Post-Development Monitoring

Post-development monitoring is aimed at continuing to assess ecosystem resilience, to detect changes in the structure of natural heritage features, and to assess the long term efficacy of EIS recommendations (i.e., mitigation measures). The requirement for post-development monitoring, along with an outline of the roles and responsibilities, will be determined as part of an approved EMP (as outlined in **Section 2.6.6.9**) in consultation with the City of London. The results of post-development monitoring will be analyzed based on timelines in the EIS. The results of post-development monitoring inform if additional remedial works are necessary or if policy changes are needed.

7.2.5.2 Compensation Monitoring

As outlined in **Section 6.3**, ecological compensation may be permitted where it is not possible to avoid, minimize, or mitigate potential negative impacts from development or infrastructure. The aim of compensation monitoring is to determine whether the ecological compensation has achieved no net loss, or preferably a net environmental benefit, in relation to the replaced or enhanced natural heritage features and their associated function(s). The proposed compensation monitoring plan must be approved prior to the implementation of compensation measures.

Compensation monitoring should be initiated upon completion of the compensation project (e.g., planting, restoration has been completed) to ensure that baseline data is captured. It is expected that monitoring will continue until the compensation goals have been achieved and the conditions approved through the EIS process (i.e., Ecological Replacement and Compensation Plan) have been fulfilled (5-year timelines should be expected) **or** the lands have been transferred to the City of London and an agreement has been made to shift monitoring responsibilities. This close-out process for compensation monitoring must be approved in consultation with the City of London.

Although compensation monitoring plan details will vary on a case-by-case basis, the following are some general recommendations:

- Compensation monitoring should capture the baseline conditions and re-evaluate the efficacy of the compensation project at the 1, 3, and 5-year milestones. Should the compensation project not meet the goal of no net loss or net environmental benefit at the 5-year milestone, compensation monitoring will be required at 5-year intervals until no net loss at minimum is achieved. This timeline may span pre-, during, and post-construction as it is recommended that compensation projects be initiated as early as possible to minimize lag time of replacing natural features and their function(s);
- Survivorship thresholds expectations should be set, with a 70% success rate being recommended as a baseline (NVCA, 2019);
- Monitoring data should be transferred to the City of London for storage and to inform future compensation strategies (e.g., lessons learned);
- Reporting should occur at each milestone to outline the succession and survivorship within the replaced or enhanced feature to assess the projects trajectory towards no net loss or net environmental benefit. Where projects are not functioning as designed and approved (e.g. expected outcomes not observed, low survivorship of plantings), as defined through the Ecological Replacement and Compensation Plan, and with consideration for the most up-to-date

research, interventions and modifications to the project will be required to ensure that the project achieves, at minimum, no net loss; and,

- Contingency measures should be outlined for varying potential impacts, as well as based on survivorship.

The City of London will provide direction on the success of the implementation of the EIS recommendations resulting in one of three outcomes; 1) do nothing, 2) remedial works identified, or, 3) policy changes identified.

8. Glossary of Terms

Adaptive management - A planned and systematic process for continuously improving environmental management practices by learning about their outcomes. Adaptive management provides flexibility to identify and implement new mitigation measures or to modify existing ones during the life of a project (Canadian Environmental Assessment Agency, 2016).

Adjacent lands – Those lands within a set or specified distance of an individual component of the natural heritage system. Adjacent lands are defined as lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area. The extent of the adjacent lands will be in conformity with the distances identified in Table 13 of ***The London Plan*** or as recommended by the Province (City of London, 2019).

Area-sensitive species - Those that require a forest to be a given size (generally a relatively extensive habitat patch) to successfully reproduce or occur in higher densities (Sandilands, 1997)

Areas of Natural and Scientific Interest (ANSI) - *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* (MMAH, 2020).

Assumption Development Stage - The developer has satisfied all parts of the development or infrastructure agreement and the assumption has been granted.

Basal Area – The basal area of a stand of trees is the sum of the cross-sectional surface areas of each live tree, measured at DBH, and reported on a per unit area basis. Basal area is a measure of tree density, and widely used in forestry, wildlife, and other natural resource management professions (Bettinger *et al.*, 2016).

Baseline Conditions – Baseline conditions may also be referred to as the environmental setting, existing conditions, and other similar terms. The baseline conditions are the physical, chemical, biological, social, economic, and cultural setting in which the proposed project is to be located, and where local impacts (both positive and negative) might be expected to occur. These conditions are the standard against which are compared projected future conditions from project alternatives. Their description and characterization are necessary for decision-makers, reviewers, and others who are unfamiliar with the project site and surrounding landscape (Shepard, 2006).

Biodiversity - The variability among organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (MNRF, 2010b).

Buffers - *An area or band of permanent vegetation, preferably consisting of native species, located adjacent to a natural heritage feature and usually bordering lands that are subject to development or site alteration. The purpose of the buffer is to protect the feature and its functions by mitigating impacts of the proposed land use and allowing an area for edge phenomena to continue (e.g., allowing space for edge trees and limbs to fall without damaging personal property, area for roots of edge trees to persist, area for cats to hunt without intruding into the feature). The buffer may also provide area for recreational trails and provides a physical separation from new development that will discourage encroachment* (MNRF, 2010b).

Carolinian Zone -

States than with the “warm continental (mixed deciduous-coniferous forests)” division farther north. It has been described as Canada’s most endangered major ecosystem, and many of its flora and fauna are found nowhere else in the nation. This is largely because many southern species are at their northern limits here, and because most of their natural habitat has been lost to human uses over the past three centuries.” (Jalava *et al.*, 2000).

Coefficient of Conservatism (for Southern Ontario) – *A numeric value between 0 (widespread) and 10 (found only in specialized habitats) assigned to each plant species indicating the degree of faithfulness a plant displays to a specific habitat or set of environmental conditions. “Conservative” plant species, such as those that are found only in relatively pristine natural habitats like bogs or prairies, are assigned a high coefficient of conservatism; other plant species that grow in a wide variety of habitats and can tolerate high levels of cultural disturbance are assigned low values. By compiling a plant species list for a natural area and looking up the coefficients of conservatism for each species listed, one can calculate a Floristic Quality Index, which can be used to compare the quality of natural areas. The NHIC has produced a list of native plants occurring in southern Ontario, and has assigned tentative coefficients of conservatism to each* (MNRF, 2010b).

Complexity, as it relates to habitats, is the number of species in the ecosystem and their relative abundances. Ecological communities and ecosystems are good examples of complex systems. They comprise large numbers of interacting entities, on many scales of observation, and their dynamics are often non-linear (causes are not proportional to consequences) – this leads to unpredictability and even apparent randomness.

Compliance Monitoring – Entails monitoring of the NHS components as needed to ensure that the approved recommendations in the EIS, along with any other applicable conditions, are met during the construction phase.

Conservation Status Ranks – *Standard methods to evaluate species and plant communities and assign conservation status ranks* (MNRF, 2020).

> **Global Rank (GRank)** - *Conservation status of a species or plant community across its entire range* (MNRF, 2020).
>
> **National Rank (NRank)** - *Conservation status of a species or plant community within a particular country* (MNRF, 2020).
>
> **Subnational Rank (SRank)** – *Conservation status of a species or plant community within a particular province, territory or state* (MNRF, 2020).

Critical Function Zones – *The term Critical Function Zone (CFZ) describes non-wetland areas within which biophysical functions or attributes directly related to the wetland occur. This could, for example, be adjacent upland grassland nesting habitat for waterfowl (that use the wetland to raise their broods). The CFZ could also encompass upland nesting habitat for turtles that otherwise occupy the wetland, foraging areas for frogs and dragonflies, or nesting habitat for birds that straddle the wetland-upland ecozone (e.g., Yellow Warbler). Effectively, the CFZ is a functional extension of the wetland into the upland. It is not a buffer for the wetland* (Environment Canada, 2013).

Cultural communities – Vegetation communities originating from, or maintained by, anthropogenic influences and / or culturally based disturbances (such as agricultural fields (croplands) and pastures (grazing), mowing, woodlot management or tree cutting, etc.,) often containing a large proportion of introduced species (adapted from Lee *et al.* 1998), but undergoing natural succession. Cultural communities include, but are not limited to, cultual meadows, cultural thickets, cultural savannahs, cultural woodland, and cultural plantation ecosites (Lee *et al.*, 1998).

Cultural savannahs and cultural woodlands - Areas where trees have been planted, or have resulted from first generation regeneration of a site originating or maintained by anthropogenic disturbances (Lee

et al., 1998). It does not include treed areas where the main stratum is dominated by native species and tree cover is >60%. Cultural savannahs are treed areas with 11-35% scattered or clumped tree cover and dominated by graminoids and forbs. Cultural woodlands have 36-60% scattered or clumped tree cover.

Cumulative effects – *The sum of all individual effects occurring over space and time, including those that will occur in the foreseeable future* (MNRF, 2010b).

Development – *the creation of a new lot, change in land use, or the construction of buildings and structures requiring approval under the Planning Act, but does not include:*

a) activities that create or maintain infrastructure authorized under an environmental assessment process;

b) *works subject to the Drainage Act* (MMAH, 2020*).*

Disturbance - Any action that will cause an **effect** or **stress**; can be natural (e.g. fire, flood) or human – generated (e.g. various forms of development activity or agricultural uses).

Drip Line - *As the location on the ground beneath the theoretical line of the outer most branches of the trees at the edge of a woodland* (City of London, 2018). *Where an asymmetric tree canopy occurs, the drip line shall be the greatest of the drip line distances measured horizontally from the base of the trunk* (City of London, 2016b).

Ecological boundary – Is determined based on ecological principles, refined through the application of **Section 4** Boundary Delineation in these Environmental Management Guidelines, and are irrespective of property lines.

Ecological Compensation – Ecological compensation is an example of a trade-off whereby loss of natural values is remedied or offset by a corresponding compensatory action on the same site or elsewhere (Brown *et al.*, 2013). Ecological compensation is a positive conservation action that is required to counter-balance ecological values lost in the context of development or resource use and is an intentional form of trade-off (Morrison-Saunders and Pope, 2013).

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* (MMAH, 2020).

Ecological integrity – *The condition of an ecosystem in which (a) the structure, composition and function are unimpaired by stresses from human activity, (b) natural ecological processes are intact and self-sustaining and (c) ecosystem evolution is occurring naturally. Ecological integrity includes hydrological integrity* (MNRF, 2010b).

1. The ability of a system to resist disturbance (resistance).
2. The ability of a system to recover or return to a balanced state when subject to some degree of perturbations and disturbance (resilience).
3. The ability to persist in the long-term with the minimum level of human maintenance.
4. The ability to maintain a structure of native flora and fauna.

Edge Effects – The distance from the periphery (of a given natural heritage feature) to the point where conditions (as indicated by specific criteria) do not differ from those in the interior habitat (adapted from Environtal Law Institute, 2003). *Edge effects are known to edge effects vary depending on natural feature type, position in the landscape and other factors... With respect to biological effects, 100 metres is robably a conservative estimate of the extent of edge effects.* (MNRF 2010b).

Edge microclimate - Sun and wind are the overriding controls of the edge microclimate. They determine which plants survive and thrive as well as having a major impact on soil, insects and other animals.

- Effects from south-facing edges tend to extend further into the feature than from north-

facing edges.

- Effects from windward edges tend to extend further into the feature than from leeward edges.

ELC Community Series - Is the lowest level of classification using ELC that can be identified through maps, air-photo interpretation and other remote sensing techniques. Community series are distinguished on the type of vegetation cover (open, shrub, or treed) and/or the plant form that characterizes the community (i.e., deciduous, coniferous, mixed; Lee *et al.*, 1998).

ELC Ecosite – Part of an Ecosection having a relatively uniform parent material, soil, and hydrology, and a chronosequence of vegetation. It is a mappable, landscape unit integrating a consistent set of environmental factors and vegetation characteristics (e.g., Dry-Forest Deciduous Forest Ecosite) (Lee *et al.*, 1998).

ELC Vegetation Type - Is the finest level of resolution in the ELC, identified through site and stand level research and inventory. Vegetation types are generated by grouping similar plant communities based on plant species composition and dominance, according to relative cover. The goal is to distill the natural diversity and variability of plant communities to a small number of relatively uniform vegetation units (Lee *et al.*, 1998).

Encroachment – Encroachment(s) into protected natural heritage features and areas can occur from other land uses in the adjacent lands. Common examples of encroachment include dumping garden refuse in the natural area, creating unauthorized access (e.g., an informal trail), extending lawn management and manicuring into the natural area, and building structures (such as forts or bike jumps). Encroachment is usually more pronounced where the limit between the protected natural area and the adjacent land use is not fenced.

Enhancement – From an ecological perspective, whereby the quality of ecosystem functions are improved. Enhancement can occur within or adjacent to a feature, and is a term that can apply to a natural heritage feature or to a natural heritage system as a whole. An example of ecological enhancement within a feature is removal of invasive plant species and related replacement with suitable native species. An example of an enhancement to a natural heritage system is the naturalization of a maintained lawn between two features to provide a more natural corridor or ecological linkage.

Feature Boundary – The delineated limit of one of the natural heritage features and areas that has been or may be included as a compoenent of the City's Natural Heritage System as per ***The London Plan*** Policies 1319 and 1320. Feature boundaries are to be determined in accordance with the applicable policies from the ***The London Plan*** and in these EMGs, **Section 4**. If not already completed, all features shall be assessed for significance accordance with the applicable policies from the ***The London Plan*** and in these EMGs, **Section 3**.

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* (MMAH, 2020).

Forest - *A terrestrial vegetation community with at least 60% tree cover* (Lee at al., 1998) of coniferous and / or deciduous trees.

Forest interior species - Are those that nest only within the interior of forests and rarely occur near the edge (Freemark and Collins, 1992).

Fragmentation – [T]he degree to which natural habitat, once continuous, is divided into remnant isolated patches (Ontario Road Ecology Group, 2010).

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* (MMAH, 2020).

Discharge Areas – Discharge areas are usually located in valleys and lowlands. There the hydraulic gradients are directed upward toward the land surface. Discharging groundwater re-enters the surface-water regime as inflow to lakes or baseflow to streams, or to become evapotranspiration from wetlands (Council of Canadian Academies, 2009).

Recharge Areas – Recharge usually occurs in topographically higher areas of a groundwater basin. Water-table elevations tend to be a subdued reflection of surface topography, and the differences in watertable elevation provide the driving force that moves groundwater by gravitational flow from recharge areas toward discharge areas at lower elevations. In recharge areas, the hydraulic gradient at the water table is directed downward, and recharging waters enter the groundwater-flow system to begin their slow journey through the groundwater basin (Council of Canadian Academies, 2009).

Hibernacula – (singular = hibernaculum) Underground chamber whereby snakes are able to safety overwinter. Hibernaculum can be a built structure or naturally occurring, i.e., animal burrow or fissure in the bedrock (Long Point Basin Land Trust, 2020).

High-Water Mark - The average **highest** level that a watercourse or waterbody rises to and remains at long enough to alter the riparian vegetation (DFO, 2007; DFO, 2019).

Indicator Species – Species used which offer an indication of the biological condition in an ecosystem (MNRF 2011b).

Invasive species - an organism that is not native to the place where found and tends to grow and spread aggressively, usually to the detriment of native species and ecosystems.

Interior Habitat - With respect to woodlands, interior habitat is usually determined as habitat 100 metres or more from the outer edge of the woodland. These interior habitats provide productive habitat for sensitive species that are sheltered from external influences and disturbance (MNRF, 2010b).

Landform - Is a topographic feature. The various slopes of the land surface resulting from a variety of actions such as deposition or sedimentation, erosion and movements of the earth crust.

Linkage - *Linear area intended to provide connectivity (at the regional or site level), supporting a complete range of community and ecosystem processes, enabling plants and animals to move between core areas and other larger areas of habitat over a period of generations. The terms are used interchangeably for planning purposes but may need to be distinguished for ecological or biological reasons* (MNRF, 2010b). Linkages can be naturally existing or restored linear landscape connections between two or more compoenent of the NHS. In the City of London, from an ecological perspective, linkage functions can be supported by many components of the NHS.Also see the definition for Upland Corridors.

The functions provided by ecological linkages are informed by characteristics such as their width (i.e., appropriate to the scale of the phenomenon being addressed), length (e.g., a long corridor will generally need to be wider than a short one), quality (e.g., vegetative structure and composition), species diversity (e.g., low non-native plant indices), type of corridor use (e.g., species in which individuals pass directly between two areas in discrete events of brief duration; or species that need several days to several generations to pass through), importance within the landscape (e.g., the last remining natural connection between two features), as well as the functions being expected of the linkage. Corridor functions may include, but are not limited to avenues along which:

- wide-ranging animals can travel, migrate and meet mates;
- plants can propagate;
- genetic interchange can occur among native flora and fauna;
- populations can move in response to environmental changes and natural disasters;
- individuals can recolonize habitats from which populations have been locally extirpated (MNRF

2010b, Environment Canada, 2013).

Low Impact Development (LID) – Approach to land development that mimics the natural movement of water in order to manage stormwater (rainwater and urban runoff) close to where the rain falls. LID uses small, simple design techniques and landscape features that filter, infiltrate, store, evaporate, and detain rainwater and runoffs at the lot level. (City of Hamilton, 2020).

Mean Coefficient of Conservatism (MCC) - Is calculated from the conservatism coefficients of all native species in a patch. MCC aids in measuring the overall quality of a site. The conservative coefficient describes the probability of finding a species in a particular habitat type or undisturbed habitat. Coefficients range from 0 (widespread) to 10 (found only in specialized habitats). See definition for Coefficient of Conservatism above.

Mitigation – *The prevention, modification, or alleviation of impacts or actions on the natural environment and -…. the prevention of negative impacts. Mitigation also includes any action intended to enhance beneficial effects* (MNRF 2010b)..

Native species – For the City of London, usually refers to species that occurred naturally in southwestern Ontario prior to European settlement. Where the status of a species is in question, the City will defer to the Natural Heritage Information Centre.

Natural Heritage Features and Areas - In the City of London, these are those features and areas identified in accordance with the Provincial Policy Statement and listed in ***The London Plan*** policies 1319 and 1320..

Natural Heritage System - *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 use* (MMAH, 2020).

Natural landform-vegetation communities - Areas of vegetation associated with landform types (e.g., ravine, floodplain, tableland). The communities should represent typical pre-settlement vegetation conditions. For example: Yellow Birch deciduous swamp type on floodplain; or fresh Hemlock coniferous forest type on steep slope/ravine.

Negative Impacts – is defined in accordance with the Provincial Policy Statement and includes policy references from that document, as follows: a*) in regard to policy 1.6.6.4 and 1.6.6.5, 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 policy 2.2, 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; c) in regard to fish habitat, any permanent alteration to, or destruction of fish habitat, except where, in conjunction with the appropriate authorities, it has been authorized under the Fisheries Act; and d) 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* (MMAH 2020).

Net effects - Those impacts that remain after mitigation has been implemented.

Non-native species - Used to refer to a species that did not originate naturally in an area. Usually refers to species that have been introduced to southwestern Ontario since European settlement. Where the status of a species is in question, the City will defer to the Natural Heritage Information Centre.

Overall Benefit Permit – Issued under the *Endangered Species Act* in which "*authorizes a person, company or organization to perform the activity, as long as an overall benefit to the species is realized*" (MECP, 2020). The person, company or organization must undertake "*actions that contribute to improving the circumstances to the species*" (MECP, 2020).

Patch clusters – Are several patches that may be connected as one Area if certain criteria for connectivity and distance are met (EPPAC, 1996). As defined in these EMGs (Section 3.1), these are vegetation patches within 250 m of each other that are not separated by major roads, highways, or urban development.

Patches – Are area of naturalized vegetation generally larger than 0.5 ha. A patch may be bisected by a utility corridor or road if the right-of-way (ROW) is less than 40 m. Patches may include one or more vegetation communities within natural feature boundaries, see Section 4.0.

Place Type (*The London Plan*) - Traditionally, Planners have focused on land use when setting plans for geographic areas within a city – often referred to as a "land use designation". ***The London Plan*** takes a different approach by planning for the type of place that is envisioned – what this Plan refers to as a "Place Type". It seeks to plan highly-functional, connected, and desirable places. Most place types support a range of intensities and a mix of land uses (City of London, 2019).

> **Environmental Review** - 779_In some cases, lands may contain natural heritage features and areas that have not been adequately assessed to determine whether they are significant and worthy of protection as part of the City's NHS. The Environmental Review Place Type will ensure that development which may negatively impact the value of these features does not occur until such time as the required environmental studies are completed. 780_ In addition to the components of the NHS which have been evaluated and shown as Green Space on Map 1 – Place Types in conformity with the policies of this Plan, additional lands are identified on Map 5 – Natural Heritage, that may contain significant natural features and areas and important ecological functions which should be protected until environmental studies have been completed, reviewed, and accepted by the City. These potential components of the NHS, shown within the Environmental Review Place Type on Map 1, will be protected from activities that would diminish their functions pending the completion, review and acceptance of a detailed environmental study (City of London, 2019).
>
> **Green Space** - 757_ The Green Space Place Type is made up of a system of public parks and recreational areas, private open spaces, and our most cherished natural areas. It encompasses a linear corridor along the Thames River, which represents the natural heritage and recreational spine of our city. It also encompasses our hazard lands, including our valleylands and ravines, and the floodplains associated with our river system. 758_ The Green Space Place Type is comprised of public and private lands; flood plain lands; lands susceptible to erosion and unstable slopes; natural heritage features and areas recognized by City Council as having city-wide, regional, or provincial significance; lands that contribute to important ecological functions; and lands containing other natural physical features which are desirable for green space use or preservation in a natural state. The components of the NHS that are included in the Green Space Place Type on Map 1 – Place Types, are identified or delineated on Map 5 - Natural Heritage. Hazard lands and natural resource lands that are included in the Green Space Place Type on Map 1 are identified or delineated on Map 6 – Hazards and Natural Resources (City of London 2019).

Plantation - A coniferous or deciduous treed community in which the majority of trees have been planted (Lee *et al*., 1998)**.**

Potential Naturalization Areas - *Potential naturalization areas are defined as areas where the opportunity exists to enhance, restore, or where appropriate, expand the NHS. These areas may include lands suitable to create natural habitats such as wetland habitat, pollinator habitat, wildlife habitat, or to compensate for trees lost to development.* (***The London Plan*** Policy 1378). *Potential naturalization areas are an important component of the Natural Heritage System. Potential naturalization areas can include lands adjacent to natural heritage features and areas, other natural 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. Potential naturalization areas may enhance, restore or strengthen and expand the health and viability of a natural heritage feature or area* (***The London Plan*** Policy 1379).

Prairie - *An area of native grassland controlled by a combination of moisture deficiency and fire. Usually containing a distinctive assemblage of species.* May include tallgrass prairie, tallgrass savannah or tallgrass woodland upland communities (Lee *et al.*, 1998).

Provincially Significant Wetland – Wetlands that have been "*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*" (MMAH, 2020)..

Restoration – From an ecological perspective, "*is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed"* (Society for Ecological Restoration website).

Savannah – A treed community with 11 to 35% cover of coniferous or deciduous trees (Lee *et al.* 1998).

Satellite Woodlands - Are small treed or forested areas located within 100 m of a larger area of significant woodland. The satellite may be part of a Patch or Patch Cluster.

Setback - A land use planning term, established through the use of zoning standards, generally providing for minimum distances from lot lines to achieve appropriate locations for buildings and structures (MNRF, 2010b; Beacon, 2012a). Within the City of London "*setbacks shall apply from any lands identified as an ecological buffer*" (City of London, 2019).

Significant - As defined by the *Provincial Policy Statement* means:

a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario MNRF 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 MNRF; 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 NHS; Criteria for determining significance for the resources identified in sections (c) 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 (MMAH, 2020).

Site Alteration – *Activities, such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site* (MMAH, 2020).

Successional / Seral Age - The stage in a vegetation chronosequence or succession at a given site.

> **Climax communities** - Are self-perpetuating and composed of climax species. A successional stage with unevenly aged and multiple height classes (Strong *et al.*, 1990).
>
> **Early successional communities** - Have not undergone a series of natural thinning. Dominant plants are essentially growing as independent individuals, rather than as members of a

phytosociological community. It is floristically similar to mid-successional stands, but is juvenile in structural development (Strong *et al.*, 1990).

Mid-Aged - A seral stage of a community that has undergone natural thinning and replacement as a result of species interaction; the community often contains examples of both early successional and late successional species. Mid-successional communities have undergone natural thinning as a result of species interaction, and may show evidence of invasion by climax species, but they are still dominated by seral species. They may include stands with an over mature understorey (Strong *et al.*, 1990).

Mature - A seral stage in which a community is dominated primarily by species that are replacing themselves and are likely to remain an important component of the community if it is not disturbed again. Significant remnants of early seral stages may still be present. **Mature Forests** are dominated primarily by species which are replacing themselves and are likely to remain an important component of the community if it is not disturbed again. Significant remains of early seral stages may still be present (Lee *et al.*, 1998).

Older Growth Forests - relatively old and relatively undisturbed by humans. The definition of older growth considers factors other than age, including forest type, forest structure, forest development and the historical and current patterns of human disturbance. Older growth forests are self-perpetuating communities composed primarily of late seral species which show uneven stand age distribution including large old trees without open-grown characteristics (Lee *et al.*, 1998).

Pioneer - A community that has invaded disturbed or newly created sites and represents the early stages of either primary or secondary succession. Pioneer communities have invaded disturbed or newly created sites, and represent the early stages of either primary or secondary succession (Strong *et al.*, 1990).

Sub-climax communities - Are successionally maturing communities dominated primarily by climax species, but significant remnants of earlier seral stages may be present (Strong *et al.*, 1990).

Young - A seral stage of a plant community that has not yet undergone a series of natural thinning and replacements. Plants are essentially growing as independent individuals rather than as members of a phytosociological community.

Rare Plant Species – List of species that can be grouped but not limited to the following:

Provincially Rare Plants includes species with an element ranking of S1-S3 (For a complete listing of Ontario's rare plant species consult NHIC at www.mnr.gov.on.ca/MNR/nhic/nhic.html).

Regionally Rare Plants - includes species with 1 to 4 stations (records) in Middlesex County (as per the *List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)*, Oldham 2017).

Regionally Uncommon Plant - *Native in the Carolinian Zone and (a) listed as common in no more than one Carolinian Zone area; and (b) not rare or historic in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X (no Status))* (as per the *List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)*, Oldham 2017).

Species Richness - The number of different species within a community (Pyron, 2010).

Species-at-Risk - Used to describe species that are listed in one of the conservation categories of "endangered", "threatened" or "vulnerable"/ "special concern"

Endangered – Any native species that on the basis of the best available scientific evidence, is at risk of extinction or extirpation throughout all or a significant portion of its (Ontario) range; a species threatened with imminent extinction or extirpation (COSEWIC).

Threatened - Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its (Ontario) range (COSSARO); a species likely to become endangered if the limiting factors are not reversed (COSEWIC).

Special Concern / Vulnerable - Any native species that, on the basis of the best available scientific evidence, is a species of special concern (in Ontario), but is not a threatened or endangered (COSSARO); a SAR because of low or declining numbers, small range or because of characteristics that make it particularly sensitive to human activities or to natural events (COSEWIC). COSEWIC has replaced the category of "Vulnerable" with "Special Concern".

Stormwater Management – The plans, public works and initiatives put in place to maintain quality and quantity of stormwater runoff to pre-development levels (City of London, 2019).

Thicket Swamp - A wooded wetland area occurring on organic or mineral substrates with a water table that seasonally drops below the substrate surface; dominated by small trees and shrubs where the tree cover is <10% and the small tree or tall shrub cover (shrubs defined by Soper and Hiemburger 1982) is >25% (Lee *et al.*, 1998).

Top-of-Slope - The intersection of the physical top of a bank or valley slope with the table land. This can be different than the geotechnical or engineered stable top-of-slope. For well-defined valleys, the physical boundary is generally defined by the stable or the predicted top-of-slope while "*for a less well-defined valley or stream corridor, the physical boundary may be defined in a number of ways, including the consideration of riparian vegetation, the flooding hazard limit, the meander belt or the highest general level of seasonal inundation*" (MNRF 2010b).

Tree Canopy – An almost continuous layer of foliageformed by the crowns of the larger trees. Shades the layers of vegetation below (CVC, 2011).

Treed – A community with tree cover of >10% (Lee *et al.*, 1998).

Unevaluated Wetland – Wetlands that have not undergone the OWES evaluation process.

Upland Corridors - *Vegetated areas, or potentially revegetated areas, that provide a link between natural heritage features and areas of the Natural Heritage System. Upland corridors may incorporate infrastructure (such as culverts or underpasses) to support connectivity* (***The London Plan*** Policy 1372). *Upland corridors support and connect valleylands to natural heritage features and areas where the valleylands do not directly connect. Valleylands are also essential for establishing connectivity for the Natural Heritage System, and they provide corridor and linkage functions between natural heritage features and areas. Both are essential in a highly fragmented or urban landscape* (***The London Plan*** Policy 1374). Upland corridors are "*to retain or create linkages between isolated natural areas*" (***The London Plan*** Policy 1417_g).

Urban Growth Boundary - The boundary shown on Map 1 and Figure 1, beyond which urban uses will not be permitted. Generally, this map boundary separates the urban parts of our city from the rural parts of our city" (City of London, 2019).

Valleylands - *A natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year* (MMAH, 2020).

Vascular Plants – Have a specialized vascular systems known as the xylen and phloem (Leslie, 2018).

Vegetation Patch – Vegetation patches are usually referred to as such in the City of London before they are assessed and screened to determine if they meet the criteria for one or more of the City's NHS components, as listed in ***The London Plan*** Policy 1319. Also, see "Patches".

Vegetation patches are considered as one unit and can be comprised of one or more "natural heritage features" inside the feature boundary (e.g., woodland, wetland, etc.).

Vernal Pool – Pool fed by either groundwater (e.g., springs), snowmelt, or surface water that may be important breeding sites for [various species], which are generally found within a woodland or in proximity to a woodland (MNRF, 2010b).

Watercourse - Is defined according to several federal and provincial Acts and Regulations and typically consists of a distinct (somewhat to well-defined) channel in which water naturally flows at some time of the year [i.e., permanent, intermittent, or ephemeral flow as defined by MNRF's Stream Permanency Handbook for South-Central Ontario (MNRF, 2013b)]. This includes anthropogenically created / maintained / altered features as well as natural features.

Watershed – *An area that is drained by a river and its tributaries* (City of London, 2019).

> **Subwatershed** - *Area drained by a stream or group of streams within the larger watershed. A subwatershed identifies streams, wetlands, forests, groundwater recharge, and other natural areas* (GRCA, 2020).

Wetland - 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 (MMAH, 2020).

In the City of London Wetlands are those that are evaluated for significance that do not meet the criteria for designation as a PSW per OWES, as confirmed by the MNRF. Examples of wetlands include:

> **Bog** - Is defined as an open or treed wetland area on deep (>40cm) peat almost entirely composed of Sphagnum species. The tree cover is less than 25%, scattered or clumped, and usually under 10 m in height. The wetland is dominated by graminoids and/or low ericaceous shrubs (Riley, 1994 from Lee *et al.*, 1998).
>
> **Fen -** Is defined as an open or treed wetland area on deep (>40cm) sedge and woody peat with a substantial component of brown moss. The tree cover is less than 25%, scattered or clumped. The wetland is dominated by graminoids and low non-ericaceous shrubs (Lee *et al.*, 1998). **Fens** may also include seepage marl areas with <40 cm peat, and/or the presence of fen indicator species.
>
> **Marsh** - Is defined as an open wetland area occurring on organic or mineral substrates with a water table that fluctuates seasonally or periodically at, near, or above the substrate surface; dominated by hydrophytic sedges, grasses, cattails, reeds, forbs or low shrubs with tree and tall shrub cover <25%; may include meadow marsh, shallow marsh, deep marsh or shrub marsh (Lee *et al.*, 1998).
>
> **Swamp** - A mineral-rich wetland community characterized by a cover of coniferous or deciduous trees (Lee *et al.*, 1998).

Wetland Plant Species – Species that are found in wetlands in Ontario. Wetland plant species range from those species that occur primarily in wetlands ("wetland indicators") to those species that occur in both wetlands and uplands (MNRF, 2014a).

> **Emergent** - Herbaceous plants which rise out of the water (MNRF, 2014a).
>
> **Floating** - Rooted, vascular hydrophytes with leaves floating horizontally on or just above the water surface (MNRF, 2014a).
>
> **Submergent** - Rooted hydrophytes with leaves entirely under the water surface (MNRF, 2014a).

Wildlife Habitat - *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 nonmigratory species (MMAH, 2020).

Woodland – A treed community with 35 to 60% cover of coniferous or deciduous trees." (Lee *et al.*, 1998), 10% tree cover (as described in **Section 3.1.1** in these Environmental Management Guidelines) or 25% shrub cover (as described in **Section 3.1.1** in these Environmental Management Guidelines). In the *Provincial Policy Statement* 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*" (MMAH, 2020).

9. References

Alani, A.M., and Lantini, L. (2020). Recent Advances in Tree Root Mapping and Assessment Using non-destructive testing methods: A focus on ground penetrating radar. Surveys in Geophysics: 41: 605-646

Bakowsky, W. (1997). Southern Ontario Vegetation Communities. Natural Heritage Information Centre.

Bakowsky, W., & Riley, J. L. (1993). A Survey of the Prairies and Savannas of Southern Ontario. Proceedings of the 13th North American Prairie Conference. Windsor.

Beacon Environmental. (2009). Restoration and Securement Strategy for Enhancing the Town of East Gwillimbury Natural Heritage System. 87 pp. East Gwillimbury, Ontario, Canada: Town of East Gwillimbury.

Beacon Environmental. (2012, December). Ecological Buffer Guideline Review. Markham, Ontario, Canada: Credit Valley Conservation Authority.

Beacon Environmental. (2014). London, Ontario, Canada: City of London.

Beak Consultants Ltd. (1995). Aquatic Resources Management Reports for Vision '96 Subwatersheds. Group 1, Groups 2/3, and Groups 4/5, London.

Bekessy, S., Wintle, B., Lindenmayer, D., McCarthy, M., Colyvan, M., Burgman, M., & Possingham, H. (2010). The biodiversity bank cannot be a lending bank. Conservation Letters, 3, 151-158.

Bergsma, B. (2004). City of London Process to Implement Policies and Develop Guidelines to Identify Ecologically Significant Woodlands. London.

Bettinger, P., Boston, K., Siry, J.P., & Grebner, D.L.. (2016). Forest Management and Planning, Academic Press 2009, second edition December 2016.

Bibby, C. J., Burgess, N. D., Hill, D. A., & Mustoe, S. H. (2000). Bird Census Techniques (2nd Ed. ed.). Academic Press.

Birds Canada. (2020). Birds Canada Webpage. Canada. Retrieved from https://www.birdscanada.org/

BSC (Bird Studies Canada). (2009a). Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. Bird Studies Canada in cooperation with Environnment Canada and the U.S. Environmental Protection Agency.

BSC (Bird Studies Canada). (2009b). Marsh Monitoring Program Participant's Handbook for Surveying Marsh Birds.

Boutin, C., & Jobin, B. (1998). Intensity of agricultural practices and effects on adjacent habitats. Ecological Applications, 14(6), 1757-1765.

Bowles, J. (2002). Regionally Rare Plants of Middlesex County.

Bowles, J. M., Draper, W. B., Heagy, A., Kanter, M., & Larson, B. (1994). City of London Sub-Watershed Studies Life Science Inventories. London: City of London, Upper Thames River Conservation Authority.

Bowles, J., & Bergsma, B. (1999). Components of the Natural Heritage System Guidelines for the Evaluation of Patches.

Bowman, I. (1996). Species at Risk in Ontario - Report of the Rare, Threatened, and Endangered Task Force. Toronto: Ministry of Natural Resources and Forestry.

Bricker, B., & Reader, R. (1999). The effect of woodlot size on woody species composition richness. In G. M. Allen, P. F. Eagles, & S. D. Price, Conserving Carolinian Canada: Conservation Biology in the Deciduous Forest Region (pp. 75-87). Waterloo, Ontario, Canada: University of Waterloo Press.

Brosofske, K. D., Chen, J. Q., Naiman, R. J., & Franklin, J. F. (1997). Harvesting effects on microclimatic gradients from small streams to uplands in western Washington. Ecological Applications, 7, 1188-1200.

Brown, M. A., Clarkson, B. D., Barton, B. J., & Joshi, C. (2013). Ecological compensation: an evaluation of regulatory compliance in New Zealand. Impact Assessment and Project Appraisal, 31(1), 34-44.

Bull, J. W., Milner-Gulland, E. J., Suttle, K. B., & Singh, N. J. (2014). Comparing biodiversity offset calculation methods with a case study in Uzbekistan. Biological Conservation, 178, 2-10.

Bull, J., & Brownlie, S. (2017). The transition from No Net Loss to a Net Gain of biodiversity is far from trivial. Oryx, 51(1), 53-59.

Burke, D. M., & Nol, E. (1998). Edge and fragment size effects on the vegetation of deciduous forests in Ontario, Canada. Natural Areas Journal, 18, 45-53.

Butler, P., Iverson, L., Thompson III, F. R., Brandt, L., Handler, S., Janowiak, M., . . . Zegre, N. (2015). Central Appalachians forest ecosystem vulnerability assessment and synthesis: a report from the Central Appachalians Climate Change Response Framework Project. Newton Square, Pennsylvania, USA: U.S. Department of Agriculture, Forest Service, Northern Region.

Burke, D., and E, Nol (1998). Influence of Food Abundance, Nest-Site Habitat, and Forest Fragmentation of Breeding Ovenbirds

Cadman, M. D., Dewar, H. J., & Welsh, D. A. (1998). The Ontario Forest Bird Monitoring Program (1987-1998): Goals, methods and species trends observed. Canadian Wildlife Service.

Canadensys. (2020). Database of Vascular Plants of Canada.

Canadian Environmental Assessment Agency. (2016). Report on Plans and Priorities. Pp. 36

Castelle, A. J., & Johnson, A. W. (2000). Riparian Vegetation Effectiveness. National Council for Improvement Technical Bulletin No. 799.

Castelle, A. J., Johnson, A. W., & Conolly, C. (1994). Wetland and stream buffer size requirements - A review. Journal of Environmental Quality, 23, 878-882.

Castelle, A.J., Conolly, C., Emers, M., Metz, E.E., Meyer, S., Witter, M., Mauermann, S., Erickson, T., and Cooke, S.S. (1992). Wetland Buffers: Use and Effectiveness. Adolfson Associates, Inc., Shorelands and Coastal Zone Management Program, Washington Department of Ecology, Olympia, Pub. No. 92-10.

Catling, P. (2013). Using Coefficients of Conservatism and the Floristic Quality Index to Assess the Potential for Serious and Irreversible Damage to Plant Communities. Canadian Field Naturalist, 127(3), 285-288.

Chapman, L. J., & Putnam, D. F. (1984). The Physiography of Southern Ontario. Special Volume 2(OGS Map P.2715), 3rd. Ontario, Canada: Ontario Geological Survey.

City of Cambridge. (2018). Cambridge Official Plan. Pp. 363

City of Guelph. (2018). Envision Guelph - The City of Guelph Official Plan. Guelph, Ontario, Canada.

City of Guelph. (2020). Guidelines for the preparation of Environmental Impact Studies. Version 2. Pp. 123

City of Hamilton. (2020). Low Impact Development (LID) – Stormwater Management. Retrieved from: https://www.hamilton.ca/home-property-and-development/water-sewer/low-impact-development-lid-stormwater-management

City of Hamilton and ESAIEG. (2015). Environmental Impact Statement (EIS) Guidelines. Hamilton, Ontario, Canada.

City of London. (1994). Guide to Plant Selection for Natural Heritage Areas and Buffers. London, Ontario, Canada: Council Approved March 22, 1994.

City of London. (2004). Guidelines for Determining Setbacks and Ecological Buffers. London, Ontario, Canada: Council Approved April 20, 2004.

City of London. (2007). City of London's Environmental Management Guidelines. London.

City of London. (2014). City of London Urban Forest Strategy. London.

City of London. (2016a). The London Plan. Offical Plan, London.

City of London. (2016b). Tree Protection By-law. London, Ontario.

City of London. (2017). London Invasive Plant Management Strategy. 47 pp. London, Ontario, Canada.

City of London. (2018). Tree Planting and Protection Guidelines. In Design Specifications and Requirements Manual (p. 36 pp.). London, Ontario.

City of London. (2019). Design Specifications and Requirements Manual – 2003, Updated August 2019. London, Ontario: City of London - Environmental and Engineering Services.

City of London. (2020). Standard Contract Documents for Municipal Construction - 2020 Edition. London, Ontario: City of London - Environmental and Engineering Services.

City of Waterloo. (2020). City of Waterloo Official Plan. Pp. 444

Couturier, A. (1999). Conservation Priorities for the Birds of Southern Ontario. Port Rowan: Bird Studies Canada.

Crins, W. J. (1996). Life Science Gap Analysis for Site District 4E-3. Ontario Ministry of Natural Resources.

de Foresta, H., Somarriba, E., Temu, A., Boulanger, D., Feuilly, H., & Gauthier, M. (2013). Towards the Assessment of Trees Outside Forests. Resources Assessment Working Paper 183.

DeWalle, D.R. (2010). Modeling Stream Shade: Riparian Buffer Height and Density as important as buffer width. Journal of the American Water Resources Association. Vol 46, No. 2

Dobbyn, J. S. (1994). Atlas of the Mammals of Ontario. Don Mills: Federation of Ontario Naturalists.

Dobson, M. (1995). Arboriculture Research and Information Note: Tree Root Systems. Arboricultural Advisory and Information Service

Dougan and Associates. (2020). CanPlant. Canada: Evergreen. Retrieved from https://can-plant.ca/

Dreimanis, A., Vagners, U. J., McKenzie, G. D., & Etherington, J. R. (1964a). Pleistocene Geology of the St. Thomas Area (West Half). (Preliminary Geological Map No. 238). St. Thomas, Ontario: Ontario Department of Mines.

Dreimanis, A., Vagners, U., McKenzie, G. D., & Etherington, J. R. (1964b). Pleistocene Geology of the St. Thomas Area (East Half). (Preliminary Geological Map No. P.606). St. Thomas, Ontario: Ontario Department of Mines.

Environment and Climate Change Canada. (1994). Migratory Birds Convention Act, 1994 SC. 1994, c.22. Canada.

Environment and Climate Change Canada. (2005). Beyond Islands of Green: A Primer for Using Conservation Science to Select and Design Community-based Nature Reserves. 80 pp. Downsview, Ontario, Canada.

Environment and Climate Change Canada. (2017). Annex A: Environment Canada Experience with Conservation Allowances. Operation Framework for Use of Conservation Allowances. Canada.

Environment Canada. (2002). Species at Risk Act, c. 29.

Environment Canada. (2012). Canadian Aquatic Biomonitoring Network Field Manual for Wadeable Streams. Science and Technology Branch. 51 pp. Dartmouth, NS.

Environment Canada. (2013). How Much Habitat is Enough? 3rd, 127 pp. Toronto.

Fahrig, L. (2020). Why do several small patches hold more species than few large patches? Global Ecology and Biogeography, 29, 615-628.

Fisheries and Oceans Canada. (1985). Fisheries Act R.S.C., 1985, c. F-14. Canada.

Fisheries and Oceans Canada. (1994). Habitat Conservation and Protection Guidelines (First ed.).

Fisheries and Oceans Canada. (2007). Isolated or Dry Open-Cut Stream Crossings. Fisheries and Oceans Canada Ontario Operational Statement, Version 1.0, 4 pp. . Ontario, Canada.

Fisheries and Oceans Canada. (2019). Request for Review Form and Guidance. 11 pp. Canada.

Fisheries and Oceans Canada. (2020). Aquatic Species at Risk Map. Canada. Retrieved from https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Forest Breeding Bird Survey. (2008). Forest Bird Monitoring Program - Site Set-Up and Bird Survey Instructions. Guelph, Ontario: Canadian Wildlife Service.

Forman, R. T. (1995). Land Mosaics: The Ecology of Landscapes and Regions. Island Press.

Francis, C. M., Austen, M. J., Bowles, J. M., & Draper, W. B. (2000). Assessing Floristic Quality in Southern Ontario Woodlands. Natural Areas Journal, 20, 66-77.

Freemark, K. E., & Collins, B. (1992). Landscape Ecology of Birds Breeding in Temperate Forest Fragments. In J. M. Hagan III, & D. W. Johnston, Ecology and Management of Neotropical Landbirds (pp. 443-454). Washington, D.C.: Manomet Bird Observatory, Smithsonian Institute Press.

Fry, G., & Sarlov-Herlin, I. (1997). The ecological and amenity functions of woodland edges in the agricultural landscape: a basis for disgn and management. Landscape and Urban Planning, 37(1-2), 45-55.

Geomatics International Inc. (1995). Management Options for Old-Field Sites in Southern Ontario - Guidelines and Literature Review. 17 pp. Ontario, Canada: Southern Region Science and Technology Transfer Unit.

Gibbons, P. G., Evans, M., Maron, M., Gordon, A., Le Roux, D., von Hase, A., . . . Possingham, H. (2015). A loss-gain calculator for biodiversity offsets and the circumstances in which No Net Loss is feasible. Conservation Letters(Open Access), 1-11.

Gilman, E. (2003). Branch-to-stem diameter ratio affects strength of attachment. Journal of Arboriculture, 29(5), 291-293.

Government of Ontario. (2014). Tree Atlas found at: https://www.ontario.ca/environment-and-energy/tree-atlas/

Grace, J. M., & Zarnoch, S. J. (2013). Influence of forest road buffer zones on sediment transport in the Southern Appalachian Region. In J. Guldin, Proceedings of the 15th Biennial Southern

Silvicultural Research Conference (Vol. 175, pp. 387-493). Asheville, North Carolina, USA: U.S. Department of Agriculture, Forest Service, Southern Research Station.

Grand River Conservation Authority (GRCA). (2005). Environmental Impact Study Guidelines and Submission Standards for Wetlands

Greater Golden Horseshoe Conservation Authorities. (2006). Erosion and Sediment Control Guideline for Urban Construction.

Gregory, R., Ohlson, D., & Arvai, J. (2006). Deconstructing adaptive management: criteria for applications to environmental management. Ecological Applications, 16(6), 2411-2425.

Guzy, J. C., Halloran, K. M., Homyack, J. A., Thornton-Frost, J. E., & Willson, J. D. (2019). Differential responses of amphibian and reptile assemblages to size of riparian buffers within managed forests. Ecological Applications, 29(8), e01995.

Harris, I. D., & Scheck, J. (1991). From Implications to Applications: The Dispersal Corridor Principle Applied to the Conservation of Biological Diversity. In D. A. Saunders, & R. J. Hobbs, Nature Conservation 2: The Role of Corridors. Surrey Beatty & Sons.

Haspel, C., & Calhoon, R. E. (1991). Ecology and behavior of free-ranging cats in Brooklyn, New York. In L. W. Adams, & D. L. Leedy, Wildlife Conservation in Metropolitan Environments (pp. 27-30). Columbia, Maryland, USA: National Institute for Urban Wildlife Symposium.

Hawkes, V. C., & Gregory, P. T. (2012). Temporal changes in the relative abundance of amphibians relative to riparian buffer width in western Washington, USA. Forest Ecology and Management, 274, 67-80.

Hilditch, T. C. (1993). Use of Woodland Evaluation System in Municipal Planning. In S. Strobl (Ed.), Significant Woodlands Workshop Proceedings (pp. 29-34). Leslie M. Frost Natural Resources Centre.

Hilty, J.A., Worboys, G.L., Keeley, A., Woodley, S., Lausche, B., Locke, H., Carr, M., Pulsford, I., Pittock, J., White, J.W., Theobald, D.M., Levine, J., Reuling, Mo., Watson, J.E.M., Ament, R., & Tabor, G.M. (2020). Guidelines for Conserving Connectivity Through Ecological Networks and Corridors (Issue 30). International Union for the Conservation of Nature (IUCN). https://portals.iucn.org/library/node/49061

Holmes, A. M., Hess, Q. F., Tasker, R. R., & Hanks, A. J. (1991). The Ontario Butterfly Atlas. (D. Friesen, Ed.) Altona.

Houlahan, J.E., and Findlay, S.C. (2003). The effects of adjacent land use on wetland amphibian species richness and community composition. Canadian Journal of Fisheries and Aquatic Sciences 60: 1078-1094.

Hounsell, S. W. (1989). Methods for Assessing the Sensitivity of Forest Birds and their Habitats to Transmission Line Disturbances. Toronto: Land Use and Environmental Planning Department, Ontario Hydro.

International Union for Conservation of Nature. (2016). Biodiversity Offsets. Retrieved from https://www.iucn.org/theme/business-and-biodiversity/our-work/business-approaches-and-tools/biodiversity-offsets

Jalava, J. V., Sorrill, P. J., Henson, J., & Brodri, K. (2000). The Big Picture Project: Developing a Natural Heritage Vision for Canada's Southernmost Ecological Region. Peterborough: Natural Heritage Information Cetnre.

Jayasuriya, M. T. (2016). Constrasting functional-based riparian management zones with the fixed-width buffer approach and how it relates to riparian management guidelines. 156 pp. Syracuse, New York, USA: State University of New York, College of Environmental Science and Forestry.

Johnson, R. G., & Temple, S. A. (1986). Assessing habitat quality for birds nesting in fragmented tallgrass prairies. In T. M. Verner, M. L. Morrison, & C. J. Raphi, Wildlife 2000: Modelling Habitat Relationships of Terrestrial Vertebrates. Madison, Wisconsin, USA: University of Wisconsin Press.

Jones, C., Palmer, R. M., Motkaluk, S., & Walters, M. (2002). Watershed Health Monitoring: Emerging Technologies. CRC Press.

Jones, C., Somers, K. M., Craig, B., & Reynoldson, T. B. (2007). Ontario Benthos Biomonitoring Network Protocol. Ontario Ministry of Environment.

Koh, N. S., Hahn, T., & Ituarte-Lima, C. (2014). A comparative analysis of ecological compensation programs: The effect of program design on the social and ecological outcomes. Sweden: Uppsala University.

Kuglerova, L., Agren, A., Jansson, R., & Laudon, H. (2014). Towards optimizing riparian buffer zones: Ecological and biogeochemical implications for forest managemnet. Forest Ecology and Management, 334, 74-84.

Lake Simcoe Region Conservation Authority. (2019). Ecological Offsetting Policy. 19 pp. Ontario, Canada.

Lauenroth, W. K., & Gill, R. (2003). Turnover of root systems. Root Ecology, 61-89.

Lee, H., Bakowsky, W., Riley, J., Bowles, J., Puddister, M., Uhlig, P., & McMurray, S. (1998). Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ministry of Natural Resources and Forestry.

Lee, P., Smyth, C., and Boutin, S. (2004). Quantitative review of riparian buffer width guidelines from Canada and the United States. Journal of Environmental Management. 70: 165-180

Lemieux, Christopher J., Aerin L. Jacob, and Paul A. Gray. 2021. Implementing Connectivity Conservation in Canada. Canadian Council on Ecological Areas (CCEA) Occasional Paper No. 22. Canadian Council on Ecological Areas, Wilfrid Laurier University, Waterloo, Ontario, Canada. vi + 216 pp.

Leslie, H. (2018). Value of ecosystem-based management. Proceedings of the National Academy of Sciences of the United States of America. Vol 115, No. 14.

Leuty, T. (1999). Fact Sheet: Farm Tile Drains and Tree Roots. Ontario, Canada: Ontario Ministry of Agriculture, Food and Rural Affairs.

Lind, L., Hasselquist, E. M., & Laudon, H. (2019). Towards ecologically functional riparian zones: A meta-analysis to develop guidelines for protecting ecosystem functions and biodiversity in agricultural landscapes. Journal of Environmental Management, 249, 109391.

Little, C., Cuevas, J. G., Lara, A., Pino, M., & Schoenholtz, S. (2015). Buffer effects of streamside native forests on water provision in watersheds dominated by exotic forest plantations. Ecohydrology, 8(7), 1205-1217.

Macfarlane, D. M., Bredin, I. P., Adams, J. B., Zungu, M. M., Bate, G. C., & Dickens, C. W. (2015). Preliminary guideline for the determination of buffer zones for rivers, wetlands, and estuaries. Water Research Commission.

Magee, D. (1996). Preliminary List of the Area-Sensitive Breeding Birds. Unpublished.

Maron, M., Brownlie, S., Bull, J. W., Evans, M. C., von Hase, A., Quetier, F., . . . Gordon, A. (2018). The many meanings of no net loss in environmental policy. Nature Sustainability, 1(1), 19-27.

Marshall Macklin Monaghan Ltd., Paragon Engineering Ltd., and Aquafor Beech Ltd. (1995). City of London Subwatershed Studies Implementation Plan. London.

Matlack, G. R. (1993). Sociological edge effects: Spatial distribution of human impacts in suburban forest fragments. Environmental Management, 17(6), 153-164.

McLachlan, S. M., & Bazely, D. R. (2003). Outcomes of longterm deciduous forest restoration in southwestern Ontario, Canada. Biological Conservation, 113(2), 159-169.

McLaren, M. A., Konze, K., & Twiss, M. (1998). Wildlife monitoring programs and inventory techniques for Ontario. South Porcupine: Ontario Ministry of Natural Resources - Boreal Science Section.

McWilliam, W., Eagles, P., Seasons, M., & Brown, R. (2012). Evaluation of planning and management approaches for limiting residential encroachment impacts within forest edges: A southern Ontario case study. Urban Ecosystems, 15(3), 753-772.

Milne, R. J., & Bennett, L. P. (2007). Biodiversity and ecological value of conservation lands in agricultural landscapes of southern Ontario, Canada. Landscape Ecology, 22, 657-670.

MECP (Ministry of Environment, Conservation, and Parks). (1990a). Environmental Assessment Act, R.S.O. 1990, c. E.18. Ontario.

MECP (Ministry of Environment, Conservation, and Parks). (1990b). Ontario Water Resources Act, R.S.O. 1990, c. Ontario.

MECP (Ministry of Environment, Conservation, and Parks). (2007). Endangered Species Act, 2007, S.O. 2007, c. Ontario.

MECP (Ministry of Environment, Conservation, and Parks). (2019). Management of Excess Soil - A Guide for Best Management Practices. MMAH (Ministry of Munipal Affairs and Housing). (2017a). The Green Belt Plan, 2017 under the Greenbelt Act, 2005. 98 pp. Ontario, Canada: Queen's Printer for Ontario.

MMAH (Ministry of Munipal Affairs and Housing). (2017b). The Oak Ridges Moraine Conservation Plan, 2017 under the Oak Ridges Moraine Conservation Act, 2001. 88 pp. Ontario, Canada: Queen's Printer for Ontario.

MMAH (Ministry of Munipal Affairs and Housing). (2020). Provincial Policy Statement, 2020 under the Planning Act. 53 pp. Ontario, Canada: Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (1990). Conservation Authorities Act, R.S.O. 1990, c. Ontario.

MNRF (Ministry of Natural Resources and Forestry). (1997a). Fish and Wildlife Conservation Act, 1997, S.O. 1997, c. 41.

MNRF (Ministry of Natural Resources and Forestry). (1997b). Forest Management Guidelines for the Protection of the Physical Environment.

MNRF (Ministry of Natural Resources and Forestry). (2000a). A Silvicultural Guide to Managing Southern Ontario Forests.

MNRF (Ministry of Natural Resources and Forestry). (2000b). Significant Wildlife Habitat Technical Guide. Peterborough: Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2004). Ontario Tree Marking Guide, Version 1.1. Ont. Min. Nat. Resour. Queen’s Printer for Ontario. Toronto. 252 p.

MNRF (Ministry of Natural Resources and Forestry). (2006). Provincial Parks and Conservation Reserves Act, 2006, S.O. 2006, C. 12 - Bill 11. Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2010a). Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales. Toronto: Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2010b). Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Toronto: Queen's Printer for Ontario.

Ministry of Natural Resources and Forestry. (2011a). Bats and Bat Habitats: Guidelines for Wind Power Projects. Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2011b). Ontario's Forest Management Guides: An Introduction. 18 pp.

MNRF (Ministry of Natural Resources and Forestry). (2012). Categorizing and Protecting Habitat under the Endangered Species Act, 2007. 8 pp. Toronto, Ontario: Speices at Risk Branch, Policy Division.

MNRF (Ministry of Natural Resources and Forestry). (2013a). Species at Risk Branch – Best Practices Technical Note. 11 pp. Peterborough, Ontario

MNRF (Ministry of Natural Resources and Forestry). (2013b). The Stream Permanency Handbook for South-Central Ontario, 2nd Ed, 30 pp.

MNRF (Ministry of Natural Resources and Forestry). (2014a). Ontario Wetland Evaluation System Southern Manual Third Edition, Version 3.3. Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2014b). Significant Wildlife Habitat Mitigation Support Tool.

MNRF (Ministry of Natural Resources and Forestry). (2015a). Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. Peterborough.

MNRF (Ministry of Natural Resources and Forestry). (2015b). Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario. Peterborough: Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2015c). Survey Protocol for Queensnake (Regina septemvittata) in Ontario. Peterborough: Species at Risk Policy Branch.

MNRF (Ministry of Natural Resources and Forestry). (2016). Survey Protocol for Ontario's Species at Risk Snakes. Peterborough: MNRF Species Conservation Poliy Branch.

MNRF (Ministry of Natural Resources and Forestry). (2017a). A Wetland Conservation Strategy for Ontario 2017-2030. 52 pp. Toronto, Ontario, Canada: Queen's Printer for Ontario.

MNRF (Ministry of Natural Resources and Forestry). (2017b). Ontario Stream Assessment Protocol - Version 10. (L. Stanfield, Ed.) Ontario, Canada: Fisheries Policy Section.

MNRF (Ministry of Natural Resources and Forestry). (2017c). Survey Protocol for Species at Risk Bats within Treed Habitats, Little Brown Myotis, Northern Myotis, Tricolored Bat. Ministry of Natural Resources and Forestry, Guelph District.

MNRF (Ministry of Natural Resources and Forestry). (2020). Natural Heritage Information Centre. Ontario, Canada. Retrieved from https://www.ontario.ca/page/natural-heritage-information-centre

MNRF (Ministry of Natural Resources and Forestry). (2021). Birds and bird habitats: guidelines for windpower projects. Retrieved from https://www.ontario.ca/page/birds-and-bird-habitats-guidelines-windpower-projects

Mitchell, G., & Crook, G. W. (1996). An Ontario Base Map terrain analysis toolbox for resource managers. NODA - Notes, Great Lakes Forestry Centre. Ontario, Canada.

Moilanen, A., & Kotiaho, J. S. (2018). Fifteen operationally important decisions in the planning of biodiversity offsets. Biological Conservation, 227, 112-120.

Morrison-Saunders, A., & Pope, J. (2013). Conceptualising and managing trade-offs in sustainability assessment. Environmental Impact Assessment Review, 38, 54-63.

Noga, W., & Adamowicz, W. L. (2014). A Study of Conservation Offset Programs: Lessons Learned from a Review of Programs, Analysis of Stakeholder Perceptions, and Investigation of Transaction Costs. 65 pp. Ottawa, Ontario, Canada: Sustainable Prosperity.

North-South Environmental. (2009). Inventory and Evaluation of Woodlands: City of London. London: City of London.

Nottawasaga Valley Conservation Authority. (2019). Achieving Net Gains through Ecological Offsetting: Guidelines for Preparing a Site-Specific Ecological Offsetting Plan. Draft for Discussion, 20 pp. Ontario, Canada.

Olden, A., Selonen, V. A., Lehkonen, E., & Kotiaho, J. S. (2019). The effect of buffer strip width and selective logging on streamside plant communities. BMC Ecology, 19(1), 9.

Oldham, M. J. (1994). Natural Heritage Resources of Ontario: Mosses. 23 pp. Peterborough, Ontario: Natural Heritage Information Centre.

Oldham, M. J. (2003). Conservation Status of Ontario Amphibians. Peterborough, ON: Natural Heritage Information Centre. Ontario Ministry of Natural Resources.

Oldham, M. J. (2017). List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E). 132 pp. Peterborough, Ontario: Carolinian Canada and Ministry of Natural Resources and Forestry.

Oldham, M. J., & Brinker, S. R. (2009). Rare Vascular Plants of Ontario. Natural Heritage Information Centre.

Oldham, M. J., & Weller, W. F. (2000). Ontario Herpetofaunal Atlas. Ontario, Canada: Natural Heritage Information Centre.

Oldham, M. J., Bakowsky, W. D., & Sutherland, D. A. (1995). Floristic Quality Assessment System for Southern Ontario. Peterborough: Ministry of Natural Resources and Forestry.

Oldham, M., Bakowsky, W., & Sutherland, D. (1995). Floristic Quality Assessment System for Southern Ontario.

Ontario American Badger Recovery Team. (2010). Recover Strategy for the American Badger (Taxidea taxus) in Ontario. 27 pp. Peterborough, Ontario: Ministry of Natural Resources and Forestry.

Ontario Breeding Bird Atlas. (2001). Ontario Breeding Bird Atlas Guide for Participants. Guelph, Ontario.

Ontario Breeding Bird Atlas. (2002). Ontario Breeding Bird Atlas - Standardized Owl Surveys. Guelph: Bird Studies Canada, Federation of Ontario Naturalists, Canadian Wildlife Service, Ontario Field Ornithologists, and Ministry of Natural Resources and Forestry.

Ontario Breeding Bird Atlas. (2007). The Atlas of the Breeding Birds of Ontario, 2001-2005. (M. D. Cadman, D. A. Sutherland, G. G. Beck, D. Lepage, & A. R. Couturier, Eds.) Toronto, Ontario, Canada: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ministry of Natural Resources and Forestry, and Ontario Nature.

Ontario Centre for Soil Resource Evaluation. (1993). Field Manual for Describing Soils in Ontario (4th ed.). Ontario, Canada: Publication No. 93-1.

Ontario Institute of Pedology. (1985). Field Manual for Describing Soils (Third ed.). Guelph: Ontario Intitute of Pedology, Guelph Agriculture Centre, and University of Guelph.

Ontario Nature. (2019). Ontario Reptile and Amphibian Atlas. Ontario, Canada: Toronto Entomologists' Association. Retrieved from https://www.ontarioinsects.org/herp/

Ontario Road Ecology Group. (2010). A Guide to Road Ecology in Ontario. 72 pp. Scarborough, Ontario

Ontario (2009). Lake Simcoe Protection Plan

Ouin, A., Cabanettes, A., Andrieu, E., Deconchat, M., Roume, A., Vigan, M., & Larrieu, L. (2015). Comparison of tree microhabitat abundance and diversity in the edges and interior of small temperate woodlands. Forest Ecology and Management, 340, 31-39.

Palone, R. S., & Todd, A. H. (1997). Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers. Radnor, Pennsylvania, USA: USDA Forest Service.

Partners in Flight (PIF). (2020). Avian Conservation Assessment Database. Retrieved from Available at https://www.partnersinflight.org/wp-content/uploads/2016/07/SPECIES-OF-CONT-CONCERN-from-pif-continental-plan-final-spread-2.pdf

Poulton, D., & Bell, A. (2017). Navigating the Swamp: Lessons on Wetland Offsetting for Ontario. Ontario, Canada.

Powell, J. S., & Babbit, K. J. (2016). Buffer-mediated effects of clearcutting on in-pool amphibian productivity: Can aquatic processes compensate for terrestrial habitat disturbance? Forests, 8(1), 10.

Powell, J. S., & Babbitt, K. J. (2015). An experimental test of buffer utility as a technique for pool-breeding amphibians. PloS one, 10(7).

Powell, J. S., & Babbitt, K. J. (2015). Despite buffers, experimental clearcutes impact amphibian body size and biomass. PloS one, 10(11).

Powney, G., Broaders, L., & Oliver, T. (2012). Towards a measure of functional connectivity: Local synchrony matches small scale movemnts in a woodland edge butterfly. Landscape Ecology, 27, 1109-1120.

Pratt, W.A., and Fox, T.R. (2009). Streamside Management Zones Effectiveness for Protecting Water Quality after Forestland Application of Biosolids. Journal of Environmental Quality. 38:2106-2120

Pyron, M. (2010). Characterizing Communities. Nature Education Knowledge, 3(10):39.

Province of Ontario. (2020). *Public Lands Act*, R.S.O. 1990, c.P.43. Ontario.

Renwick, W.H. (2009). Lakes and Reservoirs of North America in Encyclopedia of Inland Waters. 2250 pp. Millbrook, NY, USA.

Region of Waterloo. (2016). Region of Waterloo Greenlands Network Implementation Guideline. Ontario, Canada.

Richardson, J. S., Naiman, R. J., & Bisson, P. A. (2012). How did fixed-width buffers become standard practice for protecting freshwaters and their riparian areas from forest harvest practices? Freshwater Science, 31(1), 232-238.

Riley, J. L. (1995). Distribution and Status of the Vascular Plants of the Central Region. Richmond Hill: Ontario Ministry of Natural Resources and Forestry.

Riley, J. R., & Mohr, P. (1994). The Natural Heritage of Southern Ontario's Settled Landscapes: a Review of Conservation and Restoration Ecology for Land-Use and Landscape Planning. Aurora: Ministry of Natural Resources and Forestry.

Sandilands, A. (1997). Memo to London ESA Committee April 9 1997 on Freemark and Collins (1992). London, Ontario.

Sawatzky, M. E., & Fahrig, L. (2019). Wetland buffers are no substitute for landscape-scale conservation. Ecosphere, 10(4), e02661.

Semlitsch, R. D., & Newbold, J. D. (2003). Biological criteria for buffer zones around wetlands and riparian habitats for amphibians and reptiles. Conservation Biology, 17, 1219-1228.

Simmonds, J. S., Sonter, L. J., Watson, J. E., Bennun, L., Costa, H. M., Dutson, G., . . . Maron, M. (2019). Moving from biodiversity offsets to a target-based approach for ecological compensation. Conservation Letters(Open Access), 1-11.

Smith, P. G., & Theberge, J. B. (1987). Evaluating natural areas using multiple criteria: Theory and practice. Environmental Management, 11, 447-460.

Soil Classification Working Group. (1998). The Canadian System of Soil Classification (Third ed.). Agriculture and Agri-Food Canada.

Solymar, B. (2005). A Stewardship Guide to Grasslands in Southern Ontario: An Introduction for Farmers and Rural Landowners. 34 pp. Ontario, Canada: Ontario Barn Owl Recovery Project.

Strong, W. L., Oswald, E. T., & Downing, D. J. (1990). The Canadian Vegetation Classification System: First Approximation (Vol. 25). (Canada Committee on Ecological Land Classification, & National Vegtation Working Group, Eds.) Ottawa, Ontario, Canada.

Sweeney, B. W., & Newbold, J. D. (2014). Streamside forest buffer width needed to protect stream water quality, habitat, and organisms: A literature review. Journal of the American Water Resources Association, 50(3), 560-584.

Teply, M., McGreer, D., & Ceder, K. (2014). Using simulation models to develop riparian buffer strip prescriptions. Journal of Forestry, 112(3), 302-311.

Terra Geographical Studies Inc. (1994). Draft Terrestrial Resource Strategy. Ontario.

Toronto and Region Conservation Authority. (2018). Guideline for Determining Ecosystem Compensation. 46 pp. Ontario, Canada.

Toronto and Region Conservation Authority (TRCA). (2019). Erosion and Sediment Control Guide for Urban Construction. 235pp. Ontario, Canada.

Toronto Entomologists' Association. (2018). Ontario Butterfly Atlas. Ontario, Canada. Retrieved from https://www.ontarioinsects.org/atlas/

Troy, A., & Bagstad, K. (2009). Estimating Ecosystem Services in Southern Ontario. Ontario Ministry of Natural Resources and Forestry.

UTRCA (Upper Thames River Conservation Authority). (1997). Oxford County Terrestrial Ecosystems Study: A Natural Heritage Study for Oxford County. London.

UTRCA (Upper Thames River Conservation Authority). (2003). Middlesex County Natural Heritage Systems Study. London.

UTRCA (Upper Thames River Conservation Authority). (2014). Middlesex Natural Heritage Systems Study: A Study to Identify Natural Heritage Systems in Middlesex County. London.

UTRCA (Upper Thames River Conservation Authority). (2017). Environmental Planning Policy Manual for the Upper Thames River Conservation Authority.

Valdes, A., Lenoir, J., De Frenne, P., Andrieu, E., Brunet, J., Chabrerie, O., . . . Decocq, G. (2020). High ecosystem service delivery potential of small woodlands in agricultural landscapes. Journal of Applied Ecology, 57(1), 4-16.

Vanneste, T., Govaert, S., Spicher, F., Brunet, J., Cousins, S. A., Decocq, G., . . . De Frenne, P. (2020). Contrasting microclimates among hedgerows and woodlands across temperate Europe. Agricultural and Forest Meteorology, 281, 107818.

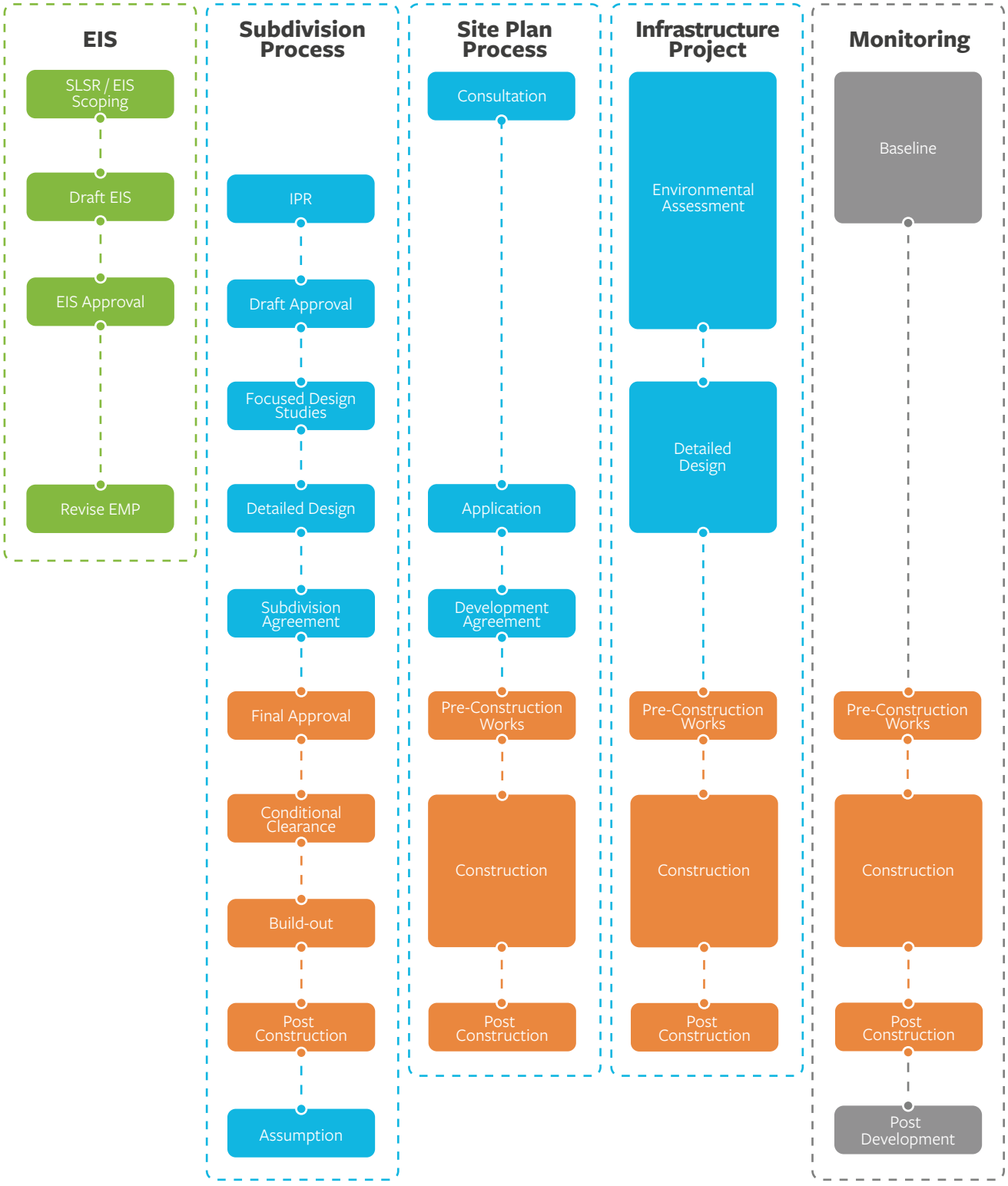
Woodard, S. E., & Rock, C. A. (1995). Control of residential stormwater by natural buffer strips. Lake and Reservoir Mangaement, 11(1), 37-45.

zu Ermgassen, S. O., Baker, J., Griffiths, R. A., Strange, N., Struebig, M. J., & Bull, J. W. (2019). The ecological outcomes of biodiversity offsets under "no net loss" polices: A global review. Conservation Letters, 12(6), e12664.

Appendix A

- **EMG Process Flowchart**

Environmental and Development/ Infrastructure Process Timeline



Appendix B

- **Environmental Scoping Checklist**

APPENDIX B - Environmental Study Scoping Checklist

Application/Project Name: _____

Proponent: _____ **Date:** _____

Proposed Project Works: _____

Study Type: _____

Lead Consultant: _____

Key Contact: _____

Subconsultants: _____

Technical Review Team:

☐ Ecologist Planner: _____ ☐ MNRF: _____

☐ Planner for the File: _____ ☐ MECP: _____

☐ Conservation Authority: _____ Contact: _____

☐ EEPAC: _____ ☐ Other: _____

☐ Project Manager, Environmental Assessment:_____

☐ First Nation(s): _____

Study Area:

Location/Address: _____

Study Area Size (approximate ha): _____ ☐ Map (attached): _____

Position of Site in Subwatershed: _____

Tributary Fact Sheet:_____

Is the proposed location within the vicinity of the Thames River (<120 m)? ☐ Yes ☐ No

If Yes, initiate engagement with local First Nation communities. Consultation activity to be provided at Application Review stage.

Policy:

☐ Study must demonstrate how it conforms to the Provincial Policy Statement (2020)

☐ Study must demonstrate how it conforms to *The London Plan* (2016)

Map 1 Place Types:

☐ Green Space ☐ Environmental Review

Other Place Types: _____

Map 4 Active Mobility Network:

☐ Pathway placement and future trail accesses shall be considered as part of this study.

Map 5 Natural Heritage System:

(Study Area delineated onto current aerial photographs, including a 5 – 10 km radius of Subject Area)

☐ Provincially Significant Wetland Name: _____

☐ Wetlands ☐ Unevaluated Wetlands*

☐ Area of Natural & Scientific Interest Name: _____

☐ Environmentally Significant Area Name: _____

☐ Potential ESAs ☐ Upland Corridors

☐ Significant Woodlands ☐ Woodlands

☐ Significant Valleylands ☐ Valleylands

☐ Unevaluated Vegetation Patches ☐ Potential Naturalization Areas

Patch No. _____

** ELC (air photo interpretation and/or previous studies) may identify potential wetlands or other potential features not captured on Map 5.*

Map 6 Hazards and Natural Resources:

☐ Maximum Hazard Line ☐ Conservation Authority Regulation Limit (and text based regulatory limit) – Project falls under *Conservation Authority Act* Section 28

Required Field Investigations:

Aquatic:

☐ Aquatic Habitat Assessment: _____

☐ Fish Community (Collection): _____

☐ Spawning Surveys: _____

☐ Benthic Invertebrate Survey: _____

☐ Mussels: _____

☐ Other: _____

Wetlands:

☐ Wetland Delineation: _____

☐ Wetland Evaluation (OWES): _____

☐ Other: _____

Terrestrial (Wetland, Upland and Lowland):

☐ Vegetation Communities (ELC): _____

☐ Botanical Inventories ☐ Winter ☐ Spring ☐ Summer ☐ Fall

- ☐ Breeding Bird Surveys (type & frequency): _____
- ☐ Raptor Surveys: _____ ☐ Shoreline Birds: _____
- ☐ Crepuscular Surveys: _____ ☐ Grassland Surveys: _____
- ☐ Amphibian Surveys (type & frequency): _____
- ☐ Reptile Surveys:
  - ☐ Turtle (type & frequency): _____
  - ☐ Snake (type & frequency): _____
  - ☐ Other (type & frequency): _____
- ☐ Bat Habitat, Cavity & Acoustic Surveys:_____
- ☐ Mammal Surveys: _____
  - ☐ Winter Wildlife Surveys: _____
- ☐ Butterflies (Lepidoptera): _____
- ☐ Dragonflies / Damselflies (Odonata): _____
- ☐ Species at Risk Specific Surveys: _____
- ☐ Species of Conservation Concern Surveys: _____
- ☐ Significant Wildlife Habitat Surveys: _____
- ☐ Other field investigations: _____

Supporting Concurrent Studies/Investigations:

- ☐ Hydrogeological/Groundwater: _____
- ☐ Surface Water/Hydrology: _____
- ☐ Water Balance: _____
- ☐ Fluvial Geomorphological: _____
- ☐ Geotechnical: _____
- ☐ Tree Inventory: _____
- ☐ Other: _____

Evaluation of Significance:

Federal:

- ☐ Fish Habitat ☐ Other Federal: _____
- ☐ Species at Risk (*SARA*)

Provincial:

- ☐ Provincially Significant Wetlands ☐ Significant Woodlands
- ☐ Significant Valleylands ☐ Significant Wildlife Habitat Ecoregion 7E
- ☐ Areas of Natural & Scientific Interest ☐ Fish Habitat

☐ Water Resource Systems

☐ Species at Risk (*ESA*): _____

Municipal/London:

☐ Environmentally Significant Areas (ESAs), Potential ESAs

☐ Significant Woodlands, Woodlands

☐ Significant Valleylands, Valleylands

☐ Wetlands, Unevaluated Wetlands

☐ Significant Wildlife Habitat

☐ Unevaluated Vegetation Patches

☐ Other Vegetation Patches >0.5 ha

☐ Potential Naturalization Area

☐ Other: _____

Impact Assessment:

☐ Impact Assessment Required

☐ Net Effects Table Required

Environmental Management Recommendations:

☐ Environmental Management Plan: _____

☐ Specifications & Conditions of Approval: _____

☐ Other: _____

Environmental Monitoring:

☐ Baseline Monitoring: _____

☐ Construction Monitoring: _____

☐ Post-Construction Monitoring: _____

Additional Requirements and Notes:

Appendix C

- **Data Collection Standards**

APPENDIX C – Data Collection Standards

Understanding the features and functions of natural areas is considered central to the assessment of significance and to the evaluation of potential impacts of development and recommendations of environmental management strategies. The following sections provide insight into the methodologies and standards required for data collection for informing Environmental Studies within the City of London.

Background

The identification and evaluation of natural features and ecological functions form the basis for assessing the effects of a proposed development on an area and its adjacent lands. It is critical to obtain sufficient, accurate information on the existing conditions of natural heritage features and their functions to ensure an informed impact assessment for a proposed development or infrastructure project (MNRF, 2010a). Inventory protocols (as outlined below) provide a standard for effectively evaluating the existing abiotic and biotic elements of natural heritage features and provide strong field data to inform impact assessment, mitigation, and monitoring for proposed development or infrastructure projects. It may be necessary to use multiple assessment methodologies to capture all data (e.g., Marsh Monitoring auditory surveys and SWH visual assessment).

Further, the intention of Data Collection Standards is to ensure that all new information collected for various studies, including EIS, uses a similar approach and format so that it may be entered into regional databases and compared with existing information. The size of the study area should not affect the ability to make comparative evaluations. Watershed and sub-watershed studies establish a robust baseline of information from which comparative evaluations can be made.

For some natural heritage features and areas, the level of effort required to determine significance may be made at a landscape level (e.g., Significant Woodlands), without conducting a detailed site inventory. However, it is important to collect all levels of information required at the landscape, community, and species levels to address the potential for impacts. The specific elements required for the natural heritage inventory and analysis component of an EIS will vary depending on the size, type, location of the development, and the natural feature that may experience negative impacts. Important elements of study for any given EIS will be selected from a detailed list, however not all elements will need to be included in every EIS (refer to **Section 2.6**).

Guidelines for Data Collection

An Environmental Study must be based on data that is considered current and collected using established protocols and standards, including data collected by the proponent as it informs the analysis, recommendations, and conclusions that are provided within the EIS. Field data reflects the site conditions at the time of collection, however over time conditions on site can change due to a variety of reasons (e.g., vegetation growth, disturbances, and shifts in vegetation community composition). These changes in conditions can affect the accuracy and applicability of the field data. The “shelf life” of field data can vary depending on the type of data, the site, or the surrounding conditions.

Where relatively current data (up to 5 years) is available for the site and it meets the City of London’s Data Collection Standards (outlined in this document), it may be applied to meet some of the requirements for three- or five-season inventory (as determined through consultation with the City of London). However, a minimum of two wildlife/ecological site visits will still be required to verify and document current/existing conditions. The timing of the site visits will be made to supplement information gaps, confirm significant, rare and sensitive features, delineate ecological boundaries, and to identify site specific impact, mitigation, and management requirements. Where there is older inventory information available (5 to 10 years) it must be confirmed through current inventory studies. The existing data

(assuming it meets the City of London's Data Collection Standards) may be used to supplement current field studies and provide historical context and population, species, vegetation trends, and changes over time. The use of these data to supplement or replace the need for more current inventory will be evaluated on a case-by-case basis in consultation with the City of London.

It is recommended that reputable citizen science data sources, such as iNaturalist and the Ontario Reptile & Amphibian Atlas, be reviewed when conducting a background review to supplement data obtained by the consultant team.

Inventory Protocols

Multi-season inventories must be conducted during optimal sampling conditions and with sufficient sampling effort, such that data is of sufficient quality to assess the presence and significance of natural heritage features and functions. Optimal sampling conditions and the necessary sampling effort differ among taxa and should be determined based on species-specific protocol recommendations and/or estimates of detection probability. Sampling design will be determined during pre-consultation using the protocols included in these guidelines. Typical timeframes, in accordance with seasonal timing windows, for various, inventory types include, but are not limited to, the following:

1. **Early Spring (late March/early April)**
    - Amphibians
2. **Spring (late April – May)**
    - Amphibians, Reptiles, Vascular Plants, Vegetation Communities, Breeding Birds (May)
3. **Early Summer (June)**
    - Amphibians, Breeding Birds, Mammals (including Bat acoustic surveys), Vascular Plants, Vegetation Communities, Aquatic Communities and Habitat, Butterfly and Insect Monitoring
4. **Summer (early July/early August)**
    - Vegetation Communities, Significant Wildlife Habitat, Vascular Plants, Butterflies and Insects
5. **Fall (September-October)**
    - Migratory Birds Vascular Plants, Vegetation Communities Reptiles, Mammals, Butterflies and Insects
6. **Winter (November-February)**
    - Bat Leaf off surveys, Winter wildlife surveys

An outline of the comprehensive inventory protocols for species occurring in the study area and adjacent lands must be conducted by qualified professionals in the appropriate seasons as described below. When applicable, MECP species-specific protocols should be used to document SAR. New and emerging techniques not listed below may be considered and/or required as determined in consultation with the City of London and other applicable agencies to ensure robust and accurate inventory results.

1. ***Vegetation Communities*** A survey of vegetation community types should be undertaken during the main growing season, preferably over three different seasons, spring, summer and fall (generally during the period late May to early September). Community description should follow the Ecological Land Classification (ELC) for southern Ontario (Lee *et al.*, 1998) to Vegetation Community Type, or contain an equivalent or greater level of structural and floristic detail. The report should present both a description of the communities and vegetation maps superimposed on an air photo or a base map of scale 1:5 000 that shows contours and water courses.

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

- A full list of vascular plant species present and an indication of their abundance.
- An assessment of soil type(s), drainage regime and moisture regime.
- An identification of the ELC Class, Series, Ecosite, Vegetation Type (Lee *et al.*, 1998).
- The element ranking for each ELC Vegetation Type (Bakowsky, 1997).
- An annotated assessment of community condition through the calculation of the Floristic Quality Index (Oldham *et al.*, 1995) or another current, equivalent community assessment method including the number of native species, number of non-native species, number of conservative species (conservatism coefficient >=7), mean conservatism coefficient of native species, and sum of weediness scores.
- A summary of tree species, with age and/or size class distribution, including basal area by size class.
- Other indications of community condition including amount of decayed coarse woody debris.

2. Vascular Plants

- A survey of vascular plants should be carried out during April-May for spring ephemerals, June-August to capture summer flowering periods and September-October to capture fall flower periods. Surveys should have regard to weather variability in a given year.
- Locations of globally, nationally, provincially and regionally rare vascular plant species should be mapped, and the extent of habitat for each species outlined. Recommendations should be made for additional protection of rare species.
- Nationally rare species as listed in the NHIC website; species with a global rank (G-rank) for G1 to G3 (Oldham and Brinker, 2009; NHIC website), or with a COSEWIC status of Endangered, Threatened, or Special Concern.
- Provincially rare species are those listed with a sub-national rank (S-rank) of S1 to S3 (NHIC website) and MNRF SAR in Ontario (Bowman, 1996) and COSSARO.
- Regional rarity status should be assessed using Oldham and Brinker (2009), Oldham (2017), or from the best available information.

3. ***Breeding birds –*** Breeding and migratory bird surveys should be conducted as follows:

- Main breeding season surveys as outlined by Cadman *et al.* (1998): a minimum of two surveys, at least a ten days apart, between May 24-July 10. The first survey should take place May 24 – June 17, and the second June 15 – July 10.
    - Surveys to occur 5:00 to 10:00 a.m. for breeding bird survey (Cadman *et al.*, 1998)
    - Time of day and weather conditions consistent with the Ontario Breeding Bird Atlas participant's guide (OBBA, 2001).
    - Line transects, point counts or a combination of both are acceptable so long as all areas receive coverage. (See Bibby *et al.*, 2000 for bird census techniques).
- Where habitat is suitable, dusk and night visits to survey for crepuscular species (e.g., American Woodcock, Common Nighthawk) in accordance with standardized protocols as outlined in OBBA (2001).
- Nocturnal owl surveys usually consist of two surveys in the spring and should be conducted in accordance with the OBBA Standardized Owl Survey Protocol (OBBA, 2002).
- Where suitable, marsh breeding bird surveys should be conducted in accordance with Marsh Breeding Bird Program standard survey techniques (BSC, 2009b).

- Where candidate Raptor Wintering Areas are identified, winter raptor surveys should be conducted to confirm SWH in accordance with the Bird and Bird Habitats: Guidelines for Windpower Projects (MNRF, 2015a; MNRF, 2021).
- Field data (such as breeding evidence, behaviours, SAR occurrences) should be collected and documented in accordance with standard protocols as above, included in mapping (i.e., aerial photography), and following standard terminology (e.g., codes, symbols; OBBA, 2001; Forest Breeding Bird Survey, 2008).

4. Herpetofauna

- Surveys for newts and mole salamanders, where required, should be conducted during seasonal migration (mid March – late April) and may include a combination of minnow traps, visual surveys (e.g., carefully flipping suitable cover, observing vernal pool egg masses), pitfall or funnel traps, or fine mesh dip nets may be required as outlined in McLaren *et al.* (1998). Consultation with local experts and the MNRF is recommended for determining the timing (as surveys are highly weather dependent to capture migration) and specific survey techniques to be used based on location, species, etc.
- Surveys to confirm presence of lungless salamanders should take place in spring or fall as outlined in the Joint EMAN / Parks Canada National Monitoring Protocol for Plethodontid Salamanders (Zorn *et al.*, 2004).
- Anuran surveys consist of documenting calls and should be conducted in accordance with the standardized Bird Studies Canada's Marsh Monitoring Program protocol for amphibians (BSC, 2009a). Surveys should be conducted as close to suitable breeding sites as possible (and preferably directly adjacent) and surveyors should record direction, distance, and call codes (BSC, 2009a).
- Observational surveys are required during the spring (between March-June) when amphibians are concentrated around suitable breeding habitat in wetlands and woodlands. (MNRF, 2000b)
- Turtle surveys may consist of nesting surveys (late May – early July) in suitable nesting habitat or along gravel shoulders of roads, as well as visual encounter surveys to detect basking turtles following Ministry of Natural Resources and Forestry protocol for Blanding's Turtle (MNRF, 2015b).
- Snake surveys may consist of the following techniques, as required:
    - Visual Encounter Surveys searches between late April and late June (Ministry of Natural Resources and Forestry Survey Protocol for Species at Risk Snakes; MNRF, 2016).
    - Hibernacula searches may be required and consist of visual encounter surveys to detect basking snakes during the first sunny, warm days in early spring.
    - Cover board surveys may be conducted where appropriate.
    - Wildlife Scientific Collector's Authorization (under the *Fish and Wildlife Conservation Act*), along with an associated Animal Care Protocol approved by the MNRF Wildlife Care Committee, and may be required for any surveys that require handling of snakes.
    - Queensnake (*Regina septemvittata*) surveys along the Thames River may be required and should be conducted in accordance with the standard Survey Protocol for Queensnake in Ontario (MNRF, 2015c).
- Resources for identification of herpetofauna egg and larval stages should be utilized (e.g., http://www.torontozoo.com/adoptapond/resources)

5. Mammals

- Bats, SAR Bats, and Bat Habitat (SWH): Criteria from the Significant Wildlife Habitat Technical Guide (2000) should be considered to determine bat related SWH. Further, the Survey Protocol for Species at Risk Bats within Treed Habitats (MNRF, 2017b) and Bat and Bat Habitats: Guideline for Wind Power Projects (MNRF, 2011b) documents provide additional information for surveying for bats and associated habitat.
    - Surveys may include bat cavity assessments, exit surveys to confirm presence, and bat acoustic monitoring to determine species composition, etc.
    - Correspondence with MNRF, MECP, and the City of London may be required to determine the design and amount of surveys required.
- Other mammals (e.g., deer, badgers, moles): Surveys may be required for other mammal-related SWH or SAR mammals with appropriate methodologies determined in consultation with the MNRF, MECP, and/or the City of London.
- Incidental mammal observations, including scat and tracks, should be recorded and included within reports. Identification resources are useful for determining mammal species present within a study area.
    - Mammal identification and Tracking Guide: https://www.forestsontario.ca/wp-content/uploads/2016/04/Mammal-Identification-and-Tracking-Guide.pdf

6. Non-target wildlife

All species incidentally observed or detected during fieldwork (e.g., Lepidoptera, Odonata, mammals, birds, herpetofauna) should be identified, recorded and integrated into report findings. As much information about the incidental wildlife should be recorded as possible including, but not limited to, species, age, photographic evidence, location, habitat, and behaviour. Incidental observations can provide insight into the environmental conditions of the site and potential SWH.

7. Aquatic communities and habitats survey:

A survey of aquatic communities and habitats should be completed at the most appropriate times for sampling various species over the course of a year and should be completed to supplement data obtained during the background review, if necessary. The scope (i.e., level of detail) and need should be determined based on agency requirements and presence of current (i.e., within the last five years) data appropriate for the particular level of study. Technical data requirements will be determined in consultation with the City of London and may include, but is not limited to the following:

Fish Community Inventory

- Fish community inventories might not be necessary if current, appropriate data are available and obtained through consultation with DFO, MNRF, MECP, CA or the City of London.
- In the event that fish community inventories are required, they should be scoped with the appropriate regulatory agency (e.g., DFO, MNRF, MECP, CA, or The City of London) based on project requirements
- Assuming fish community inventories are required, presence / absence surveys should be conducted using sampling gear appropriate to the water features, time of year, and (if appropriate) species / type of fish targeted (e.g., seine, minnow traps and electrofishing)
- Dependent upon project / agency requirements, detailed data and analysis might be required, and would be identified through consultation with the appropriate regulatory agency. Data gathering and analysis might consist of the following:
    - Index of Biotic Integrity (IBI; Steedman, 1988)
    - Ontario Stream Assessment Protocol (MNRF, 2017c)

Benthic Survey

- Often a component of detailed water quality assessments associated with specific project types such as assimilative capacity studies
- Typically includes qualitative and quantitative sampling of benthic macroinvertebrates
- Scope and specific data analysis tools should be determined on a project specific basis with appropriate regulatory agencies
- For example: Ontario Benthos Biomonitoring Network Protocol Manual (Jones *et al.*, 2007), Canadian Aquatic Biomonitoring Network (Environment Canada, 2012).

Habitat Assessment and Stream Analysis

- Target Habitat Suitability Index (I) are habitat models developed for specific target species.
- Water chemistry (e.g., dissolved oxygen, temperature, pH, conductivity)
- Watercourse morphology (e.g., bankfull width, depth, stream order)
- Substrate composition
- Riparian (i.e., within 30 m of the bank or as per mandated project-specific protocol) and in-water cover
- Surrounding land uses (i.e., beyond the immediate riparian area)

8. Significant Wildlife Habitat (SWH):

- All potential SWH criteria should be surveyed using current accepted methodologies;
- SWH surveys should be consistent with the current Significant Wildlife Habitat Technical Guide (MNRF, 2000b), Significant Wildlife Habitat Mitigation Support Tool (MNRF, 2014b), and the most current Ministry SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015a);
- SWH surveys should be consistent with additional considerations outlined in ***The London Plan* – Policy 1352 - 1355**; and,

9. Regionally Rare Species

Documentation of regionally rare species should include presence absence, population size, habitat, and any other pertinent information (e.g., nesting areas, dens, etc.) and be included in mapping as appropriate population size, condition, and the significance of the site for all regionally rare species. Regional status for Middlesex County should be assessed based on the best available information including, but not limited to:

- Mammals (Dobbyn, 1994)
- Breeding birds (OBBA, 2007; current atlas updates; Partners in Flight, 2020)
- Butterflies (Holmes *et al.*, 1991; Toronto Entomologists' Association, 2018)
- Damselflies and Dragonflies
- Herpetofauna (Oldham and Weller, 2000; Oldham, 2003; Ontario Nature, 2019)
- Vegetation (Oldham, 2017)

10. Species at Risk

If potential suitable habitat for SAR (as listed in *O. Reg. 230/08: SPECIES AT RISK IN ONTARIO LIST*) is encountered and is not covered in the above inventory protocols, MECP species-specific protocols (https://www.ontario.ca/page/species-risk-guides-and-resources) should be used in consultation with the MECP and the City of London (through scoping). Targeted surveys may be required, as determined

through the scoping process in consultation with the City of London and the MECP, based on the presence of suitable habitat, confirmed sightings, along with the potential impacts associated with a given development or infrastructure project.

Appendix D

- **Woodland Evaluation Form**

Appendix D: Woodland Evaluation Criteria

The London Plan – **Criterion 1341_1.**

The woodland contains natural features and ecological functions that are important to the environmental quality and integrity of the NHS. These include site protection (hydrology and erosion/ slope) and landscape integrity (richness, connectivity and distribution).

The London Plan – Criterion 1341_2.

The woodland provides important ecological functions and has an age, size, site quality, and diversity of biological communities and associated species that is uncommon for the planning area.

The London Plan – Criterion 1341_4.

The Woodland provides significant habitat for endangered or threatened species.

The London Plan – Criterion 1341_5.

The Woodland contains distinctive, unusual or high-quality natural communities or landforms.

Consistent with ***The London Plan*** a woodland will be considered significant if it meets either of the following evaluation scores:

- If one or more criteria meet the standard for High; or
- If five or more criteria meet the standard for Medium.

Reset

London Plan Criterion					**SCORE**
Criterion 1.1. – Site Protection	**A) Presence of hydrological features within or contiguous with the patch.**	**HIGH –** one (1) or more hydrological features (as described above) located within or contiguous with the patch.	**MEDIUM –** within 50 m of a hydrological feature.	**LOW –** no hydrological features present within 50 m of the patch.	<Select>
	B) Erosion and Slope Protection	**HIGH –** patch present on steep slopes >25% of any soil type, OR on a remnant slope associated with other features such as moraines or remnant valley slopes no longer continuous with the river system OR	**MEDIUM –** patch present on moderate to steep slopes > 10% - 25% with less erodible soils (heavy clay and clay, silty clay)	**LOW –** Patch present on gentle slopes < 10% with any soil type.	<Select>

		on moderate to steep slopes >10% - 25% with erodible soils (silty loam, sandy loam and loam, fine to coarse sands).			
	Score for **Criterion 1.1** is based on the highest standard achieved between the two measures.				
Criterion 1.2 – Landscape Integrity (Richness, Connectivity and Distribution)	**A) Landscape Richness**	**HIGH –** > 10% local vegetation cover	**MEDIUM –** 10% local vegetation cover	**LOW –** < 7% local vegetation cover.	<Select>
	B) Landscape Connectivity (linkage and distance between patches not separated by permanent cultural barriers).	**HIGH –** patches directly connected by: i. waterways or riparian habitat (generally primary or secondary aquatic corridors and streams with bridges and/or underpasses: for example, Thames, Dingman, Medway, Stoney, Pottersburg, Kettle, Dodd, Sharon, Oxbow, Kelly, Stanton, Mud, Crumlin); ii. Contiguous or semi-contiguous habitat.	**MEDIUM –** patches indirectly connected by: i. habitat gaps < 40 m; ii. areas identified as Anti-fragmentation, Terrestrial Corridor, Big Picture Corridor (https://caroliniancanada.ca/legacy/ConservationPrograms_BigPictureMaps.html) to enhance the viability of isolated woodlands by re-connection, buffering, expanding OR to infill disturbed areas or replace abandoned fields (Riley & Mohr, 1994); a. abandoned rails, utility rights-of-way (hydro corridors, water/gas pipeline); b. Open space greenways and golf courses; c. Active agriculture or pasture; d. Watercourses connected by culverts; and, **e.** First or second order streams that exhibit	**LOW –** patches not connected due to the presence of permanent cultural barriers: i. major roads and highways with no culverts; ii. urban or industrial development, large parking lots; iii. infrastructure; iv. dams, buried watercourses, channelized or greater third order watercourses; and, v. active recreational land-uses (campground, parks with major facilities – community centres, arenas).	<Select>

			channelized morphology.		
	C) Patch Distribution (isolation & arrangement of patches / patch clusters).	**HIGH –** patch clusters with total area > 40 ha OR identified as a Big Picture Meta Core (Carolinian Canada, 2000).	**MEDIUM –** patch clusters with total area 20 – 40 ha.	**LOW –** patch clusters with total area < 20 ha.	<Select>
	Score **Criterion 1.2** based on the highest standard achieved for any one of the three standards.				
Criterion 2.1 – Age and Site Quality	**A) Community Successional Stage / Seral Age**	**HIGH –** patch contains one (1) or more mature or older growth communities	**MEDIUM –** patch contains one (1) or more mid-aged communities	**LOW –** patch contains only pioneer to young communities	<Select>
	B) Mean Coefficient of Conservatism (MCC) of communities or whole patch	**HIGH –** one (1) or more vegetation community with an MCC ≥ 4.6; OR MCC of patch > 4.5	**MEDIUM –** one (1) or more vegetation community with an MCC 4.2 – 4.5; OR MCC of patch ≥ 4.0 – 4.5	**LOW –** all vegetation communities with an MCC < 4.2; OR MCC of patch < 4.0.	<Select>
	Score **Criterion 2.1** based on the highest standard achieved between the two measures.				
Criterion 2.2 – Size and Shape	**A) Patch Size**	**HIGH** Patch > 9.0 ha in size OR patch contains a woodland >4 ha.	**MEDIUM** Patch 2.0 – 9.0 ha in size OR patch contains a woodland 2-4 ha.	**LOW** Patch < 2.0 ha in size.	<Select>
	B) Patch Shape and Presence of Interior	**HIGH** Patch contains interior habitat that is more than 100 m from the edge OR has a Perimeter: Area ratio <1.5 m/m².	**MEDIUM** Patch contains no interior habitat but has a Perimeter:Area ratio 1.5 – 3.0 m/m².	**LOW** Patch contains no interior and has a Perimeter:Area ratio > 3.0 m/m²	<Select>
	C) Bird Species	**HIGH** Patch provides breeding habitat for any three (3) or more bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).	**MEDIUM** Patch provides breeding habitat for one (1) or two (2) bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).	**LOW** Patch does not provide breeding habitat any bird species of conservation concern, including provincially rare bird species (MNRF, 2015a) or species of regional concern (Partners in Flight, 2020).	<Select>
	Score **Criterion 2.2** based on the highest standard achieved for any one of the three standards.				

Criterion 2.3 Diversity of Communities, Landforms and Associated Species	**A) ELC Community Diversity**	**HIGH** – Patch contains 6 or more ELC Community Series	**MEDIUM** – Patch contains 3-5 ELC Community Series	**LOW** – Patch contains 1-2 ELC Community Series	<Select>
	B) Community and Topographic Diversity (variation and heterogeneity)	**HIGH** – Patch contains three (3) or more Ecosites in one (1) Community Series OR four (4) or more Vegetation Types OR three (3) or more topographic features (e.g. tableland, rolling upland, valley slope, terrace, bottomland).	**MEDIUM** – Patch contains two (2) or more Ecosites in one Community Series OR by three (3) Vegetation Types OR two (2) topographic features, or one (1) Vegetation Type with inclusions or complexes.	**LOW** – Patch relatively homogenous; one (1) Ecosite OR one (1) to two (2) Vegetation Types on one (1) topographic feature.	<Select>
	C) Diversity (species and individuals) and Critical Habitat Components for Amphibians	**HIGH** – three (3) or more species of amphibians present in the patch, OR one (1) species of amphibian that is abundant in one (1) or more communities; OR two (2) or more critical habitat components present in the patch.	**MEDIUM** – 1-2 species of amphibians present in the patch; OR one (1) species of amphibian that is occasional* in one (1) or more communities; OR one (1) critical habitat components present in the patch.	**LOW** – No species of amphibian present in the patch, OR no critical habitat components present in the patch.	<Select>
	D) Presence of Conifer Cover	**HIGH** – Patch contains one or more conifer communities that are > 4.0 ha in size.	**MEDIUM** – Patch contains one or more conifer communities that are between 2.0 and 4.0 ha in size.	**LOW** – Patch contains conifer communities < 2.0 ha in size.	<Select>
	E) Fish Habitat Quality	**HIGH** – Dissolved oxygen > 8.0 mg/L OR abundant instream woody debris and rocks and watercourse with a natural channel located within or contiguous with the patch.	**MEDIUM –** Dissolved oxygen 5.0 – 8.0 mg/L OR moderate amount of instream woody debris and rocks and portions of channelized watercourses within or contiguous with the patch.	**LOW** – Dissolved oxygen < 5.0 mg/L OR no instream woody debris and sparse structure and entire watercourse channelized within or contiguous with the patch.	<Select>
	Score for **Criterion 2.3** based on the highest standard achieved for any one of the five standards.				
Criterion 4.1 – Significant habitat for endangered or threatened species.	**A) Species At Risk Habitat**	SAR habitat present or previously identified: **YES** or **NO**			<Select>
	The presence of SAR habitat will add one **HIGH** score to the overall assessment				
	A) ELC Community SRANK	**HIGH** – One (1) or more communities with an SRANK of S3	**MEDIUM** – No communities with an	**LOW** – No communities with an	<Select>

Criterion 5.1 – Distinctive, unusual or high-quality communities.		or lower.	SRANK lower than S4.	SRANK lower than S5.	
	B) Significant Wildlife Habitat	SWH habitat present or previously identified: **YES** or **NO**			<Select>
				The presence of SWH habitat will add one HIGH score to the overall assessmen	
	C) Rare Plant Species Presence / Absence	**HIGH** –. 1 Rare Plant (S1-S3) or 4 Regionally Rare plants	**MEDIUM** – 1-3 Regionally Rare plants	**LOW** – 1 Regionally Uncommon Plant	<Select>
	D) Size and distribution of trees	**HIGH** – trees > 50 cm dbh abundant in one or more communities within the patch.	**MEDIUM** – trees > 50 cm dbh rare or occasional in one or more communities within the patch.	**LOW** – trees > 50 cm dbh not present in any communities within the patch.	<Select>
	E) Basal Area	**HIGH** – Average basal area of trees for any community in the patch ≥ 16m ²/ha for trees >25 cm DBH; OR > 24 m²/ha for trees > 10 cm DBH; OR all diameter class sizes are represented in the stand (saplings < 10 cm; polewood 10-24 cm; small sawlog 26-36; medium sawlog 38-48 cm; large sawlogs 50-60 cm; x-large or veteran trees > 62 cm.	**MEDIUM** – Average basal area for any community in the patch 12 – 24 m²/ha of trees >10 cm DBH; OR missing one of polewood, small, medium, or large size classes.	**LOW –** Average basal area for all communities in the patch < 12 m²/ha for trees > 10 cm DBH; OR missing two or more of polewood, small, medium, or large size classes.	<Select>
				Score for **Criterion 5.1** based on the highest standard achieved for any one of the five standards	
Criterion 5.2 – Distinctive, Unusual or High-Quality Landforms	**A) Distinctive landform types**	**HIGH** – Patch located on an Earth Science ANSI OR on the Beach Ridge or Sand Plain physiographic landform units.	**MEDIUM** – Patch located on the Till Plain or Till Moraine physiographic landform unit.	**LOW** – Patch is located on the Spillway physiographic landform unit.	<Select>
				Score for **Criterion 5.2** based on the highest standard achieved.	
				Woodland Evaluation Score	
				Significant Woodlan	

Appendix E

- **Net Effects Table Template**

APPENDIX E - Net Effects Table Template

Examples of direct and indirect impacts are italicized. These are only examples and do not provide the full extent of potential impacts. Each project will require consideration of project and site-specific potential impacts.

- Effects are defined as:
    - ***No Net Effect*** – Indicates no measurable impact to the identified ecological features or associated functions.
    - ***(-) Low Net Effect*** – Indicates loss of habitat possessing limited potential habitat value, and/or loss of a portion of habitat, which will not result in long-term impact to the remaining habitat and/or reduction in associated key ecological functions.
    - ***(-) Medium Net Effects*** – Indicates loss of habitat possessing moderate potential habitat value, and/or loss of a portion of habitat that may result in long-term impacts to the remaining habitat, and/or loss of associated key ecological functions.
    - ***(-) High Net Effects*** – Indicates loss of habitat possessing significant potential habitat value, and/or loss of a portion of habitat that may result in long-term and potentially critical impacts to the remaining habitat, and/or significant loss of associated key ecological functions.
    - ***(+) Net Positive Effects*** – indicates a measurable benefit to the habitat/ecological feature

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
1.0 Existing Impacts:			
1.1 Loss of gravel from the roadway shoulder	*Cultural meadow (CUM) – Increased surface water runoff to the cultural meadow causing flooding, thus, reducing the viability of the habitat for various species using the habitat.*	*Regrade the roadway shoulder replace gravel and enhance with hydroseeding of a native seed mix to stabilize edge and encourage infiltration.*	*(+) NET POSITIVE EFFECT Regrading the roadway shoulder will reduce surface runoff and promote infiltration and minimize flooding into the cultural meadow.*
1.2 Invasive weed (buckthorn) growth in forest understorey –	*Deciduous forest (FOD) - Reduced plant species diversity due to competition from invasive weeds*	*Prepare and implement an Invasive Weed Management Plan to selectively remove buckthorn*	*(+) NET POSITIVE EFFECT Removal of invasive plants allows for native plants to colonize and increase diversity*
1.3 …			
2.0 Direct Impacts:			

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
Planning & Engineering Design			
2.1 Housing development lots encroaching on forest community	*Deciduous forest (FOD) -* *Removal of native vegetation within a small portion of deciduous forest along edge of the study area resulting in loss of habitat for forest birds and other wildlife.*	*1) Re-design development plan to avoid loss of forest; and establish a buffer with native plantings* *2) Compensate for loss of forest habitat by filling in bays and other areas adjacent to the forest, increasing core habitat; and establish a buffer with native plantings.* *3) Proposed rear lot fencing to include no gates.*	*1) <u>(+) NET POSITIVE EFFECT</u>* *The planting of native plant species within the buffer will provide additional wildlife habitat* *2) <u>NO NET EFFECT, OR (+) NET POSITIVE EFFECT</u>* *Compensation may only provide equal habitat or it may provide a net environmental benefit.*
2.2 Widening of an existing roadway (additional lanes & services)	*Cultural meadow (CUM) –* *Loss of breeding and foraging habitat for Bobolink*	*Consult with MECP to determine permitting requirements.* *Identify and secure additional lands to provide for compensation of habitat loss. Plant compensation areas with native meadow seed mix. Develop plan for long-term management.*	*<u>(+) NET POSITIVE EFFECT</u>* *The planting of native plant species within the buffer will provide additional wildlife habitat*
2.3 …			
Construction			
2.4 Construction vehicle traffic	*Wildlife from adjacent wetland, meadow marsh (MAM) and open aquatic (OAO) habitat –* *Injury or mortality to wildlife*	*Avoid injury and mortality by preparing and implementing a Wildlife Handling Protocol, providing wildlife posters for construction trailer, and training construction crews.*	*<u>NO NET EFFECT</u>* *Potential impacts to wildlife can be avoided with appropriate protocols and training.*
2.5 …			
3.0 Indirect Impacts:			
Planning & Engineering Design			
3.1 Development plan increase in imperious	*Moist deciduous forest (FOD) and skunk cabbage population –*	*Re-design development plan to reduce impervious surfaces.*	*<u>NO NET EFFECT</u>* *Potential impacts to groundwater dependent plant populations (i.e. skunk*

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
surfaces; Stormwater management system	*Reduction in groundwater discharge due to loss of infiltration.* *Die-back and reduction of groundwater dependent skunk cabbage population.*	*Provide greater infiltration through use of best management practises, infiltration trenches, etc.*	*cabbage) can be mitigated through the use of appropriate stormwater management measures.*
3.2 …			
Construction			
3.3 Construction related runoff	*Adjacent watercourse and swamp thicket (SWT) –* *Sedimentation in watercourse covering spawning habitat and or fish eggs. Habitat loss and/or reduction of fish population.*	*Installation of sediment control fencing.* *Regular monitoring of fencing and other protection measures.*	*NO NET EFFECT* *Proper installation of sediment control fencing can prevent deposition of fill and sedimentation. No changes to site drainage.*
3.4 …			

Appendix E – External Resource Group and First Nation Comment Response Table

External Resource and First Nation Comments							AECOM/City Response				
Reviewer Affiliation	Reviewer (F. Last name)	ID	EMG Section	Page	Type of Comment 1 - Policy 2 - Format 3 -Science 4 - Process	Comment and Suggested Action	Responder Affiliation2	Responder (F. Last name)2	Comment Status Green - Closed Yellow - In Progress Red - Open	Response 1 - Incorporated 2 - Not Incorporated 3 - Not Applicable	Response Comment2
COTTFN	**F. Burch**	TOR1	ToR 3.2	4	3	Taking into consideration the stress that development may be putting on the ecosystem as a whole, acknowledging the impacts of site development / alterations beyond the City limits. Creating larger buffer zones to reduce the impacts to natural heritage sites.	AECOM	N. DeCarlo		1	Triggers for FN consultation updated to include effects to the Thames river causing impacts downstream to FN communities. Further, in general minimum buffers have been increased along with the implementation of and encouragement for larger maximum buffers.
EEPAC	**Working Group**	TOR1	ToR 3.1	3	1	Other secondary source literature should include information relevant to strategies for mitigation, restoration and monitoring (both compliance and effectiveness monitoring)	AECOM	N. DeCarlo		1	Compensation/offsetting and compliance and effectiveness monitoring sections have been added to the document. Reference to technical documents has been made (e.g., TRCA Ecosystem Compensation Protocol).
						HIGH PRIORITY COMMENTS					
EEPAC	**Working Group**	1	All sections	N/A	3	The working group recommends that a supplementary document be included as an appendix to the EMGs which lists secondary sources that are relevant to the revision of the EMGs. These sources may include but are not limited to peer-reviewed scientific studies, municipal studies (e.g. subwatershed studies by the City), comparable documents from other municipalities, sources of ecological data including citizen science databases.	AECOM	N. DeCarlo		1	Relevant sources were provided throughout and included Appendix B - Data Collection Standards
EEPAC	**Working Group**	2	All sections	N/A	1	The EMGs should be reviewed (but not necessarily rewritten) at minimum every 5 years. The frequency of this review should reflect changing conditions due to the effects of climate change (e.g. weather patterns, species shifts, species stress, greater predominance of invasive species, etc.). More regular updating will enable the document to remain consistent with current science and best practices adopted in the province and other comparable municipalities.	AECOM	N. DeCarlo		1	Specific wording has been included to ensure that proponents do not only look at the referenced materials, rather it is acknowledged within the texts that proponents review the most up-to-date science and policy throughout the process using the EMGs as guidance. The future review and revision of the EMGs is outlined in the London Plan and Provincial Policy Statement. A specific number of years for review has not been included in this process. However, it is recognized that this is an important process and consideration. The frequent review and revision will be included as a recommendation to the City of London.
EEPAC	**Working Group**	3	2	44	4	Recommend considering the development of a separate, more detailed guideline section for monitoring that includes specific monitoring protocols for various taxa (e.g. time(s) of year, time(s) of day), what to look for, how to look), based on current best practices. This would standardize the monitoring rather than leaving to the discretion of individuals +/or companies hired/engaged by the city, which results in data collection practices that may not be comparable with future/past studies, thus making interpretation of results and assessment of pre/post monitoring difficult. The preamble of the 2007 EMG acknowledges that, "The practice of environmental management requires a systematic approach which follows a predictable and traceable pattern. ...use of a consistent template...", which supports the above recommendation.	AECOM	N. DeCarlo		1	More specifics on ecological monitoring protocols have been added in-text and to Appendix B - Data Collection Standards, along with increased reference to supporting documents that outline appropriate monitoring protocols (e.g., MNRF species-specific protocols). However, there is room for flexibility as being extremely specific/prescriptive on timing, protocols, etc. may cause proponents to miss timing windows as they may shift based on the weather (e.g., snake emergence). The goal for this section is to outline in general and ensure that the proponents refer to standard protocols along with consultation with experts in taxa-specific fields to ensure appropriate monitoring is being conducted.
EEPAC	**Working Group**	4	2	N/A	1	Data collected through pre- and post- construction monitoring should be retained by the city and made available for subsequent review upon request.	AECOM	N. DeCarlo		1	Although the specifics on the repository are still unclear (e.g., public availability), data transfer to the City has been incorporated into Section 7 - Monitoring.
EEPAC	**Working Group**	5	All sections	N/A	3	The EMGs must take a landscape approach to area analyses. Ecosystems rarely stand alone and species frequently cross between areas. If the City is seeking to boost connectivity and work against fragmentation, consideration should be made towards assessing how development or other activities might affect the links to other areas and how there may be greater knock on effects within the City and beyond.	AECOM	N. DeCarlo		1	More attention has been given to taking a landscape approach. Review of appropriate/applicable background studies (including links to other adjacent/nearby development) has been included in Section 2 and to be outlined in the Environmental Study Scoping Checklist (ESSC)
EEPAC	**Working Group**	6	All sections	N/A	3	For reviewing ecological features and functions of sites, there needs to be a section which identifies and defines the system that the site/feature of study fits within (e.g. single water feature within a subwatershed) including relationships with other features outside the direct scope of the study, and the impact of development on the system. If data is deficient, this should be explicitly acknowledged.	AECOM	N. DeCarlo		1	A specific section has not been incorporated, however the evaluation of significance and function has consideration for connectivity and contributions to the overall Natural Heritage System.
EEPAC	**Working Group**	7	All sections	N/A	2,3	Somewhere in the EMGs, definitions should be included for environmental and/or ecological features and functions. This will clarify ambiguity in current language.	AECOM	N. DeCarlo		1	Ecological function is defined based on the Provincial Policy Statement in the document. Although this is a subjective definition, more specific information and references on evaluating function have been provided in Section 3 -Evaluation of Significance and Ecological Function.

External Resource and First Nation Comments							AECOM/City Response				
Reviewer Affiliation	Reviewer (F. Last name)	ID	EMG Section	Page	Type of Comment 1 - Policy 2 - Format 3 -Science 4 - Process	Comment and Suggested Action	Responder Affiliation2	Responder (F. Last name)2	Comment Status Green - Closed Yellow - In Progress Red - Open	Response 1 - Incorporated 2 - Not Incorporated 3 - Not Applicable	Response Comment2
EEPAC	**Working Group**	8	2	44	3,4	Where appropriate, pre- and post- development monitoring and ecological inventories should span across 5 seasons, including during wintertime. Certain ecological functions of a site may be evident in wintertime but not at other times of the year (e.g. providing habitat for overwintering species of mammals or raptors) and are thus not captured by standard 3-season inventory. However, 5-season inventory may not be necessary in all cases, so the frequency of monitoring should be decided on a site-by-site basis (Merrick Sharpe, North-South Environmental Inc., pers. comm. Nov 11 2019). We therefore recommend this section be revised to indicate that number of site visits be determined based on characteristics of a given site and appropriate number of site visits determined and justified accordingly, along with the type of inventories to be done and standardized protocols to be followed (e.g. follow Migratory Bird Survey, Breeding Bird Survey, Frog and Amphibian Survey protocols from Bird Studies Canada due to presence of birds and amphibians at initial site visit, respectively).	AECOM	N. DeCarlo		1	Specific prescribed number of site visits not incorporated as the frequency will be determined on a case-by-case basis in consultation with the City of London. The Data Collection Standards have been updated based on updated policy, science, and standardized protocols. **Winter to be included based on City of London Comment Sept 2020.**
EEPAC	**Working Group**	9	2	N/A	1	Data collection standards for ecological inventory require more specificity regarding protocols and methodologies. Where available, additional sources of local data should be considered, such as citizen science databases, consultation with local nature groups (e.g. data on species present, which might not necessarily be found during short-term monitoring). See secondary sources sheet for suggestions of citizen science databases and other resources.	AECOM	N. DeCarlo		1	Additional resources for monitoring protocols have been added to the EMGs. Reference to citizen science databases and consultation with local nature groups have also been included within the text.
EEPAC	**Working Group**	10	44	2	4	"Inventory Protocol" generally lacks detail/specificity. Suggested edit (in bold): 2) Spring (May) Target Species - Frogs, migratory birds, **spring ephemeral flora.** Special time requirements - warm spring evenings using road-side survey for frogs **Special time requirements - 5:00 to 10:00 a.m. for migrating and breeding bird survey; dusk and night visits for twilight and nocturnal species (e.g. American Woodcock, Common Nighthawk, owls)** 3) Early Summer (June) Target Species - Breeding Birds, spring ephemeral flora, forestry, vegetation community, fish habitat, **butterflies/caterpillars, other insect monitoring** Special time requirements - 5:00 to 10:00 a.m. for breeding bird survey **Special time requirements - dusk and night visits for twilight and nocturnal species (e.g. American Woodcock, Common Nighthawk, owls)** 4) Summer (mid-July / early August) Target Species - ELC field data collection, wildlife habitat, summer flora, wetland species, prairie species, butterflies Special time requirements - none **Note: If collecting bird breeding data, bird surveys including species counts (and ages i.e. adult/juvenile) should still be completed between dawn and ~10:00 am.**	AECOM	N. DeCarlo		1	Breeding bird survey timing, butterflies, insect monitoring, crepuscular, and nocturnal species have been included as edits.
EEPAC	**Working Group**	11	6	144	3	This is not true in 2019. Delete the statement "Many of the alien species that grow in southern Ontario do not pose a threat to natural area". Please refer UTRCA, Ontario Invasive Plants Council	AECOM	N. DeCarlo		3	This section has been removed from the EMGs so this comment is no longer applicable.
EEPAC	**Working Group**	12	5	N/A	3	EMG section 5 on buffers should be updated to reflect current science. For best practices within Ontario recommended by this group, see Beacon 2012 document (in secondary sources sheet).	AECOM	N. DeCarlo		1	A new methodology for determining buffer widths, along with updated science and best practices, has been integrated into the new Section 5.
EEPAC	**Working Group**	13	2	N/A	3	Monitoring of water courses should include BioMAP (Bioassessment of Water Quality) methodology and protocol that was developed by Ronald W. Griffiths, Ph.D. at the Centre for Environmental Training Niagara College, Glendale Campus Niagara-on-Lake, Ontario. If BioMAP is not used for monitoring aquatic habitat, an acceptable alternative is using current protocols of Ontario Benthos Biodiversity Network (OBBN).	AECOM	N. DeCarlo		1	The aquatic communities and habitat surveys section has been updated by our senior fisheries biologist. The use of BioMap was not selected, however standard protocols such as OSAP, OBBN have been included
						LOWER PRIORITY COMMENTS ORDERED BY EMG SECTION/SUBTOPIC	AECOM				
EEPAC	**Working Group**	14	N/A	N/A	2	May be helpful to incorporate a functional flow chart at the beginning of the EMGs document showing process for following each section of the document	AECOM	N. DeCarlo		2	Flow charts not included after discussion with City of London

External Resource and First Nation Comments							AECOM/City Response				
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EEPAC	Working Group	15	1	N/A	4	Specific wording is needed to address the following: How are EIS reviewed upon completion? e.g. Is there a checklist? What happens if an EIS report does not comply with the checklist? Can an EIS be deemed inadequate and provisionally sent back for revisions?	AECOM	N. DeCarlo		1	Specific wording provided in Section 2.6.3 - EIS Process.
EEPAC	Working Group	16	1	N/A	4	Provisions should be made for EISs and other studies to make reference to climate change and/or make it a prominent factor when analyzing development projects or when creating Conservation Management Plans. Already we see that the City now looks to build structures with the once-in-250-year storms as the new norm, when before they would consider the 100 year storm. It is perhaps something about which the City should be mindful in other areas and should expect developers to consider when putting together reports(i.e. regarding biodiversity, species disease, etc.).	AECOM	N. DeCarlo		1	Although no policy mechanisms for this exist, wording has been added in to encourage proponents to consider climate change in impact assessment, as well as for determining ecological compensation plans/strategies. Reference to climate affiliated climate documents will be made once these plans are approved (e.g., the City of London's Climate Emergency Action Plan).
EEPAC	Working Group	17	1	2	4	2.5 - send copy to EEPAC chair so that a working group can be established earlier in the process	AECOM	N. DeCarlo		3	Section 2.2 - Environmental Study Scoping outlines a clear process and inclusion of EEPAC early on.
EEPAC	Working Group	18	1	2	4	update name - is it still Technical Review Advisory Team?	AECOM	N. DeCarlo		1	"Technical Review Advisory Team" has been amended to "Technical Review Team" (TRT).
EEPAC	Working Group	19	1	3	1	Background and Framework paragraph -update to most recent PPS, also there should be no development within significant areas, also is there still something called a DAR?	AECOM	N. DeCarlo		1	Reference to the most recent PPS is now included; According to the PPS, development and site alteration is not permitted in "significant wetlands in Ecoregions 5E, 6E, 7E" and "significant coastal wetlands". The remainder of significant features have conditions (e.g., in accordance with provincial/federal requirements for SAR, unless no negative impacts to natural features or ecological function); "DAR" has been removed.
EEPAC	Working Group	20	1	3	1	purpose should also include compensation	AECOM	N. DeCarlo		3	Section completely reworked, but compensation is outlined in Section 2 (in relation to the Environmental Study) and Section 6 in-depth.
EEPAC	Working Group	21	1	3	2	change 'natural areas"' to 'components of the City's Natural Heritage System'(and where this term, NHS appears, it should be leading caps for each word)	AECOM	N. DeCarlo		2	Natural features and areas was the terminology used to align with LP text. NHS is capitalized throughout. There is wording outlining that natural features and areas are components of the NHS.
EEPAC	Working Group	22	1	3	1,2	Update to include London Plan policy # and in the last paragraph, line 6 should read "...ecological features and functions with respect…"	AECOM	N. DeCarlo		1	Policy numbers (where not under appeal) have been included.
EEPAC	Working Group	23	1	4	1	update Table A to current policies in London Plan. Also it should be noted that these distances should also trigger an SLSR	AECOM	N. DeCarlo		1	Table has been updated based on the LP and clarification has been made that it also triggers an SLSR
EEPAC	Working Group	24	1	5	3	The City completed 13 Sub-watershed studies in 1995. BioMAP monitoring was used to establish ecological/environmental baseline conditions for open watercourses within these 13 sub-watershed studies. This monitoring was undertaken in 1993-1995 and from approximately 2000 until 2015. These data must be included along with current data collected, in all EIS where a watercourse may be affected.	AECOM	N. DeCarlo		1	Review of appropriate/applicable background studies has been included in Section 2 and to be outlined in the Environmental Study Scoping Checklist (ESSC)
EEPAC	Working Group	25	1	5	4	section C SLSR - I am not aware Guidelines exist for the preparation of an SLSR. Are there?	AECOM	N. DeCarlo		1	Section 2.4 - SLSRs outlines this process (and links to the Environmental Study Scoping Checklist)
EEPAC	Working Group	26	1	5	4	the city often does not push to have qualifications included	AECOM	N. DeCarlo		1	Section 2 outlines that resumes for field staff, authours, etc. must be included for review.

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EEPAC	Working Group	27	1	6	4	pre consultation MUST or SHALL occur. Also, update DART to whatever it is called now	AECOM	N. DeCarlo		1	A more robust description of what must occur during pre-consultation has been added as Section 2.1.
EEPAC	Working Group	28	1	6	4	I am not aware of any time a residents group or Nature London has been invited to participate. This seems to be a good idea that should be retained and acted on	AECOM	N. DeCarlo		1	Language has been retained. Further, reference to consultation with such groups has been made in the data collection standards section.
EEPAC	Working Group	29	1	7	4	also refers to getting data from Nature London. A good idea that should be used going forward.	AECOM	N. DeCarlo		1	Language has been retained. Further, reference to consultation with such groups has been made in the data collection standards section.
EEPAC	Working Group	30	1	7	4	dated should be defined. Is it more than 5 years old?10 years?	AECOM	N. DeCarlo		1	Under data collection, it is outlined that the City considers field data up to 5 years old "current"
EEPAC	Working Group	31	1	7	2	maps - All maps should be one scale or similar maps must be the same scale to make comparisons between maps easier.	AECOM	N. DeCarlo		1	All mapping should be scaled as appropriate based on the updated Draft EMGs and the ESSC. In some instances, maps may require different scales.
EEPAC	Working Group	32	1	7	4	A figure showing the environmental management units/areas. Is this always done? If not why not? Certainly do not always get a clear picture of the existing conditions nor "how the functions/area may be measured and impacts quantified or qualified (e.g. change in area, predictions through modeling theories), nor the sensitivity of the area to potential development impacts.	AECOM	N. DeCarlo		1	The requirement remains the same within the EMGs. It is expected that proponents will provide a figure that outlines existing conditions including what is listed in the EMGs. Some additional clarification has been made within text including reference to the evaluation of significance and function. Further, terminology has been adjusted (environmental management unit no longer used) and figure requirements will be determined through the scoping process and use of the ESSC.
EEPAC	Working Group	33	1	8	4	Review of Issues Summary Checklist. Chair of EEPAC should get even if no EEPAC rep was able to attend the scoping meeting	AECOM	N. DeCarlo		3	Section re-worked. Section 2.2 outlines the process for the Environmental Study Scoping Checklist and the TRT
EEPAC	Working Group	34	1	8	4	Terms of Reference for Site Issues. EEPAC should be included in the process	AECOM	N. DeCarlo		1	The TRT reviews the ESSC which acts as the ToR. See Section 2.2.
EEPAC	Working Group	35	1	9	4	I have never seen this sheet used. Is it? If so, is it effective. For ex, how do you know analytical methods have been appropriately documented? Should it be used and if so, does it need updating.	AECOM	N. DeCarlo		1	ESSC is the updated Issues Summary Checklist
EEPAC	Working Group	36	1	10	4	Site visit - include EEPAC representative	AECOM	N. DeCarlo		1	TRT members are identified to attend site visits within the EMGs (Section 2.2.2)
EEPAC	Working Group	37	1	10	1	Scoped Site EIS must include a monitoring plan	AECOM	N. DeCarlo		1	Section 2.6.9 outlines the need for an Environmental management Plan, this is also described in-depth in Section 7

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EEPAC	Working Group	38	1	10	3,4	Scoped Site EIS - If adopt the findings of McWilliams re encroachment and the approach in Beacon re buffers, there will need to be more work done on determining buffers and Critical Function Zones	AECOM	N. DeCarlo		1	Buffer width determination and boundary delineation methods have been revised to include CFZs and to ensure effective buffers with strict minimums.
EEPAC	Working Group	39	1	11	4	last line first paragraph. Not sure this is ever done as the Environmental Management Plan is created well after this step in the approval process. It should be done at this step as the development should work around the constraints not the other way around	AECOM	N. DeCarlo		1	Proposed development description is outlined in the updated Section 2. Although detailed design is not finalized at this stage, it is expected that proponents will outline design features to meet environmental management objectives. This may be revised later in the process, however objectives should still be met with new design.
EEPAC	Working Group	40	1	11	4	second para, re grade changes. Not aware this is done at this stage. Nor are changes in drainage patterns shown to my knowledge.	AECOM	N. DeCarlo		3	This section has been reworked/updated and the description of the proposed development is outlined in Section 2.6.5
EEPAC	Working Group	41	1	12	2	first para, change 'environment' to 'ecological features and functions'	AECOM	N. DeCarlo		1	Section revised, Ecological features and functions addressed
EEPAC	Working Group	42	1	12	2	under purpose. Direct and indirect impacts must be shown. Only some like AECOM, do this regularly	AECOM	N. DeCarlo		1	Section updated for assessing direct and indirect impacts. Further, reference to the Natural Heritage Reference Manual (NHRM) impact and mitigation (Appendix C - Table C-1) has been made to provide more robust direction on impact assessment.
EEPAC	Working Group	43	1	12	4	Pre development conditions needs more. Existing subsurface is only based on if it is a recharge area or not on one of the London Plan maps.	AECOM	N. DeCarlo		1	Pre-development existing conditions will be determined through an SLSR or through the EIS process (following the data inventory standards and as determined through consultation and scoping).
EEPAC	Working Group	44	1	12	1	ID of Existing Impacts - Given the OP and London Plan say enhance, this should be given greater emphasis in the new EMG	AECOM	N. DeCarlo		3	Although the goal of enhancing the NHS is not applicable in the identification of impacts, this idea has been integrated within the updated EMGs (specifically when referring to the new compensation section).
EEPAC	Working Group	45	1	12	4	The six items listed at the bottom are good, however, it is rarely actually done by consultants who prepare an Disincline in EMG and make it a requirement of submission	AECOM	N. DeCarlo		3	This section has been reworked and includes an outline of the Impact and Net Effects Assessment (including a net effects table template).
EEPAC	Working Group	46	1	13-14	4	In 2013, EEPAC prepared an update to this page to make it more user friendly. I am not aware of how this current page is actually used and if not, why not?	AECOM	N. DeCarlo		2	To ensure defensibility, the summary of impacts and mitigation table in the NHRM has replaced these pages.
EEPAC	Working Group	47	1	13-14	4	more important would be how the proponent will avoid, mitigate or compensate for these impacts. Too often when included in an EIS, the claimed impacts are low. There is never a clear reason for this conclusion, nor is there any way to repair damage when the consultant gets it wrong.	AECOM	N. DeCarlo		1	Agreed - the NHRM table (referenced above) outlines mitigation strategies along with potential impacts. Further, the compensation section outlines how to go about compensation (after following the mitigation hierarchy - avoid, minimize, mitigate, compensate).
EEPAC	Working Group	48	1	15	4	Net Effects Assessment Table must be a required for each EIS.A sample in the new EMG would help (also the table on p. 21 should be included in the example).Rarely get a rationale for the conclusions of the net impact n analysis. It is usually just a statement (particularly for buffers).The city should make all EISs include a Table AND a) thru d) on this page. As well, there should be an e) which requires long term impacts, not just "post construction" which is an undefined time period, as well as cumulative impacts. The definition of negative impacts from the PPS must be included in the new Guideline(see page 30-32 Ottawa's 2015 EIS Guideline for an excellent example of content)	AECOM	N. DeCarlo		1	This section has been reworked and includes an outline of the Impact and Net Effects Assessment (including a net effects table template).
EEPAC	Working Group	49	1	16	2	Not sure where this fits. Is it relevant in light of OPA 438?	AECOM	N. DeCarlo		1	This has been omitted in the updated EMGs
EEPAC	Working Group	50	1	17	2,4	never seen this used. Is there something better? Better science? Impacts will vary with type of feature depending on flora and fauna affected	AECOM	N. DeCarlo		1	This has been omitted in the updated EMGs

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EEPAC	Working Group	51	1	18-19	2	This is pretty boilerplate. See it in all of AECOMs. This should be SOP by now. If not, it should be included as such. As well as Clean Equipment protocol. Should also add some limit on how long and how far from a feature soils can be left uncovered. Or that there should be a protocol to cover soil piles if heavy rains are forecasted. Also, the use of nitrate heavy grass seeding should be prohibited	AECOM	N. DeCarlo		1	Agreed - these should be SOP and have been omitted. Reference to the robust NHRM table has been made to outline mitigation strategies for potential impacts.
EEPAC	Working Group	52	1	20	2	Interesting, but how does it get translated into a monitoring program and what happens when things happen, like gates appearing on fences? If this page is retained, it needs to be incorporated into a requirement of the EIS that the proponent must include how it will avoid or mitigate these specific impacts. There should be clear criteria in the new EMGs for Environmental Management Plans or a separate Guideline	AECOM	N. DeCarlo		1	This table has been omitted, however additional information has been added Environmental Management and Monitoring Plan section, as well as more guidelines in the new Section 7 - Monitoring. As this is determined on a case-by-case basis, the determination and approval process remains the same.
EEPAC	Working Group	53	1	21	4	Including this or an up-to-date version in the EIS with the Net Effects Assessment Table should be required as it will give everyone reviewing the table a common vocabulary. Right now, when impacts are listed in a Net Effects Assessment Table, the rationale seems to either be missing or is superficial	AECOM	N. DeCarlo		1	This section has been reworked and includes an outline of the Impact and Net Effects Assessment (including a net effects table template).
EEPAC	Working Group	54	1	21	3	elimination of habitat (loss of open meadow where Meadowlarks breed for example) should be a high net effect. As should be the loss of any flora or fauna that is regionally rare or rarer. Not sure if this is meant to include a sub population like false rue or breeding pair habitat or cutting down the only shrub in that location. Need to define terms such as rare, unusual, uncommon	AECOM	N. DeCarlo		1	Examples of rare and unusual/uncommon habitat have been included.
EEPAC	Working Group	55	1	22	4	first full paragraph refers to detailed explanation. This has never been the practice. It should change if this section is to have any meaning.	AECOM	N. DeCarlo		1	This section has been re-worked/worded.
EEPAC	Working Group	56	1	22	4	other than trail development which seems to be in Woodland Management Plans (which are rare), none of the mitigation measures have been implemented. The examples are good, the follow thru needs to be part of development agreements.	AECOM	N. DeCarlo		3	These examples have been omitted from the update EMGs. The implementation of mitigation measures is mentioned in this section and addressed through Section 7 - Monitoring.
EEPAC	Working Group	57	1	22	4	last line of the page. This has never been done to the best of my knowledge. This is an implementation issue that the City should address in its development and subdivision agreements	AECOM	N. DeCarlo		1	This has been omitted from this section and addressed in Section 7 - Monitoring.
EEPAC	Working Group	58	1	23	4,2	First paragraph and bullets can be deleted. The intent was to have monitoring until assumption. Why has it defaulted to three years? Monitoring needs to specify who does, for how long (which may vary by type of development and the component of the NHS) and who pays. EIS should propose appropriate thresholds or benchmarks for monitoring purposes; Identify who will be responsible for monitoring, and the reporting structure required to ensure that results are acted upon as needed; and outline contingency plans if an impact is detected or if the proposed thresholds are not met (which means there should be holdbacks in case the mitigation measures fail during the monitoring period).Monitoring should include performance monitoring. That means what should be required are targeted, site-specific parameters that can be measured and linked to site-specific changes.	AECOM	N. DeCarlo		1	Addressed in Section 7 - Monitoring (outline of timelines, scheduling, roles/responsibilities, compliance and effectiveness/performance monitoring)
EEPAC	Working Group	59	1	24	2,4	Second "purpose" box - never seen this happen. Means the EIS was not accepted. But the quality of an EIS is irrelevant in planning processes. Simply submitting one meets the city's requirements. If retain this section, need to provide examples of unacceptable impacts. Is it from the table showing no, low, med and high impacts?	AECOM	N. DeCarlo		1	The rejection of an EIS is outlined in Section 2.6.3 - EIS Process. Based on comments from the TRT, agencies, the City may reject an EIS completely. Unacceptable impacts will likely vary on a case-by-case basis and thus will be assessed through the EIS process.
EEPAC	Working Group	60	1	25	4	First paragraph - Maps must always be at the same scale. Somehow this doesn't get demanded	AECOM	N. DeCarlo		1	All mapping should be scaled as appropriate based on the updated Draft EMGs and the ESSC. In some instances, maps may require different scales.

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EEPAC	Working Group	61	1	25	4	City Ecologist sign off on mitigation measures shall be required. A full description of proposed mitigation measures, including recommendations for timing windows or other specifications for implementation, for all potential negative impacts; For each negative impact, an indication of whether there will be any residual impact following implementation of the recommended mitigation measure(s); A description of proposed restoration or enhancement plans to compensate for impacts that cannot be avoided or minimised; Maps and/or drawings (if relevant) depicting the location, extent, and design details of proposed mitigation measures (e.g., sediment and erosion control plan)	AECOM	N. DeCarlo		1	This information is covered throughout Section 2 (e.g., mitigation measures, review of the draft EIS, data collection standards, Environmental Management and Monitoring Plan), Section 6 - Compensation, Section 7 - Monitoring.
EEPAC	Working Group	62	1	25	4	Peer review should be a possibility for any development, not just large scale ones. Not sure why this should be at the City's cost given there is a problem with the proponent's work. I have seen a Peer Review once in the last 7-10 years	AECOM	N. DeCarlo		1	In general, the City has the option to require amendments, addenda, or to fully reject an EIS that is not acceptable. The purpose of this peer-review mechanism is not to correct the 'poor' work of a proponent, rather to allow the City the option for a second qualified consultant to come and assess particularly sensitive sites or large scale developments with more uncertainty and greater potential impacts to ensure 'no negative impacts', etc. This is under the discretion of the City of London.
EEPAC	Working Group	63	1	26	2,4	Is this form even used? Who signs off if it is in use? Do the subwatershed study targets get used?	AECOM	N. DeCarlo		3	This form has been omitted from the updated EMGs.
EEPAC	Working Group	64	1	27	2	EIS must include the findings of other reports. The other reports are part of the package and are required to be submitted in order for a filing to be considered complete	AECOM	N. DeCarlo		1	This has been addressed in Section 2 and through the scoping process. As the required studies are noted in the ESSC checklist (in the appendices)
EEPAC	Working Group	65	1	27	1,4	Development conditions are important. From what I have seen in reports from Development Services, there are references to implementing recommendations of the EIS. However, the EIS is often "incomplete" as it recommends the preparation of an Environmental Management Plan. Does that become a condition of development? Should it be part of an h-2 holding provision? Guelph also requires from time to time, an EIR (Environmental Implementation Report).It includes items such as how the conditions of approval have been met, how the protection of features and their functions have been protected, etc. (Guelph, Guidelines for the Preparation of an EIS, 2017)	AECOM	N. DeCarlo		2	Environmental Managemental Management Plans are described in Section 2 and Section 7 outlines monitoring requirements. Although not included in this update to the EMGs, a review of phasing and conditions based on the EMP are to be provided as a recommendation to the City of London
EEPAC	Working Group	66	1	28	2	See Appendix 6, Ottawa 2015 EIS Guidelines for a possible replacement	AECOM	N. DeCarlo		1	Appendix 6 reviewed, however an updated version now called the ESSC was drafted
EEPAC	Working Group	67	1	29	2,4	If the development is adjacent to the City boundary, maps and photos must show the features that are on the other side of the border	AECOM	N. DeCarlo		1	Updated ESSC - Study area is delineated onto current aerial photography including a 5-10 km radius for Map 5
EEPAC	Working Group	68	1	30	3	Add to 1.2.5, sensitive flora, Coefficients of conservatism greater than or equal to 6, add to 1.2.6 Partners In Flight, 1.2.6 how is rare defined - regionally rare?	AECOM	N. DeCarlo		3	The checklist has been reworked into the updated ESSC
EEPAC	Working Group	69	1	31	1	1.2.7 update to Significant Wildlife Habitat for Ecoregion 7E	AECOM	N. DeCarlo		1	Addressed
EEPAC	Working Group	70	1	32	1	Update PPS reference.2.1.2 in the current PPS has more on connections and linkages. This should mean an EIS looks beyond the subject lands. How else can you do ecosystem planning?	AECOM	N. DeCarlo		3	The checklist has been reworked into the updated ESSC

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EEPAC	Working Group	71	1	32	2	not sure 1.3 needs to be in a scoping list	AECOM	N. DeCarlo		1	Addressed in updated ESSC
EEPAC	Working Group	72	1	33	1	update to London Plan language.1.4 use endangered, threatened and special concern. Include Federal and Provincial	AECOM	N. DeCarlo		1	Reference to SAR made in ESSC with applicable legislation referenced.
EEPAC	Working Group	73	1	34	2	3.2 add hydro period , delete 3.4 (never used)	AECOM	N. DeCarlo		1	ESSC reworked/updated and includes hydrological, geomorph, etc. studies
EEPAC	Working Group	74	1	36	2	update definitions of the categories of species at risk (endangered, threatened, species of concern)	AECOM	N. DeCarlo		1	Addressed
EEPAC	Working Group	75	1	37	1	If retain, this needs to be updated to reflect current policies. For example, an EA in London now requires an EIS as part of the submission of an ESR.	AECOM	N. DeCarlo		3	This has been moved to a new section outlining "When an EIS is not required"
EEPAC	Working Group	76	1	37	2	Is there still a Subdivision Requirements Manual? If so, it is likely no longer in the Planning Department, but rather in Development Services	AECOM	N. DeCarlo		3	This has been omitted from the updated Draft EMGs
EEPAC	Working Group	77	1	38	4	update submission requirements and room #s. Some paper copies should continue to be required as reports with maps are easier to review in hard copy than on line.	AECOM	N. DeCarlo		2	This has been omitted from the updated Draft EMGs - Digital copies are preferred.
EEPAC	Working Group	78	1	38	4	all maps used should be to the same scale, rarely get Terms of Reference in the EIS, sometimes do not get CVs with qualifications, particularly certification in ELC	AECOM	N. DeCarlo		1	All mapping should be scaled as appropriate based on the updated Draft EMGs and the ESSC. In some instances, maps may require different scales. The ESSC has now replaced the ToR and will be required for EISs, CVs are to be included for all field staff, authors, etc.
EEPAC	Working Group	79	1	39-40	3	Appendix D re Edge effect. Should this be revised and included in restoration and monitoring? Only appears on page 13 and page 125 in Guideline 5.0.Edge effects are rarely discussed when new edge is created. Rare is an EIS that requires some form of mitigation	AECOM	N. DeCarlo		1	Agreed - this has been addressed in Section 5 - Buffers, and in Section 3 - Evaluation of Significance and Function.
EEPAC	Working Group	80	1	41	2	A flow chart could be helpful. See page 11 of City of Ottawa EIS Guideline (2015) for an example. Something should be included about EEPAC's review as being part of the process. Guelph's EAC is included in its Guideline document	AECOM	N. DeCarlo		2	Flow charts not included after discussion with City of London
EEPAC	Working Group	81	1	N/A	4	currently, no update is required when a subdivision proceeds in phases or there is a delay after draft approval. The EIS should be revisited when there are phases or delays. This is Ottawa's approach (see page 14 of Ottawa's 2015 EIS Guideline	AECOM	N. DeCarlo		3	Scope of EIS shall be for the entire site, with addendums on subsequent phases as the development progresses. Delay would need to be defined; there could be an opportunity to pair the EIS review with the renewal of draft approval.
EEPAC	Working Group	82	1	N/A	4	currently, there is little done to analyze function, the focus is on features. In Ottawa, The EIS must specifically discuss the nature and extent of the ecological functions provided by the site, in relationship to the surrounding area. The EIS must include: a description of ecological functions provided by the site and identification of any functions that have contributed to the area being identified as significant; An assessment of the significance of the function, using quantitative information if possible, and relating this to the quality and integrity of the area; and, an assessment of the sensitivity of the function to the type of development proposed	AECOM	N. DeCarlo		1	Wording within Section 2 has been amended to include a focus on ecological function. Further, updates to Section 3 - Evaluation of Significance and Function outlines the importance of assessing function.
EEPAC	Working Group	83	2	N/A	3	Data Collection Standards for the Ecological Inventory needs to be based on detailed evaluations of the subject areas/sites and its' existing conditions that will be undertaken in accordance with specific field investigations/inventories and studies such as Environmental Impact, geotechnical, hydrogeological, as well as the state of art methodologies and environmental protocols that will be employed and reference in this ToR.	AECOM	N. DeCarlo		1	Data collection standards have been updated; the potential need for additional studies (e.g., geotechnical, hydrogeological) has been referenced, specifically requiring consultation with experts in those respective fields.

External Resource and First Nation Comments							AECOM/City Response				
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EEPAC	Working Group	84	2.3		1	Assessment of Development Impact (direct and indirect impact) needs to be assessed by presenting of viable alternatives where the identified impact will be defined in specific details (potential evaluated short and long term impacts), as well as all considerations of protections measures, mitigation or compensation and monitoring will be presented together with the estimated costs of these options.	AECOM	N. DeCarlo		1	The updated/reworked section does require the definition of specific details on potential impacts, as well as approved mitigation measures (following the mitigation hierarchy) and monitoring (including the EMP)
EEPAC	Working Group	85	2	42	4	are the baseline data from the subwatershed studies ever used? It would help if they were given the date of the work would show changes on the landscape.	AECOM	N. DeCarlo		1	The review of other studies/documents/etc. have been included and should be reviewed. Other studies will also be explored through the scoping process.
EEPAC	Working Group	86	2	43	4	unlikely there are sites where data is now less than three years old. Where data is over 10 years old, data collection shall be required. Not sure though of the scientific basis for the time periods (e.g. 3 years, etc.).Guelph considers data older than 5 years as "limited in its accuracy."	AECOM	N. DeCarlo		1	The threshold is 5 years for data to be considered "dated"
EEPAC	Working Group	87	2	44	3	We cannot find the "North-South Environmental Inc., 2003" reference. We contacted Merrick Sharpe, owner of North-South Environmental Inc. and he was unable to determine what this reference might be without a full citation. Therefore, we recommend either removing this section entirely or providing the full citation.	AECOM	N. DeCarlo		1	This reference has been removed.
EEPAC	Working Group	88	2	44	2,4	Natural Heritage Reference Manual (2010) and Ecoregion 7E SWH criteria should be used as the basis for drafting a new section on data collection.	AECOM	N. DeCarlo		1	These documents have been reviewed and integrated throughout the EMGs.
EEPAC	Working Group	89	2	44	3	Early Summer (June) guidelines for birds should also appear in the Spring (May) guidelines. Spring section should include specific guidelines for birds and other relevant species. Rationale: spring migrants relying on stopover sites in London and area (i.e. critical habitat) will already be passing through, and early breeding species will have breeding activity. Spring ephemerals may bloom as early as March and June is too late for easy detection in some years, especially when considering climate change.	AECOM	N. DeCarlo		1	Breeding/migratory birds have been added to Spring (May) guidelines. Spring ephemerals have been added to Spring (May). It is also the responsibility of the proponent to assess early emergence of species based on variable weather from year to year and to be approved through pre-consultation.
EEPAC	Working Group	90	2	44	4	The 2007 EMG indicates that "the Significant Wildlife Technical Guide (OMNR, 2000) is the standard reference guideline for conducting field investigations for specific natural features." If the reference is to the "Significant Wildlife Habitat Technical Guide (OMNR, 2000), https://docs.ontario.ca/documents/3620/significant-wildlife-habitat-technical-guide.pdf", then the EMG should be updated to clearly reflect this. However, this document does not provide guidelines on conducting wildlife inventories, leaving the EMG without detailed guidelines in this regard.	AECOM	N. DeCarlo		1	Reference to the SWHTG has been made with the appropriate reference. Specific detail on conducting wildlife inventories and the associated protocols included in the data collection standards
EEPAC	Working Group	91	2	44	3	Regarding the point beginning with "Spring (May) target species...", the reader should be directed to the Marsh Monitoring Protocol provided in full here: https://www.bsc-eoc.org/download/mmpqualplan.pdf and summarized here: https://www.birdscanada.org/volunteer/glmmp/?targetpg=glmmpfrog.	AECOM	N. DeCarlo		1	This reference has been integrated into the herpetofauna survey section.
EEPAC	Working Group	92	2	45	4	vii, ix, x are rarely if ever included. They should. Make the list of technical information a shall rather than a should	AECOM	N. DeCarlo		3	Data collection standards has been reworked/updated
EEPAC	Working Group	93	2	45	3	There is no mention of non-vascular plants. Some effort should be made to include survey of non-vascular plants such as mosses, fungi, and lichens, because they are a vital part of the vegetation community and are frequently used as indicator species. Other provinces have such guidelines, e.g."BC Inventory and Survey Methods for Rare Plants and Lichens"	AECOM	N. DeCarlo		2	Non-vascular plants mentioned in evaluation of significance and function for ESAs, as well as indicator species in the ESSC. However, specific surveys for non-vascular plants were not incorporated into the data collection standards
EEPAC	Working Group	94	2	46-47	3,4	Current timing is inadequate and misses early spring. Migratory bird data can be found at:https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html	AECOM	N. DeCarlo		1	Updated based on previous EEPAC comment/recommendation.

External Resource and First Nation Comments							AECOM/City Response				
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EEPAC	Working Group	95	2	46	3	There is a broken link referenced in this sentence: "Priority birds species for each municipality should be determined from Couturier, 1999, Bird Studies Canada website bsc-eoc.org." Refer instead to the Ontario Breeding Bird Atlas. A list of priority birds for each municipality exists at this address: https://www.bsc-eoc.org/dataentry/codes.jsp?page=region if you select the reference sheet "Region Checklist and Migration/Breeding Dates" and select "London" as the atlas region. Since this checklist is difficult to find, it may be included as a separate table within the EMG.	AECOM	N. DeCarlo		1	Replacement references for regionally rare bird species (e.g., PIF) have been included
EEPAC	Working Group	96	2	46	3	Cadman et al., 1987 atlas has been digitized and updated (data from 2001-2005), available here: https://www.birdsontario.org/atlas/secondatlas.jsp?lang=en	AECOM	N. DeCarlo		1	Reference has been updated.
EEPAC	Working Group	97	2	46	3	include species with a Conservation Coefficient of 6 or greater and their location, for birds use the most recent Ontario Bird Atlas and Partners in Flight. Consider using vegetation sampling protocol from U of Toronto (http://forestry.utoronto.ca/vsp/)Reference should include the most current edition of The Southern Ontario Vascular Plant Species List. Current version is 3rd edition (2013) and includes S Rank	AECOM	N. DeCarlo		1	This section has been revised and includes updated references
EEPAC	Working Group	98	2	46	3	Oldham (1996) can be replaced with the most recent edition: Oldham, M.J. & Brinker, S.R. (2009). Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario.	AECOM	N. DeCarlo		1	Reference has been updated.
EEPAC	Working Group	99	2	46	3	The NHIC website writes that they use standardized methods "developed by the international NatureServe network of conservation data centres" to assign global, national and subnational ranks. Thus, the NatureServe network should also be cited on this page (https://www.natureserve.org/conservation-tools/conservation-status-assessment).	AECOM	N. DeCarlo		2	To keep the document streamlined and concise, it was decided to not include the methodology of how NHIC determines the ranks. The proponent will find this when they use the NHIC website.
EEPAC	Working Group	100	2	46	3	The long-form reference states that the most recent report from COSEWIC is from 1996; however, the most recent edition is really from 2018, found here: https://wildlife-species.canada.ca/species-risk-registry/sar/assessment/wildlife_species_assessed_e.cfm	AECOM	N. DeCarlo		1	This reference was omitted, reference is made to the COSEWIC and COSSARO lists, however the year is not included as they are updated frequently. It is stated throughout that the most up-to-date resources must be used (as the literature will become outdated as it has in this version).
EEPAC	Working Group	101	2	46	2	In regards to the following sentence "Provincially rare species are those listed with a sub-national rank (S-rank) of S1 to S3 in Oldham (1996, Natural Heritage Information Centre (NHIC)website and MNR species at risk in Ontario (Bowman, 1996) and COSSARO," NHIC should be defined above, not here. Subnational ranks are also from NatureServe, so should be cited here (link above). Oldham & Brinker (2009) can be cited here as well. The long form citation list suggests that the most recent COSARRO report is from 1996. It is actually from 2007, found here: https://www.ontario.ca/laws/regulation/080230	AECOM	N. DeCarlo		1	Updated. As NHIC is part of NatureServe and provides information for Ontario, we will continue to reference NHIC (based on familiarity, consolidation of data searches, efficiency, etc.).
EEPAC	Working Group	102	2	46	4	Lists of the species observed, reported or expected to occur on or adjacent to the site, presented in tabular format (usually as an appendix) with notes on the species' relative abundance at the site, its residency status (i.e., is it present year-round, seasonally or only periodically; does it live on the property, forage there or use it as part of a movement corridor) and the evidence supporting its inclusion on the list (e.g., sighting, tracks, previous report);	AECOM	N. DeCarlo		1	Addressed under Non-Target Wildlife in the Data Collection Standards appendix
EEPAC	Working Group	103	2	46	3,4	Guelph's 2017 Guideline, Appendix F:Wildlife Survey Guidance includes a wide variety of fauna and flora. This appendix would be beneficial to the new Guideline	AECOM	N. DeCarlo		2	This document was reviewed for the updated Data Collection Standards
EEPAC	Working Group	104	2	46	3	Weller (1994) appears to be the most recent summary of Ontario herpetofauna, but another citation can be added: Oldham, M.J. (2003). Conservation Status of Ontario Amphibians. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario.	AECOM	N. DeCarlo		1	Reference has been included
EEPAC	Working Group	105	2	46	3	Holmes et al., 1991 can be replaced by the online Ontario Butterfly Atlas (2019) found here: http://www.ontarioinsects.org/atlas_online.htm	AECOM	N. DeCarlo		1	Reference has been updated.

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EEPAC	Working Group	106	2	47	3	In regards to information under the subheading "Breeding Bird Survey", readers should also be directed to breeding bird survey guidelines provided by the Ontario Breeding Bird Atlas (found here: https://www.birdsontario.org/download/atlas_feb03.pdf).	AECOM	N. DeCarlo		1	Reference has been added.
EEPAC	Working Group	107	2	47	3	Existing protocols for water chemistry are inadequate. For example, no mention of testing for heavy metals. Should have an inventory of possible tests for water quality, with lists of justification for each of the tests i.e. factors that may trigger the requirement for certain tests. Could possibly include bare minimum (tests that are always required) and supplemental	AECOM	N. DeCarlo		1	Specifics on what should be included have been updated for aquatic ecosystems, however based on the variability in features, development activities, impacts, etc. These assessments are still to be determined on a case-by-case basis through the scoping exercise.
EEPAC	Working Group	108	2	47	3	"base flow (water velocity, stream order, water depth, stream width and bankfull width)" This should also explicitly mention measurement of discharge volume	AECOM	N. DeCarlo		2	The data collection standards have been reworked, however what would need to be measured will be on a case-by-case basis in consultation with the City of London, therefore the section does not prescribe specific characteristics to be measured (as this may vary among sites).
EEPAC	Working Group	109	2	48	3	Under the heading "Fisheries Inventory", readers should also be referred to standardized protocols for Fish Community Sampling provided by the Ontario Stream Assessment Protocol: https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2019/06/05112225/osap-master-version-10-july1-accessibility-compliant_editfootnoteS1M4.pdf	AECOM	N. DeCarlo		1	OSAP has been added as a potential requirement, on a case-by-case basis
EEPAC	Working Group	110	2	48	3,4	Rarely see aquatic habitat work done even when a water course exists. Even subwatershed study information is ignored. So the issue is not the content but whether or not such assessments are still required.	AECOM	N. DeCarlo		1	Language in this section outlines that aquatic assessments should be conducted as required through scoping, agency requirements, and at a level appropriate for feature, development activities, impacts, etc.
EEPAC	Working Group	111	2	48	3	Under the heading "Benthic Survey", readers should also be referred to standardized protocols for Benthic Macroinvertebrate Assessments provided in the Ontario Stream Assessment Protocol: https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2019/06/05112225/osap-master-version-10-july1-accessibility-compliant_editfootnoteS1M4.pdf	AECOM	N. DeCarlo		1	OSAP referenced in-text (which utilized OBBN methodologies).
EEPAC	Working Group	112	2	48	4	Under the heading "Habitat Assessment and Stream Analysis," the EMG recommends measuring dissolved oxygen, temperature, pH, conductivity, water colour and transparency. Here, conductivity should be replaced with specific conductivity, which is measured on all standard YSI water chemistry probes and takes into account the temperature-dependence of conductivity. Probes which measure dissolved oxygen, temperature and pH also generally measure oxidation-reduction potential (ORP). ORP can reflect the antimicrobial potential of the water, so is a useful indicator of water quality that should be mentioned here. The EMG should also recommend that readers record the presence/absence of algal blooms, as such algal blooms may suggest eutrophication in the aquatic system. Water chemistry analysis of major ions/anions can indicate the cause of eutrophication (e.g., elevated nitrogen and/or phosphorous) so should be collected as part of Habitat Assessment and Stream Analysis. The Minnesota Pollution Control Agency provides separate guidelines for water chemistry analysis for lakes, rivers and streams, and wetlands: https://www.pca.state.mn.us/water/water-monitoring-standard-operating-procedures	AECOM	N. DeCarlo		2	Habitat assessment and stream analysis has been updated based on industry standards and by a Senior Fisheries Biologist. Prescribing specific water quality testing is considered out of scope for these guidelines and may be required as determined through the scoping process on a case-by-case basis in consultation with the City of London
EEPAC	Working Group	113	3	N/A	1	Guidelines Document for ESA Identification, Evaluation and Boundary Delineation will be required to include all applicable and viable information that in detailed will identified all ecological/environmental functions and featured of the subject ESA and adjacent areas and environmental/ecological relations to the existing subwatershed studies and environmental criteria established in this sub watershed. Also all applicable specific field investigations/inventories and studies such as Environmental Impact, geotechnical, hydrogeological, as well as the state of art methodologies and environmental protocols studies shall be included.	AECOM	N. DeCarlo		1	Information has been updated, where applicable. Identification of ecological function has been added to Section 3.
EEPAC	Working Group	114	3	51-54	2	turn into an Appendix if still seen as needed. Otherwise, delete	AECOM	N. DeCarlo		1	Much of this has been omitted or integrated into other sections, where applicable
EEPAC	Working Group	115	3	55	2	2.1 and 2.2 are likely not necessary anymore	AECOM	N. DeCarlo		1	This has been omitted from the updated EMGs

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EEPAC	Working Group	116	3	56	2	#8 should be revised. No need to reference the pre ELC material	AECOM	N. DeCarlo		1	Revised to solely ELC.
EEPAC	Working Group	117	3	57	2	if retain, make into a colour map. Perhaps use Map 5 of the London Plan?	AECOM	N. DeCarlo		1	Colour mapping provided
EEPAC	Working Group	118	3	58	2	not sure this needs to be retained. If so, use colour	AECOM	N. DeCarlo		1	Colour mapping provided
EEPAC	Working Group	119	3	59-76	3	is there a need to update references included in the glossaries and at the end? Otherwise, the criteria in general have been agreed to and there is no dispute that they have been workable	AECOM	N. DeCarlo		1	Glossaries and references will be consolidated for the final draft
EEPAC	Working Group	120	3	67	2,3	Is the OWES reference still current? Add to the application section, flood attenuations, retention and other modifications of nutrients and other chemicals in surface water, long term storage of atmospheric carbon dioxide, erosion control and groundwater recharge	AECOM	N. DeCarlo		1	This reference has been updated, to revisit adding these other variables however flood attenuation is likely covered under "water storage", groundwater recharge is already included, nutrient retention and modifications, as well as erosion control is likely covered under "water quality improvements". We can consider long-term carbon storage
EEPAC	Working Group	121	3	70	3	update this Criterion to include Significant Wildlife Habitat for Ecoregion 7E	AECOM	N. DeCarlo		1	Reference has been added.
EEPAC	Working Group	122	3	71	2,3	update DFO references that conclude the page. Another possible reference is AQUATIC ECOSYSTEM CLASSIFICATION FORTHE GREAT LAKES WATERSHED IN ONTARIO (2004)	AECOM	N. DeCarlo		3	Relevant fisheries and aquatic references have been added throughout
EEPAC	Working Group	123	3	72	4	Update rare plant list reference to : Oldham, M.J., and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. 188 pp.	AECOM	N. DeCarlo		1	Reference has been updated.
EEPAC	Working Group	124	3	72-73	3	update references. For example, there is an Nrank. Include in the reference list Significant Wildlife Habitat Technical Guide, October 2000, OMNR, in particular, Appendix M, Locations of known rare vegetation communities in Ontario	AECOM	N. DeCarlo		2	Rare vegetation communities have been addressed in Criterion 6. Refer to SWH Criteria Schedules for 7E (which provides sources to find up-to-date lists and locations of rare vegetation communities)
EEPAC	Working Group	125	3	74	2	replace Glossary with page 48-49 of 2014 PPS or most current version	AECOM	N. DeCarlo		3	Not applicable based on rework
EEPAC	Working Group	126	3	75	3	update reference list. Some may be found on EEPAC's list	AECOM	N. DeCarlo		1	References have been updated
EEPAC	Working Group	127	3	77	3	4.2 - not sure Review Areas are still used (see also Guideline 3).Not sure the other planning considerations mention here have ever been defined. Not sure why it says 'should' rather than must. See also 'should' in 3b, 5b and 8b-f	AECOM	N. DeCarlo		1	Review Areas has been updated within the document. Planning considerations have been clarified. As these guidelines have passed OMB, 'should' have been left in.

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EEPAC	**Working Group**	128	3	78-	2	if figures are used in the new version, update using software	AECOM	N. DeCarlo		1	Figures have been updated
EEPAC	**Working Group**	129	3	79	3	Beacon's buffer document refers to Critical Function Zones. This should be added to Guideline 1.	AECOM	N. DeCarlo		1	CFZs have been incorporated into Guideline 2 as they are wetland-specific based on the current literature (ECCC-CWS, 2013 - How much habitat is enough?).
EEPAC	**Working Group**	130	3	79	3	Revisions to Guideline 1 - Habitat zones must be included, in their entirety, within the patch boundary. Habitat zones which contribute to the successful evaluation of a patch as part of the Natural Heritage System, must be included in their entirety. Conditions: Habitat zones are requirements for - species at risk, - nationally, provincially, regionally, or locally rare species, - forest-interior or area-sensitive species - Conservation Priority bird species for Middlesex	AECOM	N. DeCarlo		1	This guideline has been updated and there have been examples incorporated for context (e.g., badger dens, vernal pools). Rare vegetation communities are covered in Guideline 4. The other recommended habitat zones are covered in the evaluation of significance and function (rare species, conservation priority species), etc.
EEPAC	**Working Group**	131	3	79	3	Revision to Guideline 2 - Rare to uncommon communities, locally, provincially, or nationally, must be included within the boundary. Rationale - Vegetation communities are important whether they are locally, provincially, or nationally rare or uncommon.	AECOM	N. DeCarlo		1	"Vegetation communities may be identified as rare to uncommon because of their limited distribution and occurrence within the country, province, or region."
EEPAC	**Working Group**	132	3	80	3	Revision to Guideline 3 - Projections of naturalized vegetation less than thirty metres (30 m) wide that extend from the main body of the patch: a) must be included within the boundary if the projection includes a wooded ravine or valley with untreed or successional habitat. Below the top-of-slope. b) should be included within the boundary if the projection provides strengthens linkage with another patch less than 100 m away, or between two portions of the same patch **or with a watercourse or wetland feature less than 100 m away** **c)must be included in the boundary if the projection lies below the maximum hazard line** **(EEPAC recommends that a graphic depicting scenario c) be added)** **d)must be included in the boundary if the projection is proximal to a Potential Naturalization Area or Potential Upland Corridor** **e) must be included in the boundary if the projection is located within a Carolinian Canada Big Picture Meta-Corridor** **(• The change in b) from 85 to 100 makes it consistent with woodland distances in Guideline #3 and #5.Scenario c) Applies the existing connection width requirements intuitively to the case where the watercourse is not immediately adjacent to the patch)**	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	**Working Group**	133	3	81	3	Guideline 4 - Watercourses: a) must be included within the boundary if the watercourse forms the boundary of the patch; and b) must be included within the boundary if the watercourse connects two or more patches within 85**100 metres or connects between two portions of the same patch** c) must be included within the boundary if the watercourse is i) a small watercourse and is within 30 m of the patch ii) a coldwater stream and is within 50 m of the patch iii) a larger river and within 100 m of the patch (EEPAC recommends that a graphic depicting scenario c) be added)	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	**Working Group**	134	3	82	3	5b - how is it determined that a satellite woodland contributes to diversity and ecological function? What are the data that would support or reject the hypothesis? There is certainly research supporting the retention of small woodlands, so this Guideline should be revised to say satellite woodlands must be included. Reference -Small patches make critical contributions to biodiversity conservation, David Lindenmayer, https://www.pnas.org/content/116/3/717 https://phys.org/news/2018-12-small-isolated-habitat-patches-crucial.html	AECOM	N. DeCarlo		3	The "Conditions" section outlines examples of contribution to ecological function. Further ecological significance and function can be determined on a case-by-case basis using a number of sources (e.g., NHRM) and the Section on evaluation of significance and function. These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.

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EEPAC	**Working Group**	135	3	82	3	Satellite woodlands that are small less than 2 ha and have a round to square shape, and are located within 100 m of a larger woodland patch: a) must be included within the boundary if the satellite contains rare species or significant communities b)should **must** be included within the boundary if they contribute to biological diversity and ecological function of the larger patch. **c) must be included within the boundary if they strengthen linkages to a permanent watercourse** **d) should be included within the boundary if they strengthen linkages between larger patches** **e) should be included within the boundary if they contain a watercourse or wetland feature** **f) must be included within the boundary if they are below the maximum hazard line** **g) must be included within the boundary if they are within a Carolinian Canada Big Picture Meta-Corridor** **(• All satellite woodlands within 100 m provide some form of benefit to the larger woodland, to connectivity and to the Natural Heritage system overall. Biodiversity is key to the long term integrity of all flora and fauna. Areas contributing to biodiversity must be preserved.)**	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	**Working Group**	136	3	83	3	Guideline 6 - Marshes, Thicket Swamps or other Untreed Wetland communities contiguous with a patch and greater than 0.2 ha in size that are relatively undisturbed and dominated by native species that are obligate or facultative wetland species (with a coefficient of wetness values of -3 to -5) must be included within the boundary if: a) the wetland is contiguous with the patch should be included in the boundary if: b) the wetland strengthens a linkage between natural areas by filling in a bay or connecting two or more patches; or c) the wetland is located above the top-of-slope of a stream corridor or ravine; or d) the wetland strengthens a linkage between connects a patch to and a permanent natural watercourse. (The lengthy qualifiers of the wetland are unnecessary. Wetland communities of all sizes and vegetative qualities provide important diversity and habitat and if they are contiguous with a vegetation patch, they must be included within the boundary.)	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	**Working Group**	137	3	84	3	**Add to Guideline 7:f) contribute to biological diversity and ecological function of the larger patch; or** **g) by their size and shape will, through natural succession, add to the amount of forest interior within the patch; or** **h) are below the maximum hazard line; or** **i) are proximal to identified Potential Naturalization Areas or Potential Upland Corridors; or** **j) are within a Carolinian Canada Big Picture Meta-Corridor**	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	**Working Group**	138	3	85	3	Plantations, including Christmas tree plantations, and abandoned orchards contiguous with patches of natural vegetation must be included in the boundary if the plantation or orchard: a) was originally established for the purposes of forest rehabilitation and/or has been managed towards a natural forest and/or has developed characteristics of a natural forest, such as natural regeneration of native species. A plantation should must be included in the boundary if it: b) minimizes edge effects to natural heritage features by providing a buffer between the feature and the surrounding land use; or c) strengthens internal linkages or reduces edge to area ratios by filling in bays; or d) connects a patch to a permanent watercourse; or e) it connects two or more patches; or f) it is below the top-of-slope in a stream corridor or ravine or is below the maximum hazard line g) is proximal to a Potential Naturalization Area or Potential Upland Corridor h) is located within a Carolinian Canada Big Picture Meta-Corridor i) by their size and shape will, through natural succession, add to the amount of forest interior within the patch • EEPAC's experience is that any "should" condition rarely gets followed. The only way to accomplish greater protection is to change "should" to "must". • The max hazard line is a current terminology and any plantation within any kind of hazard area is best included for both hazard protection and ecological protection. • It is not sensible to remove a plantation in an area already identified for rehabilitation plantings that would provide strong ecological benefit and/or linkage function. • The science behind Carolinian Canada's landscape level connectivity map is well accepted. There is strong ecological benefit for retaining and creating treed areas within these connective corridors. • The value of an existing plantation is not dependent on the proportion of the patch area it happens to occupy. Conifer plantations are accepted to be highly valuable wildlife cover and food sources.	AECOM	N. DeCarlo		3	These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.

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Reviewer Affiliation	Reviewer (F. Last name)	ID	EMG Section	Page	Type of Comment 1 - Policy 2 - Format 3 -Science 4 - Process	Comment and Suggested Action	Responder Affiliation2	Responder (F. Last name)2	Comment Status Green - Closed Yellow - In Progress Red - Open	Response 1 - Incorporated 2 - Not Incorporated 3 - Not Applicable	Response Comment2
EEPAC	Working Group	139	3	85	3	A Plantation must be included if it meets one of the criteria shown in 8b to 8f.'Should' is too vague.	AECOM	N. DeCarlo		1	Should has been updated to must where applicable through the Draft EMGs
EEPAC	Working Group	140	3	86	3	9b.Not sure what the word is before active pasture9c (which is labeled 9b) what is the definition of heavily managed??Why is the limit on size 1 ha? What happens if the amount of "managed" area has been expanded?	AECOM	N. DeCarlo		1	Word "ntried" removed, the one ha is for actively managed islands, whereas larger islands that are abandoned/rehabilitated may be included. These guidelines/criteria have been revised based on the London Plan, other policy (e.g., PPS), and pertinent scientific/technical documents (e.g., NHRM). Additional updates to these criteria are not being included at this time based on the underlying policy and the OMB defense of the guidelines. Figures will be updated for each of these criteria.
EEPAC	Working Group	141	3	86	3	Guideline 10 needs a drawing. The house at 1582 Commissioners Road W adjacent to Warbler Woods is a good example. Envelope needs to be reviewed. Need to distinguish between "envelopes" with buildings separately from those without.10a is vague. What are site specific considerations?	AECOM	N. DeCarlo		1	Envelope' language has been removed. Figures for each guidelines have been provided.
EEPAC	Working Group	142	3	86	3	an additional Guideline - Vegetation communities in areas of identified ground water recharge or watercourse headwater must be included in the boundary.(Groundwater recharge and headwater areas are important for water quality and quantity.)	AECOM	N. DeCarlo		2	Covered in Criterion 1.1
EEPAC	Working Group	143	3	87	3	habitat zone requirements can be updated .A good source is Categorizing and Protecting Habitat under the Endangered Species Act, (Ontario 2012).	AECOM	N. DeCarlo		2	This source has been considered and protection of habitat zones has been included.
EEPAC	Working Group	144	3	87-89	2,3	update references. See EEPAC list	AECOM	N. DeCarlo		1	Glossary updated.
EEPAC	Working Group	145	3	89	2	there is no section 4.0 - renumber if retain	AECOM	N. DeCarlo		1	Sections reworked/renumbered during compilation.
EEPAC	Working Group	146	3	91	2	consider deleting. Is Review Area used? What was the science behind making parts optional? This section seems inconsistent with the rest of the Guideline and is rife with subjective comments.	AECOM	N. DeCarlo		1	We have kept this in the document, however wording has been updated to remove subjectivity.
EEPAC	Working Group	147	3	92	2	is this still needed? For example, an EMS was not in SWAP. They aren't in Secondary Plans either. The last Secondary Plan EEPAC reviewed came with a Subject Lands Status Report, not an EIS.	AECOM	N. DeCarlo		3	This section is solely based around the planning process for the determination/listing of new ESAs.
EEPAC	Working Group	148	4	95	1	the only change is updating references and technical amendments to update references to the current London Plan from the previous OP, the current PPS, etc.).This Guideline has been adjudicated at the OMB and the courts. It should not be opened up again.	AECOM	N. DeCarlo		1	Technical and policy updates have been incorporated throughout this section where possible.
EEPAC	Working Group	149	5		3	Guidelines for Determining Setbacks and Ecological Buffers shall include all applicable and viable information that in all required details will identified all ecological/environmental functions and featured of the subject ESA and adjacent areas and environmental/ecological relations to the existing subwatershed studies and environmental criteria established in this sub watershed. Also shall determine all required measures to protect and maintain the existing level of protection of the existing environmental/ecological functions and features and be supported by ecological and environmental monitoring.	AECOM	N. DeCarlo		1	All evaluation of significance and function, along with all other background information required to inform the determination and implementation of buffers has been addressed prior to this, as well as a new section on monitoring. Flow charts throughout address the process.

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EEPAC	Working Group	150	5	117	3	Beacon 2012 should be used to update this Guideline	AECOM	N. DeCarlo		1	Beacon 2012 was used throughout this section to inform updates.
EEPAC	Working Group	151	5	118	3	While these terms are often used interchangeably, setbacks and buffers are not the same thing. A setback is the separation distance required between a natural feature (or hazard) and a project area, to prevent impacts from occurring to either the feature or the project. It is sometimes referred to as the development limit. Buffers are areas of natural vegetation that serve to attenuate and otherwise reduce impacts on the natural feature and its functions. They may occupy part or all of a given setback distance, or may extend beyond the setback if the adjacent land use allows (e.g., passive park features, golf course roughs, undeveloped portions of private properties).	AECOM	N. DeCarlo		1	No longer used interchangeably. Setback vs buffer will be defined in the glossary.
EEPAC	Working Group	152	5	121	4	is this process still in use? Standardized? What is a management unit? Undefined!	AECOM	N. DeCarlo		1	This has been omitted.
EEPAC	Working Group	153	5	124	3	Add here or page 126 under encroachment: McWilliam's work, e.g. Barriers to the effective planning and management of residential encroachment within urban forest edges: A Southern Ontario, Canada Case Study, Wendy McWilliam ,Robert Brown, Paul Eagles , Mark Seasons, published in 2013 in Urban Forestry & Urban Greening(See EEPAC list of sources for other publications)	AECOM	N. DeCarlo		1	McWilliam et al. (and associated literature) have been reviewed and incorporated into the new buffer section. Specifically referring to encroachment.
EEPAC	Working Group	154	5	127	2	is this helpful? Delete?	AECOM	N. DeCarlo		1	This table has been omitted
EEPAC	Working Group	155	5	128-129	3,4	not sure this is used or what the science behind it was. Use Beacon 2012 instead	AECOM	N. DeCarlo		1	This table has been omitted.
EEPAC	Working Group	156	6	131	3	2.1 - only native species must be used	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using Can Plant and be confirmed through the review process.
EEPAC	Working Group	157	6	132	3	2.2 - refer to London's Invasive Species Management Plan	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using CanPlant and be confirmed through the review process.
EEPAC	Working Group	158	6	131	2	EMG section 6 is well documents to avoid monoculture and select suitable plants. This section can be further improved. (a) Currently technology or concepts to explicitly deal with spatial heterogeneity is available, so landscape mosaic could be tailored to suite local niches, using precise data and modeling. Reference: Principles of Landscape Ecology , By: William R. Clark (Department of Ecology, Evolution, and Organismal Biology, Iowa State University) © 2010 Nature Education Citation: Clark, W. (2010) Principles of Landscape Ecology. Nature Education Knowledge 3(10):34; (b) Taking into consideration the complex nature of interaction among flora, fauna, microbes and changing environment, EMG -6 could be further refined to tackle future challenges. e.g. How native plants can be a growing ground for invasive pathogens Reference: 1. Peter Kotanen research at University of Toronto 2.Crous CJ, Burgess TI, Le Roux JJ, Richardson DM, Slippers B, Wingfield MJ. Ecological disequilibrium drives insect pest and pathogen accumulation in non-native trees. AoB Plants. 2016 Dec 23;9(1):plw081. doi: 10.1093/aobpla/plw081. [Epub ahead of print]. PMID: 28013250; PMCID: PMC5499825.	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using CanPlant and be confirmed through the review process.
EEPAC	Working Group	159	6	132	4	Update Planting Recommendation: List of woody plants: Due to climate change, taxonomic updates and more data about selected plants, some may not be suitable for London. Please revisit. There are current databases e.g.: http://www.torontozoo.com/adoptapond/urbanoutback/part53.html	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using CanPlant and be confirmed through the review process.
EEPAC	Working Group	160	6	132	4	For current plant taxonomy information: https://www.uoguelph.ca/foibis/ The list is also published as a book with additional information as the “Flora Ontario” by Newmaster and Ragupathy 2012, which can be ordered by contacting Dr Newmaster (snewmast@uoguelph.ca)	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using CanPlant and be confirmed through the review process.

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EEPAC	**Working Group**	161	6	135	3	delete Manitoba Maple?	AECOM	N. DeCarlo		3	This section has been removed from the document, plant selection will be conducted using CanPlant and be confirmed through the review process.
Nature London	**D. Wake**	1	ToR General / Timeline	-	4	The Environmental Management Guidelines are but one of a series of documents required to implement the policies of the Official Plan. Although we are eager to see the guidelines updated soon, we wonder whether this is the right time to review them, given the ongoing appeals of the London Plan. This review process needs to include provisions for further refinement of the EMG following resolution of the appeal process.	AECOM	N. DeCarlo		1	Language has been incorporated to ensure the ease of updating the EMGs document as well as allowing for refinement at a later date (following the appeals process)
Urban League	**J. Hanbuch**	1	ToR	-	3	While butterflies are listed, all pollinators need to be considered as part of a study (native bee habitats in particular - 700 types in Canada, moths, beetles and wasps are all pollinators and need protection from pesticide drift in particular - this means widening buffer zones and protecting significant pollinator habitats) meadow biotopes must be included in the terms of reference	AECOM	N. DeCarlo		1	Pollinators have been considered for buffer design; Additional consideration for other insect studies has been included in the data collection standards. Species at Risk pollinators would be identified through the background review (e.g., bees). Meadows have little protection through policy however, meadows critical to ecological function will be identified through inclusion in vegetation patches for significant woodland/ESA
Urban League	**J. Hanbuch**	2		2	3	2.3 Assessment of Dev Impacts must begin to include smaller areas - current research indicates that small " stepping stone" environments significantly impact birds, insects and contribute to heat reduction in cities (see Fernandez,Wu and Simonetti 2018)	AECOM	N. DeCarlo		1	Stepping stone or satellite woodlands are considered for inclusion in significant woodland evaluation. Other size criteria are based on most up to date technical, scientific, and policy documents. The importance of small (satellite) woodlands is outlined in Guideline 7 for determining components for inclusion in vegetation patches.
Urban League	**J. Hanbuch**	3		13	3	LU7 - ALL loss of flora has significant impact on birds, insects (in particular pollinators) a pollinator policy needs to be developed by London (see Hamilton and Toronto) that serves as an additional resource to this policy	AECOM	N. DeCarlo		3	This table outlining impacts has been replaced with reference to more up-to-date documents (Natural Heritage Reference Manual Table; Significant Wildlife Habitat Mitigation Support Tool)
Urban League	**J. Hanbuch**	4		13	3	RO5- road salt damage has a starting minimum of 30 m - should be 50 m and include wind drift variables (see Harless 2012)	AECOM	N. DeCarlo		3	This table outlining impacts has been replaced with reference to more up-to-date documents (Natural Heritage Reference Manual Table; Significant Wildlife Habitat Mitigation Support Tool)
Urban League	**J. Hanbuch**	5		13	3	R10 - light /noise damage needs to be specific all species in SW not are 1.5 k from any road already -i.e. Herons need a minimum of 100 m to nest successfully , diversity of wetlands is significantly changed within 1000m of any roadwork (Findlay 2000) The Buffer Zone information is out of date - the new standards should be used. For example - edge microclimates on page 39 mentions sun is a factor but in the checklists this isn't mentioned. In the current research on buffer zones light needs to be measured. (Beacon 2012) Also, bats , insects and other nocturnal creatures are heavily affected by ALAN. No mention of how canopy protection mitigates these issues.	AECOM	N. DeCarlo		3	This table outlining impacts has been replaced with reference to more up-to-date documents (Natural Heritage Reference Manual Table; Significant Wildlife Habitat Mitigation Support Tool)
Urban League	**J. Hanbuch**	6		32	4	Aggregate resources come under human considerations - not sure why they are here - understand their economic benefit to sewer and water main companies with aggregate mining but why would we destroy natural areas for aggregate pits	AECOM	N. DeCarlo		3	Not applicable for the Draft EMGs.

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Urban League	J. Hanbuch	7		43	3	As per the City of Ottawa's tree protection policy, drip line needs to be changed to Critical root zone (CRZ) or whichever is greater - conifers, for example have small canopies but a much greater CRZ - with die back only evident sometimes after 3-5 years . Maintenance of protected trees needs to be specifically outlined in the report if they are part of new development areas.	AECOM	N. DeCarlo		2	Drip line was maintained as the boundary for woodlands based on the majority of other municipalities polices, City of London Tree Protection By-law.
Urban League	J. Hanbuch	8		overall	4	Development of better assessment format than checklists - more transparent - a decision tree model. See City of Barrie Environmental Impact Study reports 2017	AECOM	N. DeCarlo		1	An overall flow chart, and flow charts for each section will be incorporated to guide users and improve usability.
Urban League	J. Hanbuch	9		overall	4	Monitoring needs to be specifically laid out - responsibilities for monitoring, longer timelines for environmental impact assessments including post monitoring to assist with future decision making. A contingency plan for difficulties during monitoring needs to be developed.	AECOM	N. DeCarlo		1	New sections on monitoring, compensation has been drafted addressing this comment.
Urban League	J. Hanbuch	10		overall	4	Clear objectives for protection laid out at the front of the guideline , clear objectives for improving the environment (i.e. - improvement of corridors, increase in stepping stone areas)	AECOM	N. DeCarlo		1	Clear objectives for the City of London's NHS (from The London Plan) are outlined in the text and used to guide this document.
Urban League	J. Hanbuch	11		overall	4	City of Waterloo includes all areas (Woolwich county etc....) in their environmental impact planning - including maps so a picture emerges of the region - again this goes back to my earlier concern that London is siloing the impact of urban development.	AECOM	N. DeCarlo		3	I believe this is referring to the "Region of Waterloo" which is a regional (upper-tier) municipality, whereas the City of London is a single-tier municipality (situated within Middlesex County)
UTRCA	C. Creighton	1	All sections			We recommend that much of the background information be organized into Appendices in order to keep the main document concise with procedural steps.	AECOM	N. DeCarlo		1	This has been attempted throughout without compromising the readability and flow of the document.
UTRCA	C. Creighton	2	1			It appears that there is not much consideration of the TART members with respect to determining the advancement of the process. Some statements pertaining to the sign off from the TART rather than just the City of London is required.	AECOM	N. DeCarlo		1	The role of the TRT is outlined in the document including pre-consultation, site visit, ongoing consultation, etc..
UTRCA	C. Creighton	3	All sections			The focus should be on net gain, rather than on rehabilitation or avoidance. The document should include planting ratios and theory as to how to achieve a net gain (e.g. diversification, bulking up remaining features, connectivity and linkages, etc.).	AECOM	N. DeCarlo		1	The new compensation/offsetting section outlines encouragement for moving towards net environmental gain, however the current structure of the City of London's Policy focuses on No Net Loss for wetlands and no negative impacts. With regards to infrastructure, avoidance is prioritized.
UTRCA	C. Creighton	4	All sections			The focus of the analysis should be on the catchment boundaries for wetlands in order to determine the impacts of adjacent land uses rather than setting a prescribed distance.	AECOM	N. DeCarlo		2	The focus for wetlands has been shifted to Critical Function Zones (Env. Canada, 2013). However, considerations for hydrology, hydroG, geomorph, etc. have been included in Sections 2.1, 2.6.5, and the ESSC
UTRCA	C. Creighton	5	All sections			Please incorporate more detail regarding the hydrogeological requirements / standards into the document especially with respect to protecting wetland features and their functions.	AECOM	N. DeCarlo		1	considerations for hydrology, hydroG, geomorph, etc. have been included in Sections 2.1, 2.6.5, and the ESSC. However, the requirements will be determined on a case-by-case basis.
UTRCA	C. Creighton	6	All sections			Please include definitions for “adequate" or "reasonable" buffer; "reasonably expected"; "thresholds", "compensations" as these terms are somewhat ambiguous and may be open to interpretation.	AECOM	N. DeCarlo		3	The buffer section has been completely revamped with an aim at removing ambiguity and providing a more standard methodology for determining buffer widths, while maintaining flexibility on a case-by-case basis.
UTRCA	C. Creighton	7	1	17		What is the science behind Table 1: Potential Impacts associated with different land uses?	AECOM	N. DeCarlo		1	This table has been omitted. Reference to defensible (NHRM, SWHMiST) impact assessment guidance documents has been made.
UTRCA	C. Creighton	8	ToR			Beacon noted that Sections 1, 2 & 5 provided a good process. Other than policy updates or references, will these Sections be revised?	AECOM	N. DeCarlo		1	Where possible, each of these sections have been reviewed beyond policy and reference updates, specifically Section 5 has been completely reworked.
UTRCA	C. Creighton	9	ToR			Will new Sections be created to deal with monitoring and ecological compensation (e.g. wetlands, woodlands)?	AECOM	N. DeCarlo		1	New sections on monitoring and compensation have been drafted addressing this comment.

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UTRCA	C. Creighton	10	ToR			In the proposed revisions for the PPS (Draft 2019) climate change is referenced extensively. Consider including more references to climate change in the EMGs	AECOM	N. DeCarlo		1	Climate change has been incorporated as a consideration into the updated EMGs, however there is little policy support for implementation. Reference to applicable City climate reports and tools will be made once those documents are approved.
UTRCA	C. Creighton	11	ToR			Recommend that when environmental studies (e.g. EIS, hydrogeo) that they be prepared for the entire site rather than a piecemeal/phase approach.	AECOM	N. DeCarlo		3	Altering the structure of the reporting processes for the City of London falls out of the scope of this update as the EMGs are a tool to implement policy.
UTRCA	C. Creighton	12	ToR			Scope of Work - consider expanding the document review to include documents dealing with monitoring and ecological compensation.	AECOM	N. DeCarlo		1	New sections on monitoring and compensation have been drafted addressing this comment.
UTRCA	C. Creighton	13	ToR			Timeline and Deliverables - the text is a bit confusing. Consider adding a table/figure that sets out the milestones and opportunities for commenting.	AECOM	N. DeCarlo		3	I believe this is referring to the RFP
UTRCA	C. Creighton	14	All sections			Add page numbers and headers and footers. Have a cover and table of contents.	AECOM	N. DeCarlo		1	Incorporated
UTRCA	C. Creighton	15	All sections			How do other technical studies e.g. hydrogeo and geotechnical fit into the process?	AECOM	N. DeCarlo		1	Although not the focus of these EMGs, the need for other technical studies (e.g., hydrogeology, Geotech) are mentioned in Section 1 - Introduction and Section 2 - Guidelines for the Preparation and Review of Environmental Studies. This includes pre-consultation where the requirement for these related technical studies will be determined with the City of London and the applicable Conservation Authority.
UTRCA	C. Creighton	16	All sections			How will information in addendums be incorporated? As an appendix? Into the body of the report?	AECOM	N. DeCarlo		1	The SLSR/EIS process has been revised and outlined in Section 2.
UTRCA	C. Creighton	17	All sections			Consider having one glossary for the entire document.	AECOM	N. DeCarlo		1	The updated EMGs will have one glossary for the entire document.
UTRCA	C. Creighton	18	All sections			Should all EIS recommendations be listed as conditions of draft plan approval? What happens if the EIS is not finalized until the Design Studies stage?	AECOM	N. DeCarlo		1	Addressed in Section 2.6.5 - Report Requirements
UTRCA	C. Creighton	19	All sections			How do you deal with a phased development? Recommend that technical reports be prepared for the entire site rather than on a piecemeal basis.	AECOM	N. DeCarlo		1	Scope of EIS shall be for the entire site, with addendums on subsequent phases as the development progresses.
UTRCA	C. Creighton	20	All sections			Approach regarding natural heritage - is it no negative impact? No net loss? Net benefit or gain?	AECOM	N. DeCarlo		1	The approach mirrors that of the London Plan, for which much of the policies are directly related to 'no negative impacts' as outlined in the PPS and net environmental gain. With regards to wetlands, The London Plan (Policy 1334) states that there should be 'no net loss' to feature or functions. Further, replacement ratios for compensation are at minimum 1:1, which aims for no net loss (on a land base area), with larger replacement ratios recommended in the new compensation section to encourage net gain.
UTRCA	C. Creighton	21	All sections			Update policy references - London Plan, PPS.	AECOM	N. DeCarlo		1	Policy references updated throughout.

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UTRCA	**C. Creighton**	22	All sections			Is the EIS only assessing significant features? London Plan protects all wetlands.	AECOM	N. DeCarlo		1	The updated guidelines outlines the identification, delineation, and evaluation of the components of a natural heritage system, specifically based around the designations and protection requirements outlined in the LP and other applicable policy.
UTRCA	**C. Creighton**	23	All sections			Are any impacts on the natural heritage system considered to be acceptable?	AECOM	N. DeCarlo		1	In terms of natural heritage, some negative impacts (and positive impacts) MAY be considered acceptable on a case-by-case basis. As the City of London has development goals, some negligible/temporary/low impacts may be tolerated depending on the applicable policies (e.g., PPS, ESA, etc.), sensitivity of the feature and its associated function, etc., as determined through the EIS process.
UTRCA	**C. Creighton**	24	All sections			Use consistent terminology to describe the natural heritage system.	AECOM	N. DeCarlo		1	Attempted to standardize terminology related to the NHS to avoid confusion throughout.
UTRCA	**C. Creighton**	25	All sections			Is a drainage corridor a watercourse? It sounds more like infrastructure than a natural feature.	AECOM	N. DeCarlo		1	Watercourse definition updated to cover the varying qualifying features depending on the legislation/application/etc.
UTRCA	**C. Creighton**	26	All sections			Table A - are the distances current?	AECOM	N. DeCarlo		1	This table has been updated in Section 2.6.2.
UTRCA	**C. Creighton**	27	All sections			Issue Summary checklist - the 2 box approach has always been a bit confusing. Simplify?	AECOM	N. DeCarlo		1	Addressed in new ESSC.
UTRCA	**C. Creighton**	28	All sections			Issue Summary checklist - how do you ensure that the applicant completes the list? Don't schedule the scoping meeting until the list has been completed?	AECOM	N. DeCarlo		1	Checklist updated to ESSC and scoping/checklist requirements outlined in Section 2.2.
UTRCA	**C. Creighton**	29	All sections			What if an agency does not agree with the waiving for the need of an EIS? What is the process?	AECOM	N. DeCarlo		2	In general, this occurs through policy or maximum buffer implementation. There is no process for this however waiving of the EIS is left solely to the City of London in consultation with TRT members - to be determined on a case-by-case basis. Other agencies are free to work within their own processes and requirements in situations where agreement cannot be established.
UTRCA	**C. Creighton**	30	All sections			Site visit - has been very beneficial and should be strongly encouraged.	AECOM	N. DeCarlo		1	Section 2.2.2 outlines that site visits may be required as part of or following the scoping meeting.
UTRCA	**C. Creighton**	31	All sections			Scoped EIS - how are "adequate" buffers determined? Beacon Report speaks to variable sizes of the buffers in the 9 developments that were studied. Should there be an absolute minimum size? 10 m?	AECOM	N. DeCarlo		1	The buffer section has been completely revamped with an aim at removing ambiguity and providing a more standard methodology for determining buffer widths, while maintaining flexibility on a case-by-case basis. This updated section includes minimum buffers.
UTRCA	**C. Creighton**	32	All sections			Boundary Guidelines - available from the Planning Dept - consider including as an appendix.	AECOM	N. DeCarlo		1	Boundary delineation guidelines have been addressed within the Draft EMGs
UTRCA	**C. Creighton**	33	All sections			Land Use Management - add salt - pools, driveways, sidewalks	AECOM	N. DeCarlo		3	Land use management revised throughout the draft EMGs

External Resource and First Nation Comments							AECOM/City Response				
Reviewer Affiliation	Reviewer (F. Last name)	ID	EMG Section	Page	Type of Comment 1 - Policy 2 - Format 3 -Science 4 - Process	Comment and Suggested Action	Responder Affiliation2	Responder (F. Last name)2	Comment Status Green - Closed Yellow - In Progress Red - Open	Response 1 - Incorporated 2 - Not Incorporated 3 - Not Applicable	Response Comment2
UTRCA	C. Creighton	34	All sections			What is a reasonable buffer? Beacon Report noted that in some developments there was no buffer.	AECOM	N. DeCarlo		1	The buffer section has been completely revamped with an aim at removing ambiguity and providing a more standard methodology for determining buffer widths, while maintaining flexibility on a case-by-case basis. This updated section includes minimum buffers.
UTRCA	C. Creighton	35	All sections			mitigation Measures - some of them - swm measures, pathways and trails should be located in the additional setback outside of the buffer.	AECOM	N. DeCarlo		1	The updated buffer section includes information on what land-uses cannot be used within the buffer. Mitigation measures tables have been removed and replaced with reference to the Natural Heritage Reference Manual and the SWH Mitigation Support Tool.
UTRCA	C. Creighton	36	All sections			Compensation - need a policy.	AECOM	N. DeCarlo		1	Section 6 - Compensation has been added to the EMGs.
UTRCA	C. Creighton	37	All sections			Woodlot vs woodland?	AECOM	N. DeCarlo		1	Woodland has been clearly defined within the updated EMGs.
UTRCA	C. Creighton	38	All sections			Monitoring - standard protocol - pre, during and post construction? Required for all new development?	AECOM	N. DeCarlo		1	Section 7 - Monitoring has been added to the EMGs to try and standardize monitoring protocol (with some flexibility for site variability, etc.).
UTRCA	C. Creighton	39	All sections			Mitigation measures - trail development - as long as it is located outside of the buffer in the additional setback.	AECOM	N. DeCarlo		1	The updated buffer section includes information on what land-uses cannot be used within the buffer. Mitigation measures tables have been removed and replaced with reference to the Natural Heritage Reference Manual and the SWH Mitigation Support Tool.
UTRCA	C. Creighton	40	All sections				AECOM	N. DeCarlo		3	No comment provided (referred to initial comment email)
UTRCA	C. Creighton	41	All sections			Issue Summary Checklist - update the references to natural hazards - riverine flooding hazard, riverine erosion hazard, wetlands, regulated area.	AECOM	N. DeCarlo		1	This has been addressed in the updated ESSC and Draft EMGs
UTRCA	C. Creighton	42	All sections			Ecological Buffer Zone from a watercourse - 15-30 m - clarify that in the case of a warm water watercourse a 15 m buffer on each side of the bank is required and that 30 m on each side of the bank is required for a cold water watercourse.	AECOM	N. DeCarlo		1	Section 5.3.2 Table 5.2 outlines this. Further in boundary delineation. Further, additional corridor widths are outlined in Section 4.3 when considering the inclusion of a watercourse and its associated corridor width for inclusion within a vegetation patch
UTRCA	C. Creighton	43	All sections			setback and buffer limits should be clearly marked on all plans including those used during construction and should be staked in the field	AECOM	N. DeCarlo		1	Addressed in Section 2.6.5 - Report Requirements as a recommendation for detailed design and in Section 5.

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LDI	M. Wallace	1	1		4	**Comment:** Since the Guidelines were adopted in January 2007, at a provincial level, the Provincial Policy Statement, Technical Schedules, Conservation Authorities Act, and the Endangered Species Act have all changed. Locally the development application and review process has also been adjusted; and continues to evolve. Meanwhile the roles and responsibilities of provincial agencies and Conservation Authorities are being scrutinized with the changes forthcoming. Notwithstanding the obvious need to modernize the EMGs to reflect all the plan review changes, a more streamlined approach to the submission and review process is also sorely needed. Currently, an EIS report is submitted and reviewed by three formal entities in London; City, UTRCA, and EEPAC. Comments are provided by each with an expectation of a response to each, despite the same EMG document as reference. **Suggestion:** Comments associated with the City Official Plan and EMG document need to be vetted and circulated through one entity	AECOM	N. DeCarlo		1	The process of EIS review will remain unchanged.
LDI	M. Wallace	2	1		4	**Comment:** The UTRCA also provides comment from their regulatory perspective related to hazard management (flooding, erosion, and wetland interference) along with their assigned role in source water protection. Their multiple roles create issues in the early stages of the planning process as the expectation of a sign off through the regulatory permit process requires more detail than is available at this early stage in the process. Their letter format also obscures comments requiring resolution before proceeding to the next phase and those that are recommendations to move through detailed design. **Suggestion:** The UTRCA planning comments should be guided in the EMG document.	AECOM	N. DeCarlo		1	The UTRCA role in plan review is outlined in UTRCA documents, and in Section 2 as part of the TRT. Additional outline of this role will not be included in the EMGs.
LDI	M. Wallace	3	1		1	I would also like to highlight an issue for discussion and clarification through this process regarding the future City of London EMG. We believe a discussion of LPAT Case # PL170840 (December 24, 2019) should be included at some point during this review to better differentiate between natural heritage features and man-made features in the current future City of London EMG.	AECOM	N. DeCarlo		3	This comment is out of scope for the updated EMGs.
LDI	M. Wallace	4	1		4	**Comment:** As part of the Planning Act, a complete application is needed following pre-consultation. Generally, this was, in part, to avoid "pre-approvals" before all agencies and departments have had the chance to comment. Yet, the EMG is written in such a way that features, sensitivities, and avoidance measures need to be approved before a report is submitted in the complete application queue. **Suggestion:** The EMG needs to be re-written to respect the complete application and appeal mechanisms associated with Planning Act.	AECOM	N. DeCarlo		1	Detailed guidelines for the application process have been outline in Section 2 of the EMGs.

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LDI	**M. Wallace**	5	1		4	**Comment:** From a technical perspective, expectations have also evolved. Compared to the EIS's of 2007, additional disciplines (specifically hydrology and water balance) provide supporting documentation which is then incorporated into the EIS. This leads to numerous cross discipline comments in the EIS and supporting document review responses. Additionally, as the development proceeds from draft approval to detailed design to subdivision agreements, full EIS report addendums are expected. Documentation and tracking of comment incorporation for future file reference has become... cumbersome. **Suggestion:** Separate reports, for each phase of submission, would improve the review and documentation and oversight as well as allow the supporting technical disciplines to gather more detail and refinement to better inform the next phase of the planning process submission. Recommendations from the Draft Approval report can be brought forward to a design studies report and any adjustments to the plans through detail design can be addressed without revisions to the earlier EIS. Similarly, as the plan moves from design studies to subdivision agreements.	AECOM	N. DeCarlo		2	Scope of EIS shall be for the entire site, with addendums on subsequent phases as the development progresses. Alternate opportunities for phasing could be explored; further discussion may be required.
LDI	**M. Wallace**	6	1		4	**Comment:** Clarity is needed in determining when an Area Plan, Secondary Plan, and Subject Lands Status Report (SLSR) are needed. Each site should not have to undertake all these studies as seems to be the case in London. The above studies should be to implement substantial Official Plan amendments (i.e., Agriculture to Urban Uses) at a large land base scale or, in the instance of an SLSR, to implement a similarly large OPA when an Area Plan or Secondary Plan is not available nor imminent. An EIS, on the other hand, is a document that provides OPA refinements or adjustments and zoning amendment support. **Suggestion:** As discussed previously, if reports were treated as separate documents, a detailed design studies EIS report would then provide refinements as a result of detail design	AECOM	N. DeCarlo		1	Clarity on when SLSR, EIS, Scoped EIS are required (and when they are not) has been included within the updated EMGs. The checklist has been updated and acts as the ToR creating a more streamlined process.
LDI	**M. Wallace**	7	1		4	**Comment:** Scoping meetings are a requirement of the EIS process. These meetings are often difficult to organize, and meeting minutes are often months delayed with no formal signoff often occurring within the process. Furthermore, the reality of when landowners begin the process does not often correspond well with the very formal and iterative process suggested by the current EMG. As a result, full inventories are often complete prior to initiation or formalization of the minutes. Certainly, most sites now have a very standard set of requirements and as such, the scoping process often results in agreement on what was already underway. **Suggestion:** Create a more streamlined pre-consultation process. MTE has developed a one-page checklist for other jurisdictions that, when circulated with a graphic and covering letter, results in quick agreement from agencies. A similar approach could be implemented in London. Meetings would then only need to be called for circumstances when there is disagreement on the scope or approach. Meetings are more appropriate and effective after data and analysis has taken place.	AECOM	N. DeCarlo		1	AECOM has explored the use of a single-page checklist, however it has been decided to update the current issues summary checklist to make the process more streamlined, efficient, and effective. The formal pre-consultation meeting was retained as a way to effectively scope the EIS to ensure that unnecessary fieldwork, addendums, etc. are avoided.
LDI	**M. Wallace**	8	1		3	**Comment:** The level of detail for development submissions has markedly expanded to include hydrogeological investigations, Low Impact Development, feature-based water balance studies, to name a few. Our knowledge of potential impacts and mitigation with more and more sophisticated models and water management approaches has removed much of the uncertainty that was inherent in development applications when the first set of guidelines was released. **Suggestion:** Acknowledge the higher level of detail and understanding in the EMG.	AECOM	N. DeCarlo		1	Reference to the incorporation of and use of information from hydrogeological, geotechnical, etc. other studies has been included and are important for the impact assessment and mitigation. Although these studies are included, in-depth descriptions were not included to maintain the Natural Heritage focus of the EMGs.

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LDI	**M. Wallace**	9	2,3,4,5		3	**Comment:** The guidelines within the EMG tend to lump any vegetation that is not lawn or in the agricultural cultivation as a single vegetative unit for evaluation. Within that unit, there can be sensitive, tolerant, and highly disturbed that get lost in the guideline format. Some habitat types are providing protection to more internal features or existing disturbances are impacting sensitive features or restricting a feature from being more important. Further, some impacted habitat (invasion, trails, garbage dumps, forts etc.) could be re-naturalized to improve conditions rather than protecting these circumstances and then expecting additional buffers to an already degraded site. Not only does the current process obscure these sensitivity differences within a feature but also between features. An old growth forest and buckthorn dominated thicket could both be labelled Significant Woodlands, yet they are very different features in their biological makeup and resiliency to adjacent land use changes. **Suggestion:** Some realistic guidelines are needed to help define the habitat types and sensitivities along with opportunities for improved natural heritage, perhaps even in lieu of additional setback.	AECOM	N. DeCarlo		1	Updated buffer, evaluation, and boundary delineation guidelines were included in the EMGs to better define natural heritage features and areas and to improve the science in determining buffer widths. These updates provide more focus on ecological function so that features can be defined and evaluated based on their role in the City of London's Natural Heritage System.
LDI	**M. Wallace**	10	2,3,4		3	**Comment:** Sizes of features for evaluation that are not mapped should also be revisited. A 0.5 ha patch is very small and not ecologically significant on its own unless there are some highly unusual circumstances. It is our view this additional look was aimed at features that lay near more substantial habitat rather than any and all isolated unmaintained areas. This size of unmapped feature requiring study needs to be further developed and based on science. **Suggestion:** Revise the minimum size of patch size evaluation and location for unmapped features to be evaluated.	AECOM	N. DeCarlo		3	This would require an update to the policies in the London Plan and is thus out-of-scope for the updated EMGs.
LDI	**M. Wallace**	11	1,2,3,4		3,4	**Comment:** Guidelines for Woodland Evaluation, use extremely low cut-offs and filters in the scoring system to determine significance as discussed below. This scoring system was targeted towards large features already identified as potentially significant, and, from my perspective, likely designed to make them, or a vast majority, significant. To then apply this same scoring structure on unmapped features is contrary to the stated intent of the guidelines are technically unreasonable. For example, several mature trees close together within fallow lands scores a High for Significance (guideline 2.1a), making the entire fallow land a Significant Woodland with almost no trees. More absurdly, a small patch of land left fallow for a year that is an area with more than 10% cover scores High (guideline 1.2a) and as a result, this fallow land can be a Significant Woodland without any trees at all. Implications to wholesale changes to previously approved land use and installed infrastructure, based on an unintended use of the guideline document on unidentified features needs to be duly considered when compared to evaluation of sites with known and fully public natural heritage recognition. **Suggestion:** Ensure the EMG clearly states that other measures of significance will be used to assess unmapped features.	AECOM	N. DeCarlo		2	As the Significant Woodland Evaluation Guidelines have passed through the OMB, changes to cutoffs and filters not directly supported through changes in policy were not incorporated. The evaluation of significance is outlined through policy in the London Plan and therefore other methods of evaluating significance for Significant Woodlands have not been incorporated. Clarity has been provided on evaluating significance and ecological function of different natural heritage features and areas (e.g., habitat of endangered and threatened species, etc.).

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LDI	M. Wallace	12	5		3,4	**Comment:** The Buffer calculation model has always been an option for use as specifically noted in the guideline. "The model can be used to help gauge the range of buffer that needs to be considered" pg. 121. This model results in large buffers distances that are rarely translated into actual development setbacks, suggesting its utility is limited. The calculation itself, when broken down by component is only somewhat logical from a perspective of the actual site clearing for land development (i.e. erosion related to construction) and has very little bearing on end use. For example, in the model, lands that have 10% slope suggests a range of a 2-5m buffer, while a site with 11% slope is 5-10m with no explanation for the difference the 1% extra slope poses to a feature. Presumably the lower score is if land slopes away from the feature and larger if it slopes towards. However, post-development, most land runoff is directed to stormwater management systems and rear yard slopes are almost immaterial to the feature protection. Overall, the buffers are particularly focused on rear lot setbacks to keep people that back onto a feature, out. Yet, the City then often introduces trails through the features to provide access for the entire remainder of the City. For the record, we generally support trail systems through features in an urban setting to limit indiscriminate trails and to provide educational benefits as well as closer lot limits for the same reasons. Buffer research and its effectiveness has not been well researched and there are other practical supportable mechanisms which need to be considered and encouraged. Given that buffers themselves are not proven to be fully effective, we should be open to trying other methods as well. Public education and engagement can be extremely effective if taken seriously and managed appropriately. **Suggestion:** Remove the model and provide a more fulsome review of buffer effectiveness and more specifically, alternatives.	AECOM	N. DeCarlo		1	The buffer section of the EMGs has been reworked with updated scientific research and methodology for determining buffer widths. A compensation section has also been added to provide a standardized and streamlined approach to implementing compensation/offsetting.
LDI	M. Wallace	13	1,2		4	**Comment:** Guideline documents and evaluation tools have been developed to guide site sensitivity assessment. The PPS only affords absolute constraints to development from Provincially Significant Wetlands and Coastal Wetlands. To be consistent with the PPS, other components of the Natural Heritage System should not be assessed as absolute constraints as seems to be the current practice in London. The determination for a site sensitivity should be placed into the context of the jurisdiction within the much larger ecoregion to which provincial guidelines apply. For example, Eastern Wood Pewee is considered Special Concern in the Province because of population changes along the Canadian Shield southern boundary. They are fully secure in Southern Ontario and therefore, not sensitive to development activity. Their presence in London, therefore, should not be an impediment to development, or trail systems for that matter. There are several circumstances over the last several years where habitat discussions have escalated over a disagreement on site sensitivities particularly in relation to Significant Wildlife Habitat, as well as small wetland features not meeting OWES standards. There is no internal dispute resolution mechanism to address these differences. Instead, the disagreements are vetted in a public letter exchange. Replies are often not made public **Suggestion:** There needs to be some consideration for scientific dispute resolution.	AECOM	N. DeCarlo		3	The creation of an internal dispute mechanism is likely out-of-scope for the updated EMGs, however this will be considered for recommendation to future updates for the City of London policies/EMGs.
LDI	M. Wallace	14	1		4	**Comment:** Often, there is miscommunication in the report or misinterpretation of the intent of a recommendation. More open and clear communication between proponent and review agencies prior to written responses can be effective tools to avoid conflict. **Suggestion:** Incorporate a report review meeting process prior to release of review comments to try to pre-emptively and cooperatively resolve issues.	AECOM	N. DeCarlo		1, 2	As mentioned in LDI's comment regarding pre-consultation, often these meetings are difficult to schedule, etc. Language is included in the EMGs that any major concerns that the TART has should be forwarded to the City of London Planner as soon as possible to make the process more efficient. The EMGs also outline the importance of ongoing consultation to be able to address issues throughout the process effectively and cooperatively.
LDI	M. Wallace	15	1,5,6		3,4	**Comment:** Efforts to improve our Natural Heritage System need not always to be about expansion of habitat or interference/influence on development proposals. Instead, and particularly in or near an urban environment where substantial impacts already exist, the protection of our system can often be about natural heritage enhancements. **Suggestion:** The guideline needs to acknowledge enhancements can often be an important consideration in Natural Heritage System protection	AECOM	N. DeCarlo		1	Reference to sources outlining mitigation strategies (including restoration/enhancement options) and a new section outlining compensation options and guidelines have been included in the updated EMGs.

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LDI	M. Wallace	16	1		2,3	**Comment:** It seems the agency review perspective has generally migrated to more habitat as a singular natural heritage target. This can become counter productive as there are no ecological measures associated with a "more habitat" philosophy. And, the target can just keep moving higher. There needs to be a more definitive goal-oriented target, whereby a cost/benefit analysis is possible, and success can be quantified and measured. Are we targeting songbird nesting and woodlands? Or, do we want a diversified habitat that seeks biological richness? Or, do we want a system of trails and natural heritage integration for enjoyment and education? Once the goals are established, resolution of disagreement becomes achievable. Also, post development monitoring programs become purposeful and comparable. **Suggestion:** Set an overall natural heritage goal that development and natural heritage can strive for.	AECOM	N. DeCarlo		3	Natural heritage goals are set through the London Plan and the EMGs act as a tool to implement the policies (aimed to achieve the goals outlined in the London Plan).
LDI	M. Wallace	17	1		4	**Comments:** It is our experience, that the construction phase of a development is the phase which poses the greatest potential impact to adjacent natural heritage features. There needs to be more definitive guidelines related to the implementation of EIS recommendations and oversight of natural heritage protection and mitigation while the site is developed. **Suggestion:** Incorporate a reasonable construction phase audit program to detect and mitigate potential issues that may impact Natural Heritage.	AECOM	N. DeCarlo		3	Construction monitoring requirements have been revised in Section 7. A formal audit program would be useful but falls outside the scope of this update. Potential to include text to provide reasonable timelines for submitting monitoring results throughout the construction phase; further discussion may be required.
LDI	M. Wallace	18	1		2,3,4	**Comments:** Long term monitoring is becoming a request of development through draft plan conditions and site plan approvals. This makes sense in the instances when habitat creation is proposed. Monitoring would be used to ensure the created habitat is reaching its desired wildlife use outcome. However, there is not a clear framework to allow for the development of an effective monitoring program to simply measure adjacent impacts. The data needs to be comparable to control sites and to separate development related impacts from buffer naturalization efforts, adjacent landowner, public trails, annual population variations, and/or disease outbreaks. There also needs to be a clear understanding of the end use of the data to be collected. **Suggestion:** A more clear framework for the goals, objectives, data management, and expected adaptive management responsibilities is needed to help guidepost construction monitoring expectations.	AECOM	N. DeCarlo		1	Construction monitoring requirements have been revised in Section 7. Monitoring conducted throughout development (pre-, during and post-construction) would identify where impacts are occurring. Prompt notice and action to mitigate further damage should be occurring. Where impacts are due to external circumstances (adjacent impacts), enhanced measures for protection may be warranted, and further discussion may be required.
COTTFN	E Young	2	1.1	1	1	policy standards should go beyond the Provincial Policy as the minmum standard	City	E. Williamson		3	Municipal policy does go beyond the PPS. Woodland policy is some of the strongest in the province.
COTTFN	E Young	3	1.2	1	2	No mention of treaty(s) - it is important for London to acknolwedge the treaty territory they currently occupy	City	M. Alikakos		2	Treaty specifics are not noted in this document but could be explored for inclusion in subsequent updates or separate City projects.
COTTFN	E Young	4	1.2	1-2	2	Consultation shouldn't just be on whether or not there will be an impact on the river- needs to expand to include the land too	City	M. Alikakos		3	The intent of including the river language was to be respectful of the importance of the river and volume of applications that you are receiving. If the trigger for consultation/engagement should include land as well we will want to work with you to develop a framework to accomplish this. For instance, including land not protected by the current policy framework could be included as part of Traditional Knowledge incorporation but the specifics of how/what/when to include this as a land protection vehicle would be beyond the scope of this update. By including communities in the scoping process and initiating the requirement for Traditional Knowledge we hope that we can continue to procced forward to developing what this process would entail.
COTTFN	E Young	5	1.2.1	1-2	2	Should say Deshkan **Ziibiing.** This brief section should also mention our treaty and traditional territory (I know it mentioned the consultatin protocol) but this should be clearly acknowledged	City	E. Williamson		1	Ziibiing added. Treaty specifics have not be included but can be explored through subsequent updates.
COTTFN	E Young	6	2.2.2	2-2	4	where applicable a FN representative' - how does this get defined with applicable and who decides this?	City	M. Alikakos		1	Establishing the trigger distance for consultation/engagement will be developed through a separate process to establish a framework. For instance, including land not protected by the current policy framework could be included as part of Traditional Knowledge incorporation. By including communities in the scoping process and initiating the requirement for Traditional Knowledge we hope that we can continue to procced forward to developing what this process would entail.

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COTTFN	E Young	7	2.2.3	2-2	4	what is considered as 'time senstive' and what type of investigations are allowable prior to meeting requirements?	City	E. Williamson		1	Time-sensitive refers to specific timing windows, such as amphibian surveys. In some cases, these surveys may be completed by consultants on behalf of their proponents at their own risk to ensure that the work isn't delayed by a year to meet the survey timing window.
COTTFN	E Young	8	2.3	2-3	4	when assessing significant of features, significant to who? or does input on the significance of features get determined during outread for the background info?	City	E. Williamson		1	Currently, Significance is limited to species and habitats that are afforded protection by Municipal and Provincial legislation and policy. Establishing Significance specific to First Nations Communities could be developed through a separate process. By including communities in the scoping process and initiating the requirement for Traditional Knowledge we hope that we can continue to procced forward to developing what this process would entail.
COTTFN	E Young	9	2.6.2	2-4	4	Re: buffer around woods at 30m - why is this only 30m? should be at least 60m	City	E. Williamson		1	At this time there is no policy basis to support requiring a 60 m buffer around woodlands. As the Environmental Management Guidelines are a policy implementation document this cannot be included at this time.
COTTFN	E Young	10	2.6.3	2-5	4	point 4. does this also take into account the social/cultural impacts? If not, this should be explicity included	City	E. Williamson		1	The Natural Heritage Reference Manual notes a social component. Further incorporating cultural and social components in the assessment of features and functions could be explored through the previously noted Frist Nation engagement framework, to be developed through a separate process. By including communities in the scoping process and initiating the requirement for Traditional Knowledge we hope that we can continue to procced forward to developing what this process would entail.
COTTFN	E Young	11	2.6.3	2-6	4	point 5. is there a required timeframe for monitoring post construction/development?	AECOM	G.Epp		1	The requirements for monitoring, including the timeframe, are project specific. Typically post-construction is 3-5 years following the substantial completion of a project, or completion depending on the type of project.
COTTFN	E Young	12	2.6.5.7	2-11	3	How does the impact and net assessment take into account, climate change, cumulative effects or the effects that this development could have in 10+ years? Need to include this. This includes cumulative effects not just felt locally but regionally.	City	E. Williamson		2	Climate is being discussed in other planning documents.
COTTFN	R Smith	13	1.3.4	28-33	4	Should be a section on the checklist for cumulative effects.	AECOM	G.Epp		1	The addition of cumulative effects to the checklist will be discussed with the City. If agreed, it will be added to the checklist.
COTTFN	R Smith	14		4	4	Should include areas with significant meadows	City	E. Williamson		3	There is currently no Municipal policy or Provincial Policy in place to protect meadows except for in relation to SAR habitat (such as Monarch butterflies) or as buffer to other features. Meadows could be included as part of the Traditional Knowledge framework described above through a separate process.
COTTFN	R Smith	15	1.4`	33	4	Should be inclusive of Special Concern species	City	E. Williamson		3	There is currently no Municipal policy in place to protect Special Concern species except for in relation to the Significant Wildlife Habitat Criterion Schedule 7E. Significant Wildlife Habitat is included in the EMG.
COTTFN	R Smith	16	1.2.5	30	4	Traditional Use Medicines should be included in Flora	City	E. Williamson		3	There is currently no Municipal policy or Provincial Policy in place to protect medicinal plant species except for in relation to SAR habitat. Medicinal plants could be included as part of the Traditional Knowledge framework described above through a separate process.
COTTFN	R Smith	17	1.3	32	4	Not sure if Cultural / traditional heritage is general or specific to First Nations. If it is general, then a category for First Nations should be added.	City	E. Williamson		1	Section 1.2 outlines First Nations engagement and consultation.
COTTFN	R Smith	18	1.2	2	2	This section should elaborate on First Nation Rights Holders and the Duty to Consult. Perhaps a list of First Nations for proponents to consult with under the Duty to Consult.	City	E. Williamson		1	Section 1.2 outlines First Nations engagement and consultation.
COTTFN	R Smith	19	1.2	2	2	This section should reference federal and provincial documents around consultation that the proponent should consider when engaging the Duty to Consult.	City	E. Williamson		1	Section 1.2 outlines First Nations engagement and consultation.
Urban league	J. Hanbuch	3	buffers		1	I am uncertain in my understanding of how there is such a wide variance and when it changes. Also, still no mention of light/ noise poliution.	AECOM	G.Epp/ J.deMan		2/1	The wide variance is based on the variability of the species, communities, their specific habitat requirements and the functions of the feature. Agree that light and noise pollution should be a consideration. Light and noise pollution considerations added to Sections 5.3.3 and 5.3.4.
Urban league	J. Hanbuch	3	3	22/23	1	It is great you have included butterflies.Monarchs are at risk. Little other reference to insect populations at risk - damsel flies are mentioned. Native bees are crucial pollinators (Rusty bumblebee , Gypsy Cuckoo Bumblebee, and are almost extinct)there are a number of moths and water beetles as well. There was an action plan by the Ontario government that this may fall under from 2007 ? Recovery Strategy for Rusty patched bumble bee?	AECOM	N. DeCarlo		1	This criterion has been broadened to consider insects (with example given for moths, hymenoptera, odonata).
Nature London	D.Wake	24	6.1	6-2	2	This paragraph is redundant - it repeats much of the preceding paragraph.	AECOM	N. DeCarlo		1	Addressed

External Resource and First Nation Comments							AECOM/City Response				
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Nature London	D.Wake	25	6.2	6-2	2	It would be a great help to the reader if the first set of bullets could be written in parallel structure. In other words, re-write bullets 2,3, and 4 so they also begin with "To" .	AECOM	N. DeCarlo		1	Addressed
Nature London	D.Wake	26	6.2	6-2	2	Similarly, it would be helpful to restructure the introduction and 5 bullets at the bottom of the page so that all 5 bullets are parallel. It might help to say "…the proponent shall demonstrate…"	AECOM	N. DeCarlo		1	Addressed
Nature London	D.Wake	27	6.4.2	6-6	2	Second paragrpah, replace "undertook" with "undertaken"	AECOM	N. DeCarlo		1	Addressed
Nature London	D.Wake	28	7.2.3	7-4	2	line 4, delete "implemented"	AECOM	N. DeCarlo		1	Addressed
Nature London	D.Wake	29	7.2.4	7-5	1	paragraph following the bullets, second line. I suggest replacing "should" with "must"	AECOM /City	E. Williamson/ N. DeCarlo		1	Language revised to 'shall'.
Nature London	D.Wake	30	App B	2	2	Inventory protocols, first paragraph, last sentence. Suggest rewording to say "Typical timeframes for various inventory types are described below."	Aecom	N. DeCarlo		1	Addressed
Nature London	D.Wake	31	App B	3	2	Under Breeding birds, second bullet, add "**species**" after the word "crepuscular".	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	5	2.6.1	2-3	1	We have been given to understand some cities don't even consider an application complete until the EIS has been accepted. Please consider including same here. **(a sample completeness checklist is attached)**	City	E. Williamson		1	London doesn't consider development applications complete unless required EISs are completed to the City's satisfaction.
EEPAC	EEPAC	6	2.6.3	2-5	1	impact and net assessment. Should clarify what short term and long term are. Short term might be better phrased as construction impacts and long term, or construction and post construction with time frames such as 0-5 years, 5 to 10 years, etc	Aecom	G.Epp		1	We have added references in parentheses to design and layout related for long-term and construction related for short term impacts.
EEPAC	EEPAC	7	2.6.3	2-5	1,3	Buffer section is much improved based on science. However, setbacks from ecologicial buffers seem to have disappeared although setbacks are mentioned in Section 4.3 on p. 4-12. Please explain	Aecom	G.Epp		3	Not applicable to this section. Note made to add distinction between buffers and setbacks to Section 5.1 "Definition of a Buffer"
EEPAC	EEPAC	8	2.6.3	30, 2-5	2, 4	Shouldn't it also include approximate number of and approximate locations of study sites? Normally, this is well done, but some field Investigations have not used appropriate sites (e.g., Adelaide Road widening)	Aecom	G.Epp		1	Agree. Text stating "and include an appropriate number of study locations" has been added to Section 2.6.3 pt3.
EEPAC	EEPAC	9	2.6.3	31, 2-6	1, 3, 4	Impact and Net Effects Assessment – this is a very subjective process – is there any way to make it more quantitative? Is it possible to use a metric? Table in Appendix C – should show an example that does not constitute "No Net Effect" or "+ Net Effect" – that is a "- Net Effect". Also, could + Net Effects be ranked as low, medium, high to provide a better measure of how positive they are? For example, 2.4 identifies loss of wildlife as a potential impact from construction traffic and suggests this will be limited by avoid injury and mortality by preparing a Wildlife poster and handling protocols. These mitigations in no way guarantee no loss of wildlife – how can this be listed as No Net Effect?	Aecom	G.Epp		1	Agree. A No, Low (-), Medium (--) and High (---) ranking can be added to each of the Net Negative and Net Positive (Low +, Medium ++, and High +++) evaluations. The overall evaluation can be based on the sum. This can be added to the net effects assessment section and table, subject to the City's concurrence).
EEPAC	EEPAC	10	2.6.3	31, 2-6	2	Monitoring should include pre, during and post construction – post construction tells you nothing if there is no baseline. An EIS won't always constitute pre-monitoring. This is clear later, so just needs to be added here to be consistent	Aecom	G.Epp		1	Agree. Text has been added to Section 2.6.4.
EEPAC	EEPAC	11	2.6.3 (4)	2-5	2	Change last 'should' in first paragraph to 'must' or 'shall'	City	E. Williamson		2	Flexibility is needed to meet survey timing windows. It is understood that surveys completed in advance of the scoping meeting are at risk.
EEPAC	EEPAC	12	2.6.3 (4)	2-6	4	is the intention that the Net Effects Table Template as shown in Appendix C is to be used as shown or is it just a suggested format? Prefer that a consistent one is used by all	Aecom	G.Epp		2	The template has been provided as a suggested format.
EEPAC	EEPAC	13	2.6.4	31, 2-6	2	There is nothing about Monitoring in the EIS report requirements – Monitoring is critical to determining the success of the mitigation and compensatory measures. This is clear later, so just needs to be added here to be consistent.	Aecom	G.Epp		2	Monitoring is included as part of the Environmental Management Plan in Section 2.6.6.9.
EEPAC	EEPAC	14	2.6.5.11	2-14	4	Figures - should state that all Figures should be at the same scale where appropriate, for example, the figure with the overlay of the development on the natural features should be the same scale as the figure of the existing natural features without the development overlaid	Aecom	G.Epp		1	Figure specifics are noted in Section 2.6.6.
EEPAC	EEPAC	15	2.6.5.2	2-8	2	last paragraph re consultation should include "citizen science or other sources"	Aecom	N. DeCarlo		3	Review of citizen science and other sources are included as part of the background review process and not applicable under the consultation paragraph in Section 2.6.6.2
EEPAC	EEPAC	16	2.6.5.3	33, 2-8	3	Recommend adding additional references to ensure coverage in London North and also the most up-to-date information available. Additional references to include for geology - https://data.ontario.ca/dataset/surficial-geology-of-southern-ontario and for north London – Sado and Vagners (1975) – first is a map of surficial geology of southern Ontario that can be viewed in Google Earth; second goes with the Dreimanis reports, but is for north London; http://www.geologyontario.mndmf.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=P1048	Aecom	G.Epp		1	The suggested references have been added to section 2.6.6.
EEPAC	EEPAC	17	2.6.5.4	34	4	In the box although it says Aquatic Habitat and Species – the Box should include 3 sub-disciplines - add Aquatic Habitat (Water chemistry, physical and biological Setting (e.g., water courses spawning habitat, habitat characteristics (aquatic plants, water chemistry, substrate descriptions, water temperature, barriers to fish passage etc.)	AECOM/ City	E. Williamson		2	These are not typical sections of an EIS. These aspects are included as part of the Aquatic Habitat assessments and may be noted but do not warrant their own section.
EEPAC	EEPAC	18	2.6.5.6	2-11	1,4	The proposed layout and design MUST be shown on a Figure as an overlay. It is frustrating for a reviewer not to have such a figure in the EIS.	Aecom	G.Epp		1	Inclusion of a site overlay depends on the stage of development and cannot be a steadfast requirement. Sometimes an SLSR is completed before the finalized design. However, an impact assessment cannot be done without some form of layout and design.

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EEPAC	EEPAC	19	2.6.5.7	2-11	1,3	This section, particularly impacts, seems to focus on features more so than functions. Functions should be included whever features are mentioned if the intent is to include impacts on fuctions. TRCA EIS Guidelines speaks to Assessment of Function. Also, is there a need to define direct and indirect impacts or to provide examples? There are no definitions in the Glossary.	Aecom /City	E. Williamson		2	Feature must be assessed before the function can be understood.
EEPAC	EEPAC	20	2.6.5.7	2-11	2	typo in first para 'Net' not 'Nets'	Aecom	G.Epp		1	Typo corrected.
EEPAC	EEPAC	21	2.6.5.8	2-12	2	Avoidance – add text to emphasize the importance of avoiding impacts …..avoidance of potential impacts is the preferred option and should always be considered first through…."	Aecom	G.Epp		1	Text added noting the priority of avoidance.
EEPAC	EEPAC	22	2.6.5.8	2-12	2	Edit – delete *d* in *proposed* in last line of avoidance section	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	23	2.6.5.9	2-12	2, 4	Mitigation – here three terms are used – direct impacts, long term impacts and indirect impacts; later in section 2.6.5.7 only direct and indirect impacts are defined – definitions are not clear. Need to be consistent throughout document.	Aecom	N. DeCarlo		1	Language has been clarified under Section 2.6.6.9.
EEPAC	EEPAC	24	2.6.5.9	2-12	2	add 's' to plans at end of page	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	25	3		2	Would it be helpful to include a Patch Map that has the patch numbers?	Aecom	N. DeCarlo		2	A patch map has not been incorporated into the updated EMG document.
EEPAC	EEPAC	26	3	2-5 , 2-15	4	"evaluation should be applied to features not previously evaluated....". "Previously" should be qualified to say within last 10 years. Also reevaluation may be needed if any changes in the surrounding area has impacted the subject land.	City	E. Williamson		3	Appendix A notes the data standards, noting 5 years as the duration for data to be considered 'current'.
EEPAC	EEPAC	27	3.1	3-13	2	Criterion 5.2 should have a reference to Figure 3-2 currently on page 3-17	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	28	3.1.1.1	3-2	3	Bergsman and Deyoung prepared a table of Regionally Significant Vegetation Communities in 2006. It would be helpful if included in this section (**copy of document submitted as supplementary material to this spreadsheet**)	Aecom/City	N. DeCarlo		3	The intent is not to add new criteria to the Woodland Evaluation, however this document's applicability was reviewed. However, no criteria speak specifically to Regionally Significant Vegetation Community Series. The frequency distribution from Bergsma (2004) was utilized to inform thresholds for Criterion 1.2, 2.2, 2.3. Further, Criterion 3.1a covers off rare vegetation communities based on Conservation Status Ranks.
EEPAC	EEPAC	29	3.1.1.2	NA	2	why was the score sheet from the original EMG deleted?	Aecom	N. DeCarlo		3	The score sheet was not retained to improve document flow and reduce the length. The scoring is relatively straightforward (1 High or 5+ Medium ranking), therefore the score sheet was removed.
EEPAC	EEPAC	30	3.1.1.2	3-5	1	why were isolated patches not retained in Patch Distribution?	Aecom	N. DeCarlo		3	To achieve a Medium or High ranking based on isolated patches for this criteria, the size would need to be >10 ha. As this is solely based on size, the isolated patch would already be considered High based on criteria 2.2a (Patch Size) and would meet the standard for Significant Woodland.
EEPAC	EEPAC	31	3.1.1.2	3-8	1	Not clear how the presence of multiple species will be considered - Do you mean "or any 1 regional concern species" or is the intent to use the same number, i.e. 3 or more in HIGH or 1-2 in MEDIUM? "Birds - HIGH breeding habitat of three (3) or more species of conservation concern, special concern, rare bird species (MNRF, 2015a) or any other **regional concern species** (Partners in Flight, 2020) in the patch. MEDIUM breeding habitat of 1-2 species of conservation concern, special concern, and rare bird species (MNRF, 2015a) or any other **regional concern species** (Partners in Flight, 2020) in the patch. " **Suggested change:** add text prior to listing above criteria stating "any combination of the following"	Aecom/ City	E. Williamson/ N. DeCarlo		1	This criteria has been revised. Special Concern species are noted under Significant Wildlife Habitat.
EEPAC	EEPAC	32	3.1.1.2	3-12	2	Table 3.1 from EMG 2007 has been changed. Some vegetation categories have been removed. Rationale?	Aecom/City	E. Williamson/ N. DeCarlo		3	Rationale was to revise and update the document. Where appropriate, information was removed.
EEPAC	EEPAC	33	3.1.1.2	3-11	2	Criterion numbering changes from 2.x to 5.x	Aecom	N. DeCarlo		3	Correct - the criteria correlate to the criterion numbers within the London Plan. Criterion 3 does not have any evaluation guidance associated with it. Criterion 4 was added, as it was missed in this iteration (typo).
EEPAC	EEPAC	34	3.1.1.2	3-13	2	wording is unclear in first line of page. "NOTE: 5.1c and 5.1d will require field investigations to determine size, distribution, and basal areas of trees within a given vegetation."	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	35	3.1.2	3-22	1,3	Reference to Harris and Scheck, 1991 is contrary to reference about intermittent watercourses on p. 8-9	Aecom/City	N. DeCarlo		3	The reference on pg. 3-22 refers to linear features that have been altered by anthropogenic influence such as channelized watercourses. This does not preclude intermittent or ephemeral watercourses (which are natural within the landscape), as described on pg. 8-9.
EEPAC	EEPAC	36	3.1.2.1	3-18/19	1	Parts of comment sections from EMG 2007 have been deleted. EEPAC would appreciate an explanation of why as they appear to help the user apply the criteria	Aecom	N. DeCarlo		3	Rationale was to revise and update the document. Where appropriate, information was removed. Unclear or subjective comments were removed to achieve a standardized application of the guidelines.

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EEPAC	EEPAC	37	3.1.2.1	3-14	2	replace 'above' with 'below' - "For example, if a community is identified as rare or uncommon, it would meet Criterion 1 listed **above**. If this community also contained high-quality, natural landform-vegetation communities representative of typical pre-settlement conditions, it would also meet Criterion 2 listed **above**. The community would be listed under both criteria but would only be applied towards the evaluation of significance for one of the criteria."	Aecom	N. DeCarlo		3	Addressed
EEPAC	EEPAC	38	3.1.2.1	3-19	2	Under Application, should say one of two ways - "This criterion can be met in any one (1) of three (3) ways:"	Aecom/City	E. Williamson/ N. DeCarlo		1	This has been revised.
EEPAC	EEPAC	39	3.1.2.1	3-19	2	Change 'should' to 'must' or 'shall' - "For patches or patch clusters straddling the city boundary, the area determination **should** be based on the whole patch or patch cluster since this represents the ecological unit to which the criterion is applied."	Aecom/City	E. Williamson		1	This has been included. We also note that the Municipal boundary delineates City jurisdiction.
EEPAC	EEPAC	40	3.2.2	3-25	1	top of page re permitted activities, should also include prohibited activities. Some definitions of passive exclude biking as fat tires and mountain biking activities are contrary to conservation of natural heritage areas. In other sources, passive includes biking. Clarity will be helpful here. EEPAC's position is that biking should be a prohibited activity except where otherwise permitted.	City	E. Williamson		3	The Environmental Management Guidelines is a policy implementation tool. The Trail Management Guidelines outlines the appropriate uses within ESAs. No policy specifically prohibits biking in natural areas that are not ESAs.
EEPAC	EEPAC	41	3.2.3	3-25	2	Wetlands: Under type of wetlands, PSW, wetlands and unevaluated wetlands, Include Relocated and/or artificial wetlands as well - monitoring these is important.	City	E. Williamson		2	Agree that monitoring relocated wetlands is important. Monitoring is discussed in Section 7. Further process requirements will be discussed in a forthcoming Appendix in 2022. No change to the EMGs, as relocated wetlands are wetlands. London Plan policy speaks to three categories of wetlands: Provincially Significant Wetlands, Wetlands and Unevaluated wetlands. Any relocated wetland would be included in the 'wetland' category.
EEPAC	EEPAC	42	4	various	1, 2	watercourse is sometimes used inconsistently and inconsistent with the definition in the Glossary and inconsistent to the Stream Permancy Handbook. For example, Guideline 7, p. 4-10 uses permanent watercourse in description but watercourse in the explanation at the bottom. Guideline 2, p. 4-4 says includes "permanent, natural watercourse" whereas the SPH does not distinguish betw natural and anthropogenic (see p. 4-6 bottom)	Aecom	N. DeCarlo		1	Addressed. The use of "natural" has been removed from Guideline 2. Consistency has been added where a Guideline applies to permanent watercourses. Where only watercourse is used, the definition in the glossary and under Guideline 4 apply.
EEPAC	EEPAC	43	4	4-6	1	no definition found to distinguish between small and significant watercourse. Should be something in the document that would help the user	Aecom	N. DeCarlo		1	Tied to the above. City's position is that a watercourse is a watercourse. Policy only identifies watercourses, 'significance' is tied to species composition and water regime (cold/cool/warm). Addressed - 15 m corridor for 'small' watercourses has been removed. Language updated to 30 m for watercourses with a cool/warm thermal regime, 50 for cold, 100 for large rivers such as the Thames.
EEPAC	EEPAC	44	4	4-10	2	Guideline 7 - for clarity, a thru c should end with 'or'	Aecom	N. DeCarlo		1	Addressed.
EEPAC	EEPAC	45	5	5-1	1, 2, 3, 4	Might be good to provide a rationale for buffers before defining. A short paragraph explaining the importance of buffers and protecting green infrastructure could help understand why they are required – maybe something like…. The importance of green spaces and their protection in urban areas in southern Ontario should not be undervalued (McWilliam et al, 2012; 2104; 2015 and references therein). Green spaces in urban areas provide essential ecological, social and economic services. They provide critical habitat and movement corridors for wildlife, helping to protect biodiversity especially in the face of climate change. Green spaces also cleanse the air and sequester CO2, helping to slow climate change. They provide cooling reducing urban island heat effects and mitigating the consequences of climate change. For people, they provide recreational, aesthetic and health benefits. Green spaces also increase the value of proximal housing. Unfortunately, development and resulting residential encroachment can decrease the value of urban green spaces through ecological degradation. Residential encroachment can alter abiotic (water and chemicals, especially nutrients and pesticides) flows and animal movements into and out of the green space. Residential encroachment can increase noise and light further impacting wildlife movements and decreasing the benefits to people. Vegetation trampling and the introduction of invasive species can result in a loss of biodiversity and ecosystem function. One approach to reduce these impacts and loss of green space value is to limit building near urban green spaces; another is to use buffers (McWilliam et al., 2012). Buffers can help to reduce the negative consequences of ecological encroachment protecting the value of the green spaces, and in turn of the nearby housing developments.	Aecom / City	E. Williamson		2	The goal of this update was to create a concise document. Buffers are required through provincial guidance documents, providing the rationale is not necessary in this instance.
EEPAC	EEPAC	46	5.2	5-2	1	It is not clear why after saying there are min buffer widths, does the document permit something less particularly without providing examples of "certain cases." "In certain cases, it may be possible that the City and the Proponent agree to a buffer width less than what is requiredin Table 5.2. " Given there is a table (5.3, p. 5-5) later in this section with extensive description of greater than min, detail of when less than min should be included if the "certain cases" option is retained.	Aecom/City	E. Williamson		1	Agree. The buffer section has been revised to provide greater clarity.
EEPAC	EEPAC	47	5.2	5-2	1, 2, 3, 4	Approach – Starts good, then there is a lot of wiggle room with the wording and opportunity for misunderstanding. The last sentence is particularly troubling "In certain cases it may be possible that the City and the Proponent agree to a buffer width less than what is required in Table 5.2". This sentence should be deleted.	Aecom/ City	E. Williamson		2	The buffer section has been revised to provide greater clarity. Sufficient flexibility is necessary, at the discretion of the City.

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EEPAC	EEPAC	48	5.3.2	5-3+	1,2	It may be confusing to the user when a buffer wider than the maximum shown in Table 5.2 would be required. Specifically p. 5-8 regarding residential development will be contentious unless clarified either with examples or indicated as a may instead of a shall. Guidelines should be clearer for ease of use.	Aecom/ City	E. Williamson		1	Agree. The buffer section has been revised to provide greater clarity.
EEPAC	EEPAC	49	5.3.4.2	5-10	1	It is not clear why this has been included as multi use pathways are indicated as prohibited in buffers in the same paragraph. "If a site specific buffer is equal to, or greater than 30m, a pathway can be placed within the outermost area of the buffer provided that the buffer remains naturalized. " Pathways are generally mowed by the City on both sides meaning the buffer will not remain naturalized. why not include a setback from the buffer when there is a plan for a pathway ? Setbacks are defined in the Glossary as well as included in section 7.2.4. On page 58 under "Developmental conditions" "Higher than minimum buffer is required the developemnt type is residental...." could be elaborated with exemplar scenarios such as pathways	AECOM/ City	E. Williamson		2	Agree. Buffer section has been revised to provide greater clarity. Flexibility is needed to align with all London Plan policies.
EEPAC	EEPAC	50	6.1	6-1	1	In last sentence of first paragraph, delete 'where feasible.' This section deals with compensation for unavoidable loss. It is unlikely to create the same features and functions with compensation. Hence, a benefit should be demonstrated (this would also require a change to the first bullet in section 6.2)	City	E. Williamson		2	There is no policy basis for requiring a benefit, though opportunity to do so is encouraged and recommended. The Environmental Management Guidelines update is being completed to align with current London Plan and provincial policy updates. This is not a policy creation exercise.
EEPAC	EEPAC	51	6.1	6-1	1,4	Document should speak to who pays for monitoring, and frequency of reporting of monitoring data.	City	E. Williamson		1	The proponent is responsible for construction monitoring in advance of assumption. The City is taking on monitoring post assumption moving froward in intervals appropriate to the feature. Typical internals include 1-, 3- or 5-years. Reporting of monitoring data shall be provided annually.
EEPAC	EEPAC	52	6.1	6-1, 6-2	2	some redundancy between the bottom of 6-1 and top of 6-2	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	53	6.2	6-2	1	It is unclear as to why these guidelines do not apply to: Watercourses and/or fish habitat; Buffers to natural heritage features, rather buffers must be applied (as described in Section 5.3) to the new or enhanced natural feature following compensation; or, Evaluation of ecological function (refer to Section 3).	Aecom	N. DeCarlo		3	This section outlines the compensation guidelines specific to the City of London. Other policies and processes are in place for other features (see section 6.1). Further, evaluation and the implementation of buffers are described elsewhere in the EMG document.
EEPAC	EEPAC	54	6.2	6-2	1	**Suggested change:** Add the bolded words. This may be appropriate for replacing lost habitat for grassland birds. "That compensation is implemented within the same **or adjacent** subwatershed, and preferably in as close proximity to the original feature as possible to maintain ecological connectivity;" (also requires a change in 6.4.1)	City	E. Williamson		2	This would be accomplished through consultation with City staff and does not need to be included. There may be instances where a more appropriate location is found in a watershed beyond those directly adjacent.
EEPAC	EEPAC	55	6.2	6-2	2	why is the footer and page # highlighted?	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	56	6.3	6.3	2	"Effectiveness monitoring plan" - **Suggest replacing with:** "A monitoring plan including time frames, measurables of effectiveness, reporting, and responsibilities for carrying out the monitoring."	Aecom/City	E. Williamson		1	Incorporated in Section 7.2.5.2.
EEPAC	EEPAC	57	6.3.1	6-3	1	It is unclear if this includes the CFZ and buffer. "Based on the time-lag to establish wetland function, a 3:1 replacement ratio shall be targeted. "	Aecom/ City	E. Williamson		3	The Critical Function Zone is delineated and considered as part of the feature. Buffers are established around both the wetland and Critical Function Zone accordingly. Compensation for wetlands will be based on the area that includes the CFZ, but not the buffer.
EEPAC	EEPAC	58	6.3.1.1	6-4	2	point #1 seems to contradict the 3:1 ratio included on the previous page as well as in point #2	Aecom /City	E. Williamson		3	Point 1 identifies the policy requirement for wetland compensation. Point 2 notes the preferred and recommended ratio.
EEPAC	EEPAC	59	6.3.1.2	6-4	1,3	why not base it on what would provide the likelihood of achieving a benefit (as per the sources) rather than a flat 1:1 ratio?	Aecom/City	E. Williamson		3	The Environmental Management Guidelines update is intended to align the document with current LP and provincial policy. This is not a policy creation exercise.
EEPAC	EEPAC	60	6.4.2	6-6	2	think you mean must be undertaken, not undertook - "To ensure that ecosystem structure and function is replaced, or preferably improved, consultation on the compensation plan and design must be **undertook** with the City of London and any other applicable agencies."	Aecom.	E. Williamson		1	Revised.
EEPAC	EEPAC	61	6.4.3	6-6	1, 3	"Proposed native species for planting, with consideration for climate change resiliency" What does this mean? More detail needed about how climate change will factor into species selection and procurement. For example, may be beneficial to source some seeds from further south, to grow the genetic diversity of local populations, to plant disease-prone trees with suitable spacing to minimize risk of future disease outbreaks? (see also page 7-2). Perhaps City could provide proponent with list of seed sources / stock options.	City	E. Williamson		3	Text in the EMG refers to resources for planting mixes (CanPlant). Tolerances, which take into heat and drought resistance have been included. As we expect the climate to change in the future (warmer, wetter, wilder), these tolerances should be viewed through this lens.
EEPAC	EEPAC	62	7.1	7-1	2	4th paragraph, "…natural heritage feature functions…" - do you mean impacts/effects on the natural heritage feature or its function?	Aecom	N. DeCarlo		1	Addressed
EEPAC	EEPAC	63	7.2.1	7-3	1	Monitoring should be undertaken at the 1, 3, and 5-year points after construction and or planting is complete, in order to allow for early detection and correction of any planting or construction failures. **ADD: " This is a minimum requirement. Other intervals may be more appropriate depending on the development and the feature and its functions." (Section 7.2.5.2 p. 7-6 last paragraph has wording, including when the monitoring starts, that could be included here as well)**	Aecom/ City	E. Williamson		2	The proponent is responsible for construction monitoring in advance of assumption. The City is taking on monitoring post assumption moving froward in intervals appropriate to the feature. Typical internals include 1-, 3- or 5-years.
EEPAC	EEPAC	64	7.2.3	7-4	4	The Pre-construction water quality monitoring, that provides evaluation of the existing (baseline) conditions, is critical and will establish the required mitigation and reclamation measures for water resources conditions and projects. This Pre-construction monitoring period needs to include at minimum 2 wet seasons and 1 dry.	Aecom/ City	E. Williamson		2	Pre-construction monitoring shall typically consist of 2 wet seasons and 1 dry, however this is at the discretion of the City's Hydrogeologist. Site specific conditions shall be considered to adjust requirements as appropriate.

External Resource and First Nation Comments							AECOM/City Response				
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EEPAC	EEPAC	65	7.2.3/7.2.4	7-4, 7-5	4	Document should clearly identify the minimum water quality monitoring seasons for the pre-construction and post construction conditions (3-5 seasons).	Aecom/ City	E. Williamson		2	Water quality monitoring shall be completed to City standards.
EEPAC	EEPAC	66	7.2.4	7-5	2	second 'should' change to 'must' in last paragraph of this section	Aecom/ City	E. Williamson		1	Wording has been revised to 'shall'.
EEPAC	EEPAC	67	8	8-1	3	The term Population is used frequently but not defined. Should it be? Key point to emphasize is the ability to reproduce and maintain individuals within the population. Population definitions from Biology 7th Edn Campbell & Reece. Pearson. "A population is a localized group of individuals that are apable of interbreeding and producing fertile offspring." "A population is a group of individuals of a single species living in the same general area. Members of a population rely on the same resources, are influenced by similar environmental factors, and have a high likelihood of interacting with and breeding with one another."	Aecom	S. Muscat		1	Definition not included at this time. Inclusion can be considered through a subsequent update if the omission is determined to be problematic.
EEPAC	EEPAC	68	8	8-7	2	possible grammatical errors in definition for wind speed: *"Wind speed - Air velocity upwind of a forest is typically **reduce** for a distance of about 8h (8 times the height of the trees). Downwind the wind speed is **reduce** for 25h or more. Turbulence zones in these areas may be a source of erosion and dust. Wind penetration into a forest **increase** for about 1h on the upwind side, but the elevated wind speed on the downwind forest edge is only about 0.5 h.*	Aecom	S. Muscat		1	Grammar revised.
EEPAC	EEPAC	69	Appendix A		1, 3, 4	As with bird surveys – there should be more instructions on what an aquatic habitat assessment entails (where is it done, when is it done, how many measurements need to be made, what measurements need to be done) - should provide justification for these choices. Appendix A Environmental Monitoring section – need to specify locations for, timing of, frequency of and duration – should provide justification for these choices.	Aecom	N. DeCarlo		2	Protocols are referenced where applicable for specifics of surveys. Locations, timing, level of detail are determined through the scoping process in conjunction with standard protocols, professional standards, etc.
EEPAC	EEPAC	70	Appendix B	1	4	A Raptor Wintering Area, as defined in the SWH Criteria under Habitat Criteria should trigger a winter inventory/data collection. Including this would help the user in determining when a 4 or more season inventory would be required	Aecom	N. DeCarlo		1	Addressed. This would also be determined through the scoping process.
EEPAC	EEPAC	71	Appendix B	2	1,2,3	includes the phrase 'environmentally sensitve zone' which is not defined and contradicts an earlier passage on page 4.1 "Boundary delineation guidelines shall not be used to separate a vegetation patch into specific parts that can be treated individually as having lesser or greater significance and/or contribution to ecological function." Consider removing this term/replacing with something defined in glossary.	Aecom	N. DeCarlo		1	This term was omitted to avoid confusion.
EEPAC	EEPAC	72	Appendix B	3+	2	OBBA, 2001 **or updated version once available (anticipated 2021-2022)**	Aecom	N. DeCarlo		1	This refers to the participant's guide.
EEPAC	EEPAC	73	Appendix B	2	3,4	*"It is recommended that reputable citizen science data sources be reviewed when conducting a background review to supplement data obtained by the consultant team." This is the only mention of citizen science in the EMGs and the language is vague and may lead to inconsistent implementation.* **Suggested changes:** 1) provide names of leading citizen science databases that the City of London will consult in future. Suggest prioritizing iNaturalist, eBird, Ontario Reptile & Amphibian Atlas at mimimum due their popularity and data quality; 2) clarify how and when citizen science records (i.e., local knowledge) will be considered within the timeline of an EIS, specifically around the selection and implementation of monitoring protocols (e.g., If evidence of species occurs in citizen science data at or surrounding subject land, would this be sufficient to trigger targetted monitoring if triggers are otherwise not met? How many unique observations are needed? How far back are historical records considered relevant? More details needed here); 3) Update language to use "community science" instead of "citizen science" (the former is inclusive of people who may not hold citizenship)	Aecom/ City	S. Muscat		1	Aecom - added reference to sources of Citizen Science as examples. City - 'community science' will not be included. Citizen science is the accepted industry term. Only these reputable databases will be included with exception made for TK if provided by First Nation communities. eBird could be problematic pending the peer review process.

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EEPAC	EEPAC	74	Appendix B	5	1, 3, 4	Appendix B Additions Under Aquatic Current = last five years? Is more dependent on the value of the sampling; one pH measurement 5 years ago doesn't work – probably most useful sampling is the benthic survey Benthic Survey – should follow CABIN protocols – this is Canada's standard sampling protocols – information about CABIN is available here – may be the same as Jones et al., 2012 – not sure https://www.canada.ca/en/environment-climate-change/services/canadian-aquatic-biomonitoring-network.html Water chemistry – may add to it total dissolved solids, chlorophyll a, nutrients, ecoli, - specific measurements, locations, timing and frequency of sampling needs to be determined based on project	Aecom	N. DeCarlo		1	Addressed. Current = last 5 years based on Guidelines for Data Collection under Appendix B. Reference to CABIN as an example of benthic protocol added (in addition to OBBN). Additional examples of water chemistry parameters were not included, specifics will be determined on a case-by-case basis through the scoping process.
EEPAC	EEPAC	75	Appendix B	6	3,4	Document should reflect that the basic water chemistry parameters require to be consistent with the Provincial Water Quality Objectives (PWQO) under the Ontario Water Resources Act (OWRA) and be applied in accordance with the project site specific conditions	Aecom	S. Muscat		3	This is considered out of scope and not part of the ecological assessment.
EEPAC	EEPAC	76	Appendix C	3	2	suggest moving note section to beginning of the table to aid the user	Aecom	S. Muscat		1	Revised
EEPAC	EEPAC	77	Appendix C	3	3	No Net Effect – Indicates no measurable impact to the identified ecological features **or functions.**	Aecom/City	E. Williamson/ N. DeCarlo		1	Addressed.
EEPAC	EEPAC	78	Appendix C	3	3	Net Positive Effects – indicates a **measurable** benefit to the habitat/ecological feature (makes it the mirror image of no measurable impact)	Aecom/ City	E. Williamson/ N. DeCarlo		1	Addressed
EEPAC	EEPAC	79	Appendix C	1	2	typo in 2.1 under avoidance, mitigation, compensation	Aecom	S. Muscat		1	Edited
EEPAC	EEPAC	80			1, 4	Why was guide for selection of plants removed from the EMGs? What's the replacement?	Aecom	N. DeCarlo		3	Plant selection is now outlined in Section 6.4.3 under the compensation guidelines.
al Resource Group Comment Response Table in the Oct 5, 2020 staff report to PEC											
EEPAC	EEPAC	81	Appendix E, Comment replies, EEPAC	1, ID 3	4	*"along with consultation with experts in taxa-specific fields to ensure appropriate monitoring is being conducted."* Where are these experts sourced from, and on what basis? Are they internal, i.e. within the retained firm completing EIS, or external? (e.g. from provincial ministries, local naturalists, academic) If experts are external, how are they contacted and by whom? Are these experts acknowledged in the final report?	Aecom	N. DeCarlo		3	Taxa-specific experts can include internal (within the firm completing the EIS) or external (e.g., ministry, naturalist, academics). There is no guidance on how these experts should be contacted and these experts would be referred to in the final report while justifying rationale for a given survey/monitoring protocol, specifically when deferring from standard protocols/survey timing.
EEPAC	EEPAC	82	Appendix E, Comment replies, EEPAC	1, ID 3	4	*"More specifics on ecological monitoring protocols have been added in-text and to Appendix B - Data Collection Standards, along with increased reference to supporting documents that outline appropriate monitoring protocols (e.g., MNRF species-specific protocols)."* This text could not be found in Appendix B. Please clarify.	Aecom	S. Muscat		3	Guideline for data collection have been provided on Page 1 of Appendix C
EEPAC	EEPAC	83	Appendix E, Comment replies, EEPAC	1, ID 8	3, 4	*"Number of site visits has not been prescribed as the frequency will be determined on a case-by-case basis in consultation with the City of London."* Although some flexibility is warranted, will justification for the selection of number of planned site visits will be publicized prior to the initiation of data collection (i.e. at scoping meeting, as is customary) or is # of site visits published only with EIS results? If inadequate monitoring is planned, there should be opportunities for identification and correction while further data collection is feasible. Additions to text in Appendix B described in this comment response are not evident -please specify.	Aecom	S. Muscat		3	The protocols discussed during the scoping meeting will outline the number of site visits for various protocols. The number of site visits is related to how many studies can be stacked through overlapping timing windows.
EEPAC	EEPAC	84	Appendix E, Comment replies, UTRCA	10, ID 3		*"The new compensation/offsetting section outlines encouragement for moving towards net environmental gain, however the current structure of the City of London's Policy focuses on No Net Loss for wetlands and no negative impacts. With regards to infrastructure, avoidance is prioritized."* Could you clarify where this exists in the London Plan, or in other policy? We are not aware of this. This language seems contradictory: how can the compensation/offsetting section encourage net gain if it runs contrary to Policy? Will this actually be effective at moving towards net gain? Considering the unsustainable degraded state of our natural heritage, shouldn't we be pushing for net gain where ever possible? (i.e., restoration)	City	E. Williamson		3	London Plan policies are based on the PPS requirements. PPS reference for no net loss. London Plan Policies #s: 389_ It is important to note that a number of policies are under appeal. Current language leaves room for proponents to go above and beyond.

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EEPAC	EEPAC	85	Appendix E, Comment replies, UTRCA	11, ID 29		*"In general, this occurs through policy or maximum buffer implementation. There is no process for this however waiving of the EIS is left solely to the City of London in consultation with TRT members - to be determined on a case-by-case basis."* Under what circumstances are EIS waived? Do the EMGs have anything to do with this process? (or lack of process).	City	E. Williamson		2	An EIS may be waived at the discretion of the City in instances where ecological buffers to any Natural Heritage Features meet or exceed the City's minimum buffer requirements as shown in Table 5.2 for the most sensitive natural heritage features (i.e. 30 m) and include any additional mitigation requirements as stipulated by the City (e.g. fencing without gates).A 'Focused EIS' will be required to demonstrate how the proposed plan meets the policy and application requirements (See Section 2.6.3).
UTRCA	C. Creighton	1	Table of Contents	No page #	2	*Consider adding a list of the commonly used acronyms.*	Aecom	S. Muscat		1	A list of Abbreviations and Acronyms has been added
UTRCA	C. Creighton	2	1	43831	1	Do the policies go beyond the minimum standards?	City	E. Williamson		3	London Plan policies are based on the Provincial Policy Statement requirements. London Plan Policies regarding Significant Woodlands go above the minimum standards, establishing significance for any Criteria meeting 1 High.
UTRCA	T. Tchir	3	2	N/A	2, 4	This section is a bit redundant and confusing. Suggest reorganization where a separate section provides a discussion of the types of environmental studies (Sections 2.4, 2.5, 2.6.1, 2.6.2). Then the rest of the document should be about the general process for undertaking those types of studies (Sections 2.1, 2.2 and 2.3, 2.6.3, 2.6.4, 2.6.5), as these steps would be common for all the studies. This will help remove some of the redundancy in Section 2.6.3 (scoping and background review).	Aecom/City	E. Williamson		1	A flow chart outlining general project timelines has been included in Appendix A.
UTRCA	T. Tchir	4	2.2.2	43863	4	Suggest that the TRT and the proponent can also request a site visit, not just the CoL.	City	E. Williamson		2	Environmental studies are City lead processes and approvals, completed through consultation with TRT. If agencies have outstanding concerns they are free to pursue those through their own processes, including requesting site visits.
UTRCA	C. Creighton	5	2.2.2	2;2	4	The draft ESSC and Letter should be circulated to the TRT in advance of the scoping meeting.	Aecom	G.Epp		1	Clarity provided in Section 2.2.2.
UTRCA	T. Tchir	6	2.2.3	43863	4	Should the finalized ESSC be sent to the TRT for final approval to ensure all comments have been addressed?	City	E. Williamson		2	The finalized ESSC checklist is circulated to all TRT members that attended the meeting in an information context and for comment. The EIS is a City lead process and approval, completed through consultation with TRT. If agencies have outstanding concerns regarding an EIS they are free to pursue those through their own processes.
UTRCA	C. Creighton	7	2.2.3	43863	1	"Recent investigations" is there a stale date for ecological information. E.g. cannot be older than 5 years?	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	8	2.3, 2.6.5.2	2-2,	4	Please include any decisions by the OMB / Local Planning Appeal Tribunal (LPAT) or other agencies in review of background information. Also, does the scope of this review include adjacent lands, or only subject lands? There is sometimes relevant information that has been collected on adjacent properties that should be considered.	City	E. Williamson		2	The intent of this update is to streamline the implementation process. The scope of review includes adjacent lands as noted in the PPS and London Plan (1382_)
UTRCA	C. Creighton	9	2.4	2-3,		End of first paragraph – in addition to the appropriate land use designation the recommendations should also provide for the appropriate buffer to protect the features and functions from the proposed development.	Aecom	G.Epp		3	Disagree. Buffers should be determined as part of an EIS, not a SLSR.
UTRCA	C. Creighton	10	2.5	2-3,	4	The EIS should be accepted by all parties before the EA is deemed to be complete.	City	E. Williamson		3	The EIS within the Municipal boundary is a City lead process and approval completed through consultation with TRT. If agencies have outstanding concerns regarding an EIS they are free to pursue those through their own processes.
UTRCA	T. Tchir	11	2.6.1, 2.6.3 (#4), 2.6.5.7, 2.6.5.10	2-3, 2-5, 2-6, 2-11, 2-13	4	Note that in several sections of the guidelines, the statement "the objective for any EIS is to achieve no net negative impact, or a net environmental benefit" is found. These are two very different objectives. Please clarify when these objectives are expected to be achieved. We recommend that if compensation is recommended, that only net environmental benefit is appropriate.	City	E. Williamson		3	This statement attempts to reconcile the PSS (no net loss) with our desire for net gain. London Plan policy required no net loss and encourages, but does not require, net environmental benefit. As this is a policy implementation exercise, in the absence of policy to require net environmental this is a recommendation, no net loss will be the minimum acceptable standard.
UTRCA	T. Tchir	12	2.6.1,	2-3, 2-4, 2-5, 2-6, 2-7, 2-8	1	Provide a discussion about how enhancement will need to be considered if mitigation / compensation are recommended and / or if a net benefit is to be achieved.	Aecom	N. DeCarlo		3	Compensation guidelines are provided in Section 6 and mitigation requirements will be determined as part of the EIS process (as described in Section 2). Additional discussion on enhancement measures to achieve mitigation/compensation was not included as this will be determined on a case-by-case basis in consultation with the City of London.
UTRCA	T. Tchir	13	2.6.2	2-4,	3	Recommend that trigger distance for all wetlands, significant groundwater recharge areas, and highly vulnerable aquifers should be catchment areas, where known, or the distances provided in Table 2-1 where the catchment areas are not identifiable.	Aecom/ City	E. Williamson		2	Catchment areas are not identified via aerial mapping, however, vegetation communities are. Current policy doesn't support this and OWES defines a wetland as the 50:50 vegetation community line.

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UTRCA	C. Creighton	14	2.6.3	2-4,	4	While the City of London may waive the need for an EIS other agencies may still require an analysis.	City	E. Williamson		3	The EIS within the Municipal boundary is a City lead process and approval completed through consultation with TRT. If agencies have outstanding concerns regarding an EIS they are free to pursue those through their own processes.
UTRCA	T. Tchir	15	2.6.3 (#3), 2.6.5.4, 2.6.5.11	2-5, 2-8, 2-9, 2-14	4	Recommend that all data (field investigations, mapping) be submitted electronically in formats compatible with excel and with ARC GIS.	Aecom	G.Epp		1	Agree. No paper copies are requested.
UTRCA	C. Creighton	16	2.6.3	2-4,	4	What happens if a proponent goes ahead and updates the data without completing a scoping meeting? Do they have to start over? More often proponents are coming in for scoping meetings and advising that they have already commenced the data collection be it for an EIS or hydrogeological study. It adds extra work for the technical peer reviewers.	City	E. Williamson		3	The proponent is at risk for all surveys completed in advance of the scoping meeting. There are times when survey windows occur in advance of scoping and proponent's due diligence will be to collect that data.
UTRCA	C. Creighton	17	2.6.3 4)	2-5,	4	Who determines if other evaluation criteria are appropriate?	Aecom	S. Muscat		3	This is a City lead implementation document. TRT have input… 'through consultation with the City language'
UTRCA	T. Tchir	18	2.6.3 (#5), 2.6.5.8	2-6, 2-12	3	Please provide references for the statement "the most important mitigation measure is determining the necessary ecological buffers". For example, wetlands will not function properly if their water supply is altered, regardless of the size of the buffer.	Aecom	G.Epp		1	Text edit to state that "One of the most important …"
UTRCA	C. Creighton	19	2.6.3 6)	2-6,	4	Should require a hard copy and an electronic version of the EIS. Need a process for the submission of revised EIS reports and how information is incorporated into the Final Report (e.g. addendum to final report). Often receive several iterations of EIS reports. In some cases electronic redlined versions are provided by the consultant to help scope the review. There should be a formal process for resubmissions.	City	E. Williamson		2	In an effort to conserve resources, electronic copies are sufficient and can be printed on an as-needed basis. Approvals are not granted for projects to proceed without finalized documents noting how redline comments have been incorporated. Are there any formal process suggestions for resubmissions?
UTRCA	T. Tchir	20	2.6.3 (#7)	2-6,	4	Please include some discussion about process if the TRT recommends approving, returning or rejecting the EIS report but the CoL does not.	City	E. Williamson		3	The EIS within the Municipal boundary is a City lead process and approval completed through consultation with TRT. If agencies have outstanding concerns regarding an EIS they are free to pursue those through their own processes.
UTRCA	C. Creighton	21	2.6.4	2-6,	4	6.0 should include Net Effects Table – often not provided. Revise – "The above noted components and sections are a minimum "requirement".	Aecom	G.Epp		3	6.0 is the general title; Net Effects is included in Section 2.6.5.7.
UTRCA	T. Tchir	22	2.6.5.3	2-8,	3,4	There needs to be better integration of the natural heritage features and functions identified in the EIS. Suggest copying the statement "particularly as it relates to natural heritage features" for both the soils and geology subsection, as well as the surface water and drainage subsection.	Aecom	G.Epp		3	No edit required. We already state "Soils and the underlying geology of the study area and surrounding landscape should be described in sufficient detail as to provide context for the ecological communities and ecosystems of the study area and adjacent lands
UTRCA	T. Tchir	23	2.6.5.3	2-8,	3,4	Please include the catchment boundaries of wetlands (if present) in the surface water and drainage figure, and a drainage tile map (if available) in the hydrogeology section.	Aecom/ City	E. Williamson		2	'If available' provides flexibility for this information to be included as available. The City doesn't require this, however UTRCA can request this for their processes.
UTRCA	T. Tchir	24	2.6.5.4	2-9,	3	Results and discussion should include a comparison of current findings to any past studies reviewed during the collection of background information and a discussion of any significant changes / discrepancies.	Aecom	G.Epp		1	Agree. Text has been added: "The discussion should include a comparison of findings from previous relevant studies with those of the current study."
UTRCA	T. Tchir	25	2.6.5.4	2-9,	3,4,5	Please provide a table number and heading for the outline of the main disciplines and sub disciplines table. Please include Mussels under Aquatic Habitat and Species, replace "Wetlands" with "Evaluated Wetlands", and add Crepuscular Birds and Terrestrial Crayfish under Terrestrial Habitat and Species.	Aecom	G.Epp/ N. DeCarlo		1, 2	Mussels, crepuscular species, and terrestrial crayfish added. Wetland terminology retained for consistency with the London Plan.
UTRCA	T. Tchir	26	2.6.5.8	2-12,	2	This is the first time the concept of "Compensation" is introduced. Please provide a sentence or two on when this type of measure will be accepted. Suggest a discussion about the priority of these measures, where the main priority is avoidance, followed by mitigation and then compensation as a last resort.	Aecom	G.Epp		3	Text already refers the reader to Section 6.0 rather than getting into an explanation of rationale.
UTRCA	T. Tchir	27	2.6.5.11	2-12,	2	Additional Appendices should include reptiles, mammals and Invertebrates. Also, ensure that Aquatic species include fish, benthic and mussels.	Aecom	G.Epp/ N. DeCarlo		1	Addressed
UTRCA	T. Tchir	28	3, 4	N/A	2	Suggest putting the Boundary Delineation of Natural Heritage Features (Section 4) before the Evaluation Of Significance And Ecological Function (Section 3).	Aecom	G.Epp		3	General identification of the patch to be evaluated is already part of the process; the application of the boundary delineation guidelines is a refinement and depends on what has been identified as part of a significant features based on that evaluation.

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UTRCA	T. Tchir	29	3.0, 5.3.1.1	3-1, 5-3	1	Please list the significant natural features identified in the 2020 PPS (wetlands, woodlands, valley lands, SWH, ANSIs, fish habitat, SAR). It is expected that each of these features will have their own subsection in Section 3, yet only Wetlands (Section 3.2.3), Woodlands (Section 3.1.1), Valley lands (Section 3.2.1) and SWH (Section 3.2.2) are discussed. Perhaps the statement on page 3-24 " Although other NH features may require evaluation and subsequent protection, the guidelines for evaluating those natural heritage features are outlined in the provincial, federal or other technical documents" needs to be moved to this section? If so, there needs to be references for those documents so that the appropriate evaluation and criteria are being used. Furthermore, Section 3.1.2 discusses Environmentally Significant Areas (ESAs), although these features are not listed in the PPS. This section should also include a statement that one natural heritage feature may be many types (e.g. a woodland can also be a wetland, ESA, SWH, Valley land, ANSI, etc.) and that when criteria is being applied to determine significance, it is applied to the entire feature, not just the portion on the subject lands. The first time the concept of area is discussed is in Section 3.1.2.1 (page 3-14, second last bullet) and this concept should be within the boundary delineation (Section 4.2) as well. In addition to ESAs, are there other natural heritage features that should be identified for evaluation (e.g. grasslands)	Aecom	N. DeCarlo/ J.deMan		1, 2	Clarification has been made to outline what is covered in the subsequent sections as well as the requirement to evaluate features for each type of NH feature/function (e.g., sig woodland, wetland, etc.). Grassland evaluation does not have London-specific criteria and thus was not incorporated into this section. ESAs are covered off under the first paragraph relating to the NHS as outlined in the London Plan - Environmental Policies. Section 5 now references Section 3. Does not list the features.
UTRCA	T. Tchir	30	3.1.1.2	3-6, 3-7	2	Criterion 1.2 C (c) states that "several small patches of habitat as a patch cluster have a greater species richness than single large patches of habitat"; while Criterion 2.2 A states that "patch size is generally positively correlated with biodiversity". Suggest wording to reflect that several small patches may have a larger number of species (i.e. richness), but that these species are more evenly spread out in larger patches (i.e. richness + evenness = diversity).	Aecom/ City	E. Williamson		2	Changing science has identified that the smaller the patch the greater the species richness (Fahrig, 2019).
UTRCA	T. Tchir	31	3.1.1.2	3-10, 3-11	2	Criterion 1341_4 (the presence of SAR habitat) appears out of place as it is not related to Fish Habitat Quality, nor is it considered as a score for Criterion 2.3 as stated on page 3-11. Is this meant to be a separate criterion? Furthermore, the criterion states the "the presence of SAR habitat will add one HIGH score to the overall assessment". To meet this criterion, does the species also have to be present? If not, then how is habitat determined? If so, then wording needs to be changed to reflect that.	Aecom/ City	E. Williamson		2	Criteria numbers are based on London Plan numbering from policy 1341_. Numbering for Criteria 4.1 has been included. The habitat would defined as SAR habitat based on the confirmed presence of a Threatened or Endangered species.
UTRCA	T. Tchir	32	3.1.1.2	3-11,	2	Criterion 5.1 follows Criterion 2.3. Is this a typo? Should it be Criterion 2.4? Furthermore, Criterion 5.1 b and c are the same concept.	Aecom/ City	E. Williamson		1	Criteria numbers are based on London Plan numbering from policy 1341_. The duplication has been removed.
UTRCA	T. Tchir	33	3.1.1.2	3-11,	3	Criterion rankings as stated do not make sense. Should the word "higher" be replaced with the word "lower", given that lower ranks are more significant? As it reads currently, communities ranked as S1 or S2 would be assigned a Med and a Low rank, S3 and S4 would be assigned High, Med and Low ranks and S5 would be assigned High and Low.	Aecom/ City	E. Williamson		1	Agree. Revised to provide greater clarity.
UTRCA	T. Tchir	34	3.1.1.2	3-12,	2	Please provide some rationale for Criterion 5.1 D and define the terms "abundant", "rare" and "occasional".	Aecom/ City	E. Williamson		3	The terms 'abundant' 'rare' and 'occasional' are based on accepted Ecological Land Classification Standards (Lee et.al, 1998). Reference to the glossary of terms was added
UTRCA	T. Tchir	35	3.1.1.2	3-12,	2	Need to discuss the difference between Criterion 5.1 D and Criterion 5.1 E. Note that the post-logging standard is based on maximizing yield for forestry products, rather than maximizing yield for ecological value and therefore might not be an appropriate goal.	Aecom/ City	E. Williamson/ N. DeCarlo		3	This criteria is a carry over from the 2007 EMGs and where possible, the criteria have been left in tact. Is there a proposed alternative to maximize yield for ecological value that should be considered?
UTRCA	T. Tchir	36	3.1.1.2	3-12,	2	Ensure that if Criterion 5.1 changes to Criterion 2.4 that Criterion 5.2 changes to Criterion 2.5.	Aecom/ City	E. Williamson		1	Criteria numbers are based on London Plan numbering from policy 1341_. Numbering for Criteria 4.1 has been included.
UTRCA	T. Tchir	37	3.1.2.1	3-12,	4	If the same features cannot be used to satisfy more than one criterion, then it should also be stated that the same criterion cannot be met by more than one community. In the example provided, one community meets Criterion 1 and Criterion 2 while another community meets Criterion 2. If the same feature cannot be used to satisfy more than one criterion, but the same criterion can be met by more than one community, then it could be argued that both communities meet Criteria 2, which may result in Criterion 1 not being counted and therefore missed.	Aecom/ City	E. Williamson		3	This point is noted, however given that Significance is afforded to any feature that is evaluated as 1 High in the Woodland Criteria. Effective completion of a Woodland Evaluation is the responsibility of the consultant and is verified during EIS review.
UTRCA	T. Tchir	38	3.1.2.1	3-12,	3	What qualifications are considered to meet "appropriate expertise" for each of the subjects listed?	Aecom	N. DeCarlo		1	Based on two-page resume. Reference made to Section 2.6.6.11, which states this.
UTRCA	T. Tchir	39	3.1.2.1 (Criterion #1)	3-12,	2	Please clarify the last paragraph. Does it mean that if there is an abundance or dominance of rare plant species in a vegetation community, the vegetation community will meet Criterion 1 but that the rare plants making up that community will not be counted towards Criterion 7? If so, please define the words abundant, dominant and strata from the phrase "abundant or dominant in one or more strata".	Aecom	N. DeCarlo		1	Correct - the rare plant species would not be used to satisfy Criterion 7 as they have already been used to satisfy Criterion 1. Criterion 7 could still be satisfied by the presence of other rare species. I have provided reference to/defined the terms in the comment.
UTRCA	T. Tchir	40	3.1.2.1 (Criterion #2)	3-18,	3,4	In order to rank sites to select the best examples representing a particular landform-vegetation type, all sites on that landform – vegetation type will have to have been investigated in the City of London. Has this been done?	Aecom	N. DeCarlo		3	This would be determined based on the a review of the sources provided under the application section for this criterion. (e.g., ANSIs, reviewed through Subwatershed Studies, etc.)

External Resource and First Nation Comments							AECOM/City Response				
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UTRCA	T. Tchir	41	3.1.2.1 (Criterion #2)	3-18,	4	Is there a minimum size associated with the statement "all wetlands within the City of London are protected in accordance with The London Plan"?	City	E. Williamson		3	Identifying wetlands is typically limited to the 0.5 ha ecosite area as stipulated by the Ontario Wetland Evaluation System, but London Plan policy does not stipulate a size requirement for protection.
UTRCA	T. Tchir	42	3.1.2.1 (Criterion #2)	3-18,	3	Why were the four community types listed in this section singled out verses all the other types of vegetation communities? Is it necessary to list any vegetation communities at all?	Aecom	N. DeCarlo		3	These are included to guide the reader as to what information is required/provide examples of community types for consideration under this criterion.
UTRCA	T. Tchir	43	3.1.2.1 (Criterion #2)	3-18, 3-19	2	The two bullet points and the text within the "comments" section seem to be more applicable to Criterion 1 than Criterion 2.	Aecom	N. DeCarlo		1	Addressed - incorporated into Criterion 1, but left for Criterion 2 as still applicable.
UTRCA	T. Tchir	44	3.1.2.1 (Criterion #3)	3-19	2, 4	Application of Criterion 3 states that the criterion can be met in any one of three ways, yet only two options are presented. Also, is there a minimum size of interior forest habitat under Application 2?	Aecom	N. DeCarlo		1	Addressed. There is no minimum size requirement for interior habitat (as long as its 100 m from edges with no gaps >20 m).
UTRCA	T. Tchir	45	3.1.2.1 (Criterion #3)	3-19	4	Remove "generally more than 40 hectares" and replace it with a definite size limit since the minimum size limit is based on distribution of patch area, which can be determined from remotely sensed data and past sub watershed study data. Furthermore, the statement in the comments section should apply to all patches, not just those straddling the city boundary.	Aecom/ City	E. Williamson/ N. DeCarlo		2	Opportunities to utilize the 40 ha criterion are extremely limited within the City limits. This criteria is a carry over from the 2007 EMGs and where possible, the criteria have been left in tact. This language is taken directly from The London Plan Policy 1371. The criterion itself defines definite size limits. In Section 3.1.2.1 it is outlined that the criterion apply to entire patches or patch clusters. Additional guidance was added here for clarity on evaluation of patches that straddle the City limits.
UTRCA	T. Tchir	46	3.1.2.1 (Criterion #4)	3-19, 3-20	3	Define terms such as "magnitude of the area covered", "volumes of water involved", "importance of the resource", "landscape position", "terrain setting", as well as all the bulleted terms under "Application" as these are all terms open to interpretation.	Aecom	N. DeCarlo		3	These terms are provided as background information and the intent is not to provide extensive rationale or overhaul this section. The terms outlined under application are covered in the referenced Subwatershed Studies and OWES.
UTRCA	T. Tchir	47				The text under "comments" seems more appropriate under "application".	Aecom	N. DeCarlo		1	Addressed.
UTRCA	T. Tchir	48	3.1.2.1 (Criterion #4)	3-20	3	Why must the recharge area be part of a vegetation patch?	Aecom	N. DeCarlo		3	Significant groundwater recharge that has been identified as high potential should be included ONLY to the extent that it is within the vegetation patch. This criterion was carried forward from the previous EMG as the intent was not to substantially alter the criteria.
UTRCA	T. Tchir	49	3.1.2.1 (Criterion #5)	3-20, 3-21	3,4	In order to measure relative biodiversity and to determine the expected number of species based on Species-Area Curves, all patches will have to have been investigated for floral and faunal species in the City of London. Has this been done?	Aecom	N. DeCarlo		2	Pulled from 2007 EMGs. Given that many of the criterion
UTRCA	T. Tchir	50	3.1.2.1 (Criterion #6)	3-21	3	The background description and application of this criterion refers only to SWH. If it is meant to be broader in scope, then additional information as to how it is to be applied should be provided. If it is meant to be SWH, then this criterion be changed to "The area serves as a Significant Wildlife Habitat".	Aecom	N. DeCarlo		1	I have updated "important wildlife habitat" to "significant wildlife habitat". This is based on the scope from the 2007 EMGs and the introduction of SWH criteria since these specific criteria were established.
UTRCA	T. Tchir	51	3.1.2.1 (Criterion #6)	3-21	3	Define terms such as "width", "quality" and "length" of a linkage or corridor as these are all terms open to interpretation. Can values or cut-offs be assigned to these terms?	aecom	N. DeCarlo		1	Specific cut-offs are not provided as there are number of variables that may affect linkage function. Reference to the NHRM has been added which provides more information on evaluation of function, linkage attributes, etc.
UTRCA	C. Creighton	52	3.2	3-24,	2	Should include wetlands in the introductory paragraph – bulleted list.	Aecom	N. DeCarlo		1	Addressed
UTRCA	C. Creighton	53	3.2.1	3-24,	2	Cross reference with Section 4.3.2.	Aecom	N. DeCarlo		1	Addressed
UTRCA	C. Creighton	54	3.2.3	3-25,	2	Development is not permitted in wetlands. It is then stated – "This is with the exception of when an EIS has been completed… demonstrating no negative impacts… Please provide an example. Cross reference with Section 4.3.1 Wetlands	Aecom/ City	E. Williamson/ N. DeCarlo		3	Projects receiving Provincial approval through the EA process. This is an internal process within the City of London determined on a case-by-case basis. Projects covered under the Environmental Assessment process would constitute an example of this.
UTRCA	T. Tchir	55	3.2.3	3-25,	2	Suggest changing the class of "wetland" to "evaluated wetland" to be more concise.	Aecom	N. DeCarlo		2	These are the categories outlined by the City of London and thus will not be modified in the updated EMG document.

External Resource and First Nation Comments							AECOM/City Response				
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UTRCA	T. Tchir	56	3.2.3, 4.3.1, 6.3.1.1	3-25, 4-12, 6-3	1, 2	Note that the definition of a wetland under the Conservation Authorities Act is different than the definition of a wetland provided in this document. Please include the CA definition in this section: "A wetland is a feature that is: a) seasonally or permanently covered by shallow water or has a water table close to or at its surface, AND b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse, AND c) has hydric soils, the formation of which has been caused by the presence of abundant water, AND d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d)." In addition to the surrounding areas of interference (which need to be defined in this document), the catchment area of all wetlands regulated by the Conservation Authority will require further consideration. The catchment area should include the groundwater recharge area.	Aecom	N. DeCarlo		3	This document (as mentioned in Section 3 and 3.2) refers specifically to City of London requirements as outlined in the London Plan. This document is not intended to provide guidelines on additional requirements (e.g., provincial, federal, conservation authority).
UTRCA	T. Tchir	57	4	4-1,	3	Given that municipalities can meet or exceed approaches in the PPS (as demonstrated by identification of ESAs in the City of London, which are not listed as significant natural heritage features in the PPS and as stated under "Natural Heritage System" in the Glossary of Terms - Section 8) it is recommended that the City consider other natural heritage features as part of the natural heritage system in the City of London. Refer to Middlesex and Oxford County Natural Heritage System Studies for mapping guidelines (Section 2.0) as to how natural heritage features were mapped. The studies include natural heritage features beyond those identified in the PPS. Middlesex: http://thamesriver.on.ca/wp-content/uploads//Natural%20Heritage/MNHSS-2014/MNHSS-Chapters-1-2.pdf Oxford: https://www.oxfordcounty.ca/Portals/15/Documents/CASPO/Studies/Natural%20Heritage%20Study/Draft%20ONHSS%202016.pdf	Aecom	N. DeCarlo		3	This document is intended to outline guidelines related to the existing London Plan. This recommendation can be made to the City of London but is not applicable to the EMG document at this time.
UTRCA	T. Tchir	58	4.2	4-1,	2	Please remove the word "features" in the last line of text on this page.	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	59	4.2 (Guideline #1)	4-3,	3	It is unclear if only the habitat of SAR needs to be present, or if the SAR must also be present.	Aecom	N. DeCarlo		1	SAR must be present for inclusion. This guideline has been updated to specify "confirmed SAR habitat".
UTRCA	T. Tchir	60	4.2 (Guidelines 4 and #7)	4-6, 4-10	2	Remove the explanation of Figure 4.5 and Figure 4.8 as similar Figures (e.g. 4.1, 4.2, 4.3, 4.4, 4.6, 4.7, and 4.9) do not have this additional explanation.	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	61	4.2 (Guideline #5)	4-7,	4	Figure 4.6 shows the 2 small features as separate patches, yet the criterion states they should be included within the woodland patch boundary if they are less than 2 ha and located within 100m of the woodland patch.	Aecom/ City	E. Williamson/ N. DeCarlo		3	The boundary defines the area that is protected, not that the entire area will be included as part of the patch. This is a carry over from the existing EMG. These depict the two conditions. A) outlines a rare community (SWH) as an example and b) outlines a stepping stone community.
UTRCA	T. Tchir	62	4.2 (Guideline #6)	4-8,	4	How do you determine how much of the cultural meadow should be included in the patch if it meets the first (a) criteria "a portion of meadow habitat surrounds a feature on one or more sides, and provides improved ecological function to the patch by its inclusion"?	Aecom / City	E. Williamson		3	Determining this needs to established on a case by case basis and take into account site specific factors.
UTRCA	T. Tchir	63	4.2 (Guideline #7)	4-10,	4	How do you determine how much of the plantation should be included in the patch if it meets the first (a) criteria "was originally established for the purposes of forest rehabilitation and / or has been managed towards a natural forest and / or has developed characteristics of a natural forest, such as natural regeneration of native species".	Aecom / City	E. Williamson/ N. DeCarlo		3	Determining this needs to established on a case by case basis and take into account the site specific factors. This would be determined through evaluation of ecological function as described in the Rationale section and should not occupy a large portion of the total area as described in the Condition section. This will need to be determined on a case-by-case basis depending on its contribution to the ecological integrity of the patch.

External Resource and First Nation Comments							AECOM/City Response				
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UTRCA	C. Creighton	64	4.3	4-12,	1	Has the complexing of wetland features been accounted for? Cross-reference?	Aecom / City	E. Williamson/ N. DeCarlo		1	Complexing wetland features is a provincial process and the specifics are not part of this Municipal guidance document update. Delineating wetland complexes is outlined in the OWES manual. I have added reference to wetland complexes in this section.
UTRCA	T. Tchir	65	4	N/A	2, 4	Suggest reorganization where Section 4.2 comes AFTER Section 4.3 as its seems more logical to discuss how these standalone features are defined, and then how they are incorporated into the overall patch boundary as described in Section 4.2.	Aecom	S. Muscat		1	Report has been updated
UTRCA	T. Tchir	66	5	5-1,	1	How will buffers be zoned?	City	E. Williamson		3	Buffers will be zoned as Open Space.
UTRCA	C. Creighton	67	5		1	Should include that a feature cannot buffer itself as has been suggested by consultants from time to time.	Aecom / City	E. Williamson		3	The minimum buffer around a natural heritage feature is 15 m based on the revised buffer section. This implies that nothing less than 15 m will be accepted and would preclude a 0 m buffer.
UTRCA	T. Tchir	68	5.2	5-2,	1	What is the “maximum buffer width”? According to Table 5.2, it appears to be 120m. What if the TRT members do not want to waive the requirements of an EIS? Please include some discussion about process if the TRT does not want to waive the requirements of an EIS based on maximum buffer width.	Aecom / City	E. Williamson		1	Agree. The buffers section has been revised and maximums have been removed for clarity.
UTRCA	T. Tchir	69	5.3, 5.3.1	5-2, 5-3	4	Add another Step between Step 1 and Step 2 that states “Delineate boundary of the natural feature” as this is the starting point for all the steps that follow.	Aecom	J. deMan		1	Added delineation process to Step 1.
UTRCA	T. Tchir	70	5.3, 5.3.2	5-2, 5-3	4	Suggest that Step 2 should be “Apply the Maximum Buffer Width” and Step 3 will determine the site-specific buffer width, as developers will always strive for more developable area and less protection of the features.	Aecom / City	E. Williamson		1	Agree. The buffers section has been revised and maximums have been removed for clarity.
UTRCA	T. Tchir	71	5.3	5-2,	4	Include definition of “enhancement” found in the footnote on page 5-2 into Table 5.1 under Step 4	Aecom	J. deMan		1	Footnote has been taken out, instead, definition of enhancement is in Section 5.3.4.
UTRCA	C. Creighton	72	5.3.2	5-2,		Include a footnote re fish habitat – buffer is provided on both sides of a watercourse measured from the top of bank.	Aecom	J. deMan		1	Footnote added for clarity under Table 5-2.
UTRCA	T. Tchir	73	5.3.3	5-2,	4	Suggest removing the statement “For the most part, minimum buffers as outlined in Section 5.3.2 should be sufficient for the protection of a Natural Heritage Feature(s) and its associated function(s)”. Developers will always strive for more developable area and less protection of the features.	Aecom / City	E. Williamson		2	Agree that maximizing developable area is a key driver of the natural heritage process. The revised buffer section aims to ensure a minimum that can be increased to account for additional feature Significance and sensitivity as appropriate.
UTRCA	T. Tchir	74	5.3.3	5-2,	4	We agree that buffer requirements may change over time, and suggest that this guideline propose a timeline where a thorough review of buffer research be conducted (e.g. every 5 or 10 years).	Aecom/ City	E. Williamson		3	Updating the buffer section based on the latest science will be explored during subsequent updates to the EMG. The timeline for this update has not been determined at this time and will not be included as part of this update. Recommendations to increase the update frequency of the EMGs in support of increased efficiencies will be explored in the PEC report and may be tied to other existing update processes I.e. Engineering Design Standards.
UTRCA	T. Tchir	75	5.3.3	5-2,	3	The definition of “connected” is unclear, as the boundary delineation guidelines already connect many features into the patch. Therefore, if you are looking at connectivity between patches in order to justify greater buffers, the connectivity within the patch will not be considered.	Aecom	J. deMan		1	Updates the buffer section have been provided
UTRCA	C. Creighton	76	5.3.3.	5-2,	2	Consistent terminology should be used – wider than or higher than should be greater than.	Aecom	J. deMan		1	Table 5-3 and paragraph prior have been updated with consistent language.
UTRCA	T. Tchir	77	5.3.3	5-7,	3	Edge effective soil texture focuses on increasing buffers in locations where surface flow will be greatest. We recommend that groundwater also be considered, and that highly porous soils (such as sand) also have a larger buffer.	Aecom	S. Muscat		3	No. Policy does not support this position.
UTRCA	T. Tchir	78	5.3.3, 5.3.4.2	5-5 to 5-9 (Table 5.3), 5-10	3	We agree with the prohibited uses in Section 5.3.4.2 and therefore recommend that this concept be incorporated into Table 5.3 with a row that speaks to the fact that increased buffers are needed when trails are being proposed adjacent to a buffer (trails are not to be placed within a buffer). Should clarify that multi-use pathways are paved. We also recommend increased buffers when SWM facilities are located near natural features. Please add this item to Table 5.3	City	E. Williamson		2	The buffers section has been revised and pathways have been removed from the prohibited section. In the absence of pathways, research shows that the public will create informal trails into features. By providing a pathway around a feature, additional protection will be afforded to it. As pathways are going to be included in the scoping process based on revisions to the Appendix B checklist, the SLSR/EIS will have regard for the inclusion of a pathway relative to any adjacent natural heritage features and will provide recommendations accordingly.

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UTRCA	T. Tchir	79	5.3.4.2	5-10,	3	Please provide rationale that a 30m buffer can accommodate a trail. 30m is often cited in Table 5.2 as the MINIMUM buffer for many natural heritage features, so this width seems too narrow, especially given that Section 5.3.4.2 begins by stating that multi-use paved pathways that do not provide environmental enhancement are not permitted in buffers. We suggest that the buffer must be greater than 30m if the trail is to be placed within the buffer. Otherwise, the trail is to remain entirely outside of the buffer and adjacent to the development.	City	E. Williamson		2	The buffers section has been revised and pathways have been removed from the prohibited section. In the absence of pathways, research shows that the public will create informal trails into features. By providing a pathway around a feature, additional protection will be afforded to it. As pathways are going to be included in the scoping process based on revisions to the Appendix B checklist, the SLSR/EIS will have regard for the inclusion of a pathway relative to any adjacent natural heritage features and will provide recommendations accordingly.
UTRCA	T. Tchir	80	6.1	6-1,	1	Suggest including a discussion that clearly states the preference or priority of actions: first avoid, then minimize and mitigate, with compensation as a final measure.	Aecom	N. DeCarlo		1	This section is already quite lengthy, so discussion was not incorporated. However, wording was added to the first paragraph to outline avoidance as the first step, followed by minimizing and mitigating.
UTRCA	T. Tchir	81	6.1	6-1,	1	We recognize that The London Plan has defined compensation as being implemented on a one-for-one land-area basis, but suggest that the goal be a net benefit, and that other measures should be used to achieve net benefit if policy in The London Plan cannot be changed.	Aecom/ City	E. Williamson		2	The City agrees that a net gain rather than no net loss is preferable, but notes that this is not a policy creation exercise and current policy speaks to no loss of features or functions.
UTRCA	T. Tchir	82	6.1	6-1,	1	Define “long term monitoring” in third paragraph.	City	E. Williamson		3	Monitoring is discussed in Section 7. The City will be taking on monitoring post assumption moving forward at the 1-, 3- and 5-year intervals.
UTRCA	T. Tchir	83	6.1	6-1,	1,4	Please specifically list the provincially significant features and explain why ecological compensation can only be used with non-provincially significant natural features. What happens if the provincially significant features cannot be avoided, minimized or mitigated from development impacts?	Aecom	N. DeCarlo		3	The purpose of this document is to provide guidelines for features regulated and described in the London Plan. Text has been bolded to outline this scope. As with other sections, other regulatory requirements are not outlined.
UTRCA	T. Tchir	84	6.1	6-2,	2	The first paragraph repeats the previous paragraph on page 6-1. Please delete.	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	85	6.2, 7.2.5.2	6-2, 7-6	2	Once you have moved to compensation, you are beyond no net loss and should only consider net benefit (as suggested by the second last bullet point). We suggest the following wording for bullet 1: “To restore, replace and enhance ecological structure and function of the affected NHS by achieving No Net Loss and Net Environmental Benefit” (remove “preferably” and “where possible”)	Aecom / City	E. Williamson/ N. DeCarlo		2	The City disagrees as compensation measures must achieve no net loss to fulfill the London Plan policy requirements. Based on the London Plan, there is no policy mechanism to require compensatory mitigation achieve net environmental benefit. Although net environmental benefit is recommended, no net loss/no negative impacts (e.g., Policy 1334) and one-for-one land area basis is the requirement (Policy 1401). However, replacement greater than 1:1 may be provided as compensatory mitigation (policy 1402).
UTRCA	T. Tchir	86	6.2	6-2,	4	Who determines if the compensation is ecologically equivalent to, and fully replaces the ecological structure and function to be lost? How can this objective be evaluated?	City	E. Williamson		3	This is a City lead process and is determined through consultation with TRT and staff.
UTRCA	T. Tchir	87	6.2	6-2,	1, 4	Why don’t the guidelines apply to watercourses and/ or fish habitat?	Aecom	N. DeCarlo		3	This section outlines the compensation guidelines specific to the City of London. Other policies and processes are in place for other features (see section 6.1). Further, evaluation and the implementation of buffers are described elsewhere in the EMG document.
UTRCA	T. Tchir	88	6.2	6-2,	2	Please explain what is meant by the statement “These guidelines do not apply to evaluation of ecological function”.	Aecom	N. DeCarlo		1	This was meant to be removed, and has been omitted in the current version.
UTRCA	T. Tchir	89	6.2	6-2,	3	In addition to the proposed compensation being located in close proximity to the original feature or in an area that will provide a Net Benefit (last bullet point), we suggest that the compensation occur in the same sub watershed	City	E. Williamson		2	The City agrees that a net gain rather than no net loss is preferable, but notes that this is not a policy creation exercise. No Net Loss is the policy direction. Situating the compensation within the same sub watershed is the goal, however this is not always possible. The existing wording provides flexibility should a more appropriate location be located in a subwatershed not adjoining the project location.
UTRCA	C. Creighton	90	6.2	6-2,	2	Bullet 4 – remove brackets around “or even before”. Support compensation being implemented as soon as possible where feasible. e.g. 905 Sarnia Road	Aecom	N. DeCarlo		1	Addressed
UTRCA	C. Creighton	91	6.2	6-2,	2	Use consistent terminology – No Net Loss or No Net Loss of area.	Aecom	N. DeCarlo		1	See above comments. Addressed.
UTRCA	C. Creighton	92	6.3	6-3,	2	Heading – should it be Ecological Compensation Plan?	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	93	6.3.1.1	6-3,	1	Note that the definition of a wetland under the Conservation Authorities Act includes ecological functions of the wetland features and therefore wetland function should also be evaluated utilizing the CA regulation definition in addition to the ELC and OWES.	Aecom	N. DeCarlo		3	This document (as mentioned in Section 3 and 3.2) refers specifically to City of London requirements as outlined in the London Plan. This document is not intended to provide guidelines on additional requirements (e.g., provincial, federal, conservation authority). This section already refers to section 3 and the evaluation of ecological function.

External Resource and First Nation Comments							AECOM/City Response				
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UTRCA	T. Tchir	94	6.1, 6.3.1, 6.3.1.1, 6.3.1.2	6-3, 6-4	1,3	We agree that the time-lag in establishing wetlands, as well as improving the likelihood of achieving no net loss and net environmental benefit of woodlands should be considered when determining a replacement ratio for these natural features, and suggest that the replacement ratio of 1:1 be replaced in the text for these features. This would include changes in the following sections: · Change the 1:1 ratio in Section 6.1 and (if possible) the London Plan, · Remove point 1 in Section 6.3.1.1 · Change point 1 of Section 6.3.1.2 to read "Compensation ratios for woodland features must be 2:1 land-area basis at a minimum to improve the likelihood of achieving no net loss and net environmental benefit (Beacon 2009, LRSCA 2017)	Aecom/ City	E. Williamson		2	The City agrees that a net gain rather than no net loss is preferable, but notes that this is not a policy creation exercise, but rather a policy implementation exercise. No Net Loss is the policy direction which maintains a 1:1 replacement ratio.
UTRCA	C. Creighton	95	6.3.1	6-3,	1	Should there be a limit on the time lag between removing an established feature and replacing it?	Aecom	N. DeCarlo		3	Every effort is made to ensure timely implementation, however flexibility is needed to allow for practical implementation. This timing will be determined in consultation with the City of London in the approved Ecological Compensation Plan
UTRCA	T. Tchir	96	6.3.1.1 (point 3)	6-4,	3	Recommend that compensation also consider the catchment of the wetland.	Aecom	N. DeCarlo		2	These compensation guidelines are based on the policy in the London Plan and the City's definition of a wetland and its associated delineation as outlined in Section 4.3.
UTRCA	T. Tchir	97	6.2, 6.4.1	6-2, 6-5	2	Ensure that the bullet points in Section 6.2 are in agreement with the bullet points in Section 6.4.1 (for example, Section 6.4.1 considers compensation in the same sub watershed yet that is not mentioned in Section 6.2). Perhaps these sections need to be merged to avoid redundancy? Furthermore, do the potential naturalization sites identified by the City meet the bullet points in Sections 6.2 and 6.4.1?	Aecom	N. DeCarlo		1	Section 6.2 outlines the general goals/objectives and outlines the need for an Ecological Compensation Plan. Section 6 outlines what is required in the Ecological Compensation Plan and more specifics on the implementation. References have been added to the appropriate sections for clarity. Additional clarify will be provided in a forthcoming Appendix in 2022. Potential Naturalization Sites may meet the requirements depending on the size/location/etc. of the feature being removed. Naturalization Sites provide an opportunity for restoration/enhancement and should be considered. However, site selection will need to follow the EMGs and be determined through an approved Ecological Compensation Plan.
UTRCA	C. Creighton	98	6.4	6-5,	2	First line – consider – It is important to outline a clear implantation plan for each feature to be compensated to maximize…	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	99	6.4.1	6-5,	1	Bullet point 4 should also state that proposed sites for compensation should be outside of regulated hazard areas. Remove "preferably" and add demonstrate a Net Environmental Benefit Bullet point 5 should consider the boundary guidelines, significant woodland criteria and ESA guidelines / criteria to help identify areas that could be used for compensation to improve the quality of the patch (e.g. bay areas, areas of connectivity, etc.) or feature (size, species composition, habitat).	Aecom	N. DeCarlo		1,2	Compensation within natural hazard areas may be appropriate and can be determined on a case by case basis. Based on the policies in the London Plan, the language will remain "preferably" Net Environmental Benefit. Reference to Section 3 and 4 have been included in the fifth bullet to aid in site selection.
UTRCA	T. Tchir	100	6.4	6-6,	2	Why is there a section on Environmental Monitoring for Ecological Compensation, but not for Buffer Determination? Suggest relocating Section 6.4 to Section 7.	Aecom	N. DeCarlo		3	Buffer monitoring is described throughout Section 7 as it requires baseline, construction, and post construction monitoring. Compensation monitoring is mentioned in Section 6.8 as it is required as part of the Ecological Replacement and Compensation Plan. It is brief and references Section 7 for more details.
UTRCA	C. Creighton	101	6.4.4	6-6,		2nd line – consider adding - enhance ecological feature and function(s).	Aecom	N. DeCarlo		1	Addressed
UTRCA	C. Creighton	102	7.1	7-1,	2	First Line – consider – Environmental monitoring is a…….	Aecom	N. DeCarlo		1	Addressed
UTRCA	T. Tchir	103	7.1	7-1,	4	Who pays for the monitoring and the contingency measures? Who performs the monitoring and contingency plans?	City	E. Williamson		3	The proponent is responsible in advance of assumption.
UTRCA	T. Tchir	104	7.2.1, 7.2.2, 7.2.5.2	7-3, 7-4, 7-6	2	Environmental Management must consider monitoring how well avoidance, mitigation and compensation measures are working. Bullet point 1 only discusses mitigation monitoring while the last bullet, Sections 7.2.2, 7.2.5.2 only discusses compensation monitoring. Will other measures such as avoidance and mitigation be monitored?	City	E. Williamson		3	The planning process considers avoidance established during the initial planning stages and failing to complete works would be addressed through Engineering Site Plan Requirements.
UTRCA	T. Tchir	105	7.2.1, 7.2.2	7-3, 7-4	4	Second last bullet on page 7-3 only speaks to the post construction monitoring yet Section 7.2.2 on page 7-4 recommends additional monitoring that needs to occur prior and during construction. Please include all monitoring in Section 7.2.1.	City	E. Williamson		3	The proponent is responsible for construction monitoring in advance of assumption. The City will be taking on monitoring post assumption moving forward at the 1-, 3- and 5-year intervals.
UTRCA	T. Tchir	106	7.2.1, 7.2.2, 7.2.5, 7.2.5.1, 7.2.5.2	7-3, 7-4, 7-5, 7-6	2, 4	Monitoring timelines are confusing. Are the post construction monitoring timelines of 1, 3 and 5 year points referring to both the post development and the compensation phases?	City	E. Williamson		3	The proponent is responsible for construction monitoring in advance of assumption. The City is taking on monitoring post assumption moving froward in intervals appropriate to the feature. Typical internals include 1-, 3- or 5-years. Reporting of monitoring data including those for compensation sites shall be provided annually.

External Resource and First Nation Comments							AECOM/City Response				
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UTRCA	T. Tchir	107	7.2.3	7-4,	2	Please define “shifts in hydrologic dynamics”.	Aecom	N. DeCarlo		1	More concrete examples have been provided for "shifts in hydrologic dynamics" in-text. This section is just to outline examples of what may need to be monitored. Specifics will be determined as part of the approved EMP through the EIS process.
UTRCA	T. Tchir	108	7.2.4 (bullet point #6)	7-5,	3	Compliance monitoring should include the inspection of water quality, quantity and timing.	City	E. Williamson		3	The proponent is responsible for construction monitoring in advance of assumption. The City is taking on monitoring post assumption moving froward in intervals appropriate to the feature. Typical internals include 1-, 3- or 5-years. Reporting of monitoring data including those for compensation sites shall be provided annually.
		109				**REVIEW OF GLOSSARY**					
UTRCA	T. Tchir	110	8	N/A	2	Please confirm that all terms in the glossary are used in the document. Ensure that all terms used in the glossary definitions are defined. Remove “all quotes” and the word “means” in glossary. Please use plain language, as the terms have uneven reading levels. Consider using diagrams to convey / clarify the text whenever possible.	Aecom	S. Muscat		2	All quotes and the use of the word means have been removed
UTRCA	T. Tchir	111	8	Adjacent Lands	2	Provide a reference for Table 13. Contiguous means “touching” or “sharing a common border”. Do adjacent lands have to be touching?	City	E. Williamson		2	Contiguous has not been added to the glossary, but is defined as 'sharing a common boarder; touching'.
UTRCA	T. Tchir	112	8	Area-sensitive species	2	Are only forest species considered area-sensitive? What about grassland species? Aquatic species?	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	113	8	ANSI	2	Incorporate ANSI definition from “distinctive areas” glossary term on page 8-5.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	114	8	Assumption Development Stage	2	Remove brackets and “i.e.” from definition.	Aecom	S. Muscat		1	Addressed.
UTRCA	T. Tchir	115	8	Basal Area	2	Define “cross- sectional surface area” and “DBH”.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	116	8	Biodiversity	2	Suggest a more simple definition: Biodiversity is the shortened form of two words "biological" and "diversity". It refers to all the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live. Is it necessary to list the different types of biodiversity? If so, then several terms have to be defined, including “species richness”, “genotypic variation”, “phenotypic variation”, and “levels of energy transfer”.	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions.
UTRCA	T. Tchir	117	8	Boreal species assemblages	2	Define “outliers”.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	118	8	Breeding Birds	2	Suggest removing this term. If keeping, please provide a definition, rather than a question.	Aecom	S. Muscat		1	This definition has been removed from the glossary.
UTRCA	T. Tchir	119	8	Canadian Shield	2	Suggest removing this term. If keeping, please provide a definition for the terms “sedimentary rocks” and “igneous rocks”.	Aecom	S. Muscat		1	This definition has been removed from the glossary.
UTRCA	T. Tchir	120	8	Carolinian Zone	2	Define “Ecoregion”.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	121	8	Coefficient of Conservatism	2	Define “cultural disturbance” and “floristic quality index”. Incorporate the last two sentences found in the glossary for the term “Mean Coefficient of Conservatism (MCC)”.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	122	8	Complex	2	How does this definition explain wetland complexes? Suggest removing this term. If keeping, suggest removing the definition of complexity embedded in the definition of complex as it is confusing. Also, please define “dynamics” and “causes not proportional to consequences” if keeping this glossary term.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	123	8	Conservation Easement	2	What qualified organization is being referred to in the phrase “such as ours”?	Aecom	S. Muscat		1	Removed the phrase "such as ours"
UTRCA	T. Tchir	124	8	Contingency Measures	2	In addition to mitigation, please include avoidance and compensation measures. Suggest removing “in ensuring no negative impacts as described in the Provincial Policy Statement” as this limits when contingency measures should be considered.	Aecom	S. Muscat		1	Revised.
UTRCA	T. Tchir	125	8	Conservation Status Ranks	2	Suggest the following definition: A series of ranks derived at global, national, or subnational (provincial) levels on a five-point scale from critically imperilled (G1, N1, S1) to secure (G5/N5/S5). Conservation Status Ranks reflect how at risk species and ecological communities are of being lost in Ontario These ranks can be used to inform conservation priorities”.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.

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UTRCA	T. Tchir	126	8	Corridor (or linkage) and Linkage	2	Suggest removing "supporting a complete range of community and ecosystem processes". Explain why the terms corridor and linkage can be used interchangeably for planning purposes but may need to be distinguished for ecological or biological reasons. Replace "smaller animals" with "animals", as some corridors / linkages may benefit larger animals. Either combine definition found under the terms "Corridor (or linkage)" and "Linkage" or keep corridor and linkage as separate terms and differentiate the two. Ensure definition of valley in the subset of "ravine, valley, river and stream corridor" is compatible with the glossary definition of Valleylands	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	127	8	Critical Function Zone	2	How is this zone defined? Define "biophysical functions or attributes"	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	128	8	Cultural Barrier	2	Types of cultural barriers are listed, but a definition is not provided.	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	129	8	Cultural Savannah and woodlands	2	Define "first generation regeneration", "anthropogenic disturbances", "graminoids", "forbs", "main stratum".	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	130	8.0	Development	2	Please remove point "(c)" as this refers to Ecoregion 5E, which does not pertain to the City of London.	Aecom	S. Muscat		1	Addressed.
UTRCA	T. Tchir	131	8	Ecological Buffers	2	How are Ecological Buffers different than Buffers? Consider combining these terms into one definition. Remove the sentence "the buffer may also provide area for recreational trails". Remove "fixed-width" and "site-specific" subcategories from the definition.	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	132	8.0	Ecological Compensation	2	Term is called "compensation" in the EMG. Remove "determined through the process of EIA" as other processes can determine when compensation may be acceptable.	Aecom	S. Muscat		1	Addressed.
UTRCA	T. Tchir	133	8	Ecological Integrity and Ecological Resilience	2	The 4 bullet points seem to pertain to both ecological resilience and ecological integrity. Please provide further clarification as to how these two concepts are different.	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	134	8	Edge Effects	2	The subsections "Residential development and Neotropical migrant birds", "edge microclimate", "edge width of a vegetation patch", "windspeed", "effects of edge aspect" and "environmental factors" should be put in Section 5.3 of the Environmental Management Guidelines as these provide rationale for buffer widths depending on edge characteristics. Define "ecosystem".	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	135	8	ELC Community Series, Ecosite and Vegetation Type	2	Define "ELC" and which ELC version(s) is / are the ones to be used in the Environmental Management Guidelines.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	136	8	ELC Ecosite	2	Define "Ecosection"and "chronosequence of vegetation".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	137	8	Enhancement	2	Does enhancement only apply to ecosystems? Suggest replacing the word "ecosystem" with "ecological".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	138	8	Fish Habitat	2	The subsection "Type I habitat" does not provide a definition, only a reference. Furthermore, why is only this type listed?	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	139	8	Groundwater Features	2	Define "aquifers" and "unsaturated zones". Please include wetlands as areas where discharge can be located.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	140	8	Impact	2	The definition does not consider positive impacts. Furthermore, it is unclear what is meant by "indirectly (response)". Consider a definition where the term impact means: "all the changes which are expected to happen to the characteristics of an ecosystem due to the implementation and application of a human generated action or activity. Such impacts may occur over different time and spatial scales and / or affect different parts of the ecosystem. Impacts can be positive or negative changes produced directly or indirectly, and can be intended or unintended."	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions have been included where appropriate.
UTRCA	T. Tchir	141	8	Indicator Species	2	Consider removing "indicator species", unless there is a list for the City of London. According to the MNRF 2011 document referenced in the glossary, the MNRF recommends applying course and fine filters to manage diversity, rather than using indicator species.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	142	8	Impaction	2	Should be put in Section 5.3 of the Environmental Management Guidelines as impaction effects provide rationale for buffer widths depending on edge characteristics and what materials are expected to be accumulated.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.

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UTRCA	T. Tchir	143	8	Landscape Matrix	2	This definition is very unclear. Suggest: "The landscape matrix is any land cover type other than the type of interest. In other words, the matrix may be anything from urban development to agricultural land to grassland or forest. It is the portion of the landscape in with the landcover of interest is embedded. Matrix lands have the potential to function as habitat, as well as the capacity to be barriers to movement. Just as with connectivity, the role played by the matrix will depend both on its composition and on the unique behavioral response of the species under consideration."	City	E. Williamson		3	Landscape matrix has been removed.
UTRCA	T. Tchir	144	8	Linkages	2	See comments above under "Corridor (or linkage)" and "Linkage". Provide a reference for the statement that linkages are characterized by "low non-native plant indices".	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions and have been included where appropriate.
UTRCA	T. Tchir	145	8	Mean Coefficient of Conservatism (MCC)	2	The last two sentences should be incorporated into the glossary term for "Coefficient of Conservatism".	City	E. Williamson		3	Coefficient of Conservatism definition has been pulled from MNRF 2010b.
UTRCA	T. Tchir	146	Throughout document	Mitigation	2	Note that in some instances, this term refers to a specific ecological offsetting measure, while at other times it is used to refer to a group of measures (e.g. avoidance, minimize, compensate). This is confusing. Suggest that the term "ecological offsetting measure" be used instead of mitigation to refer to the group of measures, and that the term "mitigate" or "mitigation" refer to only one type of measure. Is mitigation only used to "enhance" beneficial effects? Can it be used to ensure no net loss, which is not considered "enhancement"?	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	147	8	Natural Heritage Features and Areas	2	Only significant natural features identified in the 2020 PPS are listed as examples of natural heritage features and areas. Are these the only features identified on Map 5 of The London Plan? Are features such as grasslands, meadows and thickets not considered natural heritage features? Please remove all references to areas not found within the City of London, such as Ecoregion 5E, 6E and islands in Lake Huron and St. Marys River.	City	E. Williamson		1	Definitions for policy protected features have been included, as appropriate. Ecoregion references removed.
UTRCA	T. Tchir	148	8	Natural landform – vegetation communities	2	The concern is not with the definition, but rather how this definition is applied. Since the definition states that "the communities should represent typical pre-settlement vegetation conditions", the Environmental Management Guidelines must be cautious if a goal of restoration is to recreate these associations since climate change may make this undesirable or impossible. This must also be considered when evaluating native and non-native species. Suggest that the goal of restoration is to look to selecting species and associations that can become naturalized (but not invasive) given the conditions, rather than trying to recreate pre-settlement conditions.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	149	8	Naturalized vegetation	2	Define "weediness value / score".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	150	8	Negative Impacts	2	Provide policy references for policy 1.6.6.4, 1.6.6.5, and 2.2.	City	E. Williamson		2	Policy references have been included as appropriate.
UTRCA	T. Tchir	151	8	Net effects	2	Only mitigation is mentioned. What about avoidance and compensation measures? See comments under mitigation.	City	E. Williamson		3	Section 6 outlines compensation and avoidance measures.
UTRCA	T. Tchir	152	8.0	Non-native	2	This term refers to more than just plants.	Aecom	S. Muscat		1	Changed plants to species
UTRCA	T. Tchir	153	8	Non-point source agricultural pollutants	2	Remove the definition of point source pollution and place it as a separate glossary term. Suggest removing the term "agriculture" as may sources of pollution can be point and non-point sources.	City	E. Williamson		2	Definitions prioritized existing PPS, NHRM and London Plan definitions and have been included where appropriate.
UTRCA	T. Tchir	154	8	Patches	2	Are patches only comprised of woody vegetation? Are they only 4 ha or larger? Ensure this definition matches the boundary delineation guidelines in Section 4 or the Environmental Management Guidelines.	City	E. Williamson		1	Patch definitions have been revised.
UTRCA	T. Tchir	155	8	Place Type	2	Why are only 2 place types described as subsections? What do the numbers "779_, 780_ 757_ and 758_" refer to?	City	E. Williamson		3	The numbers refer to London Plan policies.
UTRCA	T. Tchir	156	8	Plantation	2	When is a plantation considered naturalized vegetation and functioning more like a natural feature and less like a plantation? This should be acknowledged in the plantation definition - as most restoration / enhancement starts as plantation with the goal that eventually they will be naturalized.	City	E. Williamson		3	This distinction is described in the Woodland Criteria. See Section 3.
UTRCA	T. Tchir	157	8	Potential Naturalization Areas	2	How were these identified? It would be useful to have the rules / criteria specifically identified so that site specific studies can apply those criteria to identify these areas, rather than a map that shows some potential naturalization areas, but not all areas. Furthermore, do the potential naturalization sites identified by the City meet the bullet points in Sections 6.2 and 6.4.1 of the Environmental Management Guidelines?	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	158	8	Prairie and Oak Savannah	2	Define "biome". How is this different than the term "savannah"?	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	159	8	Processes	2	Examples of processes are provided, but not a definition. Define "succession".	City	E. Williamson		1,2	Successional stages are noted. Succession has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	160	8	Provincially Significant Wetland	2	Incorporate PSW definition from "distinctive areas" glossary term on page 8-5. Should include a reference to the wetland manual in the definition.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.

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UTRCA	T. Tchir	161	8	Riparian Habitat	2	Remove "habitat" from the term and define "riparian" as: "the area relating to or living or located on the bank of a natural watercourse (such as a river) or sometimes of a lake".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	162	8	Savannah	2	How is this different than the term "prairie and oak savannah"?	City	E. Williamson		2	This is defined based on Lee *et. al.* (1998)
UTRCA	T. Tchir	163	8	Seepage	2	Are there any areas of bedrock and unconsolidated material in the City? Define "impermeable subsoil layer"	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	164	8.0	Significant	2	Recommend shortening the definition by removing components not applicable to natural heritage (e.g. remove "d" and "e")	Aecom	S. Muscat		1	(d) and (e) removed
UTRCA	T. Tchir	165	8	Successional / Seral Age	2	Define "chronosequence", "succession", "climax species", "successional stage", "phytosociological community", "seral stage", "self-perpetuating", seral species", "open-grown characteristics", "primary succession" and "secondary succession" Is there a difference in the following terms: Pioneer and early Young and mid-aged, Subclimax and mature, climax and old growth.	City	E. Williamson		2,1	These have not been included but may be revisited in subsequent updates if confusion arises. Successional stages have been included, as appropriate.
UTRCA	T. Tchir	166	8	Specialized or Rare Vegetation List	2	Define "element ranking".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	167	8	Species assemblages	2	Define "community".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	168	8	Topographic features	2	The definition "physical features of an area" is very broad. Please put term "features" as a separate glossary term rather than as a subset of topographic features.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	169	8	Urban Development	2	Please explain why storm water management facilities are not considered urban development areas.	City	E. Williamson		3	Stormwater management areas may contain and provide habitat for vegetation and wildlife communities. This has not been included in the reference.
UTRCA	T. Tchir	170	8	Valleylands	2	Ensure definition of valleylands is compatible with the definition of valleylands in the subset of "ravine, valley, river and stream corridor" provided in the glossary definition of "Corridor (or Linkages)".	City	E. Williamson		1	Addressed.
UTRCA	T. Tchir	171	8	Vascular Plants	2	Define "xylen" and "phloem".	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	172	8	Vernal Pool	2	Please include the temporary / seasonal nature of vernal pools in the definition	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA	T. Tchir	173	8	Watercourse, watershed and Wetland	2	Please include the Conservation Authority's definitions of these terms, Define "ephemeral", "water table', "hydric soils", "hydrophytic plants", "peat", "Sphagnum species", "graminoids", "low ericaceous shrubs", and "marl". Discuss how common the various types of wetlands are in the City of London. Are fens present in London?	City	E. Williamson		2	This is a City of London Guidance document, and appropriate policy and guidance sources were referenced as appropriate. Fens are not present in London, however the inclusion of them does not undermine the implementation of the EMGs as a Guidance document.
UTRCA	T. Tchir	174	8	Woodland	2	Why is this only vegetation type that refers back to specific sections in the Environmental Management Guidelines? Please remove the environmental and economical benefits from the definition of woodland, as these can be applied to other vegetation types, not just woodlands.	City	E. Williamson		2	This has not been included but may be revisited in subsequent updates if confusion arises.
UTRCA		175				**APPENDICES**					
UTRCA	T. Tchir	176	Appendix A	1 - TRT	2	What follows on the line after "Conservation Authority" and "contact"?	Aecom	S. Muscat		2	Appendix A has been updated
UTRCA	T. Tchir	177	Appendix A	1 – Study Area	2	Add "position of site in sub watershed". What is the "Tributary Facet Sheet"? Define "within the vicinity of the Thames River"	Aecom	N. DeCarlo		1, 2	Addressed. Tributary fact sheets were carried forward from the 2007 EMGs described as "Recommendations are summarized in Tributary Fact Sheets for each of 13 subwatersheds within the City of London."
UTRCA	T. Tchir	178	Appendix A	1 – Policy	2	Add some checkboxes / space for TRT policies	Aecom	S. Muscat		2	TRT policies are captured in the London Plan policies
UTRCA	T. Tchir	179	Appendix A	2 – Natural Heritage System	2	What happened to maps 2 – 4? A better distinction needs to be made between "PSWs", "wetlands" and "unevaluated wetlands" Have all "wetlands" been evaluated? Can they be called evaluated non- provincially significant wetlands? Or can the definition of "wetland" in the glossary be expanded to include this discussion. Add "conservation area" and "watercourses (permanent, intermittent)" to the list	Aecom	S. Muscat		2	maps 2-4 are not relevant to the EMGs. The types in this list are those outlined on Map 5. Conservation Areas and Watercourses are not included on Map 5
UTRCA	T. Tchir	180	Appendix A	2 – Hazards and Natural Resources	2	What happened to maps 2 – 4? List the boxes one after the other, not side by side. Item "other place types" is redundant as it is already an item under Map 1.	Aecom	S. Muscat		1	Other place type has been removed in the interest of saving space, the boxes will remain side by side

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UTRCA	T. Tchir	181	Appendix A	2 – Required "Aquatic" Field Investigations	2	Define "Aquatic Habitat Assessment". We require the following to be conducted if a watercourse assessment is deemed necessary: - Muncipal Drain - Thermal Regime - Stream order - Presence of flowing water - Water depth Other field investigations to add to the list include: - Proportion of vegetated and non-vegetated riparian habitat - In stream barriers - Downstream receiving watercourses - Mussel surveys - Catchment area of any waterbodies - Surface drainage / flow, as well as tile drain maps, where applicable	Aecom	S. Muscat		1	Mussels has been added to the list of surveys. The specifics of the studies are to be determined as part of the pre-consultation process
UTRCA	T. Tchir	182	Appendix A	3 – Required "Wetland" Field Investigations	2	Other field investigations to add to the list include: - High water boundary - Water table depth - Catchment area - CA definition of a wetland	Aecom	S. Muscat		2	The specific details for the studies is to be confirms during pre-consultation.
UTRCA	T. Tchir	183	Appendix A	3 – Required "Terrestrial" Field Investigations	2	Change title to read "Wetland, Upland and Lowland" rather than "Terrestrial to ensure that all these studies are conducted in these features. Please specify "Breeding " Bird Surveys In addition to "Raptor Surveys" and "Shoreline Birds", please add: - Crepuscular (twilight) surveys - Grassland Bird Surveys - Marsh Birds - Bank Swallow surveys - Owl surveys Bat Surveys can be acoustic, cavity and exit surveys. Why are only acoustic surveys identified? Consider removing 'indicator species', unless there is a list for the City of London. According to the MNRF 2011 document referenced in the glossary for "indicator species", the MNRF recommends applying course and fine filters to manage diversity, rather than using indicator species. Other field investiagations to add to the list include: - Tree Inventory - Soils - Badger Dens - Terrestrial Crayfish - Seeps - Groundwater Indicator Plants - Groundwater Recharge Areas (GWRA) - Highly Vulnerable Aquifer (HVA) - Significant Froundwater Recharge Area (SGWRA) - Source Water Protection Area (SWPA)	Aecom	S. Muscat		1	Updates have ben made to the list of surveys. Those not specifically listed can been captured under the SAR surveys or other category.
UTRCA	T. Tchir	184	Appendix A	3 – Supporting Concurrent Studies	2	Add "Storm water Management Study" to the list	Aecom	S. Muscat		2	Not listed specifically as the components of a SWM Report is included in the listed report types
UTRCA	T. Tchir	185	Appendix A	4 – Impact Assessment	2	Include an evaluation of potential areas for restoration / compensation that may not be affected by the development but that could be restored / enhanced for a net benefit (e.g. there may not be Monarch habitat, but conditions are suitable for planting milkweed).	Aecom	S. Muscat		2	Not specifically listed as the checklist is higher level. The project specific requirements can be listed under notes during the scoping meeting
UTRCA	T. Tchir	186	Appendix B	1 – Background	2	Refer to glossary comments for "mitigation" Section 2 does not specifically use the words "scoped EIS", but rather speaks to EIS requirements may be different based on development. Please add specific references to subsections in Section 2 where "scoped EIS" is discussed, or add a separate subsection focused on scoped EIS	Aecom	S. Muscat		1	The text has been updated for clarity.

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UTRCA	T. Tchir	187	Appendix B	1 and 2– Guidelines for Data Collection	2	Five season inventory? I am only aware of 4 seasons. Also, there are at least six (not five) timing windows for surveys under “Inventory Protocols” on page 2. Guidelines for data ≤ 5 years, and data 5 – 10 years are provided. What about data > 10 years? It is unclear what is meant by “ecological” site visits to verify and document current / existing conditions, as this is a broad term. Instead, can it be said that a minimum of two sites visits to verify checklist items identified in Appendix A? Also, both timing and scope of the site visits will be made for the two site visits. Please include that “the use of these data to supplement or replace the need for more current inventory should be evaluated in consultation with the City of London and the TRT” Who determines “reputable citizen science data”?	Aecom/ City	E. Williamson		2	5-Season inventory refers to various seasonal timing windows. Wording revised to 'seasonal-timing windows'. Data greater than 10 years would need to be re-surveyed and updated. As older data would not meet the City's data standards it would need to be updated to document current/existing conditions. Current language notes: *Where relatively current data (up to 5 years) is available for the site and it meets the City of London's Data Collection Standards (outlined in this document), it may be applied to meet some of the requirements for three- or five-season inventory (as determined through consultation with the City of London). However, a minimum of two wildlife/ecological site visits will still be required to verify and document current/existing conditions.* Data requirements will be established based on consultation with TRT and the City, noting that the City is the regulator in this case. 'Reputable citizen science data' refers to peer reviewed online databases, such as iNaturalist and eBird.
UTRCA	T. Tchir	188	Appendix B	2 - Inventory Prototcols	2	Please change the word “seasons” to “timing windows”. Add the following timing windows, recognizing that there will be more than six: High water Owl surveys Differeentiate between spring, summer, and fall surveys for upland/ lowland vascular plant species verses wetland plant species (which are present later) Raptor spring and fall migration Bats Turtles Watercourse temperature readings Fish sampling for thermal regime Mussels Fish assemblages Crepuscular bird survesy Terrestrial crayfish Aquatic habitat assessments	Aecom	S. Muscat		1	Many of these species were already included in the list if not specifically. Text has been updated.
UTRCA	T. Tchir	189	Appendix B	4– Inventory Protocols for Herpetofauna	2	Please confirm that observational surveys for amphibians start in March, given that April is when nightly air temperatures tend to reach > 5°C and the first or second warm spring shower has occurred. Avoid nesting surveys of turtles as this can lead to increased predation or abandonment of the nests. Instead, focus on basking and visual surveys instead. Note that May is an important time for visual surveys since all snake species are active and starting to leave area where hibernacula are located; vegetation is low; temperature is cool which increases likelihood of observations as snakes bask and move. Early to mid Sept is another peak period for visual surveys as snakes start to move back towards hibernacula and vegetation begins to die off. Newly birthed or hatched young are visible (highest chance of finding young of the year), and movements increase due to falling temps and lowered photoperiod. Timing of surveys for both turtle and snakes are highly dependent on the species.	Aecom	S. Muscat		2	Noted
UTRCA	T. Tchir	190	Appendix B	5 and 6– Inventory Protocols for Aquatic communities and habitats	2	Please include that “technical data requirements will be determined in consultation with the City of London and the TRT” Remove the words “but are atypical” from the first bullet point on page 6	Aecom	S. Muscat		1	Text has been updated.

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UTRCA	**T. Tchir**	191	Appendix B	6 and 7– Regionally Rare Species	2	Why are the references for Breeding Birds provided in full, but not for the other types of fauna? These should be placed in Section 9. What is the best information for Fish? What are the references for Damselflies and dragonflies?	Aecom	N. DeCarlo		1, 3	Full references for breeding bird surveys were not intended to be included here (typo). These have been removed as they are described under #3. Breeding Birds. No resources were identified outlining regionally rare damselflies/dragonflies or fish. Text has been added to consult with local experts.
UTRCA	**T. Tchir**	192	Appendix C	1,2,3	2	Given that the net effects tables always demonstrate either a no net effect or a net positive effect when avoidance, mitigation and compensation measures are recommended, it is unclear how useful the last column is to the analysis, UNLESS the goal is a net benefit.	Aecom			2	The objective for any EIS is to achieve no net negative impact, or a net environmental benefit
UTRCA	**T. Tchir**	193	Appendix E	10 and 11	2	Where is Appendix D? Role of TRT was outlined, but there are still many areas where only City is listed as approval agency and there needs to be more integration with the TRT (or there is no value in having this team). Adding a sentence such as "City of London, in consultation with TRT members" as suggested on page 11 would help. We still encourage the City to adopt a net gain goal, rather than no net loss for wetlands and no negative impacts. While we do not oppose the Critical Function Zones recommended by Env. Canada for habitat and buffers, the definition / delineation of these zones is difficult without extensive knowledge of the species habitat needs. Furthermore, the hydrology of a wetland is the most important variable influencing ecological function (Mitsch and Gosselink 2007) and if the hydrology is altered significantly, the wetland will be affected, regardless of the size of the CFZ. Therefore, we strongly recommend that a hydrological approach (such as TRCA 2017) be considered for wetlands. Please refer to the numerous buffer comments in the preceding rows. Note that while we want an absolute minimum buffer (which was provided), this should NOT be the starting point. Climate change must be considered when avoiding, restoring, compensating or mitigating natural areas as it may no longer be an appropriate that "the communities should represent typical pre-settlement vegetation conditions since climate change may make this undesirable or impossible. This must also be considered when evaluating native and non-native species.	Aecom/ City	E. Williamson		2	City is regulator in this capacity and consults with the TRT on an information basis. The City agrees that a net gain rather than no net loss is preferable, but notes that this is not a policy creation exercise, but rather a policy implementation exercise. The noted hydrological approach would require inclusion of catchment areas that extends beyond the requirements to appropriate buffer and protect the City's wetlands. The City agrees that providing an absolute minimum should not be the starting point and also note that in an development capacity, this will always be a starting point on a land: development area financial basis. Climate change concerns are being considered through separate processes. Ensuring No Net Loss or Net Environmental Benefit to the Natural Heritage System is the key climate change consideration with respect to the Environmental Management Guidelines. While a climate lens process is being developed for application enterprise-wide, this document is intended to reflect current science on appropriate ecological choices RE: planting
LDI	**M. Wallace**	1	Introduction			Recommendation: Additional wording in the first sentence after the word 'identification'. The sentence would read: 'The following Environmental Management Guidelines are intended to provide technical guidance in implementing the policies of the London Plan (2016a; hereafter The London Plan) as they relate to the identification, evaluation, protection, restoration and mitigation of the impacts of development of the significant natural features and areas of London's Natural Heritage System.' Wording based on 1303 of the London Plan Justification: It should be clear that these EMG's are technical guidance regarding the interactions of the NHS and future development. It is guidance regarding consultation and development requirements for either the public or private sector. Where there is no development these guidelines do not apply. Development is the EMG Trigger.	Aecom	S. Muscat		1	Text in the introduction has been updated to be consistent with 1303 of the London Plan.
LDI	**M. Wallace**	2	Section 1.1			Reccomendation: Change the wording to clarify that First Nation consultation would be part of the City's circulation of a development application as it does with other agencies and advisory groups. Justification: First, we appreciate the need to consult with First Nations through the development process. However, the curret wording indicates that the proponent of a development is responsible for the consultation process with the appropriate First Nations prior to the appliaiton being accepted by the City. We believe the City would be the appropriate organization to manage this process adding consistency and accountability to First Nations consultation.	Aecom/ City	E. Williamson		1	The proponent is responsible for appropriately notifying, engaging and consulting with First Nations Communities with respect to their applications. Where feasible, the City will identify the need to consult and engage. Should a framework for including Traditional Knowledge in an ecological context be established as part of a separate process, that information will be circulated at a later date.

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LDI	M. Wallace	3	Section 2.4			Recommendation: Wording of the first sentence should be changed to "Consistent with the London Plan policies 1425 to 1428," Justification: The approved section of the London Plan states the City 'may require' an SLSR where a secondary plan has NOT been completed. The current wording in the proposed EMG update document does not reference all the SLSR policies of the LOndon Plan thus opening the interpretation to require an SLSR even where the City has an approved Secondary Plan. The additional of all the London Plan SLSR clauses insures the 'may require' is included in the updated EMG protecting Council's discretion in the requirement for an SLSR.	Aecom	G.Epp		1	Texts revised to include additional policies reference.
LDI	M. Wallace	4	Section 2.6.2			Reccomendation: Add the following wording at the end of the sentence after NHS 'as mapped on Map 1 and Map 5 of the London Plan. However, once an EIS is initiated, the previous unmapped NHS components would then be included in the EIS study" Justification: Fairness for the landowner in understanding their EIS obligations.	Aecom	G.Epp		2	London Plan Polices speak to no loss of wetlands and the required evaluation of 0.5 ha unevaluated vegetation patches that may or may not be present on Map 5. Although every effort is made to map the obligations of the landowner, in certain instances these potential features may not be known in advance of pre-consultation. Ultimately, the environmental constraints to a landowner's property is their responsibility.
LDI	M. Wallace	5	Section 3.1.1			Reccomendation: Change the wording after 'Therefore' in paragraph 5 to read: 'Therefore, if an EIS is required as part of the development application, proponents must assess the lands to determine the presence of any additional Unevaluated Vegetation Patches and/or other vegetation patches larger than 0.5 ha." We are also reccommending that the City create a review process within the EMG, baed on the stage of the development, when that stage is consistent with the London Plan Map 1. Justification: This is simply a fairness issue. The development of lands even once approved in an Official Plan, can take years before a development sugmission is presented an/or completed. There needs to be a process for approved land use designated development and development that occurs in phases to evaluate vegetaion that might appear between approval and shovels in the ground. Our suggestion is a process currently not included in the draft EMG that will recognize the stage of development application.	Aecom	N. DeCarlo		2	Not all components of the Natural Heritage System are necessarily mapped on Map 5. In the review of any planning and development application, an initial review of the lands shall be undertaken to confirm the presence or absence of any natural features and areas that may be present that have not been mapped to determine if further evaluation of the feature is required.
LDI	M. Wallace	6	Section 5.2			Reccomendation: The current EMG minimum buffer be an average of 5 m from the tree drip line to a maximum of the EIS trigger of 120 m and reflect those changes in the Table 5.2 Justification: First, our industry agrees with the need for buffers, at least during construction phases of a development. However, as you have identified the evolving science concerning the size and effectiveness of the use of buffers in relation to the feature they are designed to protect. This is supported in teh 2014 Beacon report commissioned by the City: - 'Given the prevalent and long-standing use of buffesr as a mitigative tool in natural heritage plannig, particularly for watercourses and wetlands, it is surprising taht there is such a dearth of published short or long-term monitoring studies focusing on buffer effectiveness in relation to their ability to protect core habitats (Beacon, EIS Performance Evaluation, City of London, June 2014) In addition, you refer to the need for flexibility and the need to have the ability to determine minimums in some cases. We agree with these statements and recommend you modify the minimums, and reccommended, in light of evolving science, the fact taht every land formation in relation to a natural featue is different and empowering the City to determine the appropriate minimum buffer for each or part of a development. The aforementioned 2014 Beacon report on the London EIS process clearly states 'Based on our experience, and literature reviewed on the topic of ecological buffers, the application of fixed or standarized buffers is not the most scientifically defensible approach because of the number of site-specific variables that should be considered in appropriate buffer determination.' (Beacon, EIS Performance Evaluation, City of London, June 2014).	Aecom/ City	E. Williamson		2	The buffers section has been revised. The flexibility referenced is associated with the various site conditions and habitats. There is now flexibility to buffer more as necessary, but not less than 15m.

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LDI	M. Wallace	7	Section 6			Reccommendation: More discussion required regarding compensation level and triggers	Aecom	N. DeCarlo		1	Additional clarity has been added to Section 6. Compensation level/triggers are defined in the London Plan.
LDI	M. Wallace	8	Section 7			Recommendation: More discussion required regarding monitoring costs post-assumption and goal setting process for the monitoring program.	City	E. Williamson		1	The proponent is responsible for construction monitoring in advance of assumption. The City is taking on monitoring post assumption moving froward in intervals appropriate to the feature. Future discussions on the no net loss specifics will result from the current Post-Development EIS Monitoring project.