Environmental and Ecological Planning Advisory Committee Report

The 12th Meeting of the Environmental and Ecological Planning Advisory Committee
November 21, 2019
Committee Rooms #1 and #2

Attendance

PRESENT: S. Levin (Chair), L. Banks, A. Bilson Darko, C. Dyck, P. Ferguson, L. Grieves, S. Hall, S. Heuchan, B. Krichker, K. Moser, B. Samuels, R. Trudeau and I. Whiteside and H. Lysynski (Clerk)

ALSO PRESENT: G. Barrett, C. Creighton, M. Fabro, S. Hudson, J. MacKay and L. McDougall

ABSENT: I. Arturo, A. Boyer, A. Cleaver, R. Doyle, S. Esan, J. Khan, I. Mohamed, S. Sivakumar and M. Wallace

The meeting was called to order at 5:03 PM

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Gregg Barrett, Manager, Long Range Planning and Sustainability re City Owned and Privately Owned Environmentally Significant Areas

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee heard the attached presentation from G. Barrett, Manager, Long Range Planning and Sustainability, with respect to the differences between city-owned and privately owned Environmentally Significant Areas.

3. Consent

3.1 11th Report of the Environmental and Ecological Advisory Committee

That it BE NOTED that the 11th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on October 17, 2019, was received.

3.2 Municipal Council Resolution - 10th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee reviewed and received a Municipal Council resolution adopted at its meeting held on October 15, 2019, with respect to the 10th Report of the Environmental and Ecological Planning Advisory Committee.

3.3 Municipal Council Resolution - 8th Report of the Animal Welfare Advisory Committee

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee reviewed and received a Municipal Council resolution adopted at its meeting held on October 15, 2019, with respect to the 8th Report of the Animal Welfare Advisory Committee, from its meeting held on September 5, 2019.

3.4 Municipal Council Resolution - 11th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee reviewed and received a Municipal Council resolution adopted at its meeting held on November 12, 2019, with respect to the 11th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on October 17, 2019.

3.5 Municipal Council Resolution - Environmental Considerations Relating to Studies and Reports

That a Working Group BE ESTABLISHED consisting of S. Levin and S. Hall with respect to environmental considerations relating to studies and reports; it being noted that the Environmental and Ecological Planning Advisory Committee reviewed and received a Municipal Council resolution adopted at its meeting held on November 12, 2019, with respect to these matters.

3.6 White Oak Dingman Secondary Plan - Response to EEPAC's Comments

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee reviewed and received the Civic Administration's comments relating to the Environmental and Ecological Planning Advisory Committee's comments on the White Oak Dingman Secondary Plan.

4. Sub-Committees and Working Groups

4.1 Byron Gravel Pit Subject Land Status Report

That, the following actions be taken with respect to the Byron Gravel Pit Subject Land Status Report:

a) the Working Group comments relating to the Byron Gravel Pit Subject Land Status Report BE FORWARDED to the Civic Administration for consideration; and,

b) during the development of the Secondary Plan the Civic Administration BE REQUESTED to consider opportunities for retention of part or all unique landscapes, in particular, bank swallow habitat.

4.2 Environmental Management Guidelines

That the Working Group comments with respect to the Environmental Management Guidelines BE FORWARDED to the Civic Administration for consideration.

5. Items for Discussion

5.1 (ADDED) Bird Friendly Development Working Group

That B. Samuels and L. Grieves BE APPOINTED to the Bird Friendly Guidelines Working Group as the representative and alternate, respectively.

5.2 (ADDED) Subject Lands Status Report for Kilally South, East Basin Stormwater Servicing

That a Working Group BE ESTABLISHED consisting of I. Whiteside (lead), C. Dyck, P. Ferguson and B. Krichker, with respect to the Subject Lands Status Report for the Kilally South, East Basin Stormwater Servicing and to report back at the January 16, 2020 Environmental and Ecological Planning Advisory Committee meeting.

5.3 (ADDED) Wetland Conservation Strategy

That it BE NOTED that "A Wetland Conservation Strategy for London: A Discussion Paper on Best Practices" has been forwarded to the Civic Administration for their consideration.

6. Adjournment

The meeting adjourned at 6:21 PM.

Environmentally Significant Areas on Map 5 London Plan – Public and Private Ownership

21 November 2019
EEPAC

What is an Environmentally Significant Area?

1347_ Environmentally significant areas (ESAs) are **large areas** that contain natural features and perform ecological functions that warrant their retention in a natural state. Environmentally significant areas are large features of the Natural Heritage System, often represented by a complex of wetlands, woodlands, significant wildlife habitat or valleylands.

What is an Environmentally Significant Area?

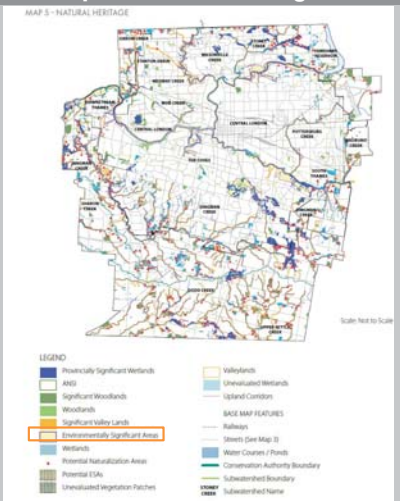
1. The area contains **unusual landforms and/or rare to uncommon natural communities** within the country, province or London Subwatershed region.
2. The area contains **high-quality natural landform-vegetation communities** that are **representative of typical pre-settlement conditions** of the dominant physiographic units within the London sub-watershed region, and/or that have been classified as distinctive in the Province of Ontario.
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.
4. The area, due to its **hydrologic characteristics**, contributes significantly to the healthy maintenance (quality or quantity) of a natural system beyond its boundaries.
5. The area has a **high biodiversity** of biological communities and/or associated plant and animal species within the context of the London sub-watershed region.
6. The area serves an **important wildlife habitat or linkage** function.
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.

ESAs on London Plan Map 5 Natural Heritage

THE LONDON PLAN
EXCITING. EXCEPTIONAL. CONNECTED.

- Council Adopted and Minister Approved in 2016
- Subject to LPAT Appeal PL170100 - May 23, 2019
- Consolidated May 23, 2019

- **1,870 hectares of ESA lands on Map 5 Natural Heritage**



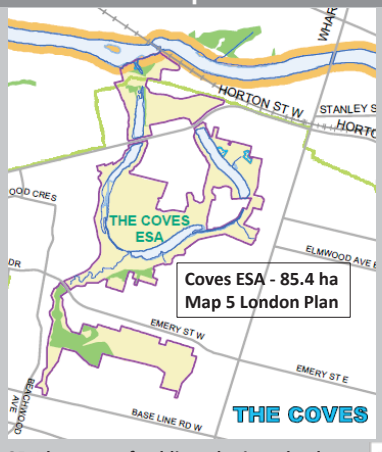
City of London Publically Owned ESAs

Publically Owned ESAs in London:

- Westminster Ponds
- Sifton Bog
- Warbler Woods
- Kains Woods
- Kilally Meadows
- Meadowlily Woods
- Medway VHF
- Coves
- Lower Dingman
- Pottersburg Valley
- Kelly Stanton

- **ESA Team manages 11 publically owned ESAs (735.5 ha) under City funded contract**
- **About 50% of the ESA lands on Map 5 of the London plan are publically owned, including Komoka Provincial Park.**

Example of public/private ownership of an ESA



Coves ESA ecological boundary includes 85.4 hectares of public and private land on Map 5 London Plan. 47.4 hectares are publically owned and 38 hectares are private.

ESAs in London Plan

1367_ Environmentally significant areas (ESAs) are large areas that contain natural features and perform ecological functions that warrant their retention in a natural state... While environmentally significant areas are protected by their inclusion in the Green Space Place Type, additional measures to provide for their protection, management and utilization are considered necessary, and may include the preparation of conservation master plans...

1409_ Some lands within environmentally significant areas are privately-owned, and this categorization of the lands is not to be interpreted as permitting access or use by the general public. Permission for public access to privately-owned lands in environmentally significant areas shall be at the discretion of the property owner.

Stewardship of Privately Owned ESAs

STEWARDSHIP 1408_
Where natural heritage areas are privately-owned, the City will encourage individual property owners to provide for their protection and conservation. In this regard, the City may use all of the following techniques:

Stewardship of Privately Owned ESAs

1. Stewardship agreements.
2. Conservation easements.
3. Programs to inform property owners of stewardship options available to protect or rehabilitate natural features and ecological functions.
4. Encourage the establishment of land trusts and the utilization of existing land trusts, as well as other mechanisms to purchase land and to rehabilitate, create or conserve natural heritage areas.
5. Encourage property owners to make use of programs and services provided by the Ministry of Natural Resources and Forestry and the conservation authorities for the management of forests and woodlots.
6. Modification of property tax assessment and/or facilitation of the Provincial Conservation Land Tax Incentive Program or the Managed Forest Tax Incentive Program .
7. Where privately-owned lands abut public lands, the City will provide signage or property demarcation to indicate the limits of publicly-owned lands.
8. Any other suitable techniques.

ESAs in London

Questions?

Environmental and Ecological Planning Advisory Committee Report

The 11th Meeting of the Environmental and Ecological Planning Advisory Committee
October 17, 2019
Committee Rooms #1 and #2

Attendance

PRESENT: S. Levin (Chair), E. Arellano, I. Arturo, L. Banks. A. Bilson Darko, A. Boyer, R. Doyle, S. Esan, P. Ferguson, L. Grieves, S. Hall, S. Heuchan, B. Krichker, I. Mohamed, K. Moser, B. Samuels, S. Sivakumar, R. Trudeau, M. Wallace and I. Whiteside and H. Lysynski (Secretary)

ABSENT: A. Cleaver, C. Dyck and J. Khan

ALSO PRESENT: G. Barrett, C. Creighton, M. Fabro, H. McNeely, S. Hudson, T. Macbeth, J. MacKay, L. Maitland and B. Page

The meeting was called to order at 5:00 PM.

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Bruce Page, Senior Planner - Byron Gravel Pit Secondary Plan

That a Working Group BE ESTABLISHED consisting of R. Trudeau (lead), I. Arturo, A. Bilson Darko and S. Hall with respect to the Bryon Gravel Pit Secondary Plan; it being noted that the Environmental and Ecological Planning Advisory Committee heard the ~~attached~~ presentation from B. Page, Senior Planner, with respect to this matter.

2.2 Tricia Lystar, Chair, Animal Welfare Advisory Committee - Proposed Changes to the "You, Your Dog and ESAs" Brochure

That, the following actions be taken with respect to the proposed "You, Your Dog and ESAs" brochure:

a) the ~~attached~~ "You, Your Dog and ESAs" brochure BE APPROVED for printing and circulation; it being noted that two of the photographs will be replaced prior to printing; and,

b) it BE NOTED that the Environmental and Ecological Planning Advisory Committee heard a verbal presentation from T. Lystar, Chair, Animal Welfare Advisory Committee, with respect to the proposed changes to the above-noted brochure.

2.3 6:00 PM Leif Maitland, Planner I, James MacKay, Ecologist and Heather McNeely, Manager, Development Services - Bird Friendly Guidelines

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee heard the ~~attached~~ presentation from L. Maitland, Planner I, J. MacKay, Ecologist Planner and H. McNeely, Manager, Development Services, with respect to Bird Friendly Guidelines.

3. Consent

3.1 10th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the 10th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on September 19, 2019, was received.

4. Sub-Committees and Working Groups

4.1 White Oak-Dingman Subject Land Status Report

That the following actions be taken with respect to the White-Oak Dingman Secondary Plan Draft Lands Status Report and the White Oak-Dingman Environmental Assessment:

a) the White-Oak Dingman Secondary Plan Draft Lands Status Report Working Group comments BE FORWARDED to the Civic Administration for consideration; and,

b) it BE NOTED that a Notice of Public Information Centre #2 relating to the Dingman Drive East of Wellington Road to Highway 401 and Area Intersections Municipal Class Environmental Assessment, was received;

it being noted that the Environmental and Ecological Planning Advisory Committee received the ~~attached~~ maps from S. Levin.

5. Items for Discussion

5.1 Notice of Planning Application - Zoning By-law Amendment - 21 Norlan Avenue

That it BE NOTED that a Notice of Planning Application dated September 18, 2019, from C. Parker, Senior Planner, with respect to the application by The Corporation of the City of London, relating to the property located at 21 Norlan Avenue, was received.

5.2 Environmental Management Guidelines Response

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee held a general discussion with respect to the Environmental Management Guidelines Working Group report.

5.3 Notice of Public Information Centre - Veterans Memorial Parkway Extension - Huron Street to Clarke Road - Detailed Design and Construction

That it BE NOTED that a Notice of Public Information Centre for the Veteran's Memorial Parkway extension from Huron Street to Clarke Road, Detailed Design Construction, was received.

5.4 Notice of Public Meeting - Kilally South, East Basin, Municipal Class Environmental Assessment

That it BE NOTED that a Notice of Public Meeting for the Kially South, East Basin, Municipal Class Environmental Assessment, was received.

6. Adjournment

The meeting adjourned at 6:57 PM.

P.O. Box 5035
300 Dufferin Avenue
London, ON
N6A 4L9

October 16, 2019

G. Barrett
Manager, Long Range Planning and Research

I hereby certify that the Municipal Council, at its meeting held on October 15, 2019 resolved:

That, the following actions be taken with respect to the 10th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on September 19, 2019:

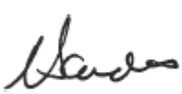
a) a Working Group BE ESTABLISHED consisting of S. Heuchan, I. Mohamed, R. Doyle, S. Esan, L. Banks, S. Levin and B. Samuels, to review the draft Subject Lands Status Report for the White Oak-Dingman Secondary Plan; it being noted that the Environmental and Ecological Planning Advisory Committee reviewed and received the presentation appended to the 10th Report of the Environmental and Ecological Planning Advisory Committee from L. McDougall, Ecologist and T. Macbeth, Planner II, with respect to these matters;

b) G. Barrett, Manager, Land Use Planning and Sustainability, BE INVITED to the next meeting of the Environmental and Ecological Planning Advisory Committee (EEPAC) to discuss the differences between City-owned and privately owned Environmentally Significant Areas; it being noted that at the EEPAC reviewed and received the Environmentally Significant Areas Meeting Minutes from its meetings held on April 30, 2019 and August 20, 2019;

c) the following actions be taken with respect to the review of the Environmental Management Guidelines:

i) the Working Group comments appended to the 10th Report of the Environmental and Ecological Planning Advisory Committee with respect to the review of the Environmental Management Guidelines BE FORWARDED to the Civic Administration for consideration; and,
ii) a special Environmental and Ecological Planning Advisory Committee BE HELD on November 7, 2019 at 5:00 PM to provide further Working Group comments on these matters; and,

d) clauses 1.1, 2.1, 3.1, 3.2 and 5.1 BE RECEIVED for information. (3.1/17/PEC)



C. Saunders
City Clerk
/lm

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cc. M. Fabro, Manager, Sustainability and Resiliency
E. Williamson, Ecologist Planner
Chair and Members, Environmental and Ecological Planning Advisory Committee

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October 16, 2019

H. Lysynski
Committee Secretary

I hereby certify that the Municipal Council, at its meeting held on October 15, 2019 resolved:

That the following actions be taken with respect to the 8th Report of the Animal Welfare Advisory Committee, from its meeting held on September 5, 2019:

a) the following actions be taken with respect to the Municipal Council resolution adopted at its meeting held on August 27, 2019 with respect to the 8th Report of the Environmental and Ecological Planning Advisory Committee:

i) the proposed, revised "You, Your Dog and Environmentally Significant Areas" brochure BE PROVIDED to the Environmental and Ecological Planning Advisory Committee for consideration; and,
ii) the Environmental and Ecological Planning Advisory Committee BE ADVISED that the current Animal Welfare Advisory Committee membership is unaware of any previous request for distribution of the "Is Your Cat Safe Outdoors?" brochure;

b) clauses 1.1, 3.1, 4.1, 5.1 and 5.2, BE RECEIVED. (2.3/11/CPSC)

C. Saunders
City Clerk
/jb

cc: Chair and Members, Animal Welfare Advisory Committee
Chair and Members, Environmental and Ecological Planning Advisory Committeee

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November 13, 2019

G. Barrett
Manager, Long Range Planning and Research

I hereby certify that the Municipal Council, at its meeting held on November 12, 2019 resolved:

That, the following actions be taken with respect to the 11th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on October 17, 2019:

a) a Working Group BE ESTABLISHED consisting of R. Trudeau (lead), I. Arturo, A. Bilson Darko and S. Hall with respect to the Bryon Gravel Pit Secondary Plan; it being noted that the Environmental and Ecological Planning Advisory Committee heard the presentation from B. Page, Senior Planner, appended to the 11th Report of the Environmental and Ecological Planning Advisory Committee, with respect to this matter;

b) the following actions be taken with respect to the proposed "You, Your Dog and ESAs" brochure:

i) the "You, Your Dog and ESAs" brochure appended to the 11th Report of the Environmental and Ecological Planning Advisory Committee BE APPROVED for printing and circulation; it being noted that two of the photographs will be replaced prior to printing; and,
ii) it BE NOTED that the Environmental and Ecological Planning Advisory Committee heard a verbal presentation from T. Lystar, Chair, Animal Welfare Advisory Committee, with respect to the proposed changes to the above-noted brochure;

c) the following actions be taken with respect to the White-Oak Dingman Secondary Plan Draft Lands Status Report and the White OakDingman Environmental Assessment:

i) the White-Oak Dingman Secondary Plan Draft Lands Status Report Working Group comments BE FORWARDED to the Civic Administration for consideration; and,
ii) it BE NOTED that a Notice of Public Information Centre #2 relating to the Dingman Drive East of Wellington Road to Highway 401 and Area Intersections Municipal Class Environmental Assessment, was received;

it being further noted that the Environmental and Ecological Planning Advisory Committee received the maps from S. Levin appended to the 11th Report of the Environmental and Ecological Planning Advisory Committee;

d) clauses 1.1, 2.3, 3.1, 5.1 to 5.4, inclusive, BE RECEIVED for information;

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it being noted that the Planning and Environment Committee heard a delegation and received the attached submission from S. Levin, Chair, Environmental and Ecological Planning Advisory Committee, with respect to these matters. (3.1/19/PEC)

C. Saunders
City Clerk
/lm

cc: T. Macbeth, Planner II
L. McDougall, Ecologist Planner
Chair and Members of the Environmental and Ecological Planning Advisory Committee
External cc List in the City Clerk's Office

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1. PhD program where my area of research is looking at how nutrients moving through groundwater can affect algal communities in streams within an agricultural landscape. My area of research is looking at human impacts of nutrient inputs and habitat degradation on lakes, wetlands, streams, and other water bodies

2. PhD Candidate at Western University, MESc in Civil and Environmental Engineering, Master's Thesis work on developing a prediction model using machine learning computer software to forecast water quality and quantity measures at the Thames River using large historical collected data-set

3. BSc Geological Engineering, MSc Geophysics

4. MSc in Biology and a PhD in Biology with Specialization in Environment & Sustainability

5. PhD candidate with a focus on the isotope geochemistry of lakes

6. BA in International Relations, MA in International Environmental Policy LLM (Masters of Law) in Environmental Law, MSc in Biodiversity, Conservation and Management

7. PhD student with two MSc (1) In entomology (2) Plant science and environmental science

8. Bachelor of Science,
   Master of Science (MSc)
   Thesis: Plant stimuli-responsive biodegradable polymers for the use in timed release fertilizer coatings
   PhD candidate
   Thesis: Improving agricultural practices: Following the fate of nitrogen within cover crop systems

9. Honours Bachelors of Science in Biology and Environmental Science
   Master's of Environment and Sustainability Candidate

10. Associate Professor in Geography at Western specializing in Lakes, Climate Change, Environmental Change, and Biogeogrpahya

11. Experienced water resources engineer

12. Masters of Neuroscience, PhD Student in Biology
    Thesis research about strategies for mitigating bird-window collisions

13. PhD in Plant Pathology

14. MSc in Biology and a PhD in Biology

15. BSc. (Biology and Chemistry) and PhD (Microbiology and Molecular Biology)

16. Forester

17. Bachelor of Applied Science -- Geomorphology, hydrogeology, hydrology and engineering geology
    Experience in the areas of soil and groundwater assessments with a particular expertise in contaminated groundwater.

18. BSc (Hons), MSc – biology, PhD candidate - biology
    Specializations: ecology & evolution, ornithology, animal behaviour,

19. PhD in Molecular Biology/Microbiology

20. Knowledge and skills related to environmental pollution, remediation, field sampling methods, data analysis, geospatial tools such as ArcGIS, stormwater management, erosion/sedimentation, scientific research and literature reviews. Previously served on the Water Control Commission for the Village of Croton-on-Hudson, New York for 4.5 years

21. Two former politicians

P.O. Box 5035
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November 13, 2019

B. R. Card
Managing Director, Legal and Corporate Services and City Solicitor

J. Fleming
Managing Director, Planning and City Planner

I hereby certify that the Municipal Council, at its meeting held on November 12, 2019 resolved:

That, the following actions be taken with respect to environmental considerations relating to studies and reports:

a) the Civic Administration BE REQUESTED to review and report back at a future Planning and Environment Committee meeting on best practices and legal limitations for performing Subject Land Status reports and Environmental Impact Studies on lands that are under private ownership and that are owned by multiple parties and, in particular, where one or more of the property owners refuse staff entry onto their lands;

b) the Environmental and Ecological Planning Advisory Committee BE REQUESTED to perform an environmental scan of practices in other municipalities related to the above-noted evaluations; and,

c) the Civic Administration BE REQUESTED to review the plan for Meadowlark habitat on a comprehensive ecological systems basis, so that Secondary Plans and Planning Applications can address habitat requirements in accordance with this larger context. (5.1/19/PEC)

C. Saunders
City Clerk
/lm

cc: G. Barrett, Manager, Long Range Planning and Research
L. McDougall, Ecologist Planner
S. Hudson, Ecologist Planner
J. Hutchison, Office Manager and Executive Assistant to City Solicitor
S. Langill, Executive Assistant to the Managing Director, Planning and City Planner
Chair and Members, Environmental and Ecological Planning Advisory
PEC Deferred List

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EEPAC Comments (October 11, 2019) on the Draft Subject Lands Status Report White Oak - Dingman Secondary Plan, by Parsons Inc. (September, 2019)	**Responses to EEPAC's Comments by Parsons Inc. and City Planning (November 14, 2019)**
City Planning and Parsons Inc. thank EEPAC for their detailed review of the Draft Subject Lands Status Report - White Oak - Dingman Secondary Plan (WODA SLSR) by Parsons Inc. (September 2019) and agree with the majority of EEPAC's comments. Detailed responses are provided below and minor revisions to Parsons Draft WODA SLSR report will be made where appropriate as identified below.	
EEPAC Summary Recommendations: An EIS be required for any developments adjacent to any environmental feature including all wetlands and all confirmed and candidate Significant Wildlife Habitat as per the distance table in the London Plan.	**Parsons Response:** Agreed, and Section 6.1.2 Environmental Impact Study Requirements in the *WODA* SLSR identifies the London Plan triggers for an EIS which includes development adjacent to components of the Natural Heritage System including all wetlands and Significant Wildlife Habitat. No change to report.
This should include amphibian surveys on the properties to which access was not granted to the consultant.	**Parsons Response:** Agreed, and the scope of future EISs will meet City and provincial EIS requirements, which will include required amphibian surveys for the property(ies) involved in the project. No change to report.
Any wetland relocations must be to areas that have sufficient water resources to maintain wetland function as development lowers water tables. The area between WE-8 and WE-23 shown on Figure 8 be incorporated into the Significant Woodland feature, either as part of a recreated wetland or revegetated to provide meaningful ecological features and functions. This would also compensate for the earlier destruction of Patch 10099 and the recent filling in of wetlands found in the northwest section of the study area.	**Parsons Response:** Agree in part noting Patch 10099 is existing, protected and mapped on Figure 1 of the SLSR. WE-8 and WE-23 are already included in the Significant Woodland (Patch 10099). The gap between these two wetlands is part of an active agricultural field which is why it was not included as part of the Significant Woodland. The SLSR does recommend this area as a Potential Wetland Creation/Restoration Area, *"…on Figure 11 (Appendix A) and are conceptual only and based on existing conditions, not future landuse. Restoration and enhancement should be considered and refined as part of an EIS, which would take into consideration future landuse. It is further noted that there may be potential for replacement of wetlands, including relocation, in accordance with Policy 1334_ of The London Plan (see Section 5.3).*" The use of this area as compensation habitat would be part of a future EIS. Parsons notes that this is not part of the scope of an SLSR. No change to report.

EEPAC Comments (October 11, 2019) on the Draft Subject Lands Status Report White Oak - Dingman Secondary Plan, by Parsons Inc. (September, 2019)	Responses to EEPAC's Comments by Parsons Inc. and City Planning (November 14, 2019)
The City **must** take action now to identify replacement habitat for lost Eastern Meadowlark habitat at this and other sites in the Southwest. Replacing habitat is a Provincial requirement. Given the many sites already identified for development or road widenings, the need is urgent.	**City Planning Response:** The City's Dingman Creek Erosion Control Wetland (2015) is an example of the City's leadership in habitat restoration in the area and is a widely recognized birding hotspot (Ebird, Free Press etc.) and includes restored grassland habitat with Meadowlarks observed in citizen science e-bird reports. The City's Dingman Creek EA process is underway and the overarching concept of the EA is to create a naturalized corridor within South London as part of the stormwater management strategy. As such, the study includes looking at the option of creating a "complete corridor" to convey water, wildlife and people. The White Oak-Dingman Secondary Plan project is not a development proposal. The Secondary Plan process will identify future land use (Place Types) for London Plan Map 1 and Natural Heritage Features for London Plan Map 5. Should portions of these lands be proposed for future development based on appropriate Place Type policies in the Secondary Plan, (noting large portions are within the UTRCA's Screening Area on Figure 6 in the SLSR) any required habitat compensation would be determined as part of a future required EIS (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). The Meadowlark habitat identified on City of London lands in the east part of study area will continue to be protected in situ. Agree that the City and Developers must comply with Provincial requirements noting the SLSR identifies "*This area is also confirmed breeding habitat for Eastern Meadowlark, a Threatened species under the ESA, 2007 and may require species-specific surveys during a future EIS."* Landowners are aware of the Meadowlark habitat identified and mapped in the SLSR and would be required to consult with the Ministry of the Environment, Conservation and Parks (MCEP) as per the Endangered Species Act (ESA). The WODA SLSR and recommendations would be discussed and cited in the future required EISs, scoping meetings and minutes. No change to report.

EEPAC Comments (October 11, 2019) on the Draft Subject Lands Status Report White Oak - Dingman Secondary Plan, by Parsons Inc. (September, 2019)	Responses to EEPAC's Comments by Parsons Inc. and City Planning (November 14, 2019)
RECOMMENDATION #1 - An EIS be required for all developments proposed within the distance limits outline in the OP (table 15.1) and The London Plan (Table 13), unless a comprehensive EIS is undertaken for the entire Area.	**Parsons Response:** Agreed, and Section 6.1.2 Environmental Impact Study Requirements provides the requirements to undertake EIS(s). No change to report.
Rationale As noted on page 7, Section 3.4 of the document, it important to note the comment under Table 2 - only half the site was surveyed. Much information about the wetlands, therefore, is missing.	**Parsons Response:** Agreed, noting section 6.1.2 Environmental Impact Study Requirements provides the requirements to undertake EIS(s). All lands will require field verification as part of a future EIS to meet City and provincial requirements. No change to report.
On page 28, Section 7, there are a number of recommendations that speak to "a" EIS. However, given the variety of land ownership, how will a comprehensive, area-wide determination be done? The city should encourage the landowners to co-operate in the preparation of one EIS for the Area. Not doing so is contrary to ecosystem planning which is a goal of the subwatershed studies done for the Dingman Creek Sub-watershed.	**City Planning Response:** Agree in part noting specific development proposals have not been submitted at this time, and EIS requirements are identified throughout Parsons SLSR with details provided in Section 6.1.2 Environmental Impact Study Requirements. The WODA SLSR and recommendations would be discussed and cited in all required future EISs in scoping meetings and minutes (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). No change to report.
p. 14 two bat species found thru acoustic surveys. Neither SAR (surprisingly given the decline of bat populations). Cavity trees should be retained.	**Parsons Response:** Agreed, noting majority of cavity trees will be protected inside the Significant Woodland feature and by the Tree Protection by-law. The SLSR in Section 7. Preliminary Recommendations for Future Development recommends future EISs includes this recommendation: "*Undertake a Tree Inventory, including a snag survey within Patch #10099 to confirm the potential for SAR bat habitat following the Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tricolored Bat (MNRF 2017) and Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR 2010);"* No change to report.
5.4.1 and page 21, Candidate Raptor Wintering Area - Parsons recommends winter studies at later stages as none done for SLSR. EEPAC agrees but is concerned how this will be captured at the EIS stage when it is individual landowners and not the city responsible?	**Parsons Response:** Requirements for future EISs will include those features on (and proposed to be added to) Map 5 and features identified through the SLSR for the Secondary Plan as identified in Section 6.1.2 Environmental Impact Study Requirements. The WODA SLSR and recommendations would

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	be discussed and cited in the EIS scoping meeting and minutes (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). No change to report.
Page 15, 5.1.1, Further refinement of the significant valleyland boundary is recommended for future development projects as part of an EIS. This must be captured by the city as a condition of development requirement. Who is in charge of doing so? How will this requirement be captured when lands are proposed for development?	**Parsons Response:** Triggers for future EISs will include those features on (and proposed to be added to) Map 5 of the London Plan *including Significant Valleylands* and features identified through the SLSR for the Secondary Plan as identified in Section 6.1.2 Environmental Impact Study Requirements. The WODA SLSR and recommendations would be discussed and cited in the required EIS scoping meeting and minutes (*with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs*). No change to report.
Vegetation surveys - EEPAC also believes that spring vegetation surveys done for an EIS should be earlier than May 29th in order to identify any spring ephemerals Breeding Birds - The following should be used to determine when breeding bird surveys should take place. It appears to EEPAC that the dates of the surveys having been June 14 and June 29, were late. https://www.canada.ca/en/environmentclimate-change/services/avoiding-harm-migratory-birds/general-nestingperiods/nesting-periods.html	**Parsons Response:** All survey dates are consistent with the Environmental Management Guidelines "Data Collection Standards for Ecological Inventory" and all other protocols for southwestern Ontario. The breeding bird surveys for the SLSR were completed in accordance with the Ontario Breeding Bird Atlas Guide for Participants (Birds Studies Canada, 2001) which indicates a timing window for surveys between late May to early July. This timing window is an industry standard and is intended to capture peak nesting activity for the majority of breeding birds. While it is acknowledged that the nesting period for migratory birds in Zone C2 (which includes the Project) extends from early April – late August, surveys conducted too early may include non-breeding migrants or some late arrival species may be missed. Any breeding birds that arrive early would still be present in June/July. No change to report.
WETLANDS **RECOMMENDATION # 2 (p. 19, 5.3) - What appears to be missing in this study is the source of the water for the wetlands. A water balance and hydrogeological work must be done during any EIS to determine the best location for any wetland relocation. There should be a comprehensive geotechnical and hydrogeological study**	**Parsons Response:** Parsons will add the **bolded text** to the following text under "wetland evaluation", first paragraph on page 20 of the SLSR "*A total of 23 wetlands have been identified as part of this SLSR, 12 of which were field verified.* ***None of the wetlands are hydrologically connected; however, are within 750 m of each other.*** *All of the unevaluated wetlands identified on The London Plan (Map 5) and/or 1989 OP (Schedule B1) were not field verified as PTEs were not obtained. Although not*

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of the Area before the Plan is completed. If landowners do not give PTE, then they should be required to do such work on individual parcels at their own costs however, a comprehensive study undertaken by the city would be better and more complete way to determine if the pre and post water balance is within 80%.	*all wetlands were field verified, the majority were verified from adjacent lands or through air photo interpretation and carried forward for evaluation as OWES does allow for desktop assessments.*" Also noted on page 20 of the SLSR: "*A wetland evaluation was completed for all wetlands within the Subject Lands following the OWES Southern Manual (MNRF, 2014).*" Triggers for future EISs will include those features on (and proposed to be added to) Map 5 including all the wetlands and features identified through the SLSR for the Secondary Plan as identified in Section 6.1.2 Environmental Impact Study Requirements. No change to report.
RATIONALE 5.3, page 20 Based on their size, the wetlands found within the Subject Lands do not qualify for evaluation individually under OWES, however, the wetlands are within 750 m of each other and may be considered as a 'complex' and evaluated as a single unit. Furthermore, several wetland communities were not field verified and further ground-truthing and boundary delineation would be required. Those that were not evaluated, are they within 750 m and should be complexed? Is there a hydro geological connection? How this will be addressed in future EIS work is unclear to EEPAC.	**Parsons Response:** The wetlands do meet the definition of a "wetland" under The London Plan and can be protected through those policies. Triggers for future EISs will include those features on (and proposed to be added to) London Plan Map 5 including all the Wetlands and features identified through the SLSR for the Secondary Plan as identified in Section 6.1.2 Environmental Impact Study Requirements. No change to report.
SIGNIFICANT WOODLAND **Recommendation #3 - p. 11, 4.2.2, when an EIS is scoped for development adjacent to the Significant Woodland, the Environmental Management Plan must include a detailed invasive species management plan and a detailed woodland management plan to the satisfaction of the City.**	**Parsons Response:** Agreed, and Parsons will add the following recommendation to Section 7: *"Include an Invasive Species Management Plan and Woodland Management Plan where development is proposed adjacent to the significant woodland."* To avoid any misunderstanding, Parsons will keep the existing recommendation "*Include an Invasive Species Management Plan to remove or control the spread of Common Reed (Phragmites) and other invasive plant species during construction"* as this will pertain to lands not adjacent to the significant woodland.
Recommendation #4 - The odd boundary on the east side of the Significant Woodland is not conducive to ecological function. There must be more of a "link" from the wetland portion to the easternly section as shown in	**Parsons Response:** The existing linkage is limited to the hedgerow area as the lands to the south are actively farmed. The linkage area can be enhanced as part of an EIS, such as wetland creation. Linkages, wetland/wildlife creation would be

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Figure 11 of the SLSR. RATIONALE A narrow amphibian movement corridor will likely not work and there will be no future opportunity to expand it or replace it post development. As such, the SWH section of the SLSR only mentions future EIS work to determine if they exist. Seems that they should be created if not already there. 5.4.1 page 21, confirmed SWH for amphibian breeding in City owned lands near Shamrock Road. Candidate SWH for the private lands. There is also a candidate amphibian movement corridor.	determined at the EIS stage. The Significant Woodland boundary in the SLSR was identified through application of the City's Guidelines for Assessing the Ecological Boundaries of Vegetation Patches*, including* the 20-30 meter wide amphibian movement corridor *(linkage),* and will be *recommended to be* added to Map 5 of the London Plan as recommended in the SLSR. The SLSR recommends restoration to widen the corridor, "…on Figure 11 (Appendix A) and are conceptual only and based on existing conditions, not future landuse. Restoration and enhancement should be considered and refined as part of an EIS, which would take into consideration future landuse. It is further noted that there may be potential for replacement of wetlands, including relocation, in accordance with Policy 1334_ of The London Plan (see Section 5.3)." No change to report.
Given the past destructive nature of a landowner (loss of Patch 10099 and wetlands in the northwest section of the site), how will the candidate areas be protected until survey work can be done as part of an EIS? Given the history of activity against natural heritage in the area, what will be done to ensure these ecosites are protected and properly surveyed during an EIS? Landowners should be put on notice that there will be consequences for alteration of lands prior to development approvals.	**City Planning Response:** Patch 10099 is existing, and protected by London Plan policy and mapping etc. The Tree Protection by-law also applies to majority of trees in the subject lands. Triggers for future EISs will include those features on (and proposed to be added to) Map 5 of the London Plan and features identified through the SLSR for the Secondary Plan as identified in Section 6.1.2 Environmental Impact Study Requirements. The WODA SLSR and recommendations would be discussed and cited in the required EIS scoping meeting and minutes (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). No change to report.
MEADOWLARK / BOBOLINK HABITAT **Recommendation #5 - The City start a comprehensive effort to set aside enough land to compensate for the continuing loss of Meadowlark habitat from city and private projects. A number of projects including this one, the widening of Southdale Road, the White Oak – Dingman Drive intersection have all identified breeding meadowlark. Without a compresensive effort, in short order, all available lands will become unavailable for replacement.**	**City Planning Response:** The City's Dingman Creek Erosion Control Wetland (2015) is an example of the City's leadership in habitat restoration in the area and is a widely recognized birding hotspot (Ebird, Free Press etc.) and includes restored grassland habitat with Meadowlarks observed in citizen science e-bird reports. The City's Dingman Creek EA process is underway. An overarching concept of the EA is to create a naturalized corridor within South London as part of the stormwater management strategy. As such, the study includes looking at the option of creating a "complete corridor" to convey water, wildlife and people.

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	The White Oak-Dingman Secondary Plan project is not a development proposal. The Secondary Plan process will identify future land use (Place Types) for London Plan Map 1 and Natural Heritage Features for London Plan Map 5. Should portions of these lands be proposed for future development based on appropriate Place Type policies in the Secondary Plan, (noting large portions are within the UTRCA's Screening Area on Figure 6 in the SLSR) any required habitat compensation would be determined as part of a future required EIS (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). The Meadowlark habitat identified on City of London lands in the east part of study area will continue to be protected in situ. Agree that the City and Developers must comply with Provincial requirements noting the SLSR identifies "*This area is also confirmed breeding habitat for Eastern Meadowlark, a Threatened species under the ESA, 2007 and may require species-specific surveys during a future EIS."* Landowners are aware of the Meadowlark habitat identified and mapped in the SLSR and would be required to consult with the Ministry of the Environment, Conservation and Parks (MCEP) as per the Endangered Species Act (ESA). The WODA SLSR and recommendations would be discussed and cited in the future required EISs. No change to report.
RATIONALE Table D1 and Figure 5 and p. 25 - Eastern Meadowlark, adults and fledglings, in meadows on west side of site AND east side in City owned lands (although page 26 does not say so). This is a threatened species for which habitat compensation is required under Endangered Species Act.	**Parsons Response:** Agreed, and Parsons will revise the following statement about Eastern Meadowlark (last sentence) on page 26 "*The large cultural meadow community in the western portion of the Subject Lands (i.e., vegetation community ID#5) was determined to be breeding habitat for two indicator species: Savannah Sparrow and Grasshopper Sparrow. As such, this area is confirmed significant open country bird breeding habitat (Figure 9, Appendix A).* ***This area is also confirmed breeding habitat for SAR, specifically Eastern Meadowlark (Figure 11, Appendix A)."***

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	Bolded text to be revised to: *"*Eastern Meadowlark has been confirmed in the meadow communities located at the west and eastern boundaries of the Subject Lands (Figure 10, Appendix A)*."*
The SLSR also identified savannah sparrows. Open Country Breeding Bird Habitat confirmed! This is very unusual in the city. What will be done to protect or compensate for the loss of over 30 ha of Significant Wildlife Habitat?	**Parsons Response:** Should portions of these lands be proposed for developed in the future, (noting it is primarily within the UTRCA Screening Area on Figure 6 in the SLSR) habitat compensation would be determined as part of a future required EIS (with standard invitation to EEPAC to attend the scoping meetings and provide comments on the EISs). No change to report.
OTHER. **Recommendation #6 - The City should move to amend London Plan and existing OP now as recommended in the SLSR as shown in Figure 12, as well as put the "square" between WE-8 and WE-23 into Environmental Review, pending a decision on compensatory mitigation and wetland relocation.**	**Parsons Response:** Agree in part as updating the London Plan, including Map 5 – Natural Heritage is a requirement of the Secondary Plan process. While the SLSR does identify and recommend that area for restoration on Figure 11, actively farmed agricultural lands are not mapped as Environmental Review as per London Plan policy_783. No change to report.
FUTURE ROAD WORKS R2, consultant notes possible connection for amphibians thru culvert. How will this be captured in future studies?	**Parsons Response:** Agreed, and Parsons will include a recommendation to Section 7 that states "Assess the need for wildlife ecopassages as part of detailed design."
TEXT to be EDITED Crayfish are not insects as stated on page 15 at the top	**Parsons Response:** Agreed, crayfish are crustaceans; will revise paragraph to state that seven insects and one crustacean were documented (vs eight insects). Section 4.3.4 and Table F2 (Appendix F) headings for "insects" will be revised to "Invertebrates."
5.4.2, page 22 "There were wetlands in the **eastern** portion of the Subject Lands property that had been filled in" (see Figure 8, Appendix A) Should this say **western**??	**Parsons Response:** Agreed, and this will be corrected to "western" on page 22. A search of the report did not find any additional errors related to this.

EEPAC Review of the SLSR for the Byron Pit

Ian Arturo
Alex Bilson Darko
Susan Hall
Randy Trudeau

The opportunity to review the Byron Pit SLSR provided the working committee with a 'Big Picture' overview of the 'Study Lands' and 'Site Lands' designated for development. The report highlighted natural heritage features associated with the Byron Pit and listed the flora and fauna living and/or foraging in the B.P. habitat and adjacent areas.
The Working Committee focused on the Natural Heritage Recommendations in section 11 of the document. This section was divided into the following categories.

11.1 Habitat of Endangered and Threatened Species
11.2 Significant Woodland
11.3 Significant Wildlife Habitat
11.4 Future Studies

The Working Committee supports every recommendation.

However, there is concern for the large nesting colony of Bank Swallows (SAR - Threatened species). The recommendation was to consult with the Ministry of the Environment, Conservation and Parks (MECP) prior to any site alteration for the rehabilitation of the pit. Rehabilitation (backfilling) of the southern end of site has already begun. The colony, located on the southwest vertical cliff, is in the vicinity of this alteration. The birds have migrated but has the aggregate operator developed a strategy in accordance with the 'Best Management Practices' (BMPs) outlined by the MECP.

The Working Committee has provided a collection of facts and statements related to bank swallow behaviour, recovery and mitigation.
The sources used were:

1. Ontario Ministry of Natural Resources and Forestry. 2017. **Best Management Practices for the Protection, Creation and Maintenance of Barn Swallow Habitat in Ontario.** Queen's Printer for Ontario., 2017. 37pp
2. Ontario Ministry of Natural Resources and Forestry. 2016. **Recovery Strategy for the Bank Swallow (Riparia riparia) in Ontario. Prepared for the MNRF.** Peterborough, Ontario. 70pp

Facts and Statements

Bird Behaviour

- Bank Swallows are aerial insectivorous birds, foraging in wetlands, open waters, riparian areas, grasslands, agricultural areas, shrublands, but not dense forest.
- Habitat needs include foraging habitat, nest sites and nocturnal roosting sites.
- New burrows are typically dug each year, average apparent survival is 33-35% for juveniles and 40-53% for adults, feed within 260m of the colony when nestlings present and 690m when next building.
- Average age 1.7- 3 years, surviving adults generally return to breeding sites, start arriving in April/May and depart late July, August and September.
- Bank swallows exhibit high site fidelity to nest sites but many nest sites are naturally ephemeral.
- Migration and dispersal – very little is known about Bank Swallows in Ontario.

Recovery

- Abundance data varies but population trends suggest a 4.8% annual decline in Ontario.
- Conflicting legislation leads to difficulties protecting bank swallow living in aggregate pits.(Aggregate Resources Act 1990, Endangered Species Act 2007)
- Recovery goal – maintain 330000 breeding individuals over the next 10 years and reduce the rate of decline.

- Recovery strategy – 1. Address knowledge gap. 2. Protect habitat. 3. Inventory and monitor.
- Nesting sites in Aggregate Pits – Natural erosion and human-related excavation of material refreshes the vertical profile and keeps the bank suitable for nesting. Stopping extraction and rehabilitating the site may halt refreshing. If not refreshed, the slope slumps and stabilizes within several years and the colony disappears.
- Critical approach to recovery – investigate feasibility of maintaining or creating nesting habitat as part of a final rehabilitation plan for aggregate pits and quarries.
- If creating a nest face that requires excavation for fill, consider digging in front of the wall such that a small wetland is created there.

Mitigation

- Pits and quarries are eligible for exemptions under the ESA regulation 242/08.
- Aggregate proponents that have entered into the Pits and Quarries provision of Ontario Regulation 242/08 require a Mitigation Plan, including annual reports on the effectiveness of Bank Swallow management practices. The Mitigation Plan must be retained for at least five years after the activity ends.
- Artificial structures – Two types of structures piloted in Ontario – 1.earthern embankment. 2.concrete structure with sand-filled burrow tubes. Both are still experimental. Studies show Bank Swallows prefer existing slopes.

Comments/questions regarding:

Surface water and Groundwater in Byron Pit.

1. Are we able to get the following study: “Feasibility Study for the Rehabilitation and After Use of The Byron Gravel Pits”, mentioned in the following document from 1992. (Southeast Byron Area Study 1992) http://www.london.ca/business/Planning-Development/secondary-plans/Documents/South-East-Byron-Area-Study-1992.pdf
2. For the pond towards the north which will remain in all three of the conceptual site plans:
    a. It is clear that there is no surface water outlet. Presumably, groundwater flows from the pond (242 m asl) towards the Thames River (230 m asl). A groundwater contour map would be helpful in understanding local hydrogeology.
    b. Are there other examples of quarry/pit pond reuse for recreational and natural purposes? What challenges were encountered?
    c. Is there a plan to reduce nutrient and chloride loading into the pond?
3. The 1992 document (link above) mentions an old landfill adjacent to North Road. Will the groundwater flow regime from the landfill site change as a result of pit reclamation? Could groundwater from the landfill impact natural resources in the reclaimed pit?

Other

1. Quote from the 1992 document: “MNRF is to encourage the restoration of depleted pits to a condition suitable for an acceptable after use and compatible with adjacent land use.” Define suitable?
2. Is the objective, to ‘backfill’ the southern end of the pit to the original grade?
3. Did the aggregate operator inform the MNRF or MECP of the bank swallow colony and formulate a mitigation plan? If so, where is the plan? EEPAC would appreciate the opportunity to review it along with researchers at the Advanced Facility for Avian Research.
4. Considering a mitigation plan would have to coordinate with the closure of the Byron Pit, how long will the ‘backfilling’ take?
5. Will there be any future aggregate extraction in the area?

Thanks to Brendan Samuels for providing the following supporting documents.

1. The only successful case study of successful artificial habitat development for bank swallows (from the UK)
http://downloads.gigl.org.uk/website/artificial_bank_creation.pdf

2. Graduate thesis from Trent University about bank swallow habitat in aggregate pits
http://digitalcollections.trentu.ca/objects/etd-553

3. Recovery Strategy for Bank Swallows in Ontario
https://files.ontario.ca/mnrf_bans_rs_final-accsbl.pdf

Reviewer Affiliation	Reviewer (F. Lastname)	Comment #	EMG Section	Page #	Type of Comment 1 - Policy 2 - Format 3 -Science 4 - Process	Comment and Suggested Action	Responder Affiliation	Responder (F. Lastname)	Status Green - Closed Yellow - Pending Red - Open	1 - Incorporated 2 - Information Required 3 - Not	Response Comment
						HIGH PRIORITY COMMENTS FORMATTED BELOW IN RED					
		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 source 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.					
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.					
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.					
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 reques					
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 agains 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.					
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 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.					
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					
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 eviden 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). W 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).					
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 a 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.					
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**)**) 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.**					
EEPAC	Working Group	11	6	144	3	This is not true in 2019. Delete the statement "Many of the alien species tha grow in southern Ontario do not pose a threat to natural area". Please refer UTRCA, Ontario Invasive Plants Council					
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).					
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 Environmenta 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).					
						LOWER PRIORITY COMMENTS LISTED BELOW IN BLACK FONT, ORDERED BY EMG SECTION/SUBTOPIC					
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					
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?					
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).					
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					
EEPAC	Working Group	18	1	2	4	update name - is it still Technical Review Advisory Team?					
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?					
EEPAC	Working Group	20	1	3	1	purpose should also include compensation					
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)					
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..."					
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					
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-watershe 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.					
EEPAC	Working Group	25	1	5	4	section C SLSR - I am not aware Guidelines exist for the preparation of an SLSR.Are there?					

EEPAC	Working Group	26	1	5	4	the city often does not push to have qualifications included					
EEPAC	Working Group	27	1	6	4	pre consultation MUST or SHALL occur.Also, update DART to whatever it is called now					
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					
EEPAC	Working Group	29	1	7	4	also refers to getting data from Nature London.A good idea that should be used going forward.					
EEPAC	Working Group	30	1	7	4	dated should be defined.Is it more than 5 years old?10 years?					
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.					
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.					
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 scopiing meeting					
EEPAC	Working Group	34	1	8	4	Terms of Reference for Site Issues.EEPAC should be included in the process					
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.					
EEPAC	Working Group	36	1	10	4	Site visit - include EEPAC representative					
EEPAC	Working Group	37	1	10	1	Scoped Site EIS must include a monitoring plan					
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					
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 developmen should work around the constraints not the other way around					
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.					
EEPAC	Working Group	41	1	12	2	first para, change 'environment' to 'ecological features and functions'					
EEPAC	Working Group	42	1	12	2	under purpose.Direct and indirect impacts must be shown.Only some like AECOM, do this regularly					
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.					
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					
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 EIS.Include in EMG and make it a requirement of submission					
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?					
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 thi conclusion, nor is there any way to repair damage when the consultant gets it wrong.					
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 th conclusions of the net impact n analysis.It is usally 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)					
EEPAC	Working Group	49	1	16	2	Not sure where this fits.Is it relevant in light of OPA 438?					
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					
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					
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 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					
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 impact are listed in a Net Effects Assessment Table, the rationale seems to either be missing or is superficial					
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 thi 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					
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.					
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 thr needs to be part of development agreements.					
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					
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 var 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 (whic 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.					
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.I retain this section, need to provide examples of unacceptable impacts.Is it from the table showing no, low, med and high impacts?					
EEPAC	Working Group	60	1	25	4	First paragraph - Maps must always be at the same scale.Somehow this doesn't get demanded					
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 fo 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)					
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 Pee Review once in the last 7-10 years					
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?					
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					
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 ofte "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)					
EEPAC	Working Group	66	1	28	2	See Appendix 6, Ottawa 2015 EIS Guidelines for a possible replacement					
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					
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?					
EEPAC	Working Group	69	1	31	1	1.2.7 update to Significant Wildlife Habitat for Ecoregion 7E					

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?					
EEPAC	Working Group	71	1	32	2	not sure 1.3 needs to be in a scoping list					
EEPAC	Working Group	72	1	33	1	update to London Plan language.1.4 use endangered, threatened and special concern.Include Federal and Provincial					
EEPAC	Working Group	73	1	34	2	3.2 add hydro period , delete 3.4 (never used)					
EEPAC	Working Group	74	1	36	2	update definitions of the categories of species at risk (endangered, threatened, species of concern)					
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.					
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					
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.					
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					
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 discusssed when new edge is created.Rare is an EIS that requires some form of mitigation					
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.Guelp's EAC is included in its Guideline document					
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					
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					
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.					
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 (potentia 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.					
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.					
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 tho 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."					
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 referenc might be without a full citation. Therefore, we recommend either removing this section entirely or providing the full citation.					
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.					
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.					
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.					
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.					
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					
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"					
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					
EEPAC	Working Group	95	2	46	3	There is a broken link referenced in this sentence: "Priority birds species for each mulicipality 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.					
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					
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					
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.					
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).					
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					
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					
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);					
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 benefitical to the new Guideline					
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.					
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					
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).					
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					
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					

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					
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 sti required.					
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					
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 Aassessment an 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					
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 al 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.					
EEPAC	Working Group	114	3	51-54	2	turn into an Appendix if still seen as needed.Otherwise, delete					
EEPAC	Working Group	115	3	55	2	2.1 and 2.2 are likely not necessary anymore					
EEPAC	Working Group	116	3	56	2	#8 should be revised.No need to reference the pre ELC material					
EEPAC	Working Group	117	3	57	2	if retain, make into a colour map.Perhaps use Map 5 of the London Plan?					
EEPAC	Working Group	118	3	58	2	not sure this needs to be retained.If so, use colour					
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					
EEPAC	Working Group	120	3	67	2,3	Is the OWES reference still current?Add to the application section, flood attentuations, retention and other modifications of nutrients and other chemicals in surface water, long term storage o atmospheric carbon dioxide, erosion control and groundwater recharge					
EEPAC	Working Group	121	3	70	3	update this Criterion to include Significant Wildlife Habitat for Ecoregion 7E					
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)					
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.					
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 rar vegetation communities in Ontario					
EEPAC	Working Group	125	3	74	2	replace Glossary with page 48-49 of 2014 PPS or most current verison					
EEPAC	Working Group	126	3	75	3	update reference list.Some may be found on EEPAC's list					
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.Se also 'shoulds' in 3b, 5b and 8b-f					
EEPAC	Working Group	128	3	78-	2	if figures are used in the new version, update using software					
EEPAC	Working Group	129	3	79	3	Beacon's buffer document refers to Critical Function Zones.This should be added to Guideline 1.					
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 Natura 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					
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.					
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 th projectionprovidesstrengthens 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 th watercourse is not immediately adjacent to the patch)					
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 85100 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)					
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 supportin 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					

EEPAC	Working Group	135	3	82	3	Satellite woodlands that are small less than 2 ha and have a round to square shape, andare 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)shouldmust 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.)					
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 betweennatural areas by filling in a bay or connectingtwo 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 betweenconnectsa patchtoand 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.)					
EEPAC	Working Group	137	3	84	3	Add to Guideline 7:f) contribute to biological diversity and ecological function of the larger patch; o 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					
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.					
EEPAC	Working Group	139	3	85	3	A Plantation mustbe included if it meets one of the criteria shown in 8b to 8f.'Should' is too vague.					
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?					
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?					
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.)					
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).					
EEPAC	Working Group	144	3	87-89	2,3	update references.See EEPAC list					
EEPAC	Working Group	145	3	89	2	there is no section 4.0 - renumber if retain					
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.					
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.					
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.					
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.					
EEPAC	Working Group	150	5	117	3	Beacon 2012 should be used to update this Guideline					
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).					
EEPAC	Working Group	152	5	121	4	is this process still in use?Standardized?What is a management unit?Undefined!					
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)					
EEPAC	Working Group	154	5	127	2	is this helpful?Delete?					
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					
EEPAC	Working Group	156	6	131	3	2.1 - only native species must be used					
EEPAC	Working Group	157	6	132	3	2.2 - refer to London's Invasive Species Management Plan					

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 spatia 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 amoung flora, fauna, microbes and changing environment, EMG -6 could be further refined to tackle future challenges. eg 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.					
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 revist. Ther are current databases eg: http://www.torontozoo.com/adoptapond/urbanoutback/part53.html						
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)						
EEPAC	Working Group	161	6	135	3	delete Manitoba Maple?						

Source Number	Identify source type 1-peer reviewed science 2-municipal documents 3-provincial documents 4-Federal documents 5-NGO documents	Year Published	Specific to Southern Ontario? (Y/N)	Does this apply to a specific EMG section? (Yes/No). If yes, list section(s): 1. EIS, 2. Data collection standards, 3. ESA, Boundary Delineation, 4. Significant Woodlands, 5. Buffers, 6. Plant selection.	Title and/or Reference	Summary or description (if applicable)	Link to access document (if applicable)
					HIGH PRIORITY SOURCES FORMATTED BELOW IN RED		
1	2	2012	Y	5	Buffers – Beacon Environmental 2012 (Credit River CA)	Buffers	Beacon on buffers
2	2	2017	Y	*1*	*Guidelines for the Preparation of Environmental Impacts Studies, version 1, City of Guelph. Prepared with the assistance of Beacon Environmental. Last accessed August 21, 2019 (includes a clearer way of presenting impact assessments and divides monitoring into three different types. Also good appendices on Wildlife Survey Guidance*	EIS	https://guelph.ca/city-hall/planning-and-development/community-plans-studies/environment-planning/guidelines-preparation-environmental-impact-studies/
3	3	2017	Y	*other*	*Monitoring – Conservation Halton Ecological Monitoring Protocols, version 1.0, February 2017*	monitoring	https://www.conservationhalton.ca/long-term-environmental-monitoring
4	2	2015	N	*1,2*	*City of Ottawa, Environmental Impact Statement Guidelines, October 2015, includes identifying cumulative impacts. Appendix 10 includes standard mitigation measures for various natural heritage features and functions. Appendix 6, Preliminary Environmental Data Collection Checklist seems, in part, easier to use then our current one.*	EIS	https://ottawa.ca/en/living-ottawa/environment/environmental-policy-and-planning#natural-heritage-system
5	5	2019	Y	2	BioMAP (Bioassessment of Water Quality)	BioMAP (Bioassessment of Water Quality) methodology and protocol was developed by Ronald W. Griffiths, Ph.D. at the Centre for Environmental Training Niagara College, Glendale Campus Niagara-on-Lake, Ontario. The City of London completed 13 Sub-watershed studies in 1995. The MOE requested that the 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.	Previous reports prepared for the city of London that use BioMAP can be made available upon request. https://www.amazon.ca/BioMAP-Bioassessment-quality-Ronald-Griffiths/dp/0968592104
6	3	2004	Y	1	Forest Edge Management Plan Guidelines, Toronto and Region Conservation Authority, 2004 (this should be included in restoration where new edge is created)		http://trca.on.ca/dotAsset/40029.pdf
7	1	2007	N	1	Nirupama, N., & Simonovic, S. P. 2007. Increase of flood risk due to urbanisation: a Canadian example. Natural Hazards, 40(1), 25.		
8	1	2018	N	1	Agrawal, N. (eds.). 2018. Natural Disasters and Risk Management in Canada. Advances in Natural and Technological Hazards Research, vol. 49. Springer, Dordrecht.		
9	1	2017	N	1	Edge, C. B., Fortin, M. J., Jackson, D. A., Lawrie, D., Stanfield, L., & Shrestha, N. 2017. Habitat alteration and habitat fragmentation differentially affect beta diversity of stream fish communities. Landscape Ecology, 32(3), 647-662.		
10	2	2010	Y	1	Beacon Environmental. 2010. Recommendations for Conducting Wetland Environmental Impact Studies (EIS) for Section 28 Regulations Permissions. Prepared for Conservation Ontario by Beacon Environmental in association with SCS Consulting Group and Blackport and Associates.		
11	4	2014	N	1	The Water Survey of Canada (Environment Canada)	Pg 4 outlines requirements to measure flow - can be adapted for stream habitat analysis to standardize measurements	http://publications.gc.ca/collections/collection_2014/ec/En56-245-1999-eng.pdf
12	4	2006?	N	1	Table 5: Sensitivity of Fish and Fish Habitat from Practitioners Guide to the Risk Management FRAMEWORK FOR DFO HABITAT MANAGEMENT STAFF, version 1.	EIS	EIS Table 5 from DFO
13	3	2017	N	1	Preparing environmental assessments. Government of Ontario		https://www.ontario.ca/page/preparing-environmental-assessments
14	2	2015	N	1	BASELINE WATER QUALITY MONITORING PROGRAM FOR THE FUTURE WIARTON WASTEWATER TREATMENT PLANT, FALL 2015. Draft III Report prepared for: Saugeen Ojibway Nation (SON) and Town of South Bruce Peninsula. Prepared by: ZEAS Incorporated. 36 McCutcheon Ave Nobleton, Ontario L0G 1N0	"Benthic macroinvertebrate data were statistically evaluated and used to assess water quality in Colpoys Bay. Four end-points were used; total density, total number of taxa, Simpson's Diversity Index and the Bray-Curtis Index. In addition the BioMAP metrics were calculated. BioMAP utilizes a biotic "Water Quality Index" (WQI(d)) and a set of summary metrics to determine the status of a water body (Griffiths 1999). The BioMAP Water Quality index (WQI(d)) is an abundance-weighted mean sensitivity value of the benthic macroinvertebrates occurring at a site. The sensitivity values assigned to macroinvertebrates range from 0 to 4 with 0 being assigned to the most tolerant taxa and 4 assigned to the taxa most sensitive to environmental stresses"	
15	1	2018	Y	2	Tim P. Duval, Effect of residential development on stream phosphorus dynamics in headwater suburbanizing watersheds of southern Ontario, Canada. Science of The Total Environment. Volumes 637–638, 2018. Pages 1241-1251. ISSN 0048-9697. https://doi.org/10.1016/j.scitotenv.2018.04.437.	Suburban landscapes are known to have degraded water quality relative to natural settings, including increased total phosphorus (TP) levels; however, the effect of subdivision construction activities on stream TP dynamics are less understood. This study measured TP and its constituents particulate, dissolved organic, and dissolved inorganic phosphorus (PP, DOP, and DIP, respectively) in two headwater streams of contrasting urbanization activity to examine whether the land-use conversion process itself contributed to TP concentrations and export. The nested watershed undergoing significant active residential community construction contained large areas of cleared former agricultural field and associated sediment mounds with elevated soil TP (~1000 mg kg−1), and twice as many stormwater management (SWM) ponds than the watershed with completed suburban communities. Daily stream sampling for six months revealed limited differences in TP between urbanized and urbanizing watersheds regardless of season or stream flow condition; however, the forms of TP varied significantly. The proportion of TP as DOP was consistently higher in the urbanizing stream relative to the urban stream, which was in line with significant decreases in DOP concentration as proportion of cleared former agricultural land decreased and density of SWM ponds increased. The DOP, and to a lesser extent DIP and PP, dynamics resulted in a 2.5× greater areal export of TP from a small watershed actively being suburbanized during the study period compared to the larger watershed with greater land urbanized 3–5 years ago. The results of this study suggest stream TP concentrations are relatively unresponsive to active versus established suburban cover, but the forms of TP can be quite different, and the period of home construction can increase phosphorus (P) delivery to and export through nearby streams. This information can aid land managers and urban planners update best management practices to mitigate the transfer of terrestrial P to the aquatic environment.	
16	3	2018	N	2	Vegetation Resources Inventory – British Columbia. Ground Sampling Procedures, 2018. Inventory Methods for Forest and Grassland Songbirds. Prepared by Ministry of Environment, Lands and Parks (BC) Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, March 16, 1999.		
17	3	2011	Y	2	A land manager's guide to conserving habitat for forest birds in southern Ontario, Ministry of Natural Resources, 2011, 140 pp.		https://npca.ca/images/uploads/common/mnr-guide-s-ontario-forestry.pdf
18	5	2015	Y	2	Ontario Nature, 2015, The Ontario Reptile and Amphibian Atlas	Data source	https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/
19	2	2014	Y	2	Middlesex County, 2014, Middlesex Natural Heritage System Study, 48 pp.	Data source	
20	4			2	Data collection - Aquatic Species at Risk Maps. DFO. http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html	Data collection	
21	4	2007		2	Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. April 2007 Environment Canada, Canadian Wildlife Service, 33 pp. (the protocols can be applied to any situation, not just wind turbines)	Data collection	http://publications.gc.ca/site/eng/458449/publication.html
22	5	2005	N	2	The Atlas of the Breeding Birds of Ontario (2001-2005) and its predecessor and any updated version	Data source that should be used to determine how bird distributions have changed.	
23	5		Y	2	Nature London's Annual Christmas Bird Counts	Bird count data could be used for specific sites in London as a data source for changes in populations as there are data for specifics sites that have been sampled each year for a number of years.	http://www.naturelondon.com/annual-bird-counts/
24	5	2004	N	2	Ontario Benthos Biomonitoring Network (OBBN)	Data collection protocol for aquatic invertebrates	https://desc.ca/programs/OBBN
25	5			2	Bird Studies Canada Citizen Science Programs	Bird Studies Canada offers multiple programs based on citizen science (e.g. Breeding Bird Survey, Canadian Migration Monitoring Network, Christmas Bird Count, eBird, Great Backyard Bird Count, Great Canadian BirdAthon, National Nocturnal Owl Surveys, Project Feederwatch, Project NestWatch, Swifts and Swallows). Data can be useful as indicators of species abundance over time, as well as sightings of elusive or threatened species possibly missed by standard monitoring	https://www.birdscanada.org/volunteer/programmap/index.jsp?lang=EN&targetpg=caprograms

26	1	2017	N	2	Chilima, J. S., Blakely, J. A., Noble, B. F., & Patrick, R. J. 2017. Institutional arrangements for assessing and managing cumulative effects on watersheds: Lessons from the Grand River watershed, Ontario, Canada. Canadian Water Resources Journal, 42(3), 223-236.	monitoring	https://tandfonline.com/doi/abs/10.1080/07011784.2017.1292151?scroll=top&needAccess=true&journalCode=tcwr20
27	5	2006	Y	2	The Southwestern Ontario Orthophotography Project (SWOOP)	Data set consists of multiple remotely sensed data products including 30 cm which was derived from digital aerial photography collected in the spring and summer of 2006 by First Base Solutions. SWOOP encompasses the following municipal tiers: Bruce County, Brant County, Elgin County, Essex County, Grey County, Haldimand County, Huron County, Lambton County, Middlesex County, Norfolk County, Oxford County, Perth County and Wellington County, Dufferin County (west), Municipality of Chatham-Kent. (Restricted access)	
28	4		N	2	GeoGratis	A portal provided by the Earth Science Sector (ESS) of Natural Resources Canada (NRCan).	http://geogratis.gc.ca/
29	5		N	2	Scholars GeoPortal	An award-winning geospatial data discovery tool made possible by the Ontario Council of University Libraries and Government of Ontario (Restricted access)	
30	4		N	2	EarthExplorer	Provides basic information and on-line access to remotely-sensed data from the U.S. Geological Survey Earth Resources Observation and Science (EROS) Center archive.	http://earthexplorer.usgs.gov/
31	1	2012	N	2	Quantifying Stream Substrate for Habitat Analysis Studies	How to identify substrates in a sediment	https://www.tandfonline.com/doi/abs/10.1577/1548-8659%281985%295%3C499%3AQSSFHA%3E2.0.CO%3B2
32	5	2012	N	2	Alberta Native Plant Council (ANPC) Guidelines for Rare Vascular Plant Surveys in Alberta	Guidelines for conducting rare plant surveys. The guidelines were prepared as... a need was identified to standardize the methodology, because it was noted that pre-disturbance surveys were sometimes conducted with inappropriate techniques, timeframes and scopes.	https://anpc.ab.ca/wp-content/uploads/2015/01/Guidelines-For-Rare-Plant-Surveys-in-AB-2012-Update.pdf
33	4	2015	N	2	Rare prairie plant survey protocol.	Protocol provides instructions on survey techniques and data collection for presence/not-detected status of rare prairie plants	http://www.environment.gov.sk.ca/Default.aspx?DN=fcbfda20-dfdc-4e13-b56d-af4a9c7a70d0
34	4	2018	N	2	Inventory and Survey Methods for Rare Plants and Lichens	This document was developed in response to a critical need to standardize methods of detecting the presence of rare vascular plants, bryophytes, and lichens in British Columbia (BC) to inform projects related to environmental assessment, species at risk surveys, and other inventories where it is important to know the distribution of rare plants and lichens. The compilation was guided in part by published standards employed in other North American jurisdictions as well as by the experience and knowledge of BC's community of professional botanists. The primary survey types are floristic inventories and targeted surveys	https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/inventory_and_survey_methods_for_rare_plants_and_lichens.pdf
35	1	2010	N	2	Vanderpoorten A, Papp B, Gradstein R. Sampling of bryophytes. In: Eymann J, Degreef J, Häuser C, Monje JC, Samyn Y, Vandespiegel D, editors. Manual on field recording techniques and protocols for all taxa biodiversity inventories Vol 8. Belgium: ABC taxa; 2010. p. 331-45.	Sampling methods for bryophytes (mosses), non-vascular plant sampling	
36	1	2005	N	2	Newmaster, S. G., Belland, R. J., Arsenault, A., Vitt, D. H., & Stephens, T. R. (2005). The ones we left behind: comparing plot sampling and floristic habitat sampling for estimating bryophyte diversity. Diversity and distributions, 11(1), 57-72.	Sampling methods for bryophytes (mosses), non-vascular plant sampling	
37	1	2018	N	2	Bowering, R., Wigle, R., Padgett, T., Adams, B., Cote, D., & Wiersma, Y. F. (2018). Searching for rare species: A comparison of Floristic Habitat Sampling and Adaptive Cluster Sampling for detecting and estimating abundance. Forest Ecology and Management, 407, 1-8.	Sampling methods for rare species	
38	5		Y	2	Muma, Robert. A graphic guide to Ontario mosses.	Ontario moss ID guide	https://worldofmosses.com/ggom/ggomClassIdent.html
39	5	2016	N	2	Brodo, Irwin M. 2016. Keys to Lichens of North America: Revised and Expanded	Lichen ID guide	
40	5	2016	Y	2	Pope, Ralph H. 2016. Mosses, Liverworts, and Hornworts: A Field Guide to the Common Bryophytes of the Northeast	ID guide to non-vascular plants	
41	5	2007	N	2	Walewski, Joe. 2007. Ferns & Allies of the North Woods: A Handy Field Reference to All 86 of Our Ferns and Allies	Fern ID guide	
42	5	2017	Y	2	Baroni, Timothy J. 2017. Mushrooms of the Northeastern United States and Eastern Canada: Timber Press Field Guide	Mushroom ID guide	
43	5	2016	Y	2	Barron, George. 2016. Mushrooms of Ontario and Eastern Canada. Lone Pine.	Mushroom ID guide	
44	4	2017	N	2	Completing and Using Ecosystem Service Assessment for Decision-Making: An Interdisciplinary Toolkit for Managers and Analysts		http://publications.gc.ca/collections/collection_2017/eccc/En4-295-2016-eng.pdf
45	5	NA	Y	2	Recommend using data from the many freely available citizen science apps to gain local knowledge of species as part of data collection process	Suggested apps: iNaturalist (https://www.inaturalist.org/), Seek (https://www.inaturalist.org/pages/seek_app), eBird (https://ebird.org), Ontario Reptile and Amphibian Atlas (https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/), Bumble Bee watch (https://www.bumblebeewatch.org/); Natural Heritage Information Centre (NHIC) (https://www.ontario.ca/page/natural-heritage-information-centre); Leafsnap (http://leafsnap.com/); Journey North monarch monitoring (http://journeynorth.org/monarch/); EDDMapS Ontario (https://www.eddmaps.org/ontario/) - invasive species reporting	
46	5	NA	N	2	Birds Canada. "Amphibian Surveys Overview." https://www.birdscanada.org/volunteer/glmmp/?targetpg=glmmpfrog	Guidelines for conducting amphibian surveys in Canada.	
47	1	2009	N	2	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.	An updated atlas of vascular plants in Ontario (previous version was Oldham (1996)).	
48	5	NA	N	2	Nature Serve. "Conservation Status Assessment." https://www.natureserve.org/conservation-tools/conservation-status-assessment	Generally, the NHIC website is cited when referring to global ranking of rare species. However, these rankings originate from Nature Serve, so it should also be cited.	
49	4	2018	N	2	Government of Canada. 2018. "COSEWIC list of wildlife species assessed." https://wildlife-species.canada.ca/species-risk-registry/sar/assessment/wildlife_species_assessed_e.cfm	This is an updated list relative to the 1996 COSEWIC report referenced in Section 2 of the EMG.	
50	3	2018	N	2	Government of Ontario. 2007. "Species at risk in Ontario list." Most recently updated in 2018 https://www.ontario.ca/laws/regulation/080230/v13	This is a link to the most recent list of species at risk, assembled by COSSARO.	
51	5	2019	N	2	Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. (2019). "Atlas of the Breeding Birds of Ontario." https://www.birdsontario.org/atlas/secondatlas.jsp?lang=en	This is a link to the digitized Breeding Bird Atlas of Ontario, which can replace the older reference to Cadman et al., 1987.	
52	5	2019	N	2	Toronto Entomologist's Association. (2019). "Ontario Butterfly Atlas." http://www.ontarioinsects.org/atlas_online.htm	This is a link to the digitized Ontario Butterfly Atlas, which can replace the print version cited in section 2 of the EMG (Holmes et al., 1991).	
53	1	2003	N	2	Oldham, M.J. (2003). *Conservation Status of Ontario Amphibians.* Natural Heritage Information Centre, Ontario Ministry of Natual Resources. Peterborough, Ontario.	This citation lists the conservation status of Ontario amphibians and can be used to complement the older summary of Ontario herpetofauna by Weller (1994). Weller (1994) is cited in section 2 of the EMG.	
54	5	2001	N	2	Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. (2001). "Guide for participants." https://www.birdsontario.org/download/atlas_feb03.pdf	This guide for participants, published by the Ontario Bird Atlas, provides detailed guidelines for conducting breeding bird surveys in Ontario, with specific instructions for southern Ontario.	
55	4	?	Y	2	General nesting periods for migratory birds by zones. London is in the C1 zone	Determine when migratory birds might be nesting so you can plan your activities to reduce the risk of harming migratory birds.	https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html
56	1	2019	N	2	Project Feederwatch by the Cornell Lab of Ornithology.	A citizen science database of bird sightings over long-term monitoring periods.	https://feederwatch.org/about/project-overview/#about-the-data
57	3	2018	N	2	Minnesota Pollution Control Agency. Minnesota Pollution Control Agency Guidelines for monitoring of lakes, rivers and streams, and wetlands. 2018. https://www.pca.state.mn.us/water/water-monitoring-standard-operating-procedures	A collection of extensive monitoring guidelines for lakes, rivers and streams, and wetlands. These guidelines are recommended by EEPAC for monitoring of aquatic systems.	
58	3	2017	N	2	Stanfield, L. *Ontario Stream Assessment Protocol. 2017. https://www.pca.state.mn.us/water/water-monitoring-standard-operating-procedures*	Provincial guidelines for assessing streams.	

59	1	2015	N	3	*Jarzyna, Marta A., et al. "Landscape Fragmentation Affects Responses of Avian Communities to Climate Change." Global Change Biology 21.8 (2015): 2942-53.*	Forecasting the consequences of climate change is contingent upon our understanding of the relationship between biodiversity patterns and climatic variability. While the impacts of climate change on individual species have been well-documented, there is a paucity of studies on climate-mediated changes in community dynamics. Our objectives were to investigate the relationship between temporal turnover in avian biodiversity and changes in climatic conditions and to assess the role of landscape fragmentation in affecting this relationship. We hypothesized that community turnover would be highest in regions experiencing the most pronounced changes in climate and that these patterns would be reduced in human -dominated landscapes. To test this hypothesis, we quantified temporal turnover in avian communities over a 20 -year period using data from the New York State Breeding Atlases collected during 1980–1985 and 2000–2005. We applied Bayesian spatially varying intercept models to evaluate the relationship between temporal turnover and temporal trends in climatic conditions and landscape fragmentation. We found that models including interaction terms between climate change and landscape fragmentation were superior to models without the interaction terms, suggesting that the relationship between avian community turnover and changes in climatic conditions was affected by the level of landscape fragmentation. Specifically, we found weaker associations between temporal turnover and climatic change in regions with prevalent habitat fragmentation. We suggest that avian communities in fragmented landscapes are more robust to climate change than communities found in contiguous habitats because they are comprised of species with wider thermal niches and thus are less susceptible to shifts in climatic variability. We conclude that highly fragmented regions are likely to undergo less pronounced changes in composition and structure of faunal communities as a result of climate change, whereas those changes are likely to be greater in contiguous and unfragmented habitats.	
60	1	2012	N	3	Gray, P.A., D. Paleczny, T.J. Beechey, B. King, M. Wester, R.J. Davidson, S. Janetos, S.B. Feilders, and R.G. Davis. 2012. Ontario's Natural Heritage Areas: Their Description and Relationship to the IUCN Protected Areas Classification System (A Provisional Assessment). Version 1.1. Queen's Printer for Ontario, Peterborough, Ontario, Canada. 356 pp.		
61	5	2016	N	3	Worboys, G. L., Ament, R., Day, J. C., Lausche, B., Locke, H., McClure, M., ... & Woodley, S. (2016). Advanced draft, areas of connectivity conservation guidelines: definition, types, selection critera, and governance. Gland, Switzerland: IUCN.	Areas of Connectivity Conservation (ACCs) interconnect protected areas and connect them to the wider semi-natural and natural landscapes, freshwaterscapes and seascapes. This Guideline defines and describes ACCs and is based on connectivity conservation research and practice pioneered by IUCN WCPA researchers, practitioners and experts from other organisations prior to and following the 2003 IUCN Durban World Parks Congress.	https://www.iucn.org/sites/dev/files/content/documents/acc_advdraft_guidelines_28may2016.pdf
62	1	2015	N	4	Effects of habitat structure, human disturbance, and habitat connectivity on urban forest bird communities, Kang, W., Minor, E., Park, C-R., Lee, D., Urban Ecosyst, on line January 2015	Remnant patches with lower levels of human distrubance had higher diversity than newly established patches where intense human activities had occurred more frequently.	doi 10.1007/s11252-014-0433-5
63	3	2015		5	Appendix F: Guidelines for Ecological Buffer Areas, Environmental Planning Policies - April 2015, Cataraqui Region Conservation Authority	EIS	EcologicalBuffers Cataraqui Region CA
64	3	2012	N	5	Categorizing and Protecting Habitat under the Endangered Species Act, Feb 2012, Ontario. https://www.ontario.ca/page/species-risk-guides-and-resources		
65	1	2006	N	5	Effects of Habitat Disturbance from Residential Development on Breeding Bird Communities in Riparian Corridors, SUZANNE M. LUSSIER, Environmental Management Vol. 38,No. 3,pp. 504–521		
66	1	2016	N	5	King, S. E., Osmond, D. L., Smith, J., Burchell, M. R., Dukes, M., Evans, R. O., ... & Kunickis, S. (2016). Effects of riparian buffer vegetation and width: a 12-year longitudinal study. Journal of environmental quality, 45(4), 1243-1251.	Project objective: determine effectiveness over 12 years of buffer types and buffer widths on reducing groundwater nitrate. Results: wider buffers more effective, buffer efficacy increased over time, buffer vegetative type was not significant.	
67	1	2018	N	5	Lima, E. A. C. F., & Ranieri, V. E. L. (2018). Land use planning around protected areas: Case studies in four state parks in the Atlantic forest region of southeastern Brazil. Land use policy, 71, 453-458.	Study results indicate that the use of the buffer zone as an effective strategy for the management of protected areas (PA) requires a link between the PA managers and local government, to facilitate articulation between management plan of the PA and the municipal master plan. Otherwise, establishment of buffer zone risks having no practical effect on biodiversity conservation in the protected area.	
68	1	2014	N	5	Dindaroğlu, T., Reis, M., Akay, A. E., & Tonguc, F. (2015). Hydroecological approach for determining the width of riparian buffer zones for providing soil conservation and water quality. International Journal of Environmental Science and Technology, 12(1), 275-284.	Approach for determining buffer width. A hydroecological approach using geographical information system technology can be successfully implemented to provide maximum sustainable protection of water and soil resources in riparian zones, especially in the lake basins	
69	1	2013	Y	5	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, Urban Forestry & Urban Greening, 2013	Prevailing planning, design and management approaches in Southern Ontario municipalities in Canada indicate planning and management tools have been developed to remove and impede encroachment impacts; however, many are infrequently implemented. This lack of implementation contributes to a high prevalence and spa-tial area of encroachment within Southern Ontario municipal woodland edges with adjacent housing	ttp://dx.doi.org/10.1016/j.ufug.2013.08.002
70	1	2010	Y	5	The housing-forest interface: Testing Structural approaches for protecting suburban natural systems following development, Mcwilliam, W. et. al.,Urban Forestry & Urban Greening (2010)	Even under the most effective boundary treatment, encroachment activities continued at significant distances from forest borders. Forested buffers of at least 50 m wide are required to segregate encroachment impacts from sensitive forested natural systems.	doi:10.1016/j.ufug.2009.12.002
71	1	2011	Y	5	Wendy J. McWilliam, Paul F.J. Eagles, Mark L. Seasons & Robert D. Brown (2011): Effectiveness of Boundary Structures in Limiting Residential Encroachment into Urban Forests, Landscape Research	Transect and quadrat sampling of 40 forest edges adjacent to 186 residential properties were sampled in six Southern Ontario municipalities to determine impact frequency and area cover of encroachment. The results indicated some structures are effective in reducing the frequency and area cover of some encroachment behaviours. Other behaviours were not signi ficantly reduced by any structural treatment. Furthermore, some behaviours were increased by structures. Substantial areas of encroachment continued to occur under even the most effective boundary treatments. The treatment most successful in reducing frequency and area was ungated fencing in combination with a mown grass strip. It was found to reduce the incidence of yard extensions and concentrate encroachments closest to forest edges.	To link to this article: http://dx.doi.org/10.1080/01426397.2011.592243
72	1	2010	Y	5	Assessing the Degradation Effects of Local Residents on Urban Forests in Ontario, Canada, Wendy McWilliam, Paul Eagles, Mark Seasons, and Robert Brown, Arboriculture & Urban Forestry 2010. 36(6): 253-260	Encroachment results from various boundary treatments; however, it is not known whether encroachment represents a substantial source of degradation within Ontario, Canada, municipal forests. To evaluate this, percentage cover of encroachment impacts adjacent to 186 homes within 40 forests of six Southern Ontario municipalities was surveyed. The results indicated degradation re-sulting from encroachment was substantial. Encroachment occurred in highly valued and sensitive ecosystems, and during sensitive time periods. This was highly prevalent and covered a substantial proportion of the forest edge. Some encroachment behaviors were particularly harmful, resulting in the loss of signi ficant forest area to residential land uses. Furthermore, encroachments remained over long periods.	
73	1	2012	Y	5	Evaluation of planning and management approaches for limiting residential encroachment impacts within forest edges: A Southern Ontario case study, McWilliam, et. al., Urban Ecosyst (2012) 15:753-772	Recommendations for improved approaches for managing residential encroachment impacts within forest edges is provided.	doi 10.1007/s11252-012-0232-9
74	5	2015	N	5	Guidelines for Ecological Buffer Areas: CRCA Environmental Planning Policies - April 2015 - Appendix F - Page 1 of 7		CRCA Guideline for Buffers
75	1	2012	Y	6	Newmaster, S.G. and S. Ragupathy, 2012. Flora Ontario – Integrated Botanical Information System (FOIBIS), Phase I. University of Guelph, Canada. Available at: http://www.uoguelph.ca/foibis/	Provides uptodate information about flora	
76	1	1996	Y	3,5	Norman, A. J. (1996). The use of vegetative buffer strips to protect wetlands in southern Ontario. Wetlands. Environmental gradients, boundaries and buffers. CRC Press, New York, 263-275.	Recommendations on width of buffer strips for protecting wetlands in Ontario	
77	1	2008	N	3,5	Corlett, D., & Phillips, M. (2008). Science-based watershed policy for stream corridors: Integrating economic and ecological considerations (Doctoral dissertation, Master's thesis (portion) presented to the Department of Landscape Architecture and Regional Planning at the University of Massachusetts, Amherst).	methodology for sizing protective stream corridors and evaluating existing programs	
78	1	2008	Y	1,3	Eigenbrod, F., Hecnar, S. J., & Fahrig, L. (2008). Accessible habitat: An improved measure of the effects of habitat loss and roads on wildlife populations. Landscape Ecology, 23(2), 159-168. doi:10.1007/s10980-007-9174-7	Habitat loss is known to be the main cause of the current global decline in biodiversity, and roads are thought to affect the persistence of many species by restricting movement between habitat patches. However, measuring the effects of roads and habitat loss separately means that the configuration of habitat relative to roads is not considered. We present a new measure of the combined effects of roads and habitat amount: accessible habitat. We define accessible habitat as the amount of habitat that can be reached from a focal habitat patch without crossing a road, and make available a GIS tool to calculate accessible habitat. We hypothesize that accessible habitat will be the best predictor of the effects of habitat loss and roads for any species for which roads are a major barrier to movement. We conducted a case study of the utility of the accessible habitat concept using a data set of anuran species richness from 27 ponds near a motorway. We defined habitat as forest in this example. We found that accessible habitat was not only a better predictor of species richness than total habitat in the landscape or distance to the motorway, but also that by failing to consider accessible habitat we would have incorrectly concluded that there was no effect of habitat amount on species richness.	

79	1	2019	N	1,3	Ongoing accumulation of plant diversity through habitat connectivity in an 18-year experiment	Deleterious effects of habitat fragmentation and benefits of connecting fragments could be significantly underestimated because changes in colonization and extinction rates that drive changes in biodiversity can take decades to accrue. In a large and well-replicated habitat fragmentation experiment, we find that annual colonization rates for 239 plant species in connected fragments are 5% higher and annual extinction rates 2% lower than in unconnected fragments. This has resulted in a steady, nonasymptotic increase in diversity, with nearly 14% more species in connected fragments after almost two decades. Our results show that the full biodiversity value of connectivity is much greater than previously estimated, cannot be effectively evaluated at short time scales, and can be maximized by connecting habitat sooner rather than later.	https://science.sciencemag.org/content/365/6460/1478.full
80	1	2011	Y	1,5	Falk, K., Nol, E., & Burke, D. (2011). Weak effect of edges on avian nesting success in fragmented and forested landscapes in ontario, canada. Landscape Ecology, 26(2), 239-251. doi:10.1007/s10980-010-9543-5	We studied the effects of anthropogenic edges on predation and parasitism of forest bird nests in an agriculturally fragmented landscape and a continuously forested landscape in Ontario, Canada. Nesting data were collected at 1937 nests across 10 species in the fragmented landscape from 2002–2008, and 464 nests across 4 species in the continuously forested landscape from 2006–2008. Brood parasitism only occurred in the fragmented landscape, and was positively related to the proportion of rural grassland and row crop habitats within 500-m of nests. Daily nest survival was negatively related to the density of roads within 500-m of nests in the fragmented landscape, but was not influenced by distance to anthropogenic edge in either landscape. Predation rates were higher in the fragmented landscape for Ovenbird and Rose-breasted Grosbeak nests, but did not differ between landscapes for Veery and American Redstart nests. Uniformly high predation in the fragmented landscape may be a result of (1) matrix predators that penetrate deep (>300 m) into the forest interior, or (2) the additive effect of forest-dependent and matrix-associated predators that results in high predation pressure in both edge and interior habitats. Further research focused on the identification of nest predators, their population dynamics, and habitat use is required to understand the underlying mechanisms leading to uniformly high nest predation in fragmented landscapes.	
81	3	2014	Y	1,2	Toronto and Region CA Environmental Impact Statement Guidelines, Oct 2014, pp. 31. Includes data collection standards for the inventory of natural components for an EIS	data collection	TRCA EIS Guidelines
82	3	2017	Y	1,2	EIS - Conservation Halton's Guidelines for Ecological Studies, August 2017. 6 pp. has nice table of studies, their timing as well as method and protocol.	EIS	#VALUE!
83	1	2016	Y	No	Kirchhoff, D., McCarthy, D., Crandall, D. D., McDowell, L., & Whitelaw, G. 2016. A policy window opens: strategic environmental assessment in York Region, Ontario, Canada. In Progress in Environmental Assessment Policy, and Management Theory and Practice (pp. 27-48).		
84	3	2011	Y	No	A Summary of the Effects of Climate Change on Ontario's Aquatic Ecosystems	MNR Climate Change Research Report	https://files.ontario.ca/environment-and-energy/aquatics-climate/stdprod_088243.pdf
85	1	2014	Y	1,3	*Koen, Erin L., et al. "Landscape Connectivity for Wildlife: Development and Validation of Multispecies Linkage Maps." Methods in Ecology and Evolution 5.7 (2014): 626-33.*	The ability to identify regions of high functional connectivity for multiple wildlife species is of conservation interest with respect to habitat management and corridor planning. We present a method that does not require independent, field-collected data, is insensitive to the placement of source and destination sites (nodes) for modeling connectivity, and does not require the selection of a focal species. In the first step of our approach, we created a cost surface that represented permeability of the landscape to movement for a suite of species. We randomly selected nodes around the perimeter of the buffered study area and used circuit theory to connect pairs of nodes. When the buffer was removed, the resulting current density map represented, for each grid cell, the probability of use by moving animals. •We found that using nodes that were randomly located around the perimeter of the buffered study area was less biased by node placement than randomly selecting nodes within the study area. We also found that a buffer of ≥ 20% of the study area width was sufficient to remove the effects of node placement on current density. We tested our method by creating a map of connectivity in the Algonquin to Adirondack region in eastern North America, and we validated the map with independently collected data. We found that amphibians and reptiles were more likely to cross roads in areas of high current density, and fishers (Pekania [Martes] pennanti) used areas with high current density within their home ranges. Our approach provides an efficient and cost effective method of predicting areas with relatively high landscape connectivity for multiple species.	
86	3	2015	Y	1,3	Ontario Ministry of Natural Resources and Forestry. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E.		https://docs.ontario.ca/documents/4776/schedule-7e-jan-2015-access-vers-final-s.pdf
87	1	2012	N	2, 3	Gunson, K. E., Ireland, D., & Schueler, F. 2012. A tool to prioritize high-risk road mortality locations for wetland-forest herpetofauna in southern Ontario, Canada. Northwestern Journal of Zoology, 8(2), 409-413.		
88	1	2010	Y	2,3	Area-Sensitivity by Forest Songbirds: theoretical and practical implications of scale dependency, Desrocher, Renaud, Hockachka, Cadman, Ecography 33:921-931, 2010	Songbird presence is often associated with the area of suitable habitat in the surrounding landscape. However, the size of landscape for which this association is maximized is generally unknown, likely to vary among species, and may affect our ability to incorporate songbirds in landscape management. We measured the occurrence and the persistence of forest songbirds in relation to the amount of habitat measured at several scales: local (100, 200 m radius), neighborhood (400, 800 m), landscape (1.6, 3.2, 6.4 km) and regional (12–24 km), based on data from Ontario's Forest Bird Monitoring Program (1987–2005). Songbird occurrence was obtained from point count sites distributed across southern Ontario and each revisited in multiple years (mean=5.8 yr). Presence of each species at a site was associated with forest habitat area measures that account for differences in preferred forest cover types among species. Area of coniferous, deciduous and mixed forest was derived from Landsat TM imagery. Thirty-two of the 35 species studied were area-sensitive, and area-sensitivity was apparent for 13–25 species at each spatial scale. For 24 species, the strength of area-sensitivity varied with scale, suggesting the importance of local, neighborhood, landscape and regional habitat for 3, 5, 5, and 11 species respectively. As a result, the list of the five most area-sensitive species varied depending on the scale at which habitat was described. We conclude that area-sensitivity can occur at a broader set of scales than generally assumed, and is most pronounced at the regional scale. We suggest that a broad set of scales should be examined before taking conservation decisions based on avian area-sensitivity.	
89	1	2003	Y	3,4,6	*McLachlan, S. M., and D. R. Bazely. "Outcomes of Longterm Deciduous Forest Restoration in Southwestern Ontario, Canada." Biological Conservation 113.2 (2003): 159-69.*	At present, forest cover in southwestern Ontario, Canada, remains at less than 5% due to intensive agricultural and urban land use. Although much of the extant forest is increasingly protected by legislation, remnants continue to be degraded by the spread of non-native plant species, overgrazing, and recreational use. Some parks in the region have adopted management programs aimed at mitigating this degradation. Over the last 35 years, cottages and roads at Point Pelée National Park have been removed and sites either passively restored (i.e. road or cottage eliminated and vegetation allowed to regenerate) or actively restored (i.e. road or cottage eliminated, exotic vegetation removed, and native species planted). In 1994 and 1995, we assessed the effectiveness of restoration by comparing the understorey plant communities in 28 restored sites with those in less disturbed reference sites. There was a significant increase ($P<0.0001$) in the similarity of understorey plant communities between restored and reference sites as time-since-restoration increased. Soil moisture, canopy cover, distance to continuous forest, and site-shape all significantly affected plant species composition. Former road sites recovered significantly ($P<0.05$) more rapidly than former cottage sites, and the former lawns of passively restored cottage sites were the slowest to recover. Five years following active restoration, non-native ruderal species continued to dominate restored sites. The observed recovery of understorey plant communities in restored sites is attributed to their proximity to natural vegetation, and its function as a seed source. In some sites, recovery is substantial and, assuming present trajectories of change are maintained, we predict that recovery could occur in many mesic sites within the next 20 years. Restoration activity facilitates forest recovery and would appear to have a valuable function in mitigating ongoing conflicts between conservation and human use in this region.	
90	1	2007	Y	3,5	*Milne, Robert J., and Lorne P. Bennett. "Biodiversity and Ecological Value of Conservation Lands in Agricultural Landscapes of Southern Ontario, Canada." Landscape Ecology 22.5 (2007): 657-70.*	In eastern North America, large forest patches have been the primary target of biodiversity conservation. This conservation strategy ignores land units that combine to form the complex emergent rural landscapes typical of this region. In addition, many studies have focussed on one wildlife group at a single spatial scale. In this paper, studies of avian and anuran populations at regional and landscape scales have been integrated to assess the ecological value of agricultural mosaics in southern Ontario on the basis of the maintenance of faunal biodiversity. Field surveys of avian and anuran populations were conducted between 2001 and 2004 at the watershed and sub-watershed levels. The ecological values of land units were based on a combination of several components including species richness, species of conservation concern (rarity), abundance, and landscape parameters (patch size and connectivity). It was determined that habitats such as thicket swamps, coniferous plantations and cultural savannas can play an important role in the overall biodiversity and ecological value of the agricultural landscape. Thicket swamps at the edge of agricultural fields or roads provided excellent breeding habitat for anurans. Coniferous plantations and cultural savannas attracted many birds of conservation concern. In many cases, the land units that provided high ecological value for birds did not score well for frogs. Higher scores for avian and anuran populations were recorded along the Niagara Escarpment and other protected areas as expected. However, some private land areas scored high, some spatially connected to the protected areas and therefore providing an opportunity for private land owners to enter into a management arrangement with the local agencies.	

91	1	2018	Y	No	Cropland patchiness strongest agricultural predictor of bird diversity for multiple guilds in landscapes of Ontario, Canada. Frei, B., Bennett, E.M. & Kerr, J.T. Reg Environ Change (2018) 18: 2105. https://doi.org/10.1007/s10113-018-1343-5	The potential for agricultural landscapes to support biodiversity may vary greatly based on agricultural land use. Current knowledge suggests that agricultural composition and intensity are dominant drivers of biodiversity in agricultural landscapes, with variable effects of agricultural configuration and landscape diversity. The aim of this study was to determine the relative effects of agricultural composition, intensity, configuration, and landscape diversity on the species diversity of six distinct bird guilds on the landscape scale in a large and complex landscape in Ontario, Canada. We found that agricultural configuration, specifically patchiness of croplands, and to a lesser degree forage lands, was the strongest predictor of bird diversity for three of the six bird guilds considered (forest, shrubland, and town). The effects of increased cropland patchiness were variable, with forest and shrubland bird diversity increasing from small to moderate patchiness, and town bird diversity declining from moderate to high patchiness. Grassland birds, a group of considerable conservation concern, increased near linearly with increased agricultural land cover in the landscape, highlighting the need to consider agricultural lands in conservation planning for this species group. Woodland bird diversity declined significantly with all increasing measures of agricultural intensity, including the proportion of high-intensity agriculture and larger patches of agricultural land. Wetland birds were unique from the other guilds, showing primarily a strong association between diversity of land cover types and guild-level bird diversity. Surprisingly, increased cover of agricultural lands, which we predicted to be a dominant driver of guild-level bird diversity declines due to habitat loss, had weak, non-significant effects relative to the other land use variable being tested, except for the positive association with grassland birds. Our findings suggest that a mix of management strategies should be employed to consider the varying effects of agricultural lands on different bird guilds, such as the inclusion of agricultural land in conservation strategies for grassland species and further managing the configuration of agricultural lands to enhance biodiversity of agricultural landscapes.	
92	2	2007	Y	No	TERRESTRIAL NATURAL HERITAGE SYSTEM STRATEGY Toronto Region Conservation Authority, 2007.		https://trca.ca/conservation/greenspace-management/terrestrial-natural-heritage/
93	1	2016	Y	No	Kirchhoff, D., McCarthy, D., Crandall, D. D., McDowell, L., & Whitelaw, G. 2016. A policy window opens: strategic environmental assessment in York Region, Ontario, Canada. In Progress in Environmental Assessment Policy, and Management Theory and Practice (pp. 27-48).		
94	3	2011	Y	No	A Summary of the Effects of Climate Change on Ontario's Aquatic Ecosystems	MNR Climate Change Research Report	https://files.ontario.ca/environment-and-energy/aquatics-climate/stdprod_088243.pdf
95	2	2005	Y	1,2	Dingman Creek Subwatershed Study	See section 11.2 Monitoring Program Update for information about short and long term monitoring recommendations	https://www.london.ca/city-hall/master-plans-reports/reports/Documents/Dingman-Creek-Subwatershed-Study-Update%20Volume%201%20Main%20Report.pdf
96	2	2009	Y	1,2	Water Quality Monitoring Program for Dingman Creek	Includes BioMAP methods	https://www.london.ca/residents/Environment/Rivers-Creeks/Documents/Zeas-2009-Dingman.pdf