12TH REPORT OF THE

ENVIRONMENTAL AND ECOLOGICAL PLANNING ADVISORY COMMITTEE

Meeting held on November 17, 2016, commencing at 5:05 PM, in Committee Rooms #1 and #2, Second Floor, London City Hall.

PRESENT: S. Levin (Chair), E. Arellano, A. Boyer, L. Des Marteaux, C. Evans, P. Ferguson, S. Hall, D. Hiscott, Dr. N. Huner, C. Kushnir, K. Moser, S. Peirce, N. St. Amour, R. Trudeau, N. Weerasuriya and I. Whiteside and H. Lysynski (Secretary).

ABSENT: E. Boynton, M. Thorn and M. Watson.

ALSO PRESENT: C. Creighton, J. MacKay and L. McDougall.

I. CALL TO ORDER

1. Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

II. SCHEDULED ITEMS

2. Proposed 2017 Environmentally Significant Area (ESA) Capital Projects

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee received the attached presentation from L. McDougall, Ecologist Planner, with respect to proposed 2017 Environmentally Significant Area Projects.

III. CONSENT ITEMS

3. 11th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the 11th Report of the Environmental and Ecological Planning Advisory Committee from its meeting held on October 20, 2016, was received.

4. 11th Report of the Advisory Committee on the Environment

That it BE NOTED that the 11th Report of the Advisory Committee on the Environment from its meeting held on November 2, 2016, was received.

5. 10th Report of the Trees and Forests Advisory Committee

That it BE NOTED that the 10th Report of the Trees and Forests Advisory Committee from its meeting held on October 26, 2016, was received.

6. Notice of Application - Peter Jordan - 3668 Homewood Lane

That it BE NOTED that a Notice dated November 3, 2016, from B. Page, Senior Planner, with respect to the application by Peter Jordan, relating to the property located at 3668 Homewood Lane, was received.

IV. SUB-COMMITTEES & WORKING GROUPS

7. Ecological Restoration Plan for Westminster Ponds/Pond Mills ESA

That the attached Working Group comments related to the Ecological Restoration Plan for Westminster Ponds/Pond Mills Environmentally Significant Area BE FORWARDED to the Civic Administration for consideration.

V. ITEMS FOR DISCUSSION

8. Workplan

That the attached, updated, 2016 Environmental and Ecological Planning Advisory Committee Work Plan BE RECEIVED.

9. City Responses to EEPAC's 2016 List Of Suggested ESA Capital Project Ideas and Questions

That it BE NOTED that the Civic Administration's responses, dated November 2016, to the Environmental and Ecological Planning Advisory Committee's list of suggested 2017 Environmentally Significant Area Capital Projects and Questions, was received.

10. Medway Valley Heritage Forest ESA Habitat Protection, Restoration and Stewardship Initiatives

That it BE NOTED that the Medway Valley Heritage Forest Environmentally Significant Area Habitat Protection, Restoration and Stewardship newsletter was received.

11. Invasive Species Control Program Results, Medway Valley Heritage Forest ESA, December 2015

That it BE NOTED that the City of London Invasive Species Control Program Results for the Medway Valley Heritage Forest Environmentally Significant Area prepared by Dillon Consulting, was received.

12. ON Nature Magazine - Commitment to Protecting ESAs

That it BE NOTED that the City of London recognition in the "ON Nature" magazine, for its commitment to protecting Environmentally Significant Areas, was received.

13. ESA Management Committee Minutes - October 12, 2016

That it BE NOTED that the ESA Management Committee Meeting Minutes from its meeting held on October 12, 2016, were received.

14. London Invasive Plant Management Strategy

That the attached comments received from M. Thorn, J. Stinziano and S. Peirce, with respect to the London Invasive Plant Management Strategy, BE FORWARDED to the Civic Administration for consideration.

15. Notice of Application - 1577 and 1687 Wilton Grove Road

That the attached Working Group comments, related to the application by Forest City Industrial relating to the properties located at 1577 and 1687 Wilton Grove Road, BE FORWARDED to the Civic Administration for consideration.

16. "Living With the Wild" Document

That it BE NOTED that a general discussion was held with respect to the "Living With The Wild" document that has been posted on the City of London website.

17. Brainstorm Session for Projects

That the following actions be taken with respect to the Environmental and Ecological Planning Advisory Committee's brainstorming session for projects:

a) the Civic Administration BE REQUSTED to attend a future meeting of the Environmental and Ecological Planning Advisory Committee to have a general discussion with respect to proposed projects and potential implementation; and,

b) a Working Group consisting of L. Des Marteaux, S. Hall, C. Kushnir and S. Peirce BE ESTABLISHED to outline the steps necessary to ensure that people keep their cats indoors, from an environmental and ecological perspective; it being noted that this initiative will be further outlined at the next Environmental and Ecological Planning Advisory Committee meeting.

VI. DEFERRED MATTERS/ADDITIONAL BUSINESS

18. (ADDED) Sifton Bog Report: Vegetation Monitoring and Vascular Flora Inventory

That the attached Working Group comments, related to the Sifton Bog Report 2015 prepared by Stantec, BE FORWARDED to the Civic Administration for consideration.

19. (ADDED) Sifton Bog Platform Location

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee (EEPAC) held a general discussion with respect to the location of the platform located at Sifton Bog; it being noted that the Upper Thames River Conservation Authority would like the platform to remain in its existing location; it being further noted that the EEPAC received the attached Appendix L1. Geological Cross-Section of Sifton Bog ESA relating to this matter.

20. (ADDED) Draft Huron Industrial Lands Subject Lands Status Report

That a Working Group, consisting of S. Levin (lead) and I. Whiteside BE ESTABLISHED to review the draft Huron Industrial Lands Subject Land Status Report and to report back at the next Environmental and Ecological Planning Advisory Committee meeting.

21. (ADDED) Sunninglea Scope Environmental Impact Statement

That consideration of the updated Sunninglea Scoped Environmental Impact Study BE POSTPONED to the next Environmental and Ecological Planning Advisory Committee meeting.

VII. ADJOURNMENT

The meeting adjourned at 7:32 PM.

NEXT MEETING DATE: December 15, 2016

City of London Environmentally Significant Areas – 2016 / 2017 Capital Projects

Environmental and Ecological Planning Advisory Committee

November 17, 2016

London
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City of London ESAs

- **Presentation Overview**

- Management of ESAs in London

- Summary of 2016 Accomplishments

- Summary of 2017 Projects
  - Master Plans & Other Studies
  - Invasive Species Management
  - Trail / Signage Work
  - Adopt an ESA Groups

- Questions

Adopt an ESA / Friends of Medway Creek Maintaining Turtle Habitat, April 2016 Community Event

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What is an Environmentally Significant Area?

Eastern Meadowlark (Threatened)

Eastern Wood-Pewee (Special Concern)

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.

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.

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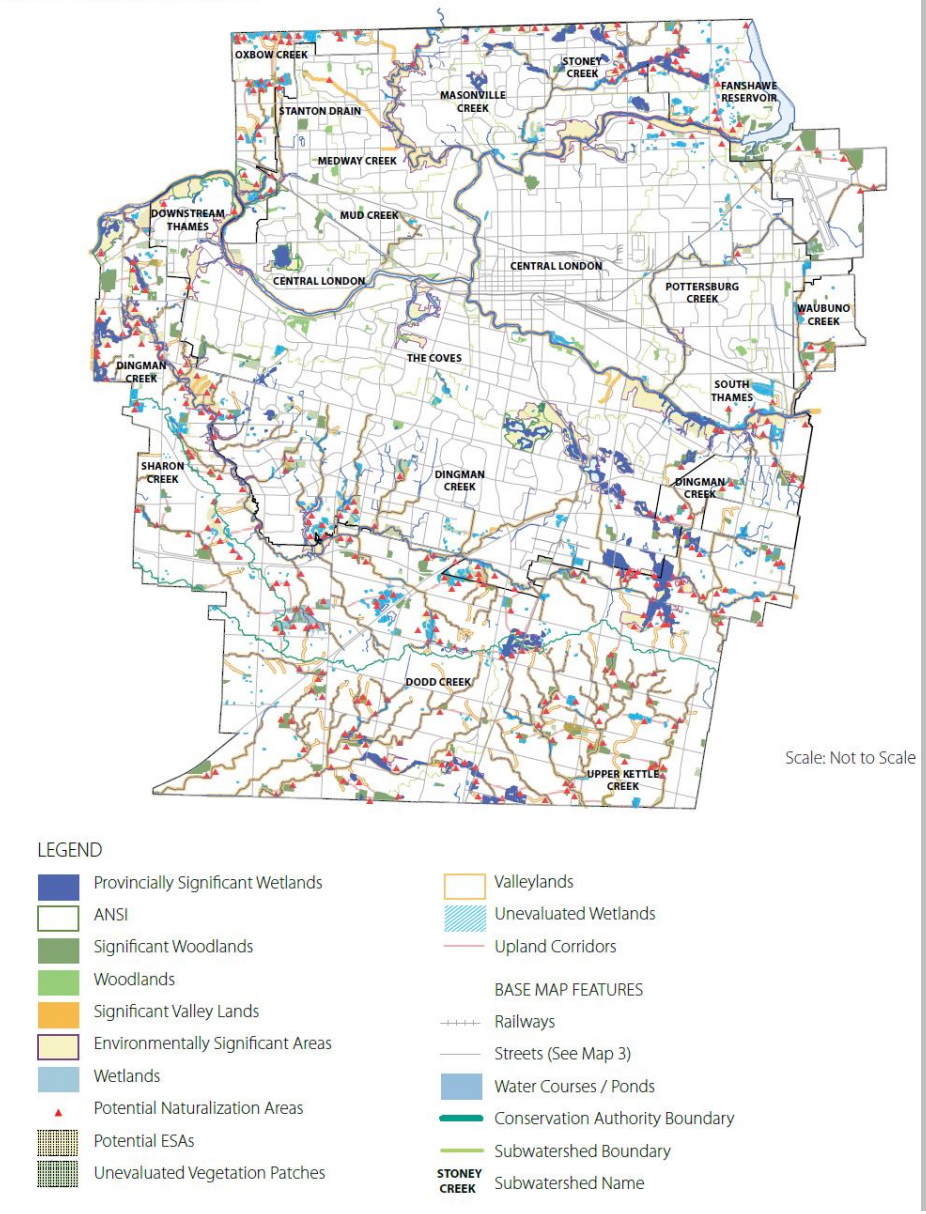
City of London ESAs

THE LONDON PLAN

EXCITING. EXCEPTIONAL. CONNECTED.

MAY 2016

MAP 5 - NATURAL HERITAGE



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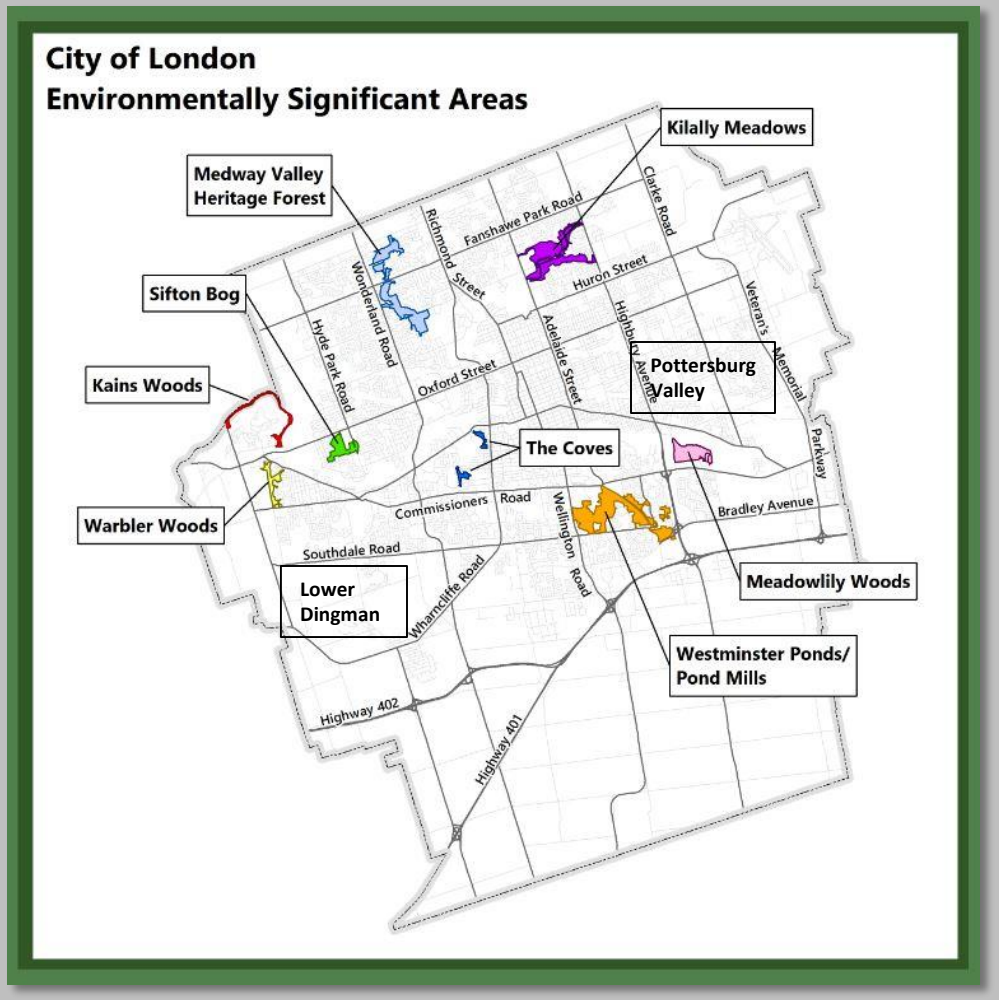
City of London ESAs

- Managed ESAs in London

- Westminster Ponds (200 ha)
- Sifton Bog (42 ha)
- Warbler Woods (29 ha)
- Kains Woods (28 ha)
- Kilally Meadows (145 ha)
- Meadowlily Woods (60 ha)
- Medway VHF (134 ha)
- Coves (46 ha)
- + Lower Dingman (20 ha in 2017)
- + Pottersburg Valley* (est. 2018)

UTRCA will manage 9 City owned ESAs in 2017 ~ 700 ha under a contract funded by the City

*Managed by Parks Operations



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City of London ESAs

- **ESA Team**

- 9 ESAs are managed by the UTRCA under agreement funded by the City.

- ESA Team have unique skills:
  - Wildlife management
  - Professional foresters/arborists
  - Tree Risk Assessor Qualification
  - Carpentry
  - Municipal bylaw enforcement
  - Licensed pesticide applicator
  - GPS/GIS

- Yearly Operating Budget
- Yearly Capital Budget

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Project Planning in ESAs

- Conservation Master Plans

- Goals, Objectives, Recommendations
- Phase I and Phase II Process

• Sifton Bog	2009
• Westminster Ponds	2005 & 2015
• Kilally Meadows	1999
• Medway Valley HF	1996
• Meadowlily Woods	1989
• Coves	2014

- Update to Medway VHF (south) in progress
- Update to Meadowlily Woods in progress

- Kains, Warbler Woods, Lower Dingman no CMP yet

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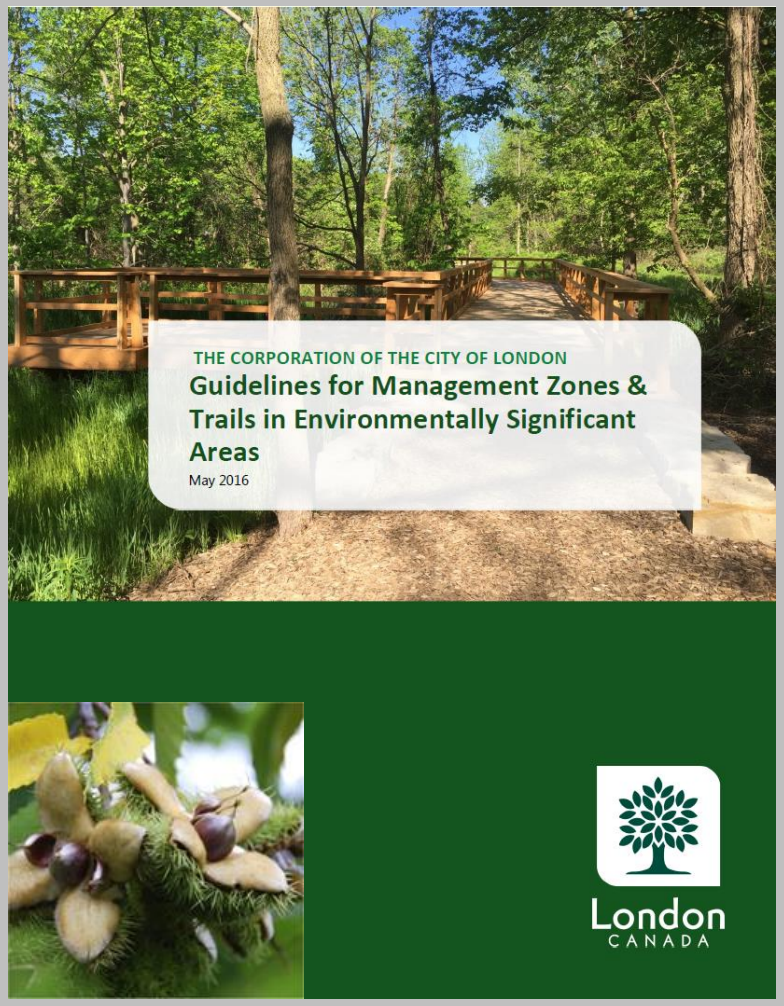
Overview of 2016 Capital Projects in ESAs

- **Master Plans & Other Studies**

- Guidelines for Management Zones and Trails in ESAs - Trails Focus Group 2016
- Sifton Bog Terrestrial Study
- Butternut Habitat Stewardship Protection SAR – Federal Grant - Study w UTRCA - ESA Team
- American Chestnut (END SAR) breaking isolation project / study with Canadian Chestnut Council (no cost to City)



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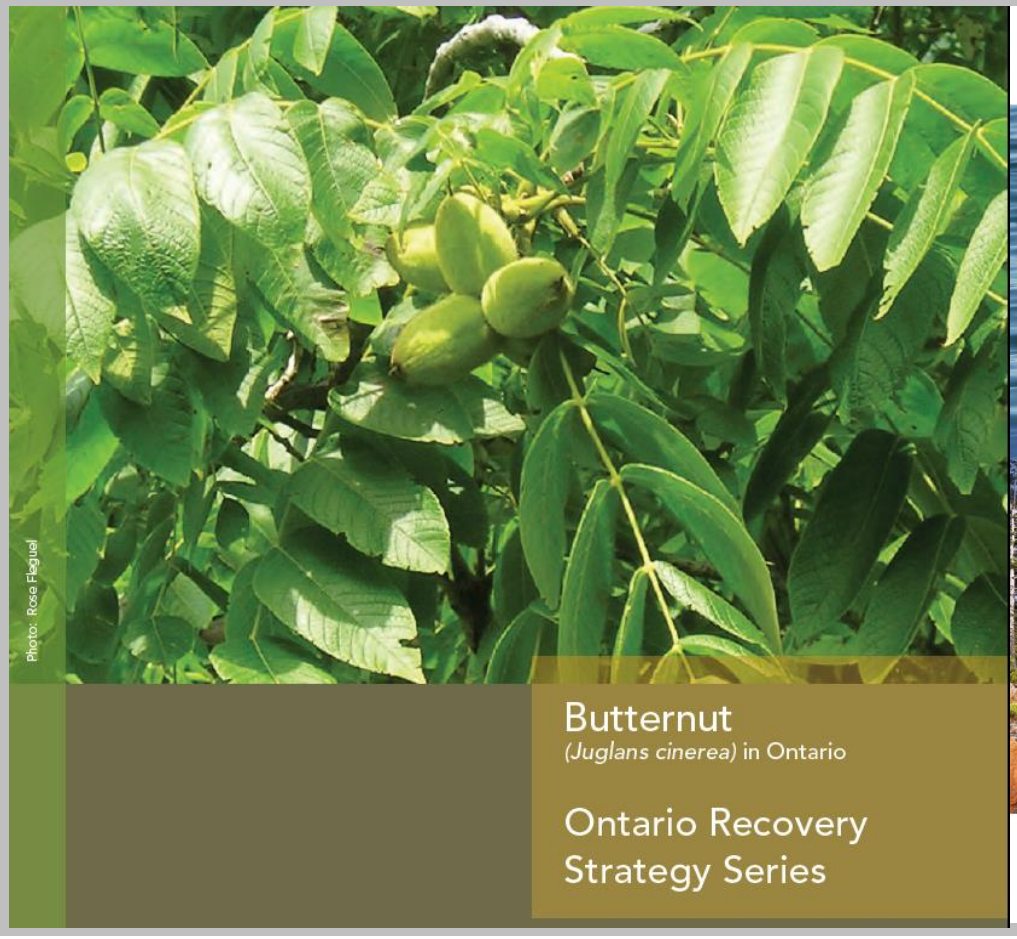
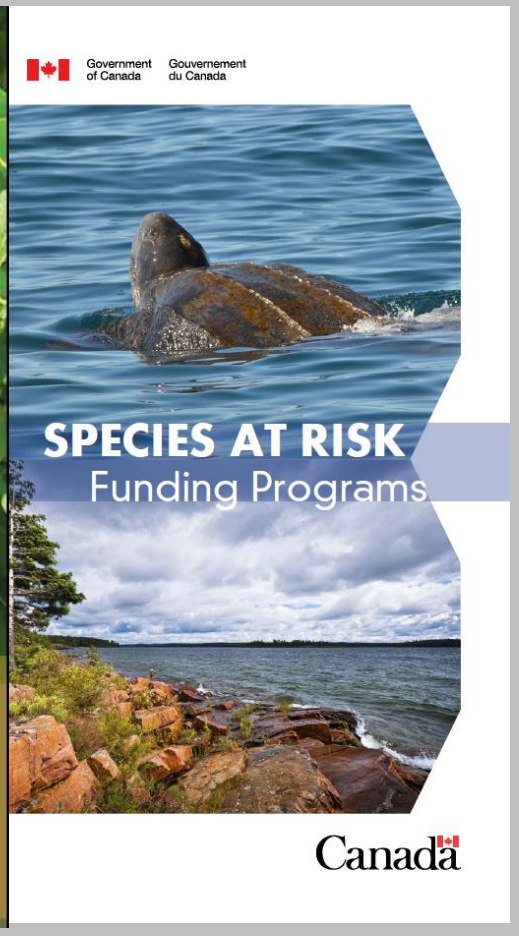
Butternut (END) SAR Project in all ESAs

- Brandon Williamson, ESA Team - UTRCA
- Habitat Stewardship Program - Grant for Butternut Project





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Overview of 2016 Capital Projects in ESAs

- **Invasive Species Management & Habitat Restoration**

- Species at Risk (SAR) False Rue-anemone Protection and Goutweed Invasive-species Mitigation Project funded by the City - with Dillon Consulting and UTRCA is successful in protecting SAR. The invasive species control, monitoring and restoration continues through 2017.
- Invasive species including Phragmities, Japanese Knotweed, Buckthorn, Scots Pine, Goutweed, Garlic Mustard, Periwinkle, Black Locust, Hogweed, Purple Loosestrife, Exotic Honeysuckle and more are managed/monitored.
- Tree-Azin Emerald Ash Borer, bi-annual injection Program, 136 healthy ash trees are protected. London is a leader in protecting Ash trees in natural areas.

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Overview of 2016 Capital Projects in ESAs

	2009	2010	2011	2012	2013	2014	2015	2016
Giant Hogweed				X	X	X	X	X
Phragmites						X	X	X
Periwinkle							X	X
Dog-strangling vine					X	X	X	
Japanese Knotweed						X	X	X
Goutweed							X	X
Garlic Mustard	X						X	X
Purple Loosestrife	X						X	X
Russian/Autumn Olive						X	X	X
Buckthorn	X	X	X	X	X	X	X	X
Honeysuckle							X	X
Black Locust							X	X
Scots Pine						X	X	X
Water Soldier								X
Water Lettuce					X	X	X	X
Water Hyacinth					X	X	X	X
Goldfish	X	X	X	X	X			
Emerald Ash Borer				X		X	X	X

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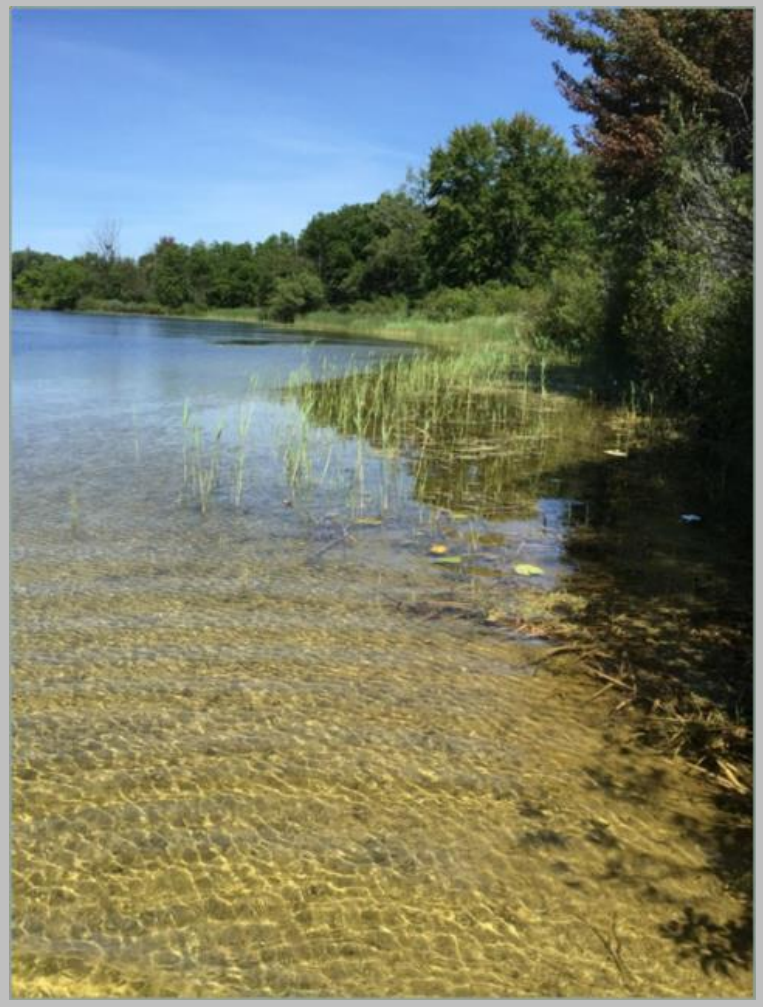
Overview of 2016 Capital Projects in ESAs



ESA Team Photos – Managing Invasive Phragmities by cutting & drowning it in South Pond in WMP ESA

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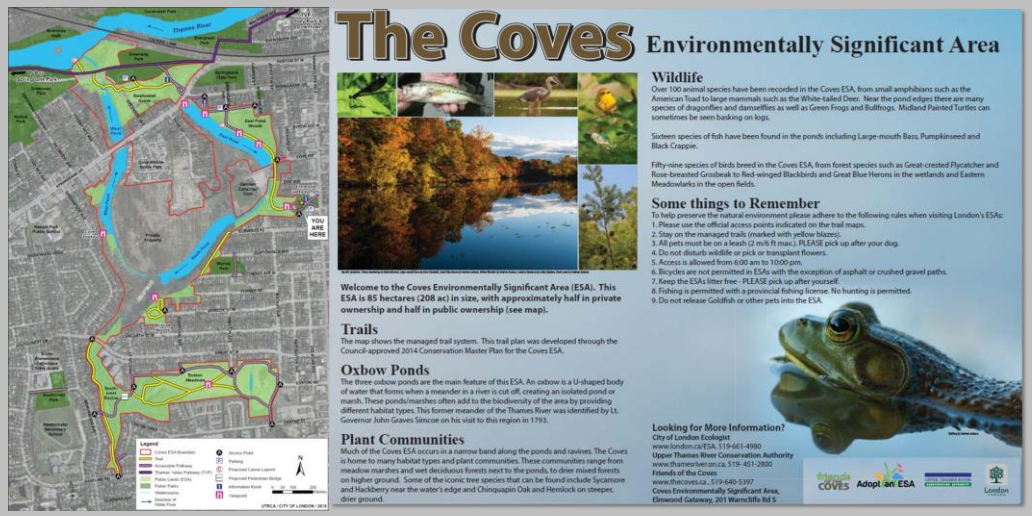
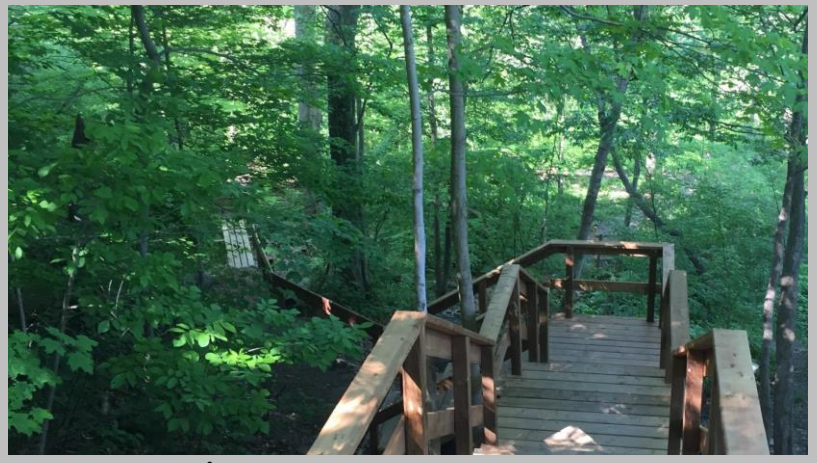
Overview of 2016 Capital Projects in ESAs

- **Trail Work & Signage**

- TAG Kains Woods recommendations- accessible boardwalks installed
- TAG Medway Metamora staircase repair, boardwalks and slope restoration
- Warbler Woods boardwalk extensions
- 2 new kiosk signs in Coves
- Elmwood Gateway link, Euston Meadow and Silvercreek Ravine trails in Coves as per CMP/LIC (*funded by grants secured by Friends of the Coves*)
- Naturalization signs and directional signs in Coves
- TAG & Council WMP granular trail over former landfill, beside rail-line and hydro-corridor. Closure of trails through Meadowlark habitat / educational signage, strategic native plantings and bike barriers



Coves - New Kiosk Signs at 2 Access Points



TAG - Medway Metamora staircase repair, new boardwalks & restoration

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2016 Stewardship and Education in ESAs

Adopt an ESA / Meetings / Events

- **12 Adopt an ESA Groups**
- **Medway Community tree planting and fish demonstration event** – April 2016
- **WMP CMP Community Update Meeting** September 2016
- **Adopt an ESA Volunteer Appreciation Event** – native seed/ecological restoration workshop November 2016
- **Friends of Coves raised 200k** for CMP implementation
- **2 Trails Advisory Group (TAG) Meetings** – Medway (south) & WMP
- **3 Coves Local Implementation Committee** (LIC) Meetings
- Osprey Platforms Coves / Greenway (volunteer consultant from Georgian Bay Osprey Society)

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2017 Capital Projects in ESAs

- **Master Plans and Studies**

- Medway (south) Phase I & Phase II CMP
- Meadowlily Phase I CMP
- Environmental Management Guidelines Update (in house)
- Butternut Habitat Stewardship Protection SAR – Federal Grant - Study w UTRCA - ESA Team
- American Chestnut (END SAR) Breaking Isolation project / study with Canadian Chestnut Council (no cost to City)
- London Invasive Plant Management Strategy (in house with Ontario Invasive Plant Council)

Sifton Bog - *Calopogon tuberosus*

Photo by Dave Wake

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2017 Projects in ESAs

- **Invasive Species / Habitat Restoration**

- WMP / Coves – Purple Loosestrife beetle project
- WMP W.E. Saunders Cabin Buckthorn & Dead Ash Restoration
- Killaly - Dog Strangling Vine
- All ESAs - Phragmities EDRR
- Medway (south) – SAR / Goutweed / Knotweed Project
- Kains – Buckthorn, Goutweed, Knotweed
- Coves - woody inv. Euston/Elmwood
- London Invasive Strategy (w OIPC)

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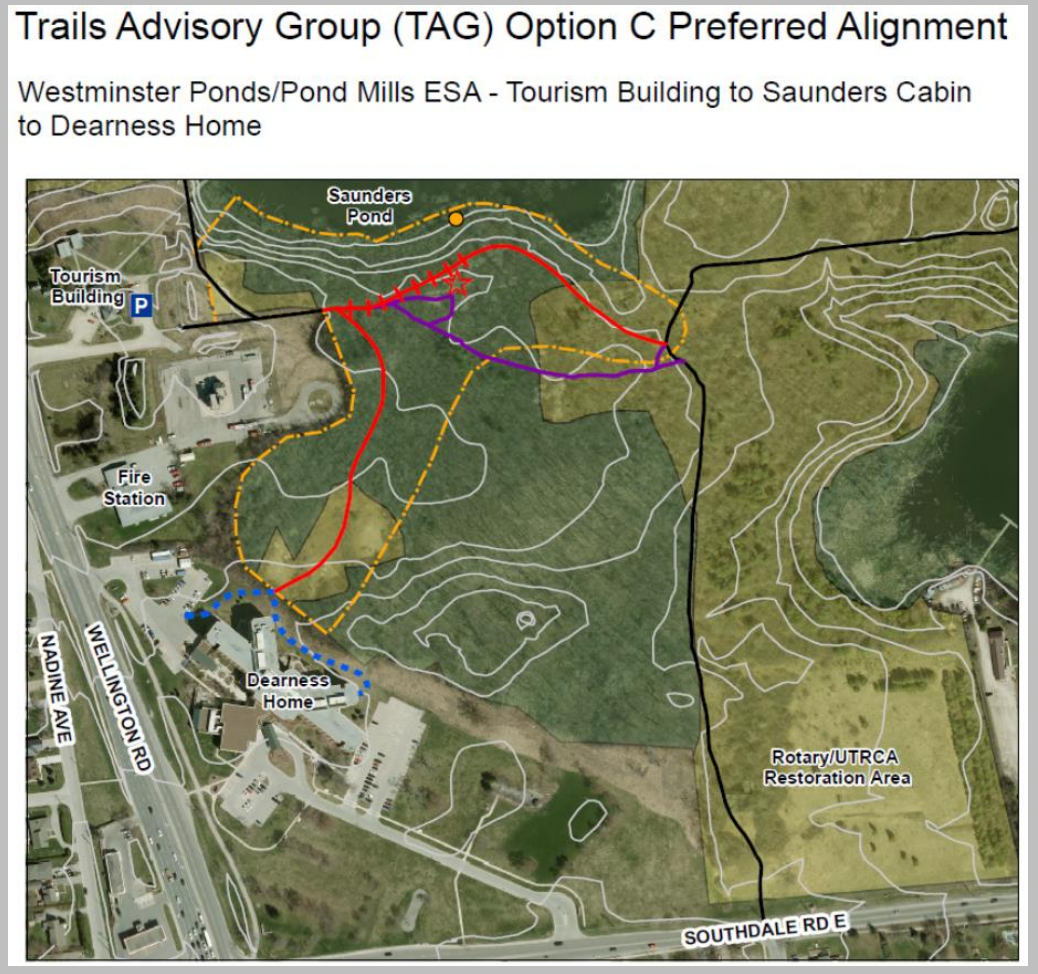
2017 Projects in ESAs

- **Trail Work**

- Westminster Ponds – Accessible trails and boardwalks as per CMP & TAG – 100k Canada 150 Grant

- Sifton Bog Naomee Place trail update w TAG



CANADA 150 COMMUNITY INFRASTRUCTURE PROGRAM

CANADA 150 1867-2017

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2017 Projects in ESAs

- **Stewardship / Education / Signs**

- Green ESA signage with QR codes at more access points (in addition to over 70 existing)
- Update to the WMP Kiosk sign at the Tourism Building access point
- New signage for W.E. Saunders Cabin site
- Additional stay on marked trail signs, way-finding signs
- Friends of Medway Creek's City grant funded interpretative signs (Not from ESA Capital Budget)
- Interpretive sign for Redmond's Pond in the Bog
- Medway (north) Friends of Medway Creek / City - Spring Community Planting Day date TBD
- WMP Saunders Pond Community Education & Stewardship Event for Loosestrife beetle release June/date TBD

https://www.flickr.com/photos/utrca/sets/72157667717182301

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City of London - Ontario Nature Award Recipient

- The City of London was recognized by **Ontario Nature with the 2015 Lee Symmes Municipal Award for its commitment to protecting Environmentally Significant Areas**. Ontario Nature commended the City of London for ensuring a natural legacy for future generations.

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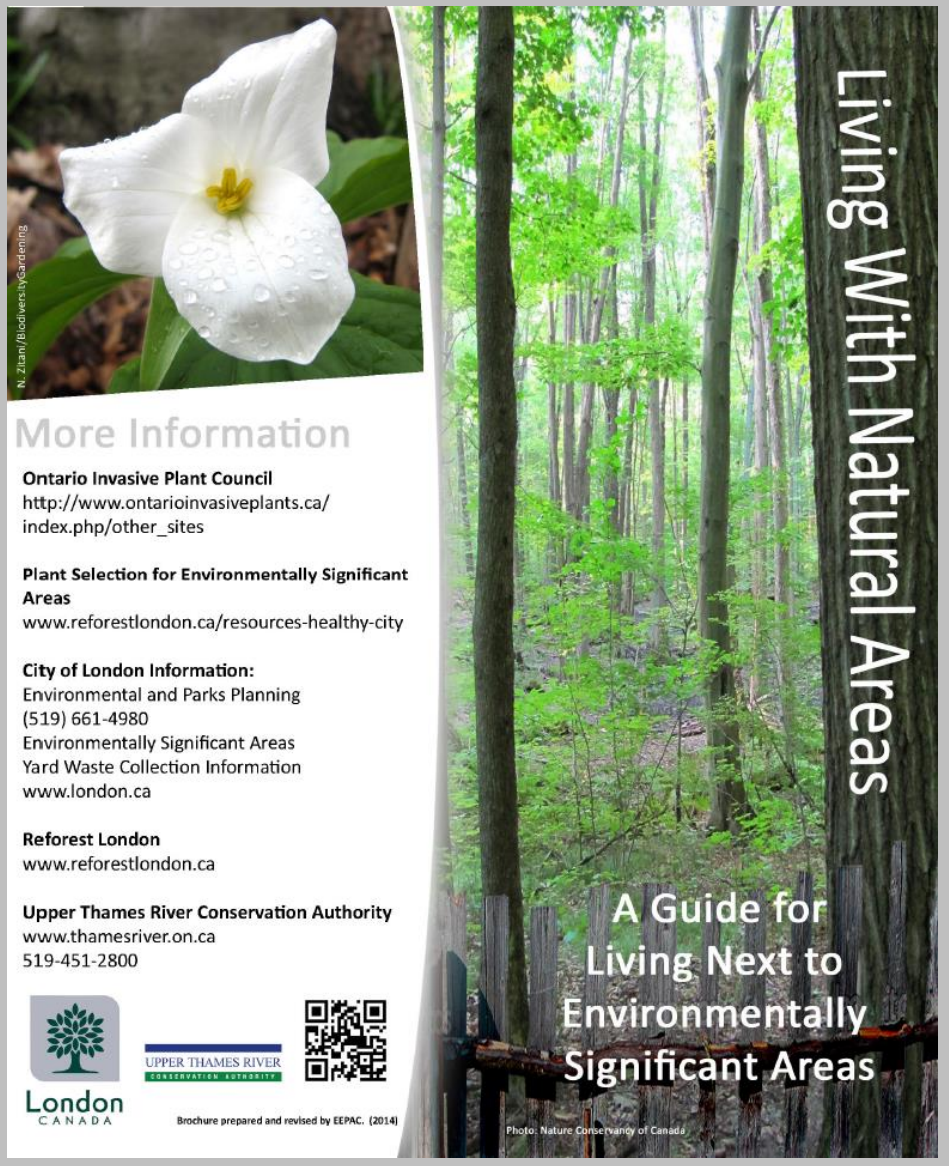
What Can You Do to Protect ESAs?

- Guide for Living With Natural Areas (by EEPAC)
- Adopt an ESA
- Introduce young people to the ESAs to inspire next generation



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2016 - 2018 Projects in ESAs

- **Anticipated ESA CMP Meetings 2016-2018**

- Medway VHF CMP Phase I to Planning and Env. Committee - Winter 2017
- Medway VHF CMP Phase II Start-up - 2017
- Medway VHF CMP Phase II Local Advisory Committee (LAC) - 2017
- Meadowlily Woods CMP – Phase I Summary 2017
- Meadowlily Woods CMP Phase II Start-up - 2018
- Meadowlily Woods CMP Phase II Local Advisory Committee (LAC) - 2018

Adopt an ESA Volunteer Appreciation Event 2016 – Native Seed/Restoration
From left: Jason Jordan, Don McLeod, Sandy Levin, Mary Gartshore, Nina Zinti, and Janice Gilbert

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EEPAC Working Group Comments on Ecological Restoration Plan for Westminster Ponds/Pond Mills ESA

Working Group: Nimalka Weerasuriya, Erick Arellano, Joseph Stinziano

Regarding: 'TAGs viewing opportunity model would restore open woodland or savanna with native moist wet meadow species (grasses sedges and wildflowers) between realigned trail section and wetland edge zone (4).' (pg 8)
Regarding: 'Heavy equipment restricted to areas of low habitat sensitivity to limit erosion impacts.' (pg 10)
Regarding: 'Regions where ecological sensitive features are present (Saunders Pond or retainable native plants/communities), basal bark and manual removal with chainsaws or less intrusive methods (weed wrench) will be used' (pg 10)
Regarding: 'American toads – burrow beneath frost line and will not be impacted' (pg 15)
Regarding: 'The wetland edge is a band running 3 to 5 metres in width along the south shore of the pond' (pg 8)

> **Comment:** What is the size of the 'buffer zone' between the edge of the Pond outwards that will be restricted to hand weeding and basal bark applications and not heavy machinery?

Regarding: Figure 1

> **Comment:** Will there be future maintenance requirements in the MEMM4 site (future Bur Oak savanna) for viewing points along the proposed path?

Regarding: 'The wetland edge has ephemeral drainage channels' (pg 20)'

> **Comment:** Will the continued growth of grasses/sedges/wildflowers limit the movement of water via ephemeral streams to the pond over time?

Regarding: Funding

> **Comment:** Are sufficient funds allocated to achieve the monitoring and adaptive management programs? What is an approximate cost breakdown?

Regarding: 'All machinery and equipment will be inspected and cleaned in accordance with the Clean Equipment Protocol:' (pg 16)

> **Comment:** Will an ecologist be regularly present to ensure proper Clean Equipment Protocols are followed?

Regarding: 'Potential Risks – Bats: no hibernacula present in restoration area or within the ESA, and will not be affected. Large trees that require management will be inspected (cavity search) by qualified personnel' (pg. 14):

> **Comment:** Will it be possible to add in bat boxes/hibernacula on suitable habitats after successful forest regeneration to promote the future use of this area by bats?

Regarding: Table 1 (pg 13):

> **Comment:** Readjustment of time frame (Table 1) to reflect delays in scheduling – shift to fall/winter of 2017 instead of 2016

Regarding: 'Use of Habitat and conditions described in the Westminster Ponds/Pond Mills ESA: Ecological Inventory & Management Zone Report Volume 1 by North South Environmental (NSE), and includes and Volume 2 reports on the Hydrological Investigation; Water Quality Monitoring and Paleolimnology Study to base planting decisions' (pg 3)

Comment: No copy of these Volumes were given to EEPAC and we cannot provide detailed comments on the Plan

Miscellaneous comments:

Comment: A walk through beyond the restoration area showed a substantial number of mature (10+ yr.) buckthorn trees and seedlings still present in the understory. What steps will be taken to mitigate buckthorn encroachment beyond the approximate restoration area? Will there be consideration made in assessing areas south-east of the restoration zone to further remove nonnatives in the future?

Recommend: Implementation of additional signage along newly made trails and boardwalk to maintain the dogs on leash policy (owner and off-leash dog was seen during the walk-through)

Advisory Committee Work Plan – 2016

May 2016

Activity	Background	Responsibility	Timeline	Strategic Plan Alignment
Environmental Management Guidelines	• Literature review of research on buffers and buffer effectiveness • Review of data collection standards and protocols for Community Plans, Area Plans and Secondary Plans • More detailed and more consistent direction regarding restoration • Ensure hydrology is addressed properly and the proper language is used	Lauren, Michael, Caitlin for Aquatic aspects	Consistent with Planning Department's 2 Year Work Plan and staff's direction	3E
Invasive Species	• Assisting staff in developing Invasive Species Plan • Committee members expertise will be applied to the development of the Plan and review of drafts	tbd	Consistent with Planning Department's 2 Year Work Plan and staff's direction	3E
Enforcement By-law	• Possibly develop an Encroachment By-law to regulate unauthorized land uses into publicly owned portions of the Natural Heritage System	A By-law Enforcement Officer has been assigned to encroachments in ESA's	One year. Requires review of other municipal by laws	3E
Collaboration with other Advisory Committees	• An EEPAC representative is cross appointed to ACE. Where appropriate, EEPAC members will provide advice to its representative on this body. EEPAC has representation on the Trees and Forests Advisory Committee. • Dark Sky/Bird deaths in relation to high rise buildings Working Group with ACE & AWAC	N. St. Amour Hoping to have Report on the December EEPAC Agenda	As needed	3E
Review of Environmental Impact Studies and Environmental Assessments	• The main role of EEPAC is to provide a technical review of the work done by consultants for the city and private proponents.	Assigned as needed based on expertise	Within timeline requested by city staff file manager	3E

Thorn Comments – London Invasive Plan Management Strategy:

- The document is very detailed about the policies and legislation supporting the control of invasive plant species, and I understand the need to provide a policy context for the development and implementation of an invasive plant management strategy. However, the document spends too much time directly quoting the supporting sections out of these various policies and legislation. Many of the statements supporting the control of invasive species are very similar among the policies and legislation, which makes the "Policy Context" section difficult to read. Perhaps this section can be made more concise by summarizing the main ways in which the existing policy and legislation support the invasive plant management strategy.
- Incorporate the various departments of the City directly into the "Strategic Process" section of the management strategy instead of talking about the Storm Water Management and Parks Operations departments as separate sections at the end of the document. This will better establish the need to incorporate all relevant departments of the City into the invasive plant management strategy.
- Why were the four priority invasive plant species selected? It would be helpful to specifically explain why Phragmities, Japanese Knotweed, Dog Strangling Vine, and Giant Hogweed were selected as priority species.
- In the "Socio-Economic" subsection of "Impacts of Invasive Species" the primary example provided for the economic impacts of invasive species was Emerald Ash Borer. Though I agree this is an important invader, the example is poorly chosen given the section is about the impacts of invasive plants. Perhaps a specific example of the economic impacts of plants would be more effective and illustrative.
- The document could be improved by making a section emphasizing the effectiveness of invasive plant species control programs. The document speaks broadly about how the control of invasive species is important for the health of the natural heritage features and will reduce future control costs. However, do invasive plant species control programs work and on what scale? Are there existing examples of programs that are effectively controlling invasive plant species? St. Thomas was used as a case study, but there is not sufficient evidence provided about this example to support whether invasive plant management is truly effective. Providing evidence to support the viability of invasive plant species control programs will help bolster support from council and the community because there are doubts about whether we can manage such a persistent and widespread threat.
- More detail about the implementation of the strategic process for invasive plant species management would strengthen the document. Currently, the strategic process section is very high level and provides few specific details about the implementation of the strategy. Also, more information regarding "who" will be involved in the various steps of the strategic process will be helpful. For example, who is going to do the inventory/mapping or deal with early detection? Who will be involved with the rapid response to an early detection of an invasive plant? Providing more detail on implementation will make the strategy seem more feasible and realistic.

From: Joseph Ronald Stinziano
Subject: Re: EEPAC - Invasive Species Strategy review

Hi Sandy,

Here are my comments on the document. I agree that there is more philosophy than concrete action outlined in the document, and it doesn't offer too many clear directives.

What is the prioritization order for invasive species and sites (e.g. protect SAR first, then riparian corridors)?

What is the seasonal time course for invasive control (i.e. need to hit invasives before they flower, if applicable)? A generic annual timeline for invasive control would be good to have, and make sure that no funds or time allocated to invasive control goes to waste. Something like this needs to be in this document - it might be something that the city ecologists know, but it is unlikely that anyone else in the civic administration is aware of it.

I am concerned with whether sufficient funds will be allocated to properly deal with invasives under this strategy. Given how aggressive the approach needs to be, it is something with which Council needs to be on board.

Complete and absolute prohibition on the sale and trade of invasives needs to be enacted immediately and enforced with extreme prejudice if any invasive management strategy is to work.

Cheers,
Joe

Joseph R. Stinziano
Fulbright Visiting Researcher at the University of New Mexico
Ph.D. Candidate, Way Lab
The University of Western Ontario
ORCID: 0000-0002-7628-4201

Draft – London Invasive Plant Management Strategy

1.0 Executive Summary

~~The City of London's Official Plan policies support and direct The City to protect, restore and enhance the Natural Heritage System.~~ Council's Strategic Plan for the City of London (2015-2019) identifies areas of focus for the city's long-term vision which includes the protection and enhancement of the Natural Heritage System and specifically the control of invasive species. In addition, the newly adopted London Plan (2016) builds on the City's environmental policies and the importance of the Natural Heritage System, its biodiversity, ecosystem health, and how it is an essential component of the City's landscape and character.

The City of London is currently a leader in Ontario regarding invasive species management. Within our Environmentally Significant Areas (ESA), the council approved Conservation Master Plans direct and emphasize the need for invasive species control projects. The City has a woodland management fund that is used in part to addresses invasive species management issues.

However, the City of London, as with all Ontario municipalities, lacks a ~~city-wide~~ comprehensive strategy to address invasive species concerns over the long-term. It is widely recognized that if invasive species are ignored, not only does this affect the health of ecosystems in the long-term, but drastically increases costs associated with controlling invasive species once they can be no longer ignored and action must be taken. ~~In effect,~~ this lack of a long-term strategy and clear focus ~~will~~ limit our ability to control priority invasive species throughout the Natural Heritage System and substantially increase control and restoration costs.

With the help of the Ontario Invasive Plant Council's (OIPC) strategic framework for developing a city-wide invasive species management strategy, London will be the first City in Ontario to ~~bring this forward to~~ address city-wide invasive species control over the long-term. This will be accomplished ~~through~~ applying the ~~strategic process identified in the~~ London Invasive Plant Management Strategy (LIPMS) ~~and by~~ specific management programs for priority invasive plant species~~.~~ ~~These species~~ include *Phragmites* (Common Reed), Japanese Knotweed, Dog Strangling Vine, and Giant Hogweed.

A major component of the LIPMS is to include multiple city departments in the identification and control of the priority species, making the LIPMS truly "city-wide". The City of London will create its own Phragmites control program~~, similar to and~~ in consultation with the City of St. Thomas, which has recently adopted a "Phrag Free City by 2020" program. Working with regional partners will enhance the effectiveness and sustainability of invasive species control efforts over the long-term. The LIPMS is intended to be a working document and the recommendations identified in the LIPMS will form the basis for the implementation of the LIPMS

2.0 Introduction

Defined as any plant species that has been introduced and exerts substantial negative impact on native biota, economic values, or human health (Lodge et al. 2006), invasive plants are becoming an increased threat to London ecosystems, ~~the~~ economy, and social and recreational environments. As many invasive plant species lack natural enemies, they easily out-compete many colonies of important native vegetation, negatively altering existing ecosystem function.

Invasive species are the second most significant cause of species extinctions worldwide, after habitat loss (IUCN, 2014). The ecological effects of invasive species can be irreversible and, once established, they are difficult and costly to control.

A survey conducted in 2012 by the OIPC with the Invasive Species Centre (ISC), the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Ontario Federation of Anglers and Hungers (OFAH) identified that many municipalities face significant challenges with regards to invasive plant management. Section 15.3.7 of the Official Plan states that "The City will encourage rehabilitation and enhancement measures that protect the ecological function and integrity of the Natural Heritage System." The City of London is the first municipality in Ontario to create a comprehensive invasive plant species management plan following the publication of the "Creating an Invasive Plant Management Strategy: A Framework for Ontario Municipalities" by the OIPC in March 2015. Establishing a city-wide ~~LIPMS~~ with specific attention drawn to ESAs, wetlands, significant woodlands, and the Thames Valley Corridor, recognized by the City as "its most important natural, cultural, recreational and aesthetic resource (Section 2.9.3. iv London OP, 2006), will be a crucial step towards achieving this goal for the City of London.

3.0 Impacts of Invasive Plants

3.1 Degradation of the Natural Heritage System

Natural areas such as forests, prairies, wetlands and aquatic habitat provide many services and benefits to the economy, society, and the environment. Natural areas provide shelter and food for wildlife, remove pollutants from air and water, produce oxygen through photosynthesis and provide valuable recreational and educational opportunities. They are the green infrastructure that helps buffer the impact of climate change and severe weather, which in turn ~~buffers~~ the impact on the municipal budget. Invasive plants can have a large impact on natural areas and threaten these important services that they provide.

Invasive plants ~~impact~~ species diversity and species richness by competing heavily for resources such as light, moisture and soil nutrients that native plants require to establish and grow. These changes in ~~species~~ composition affect wildlife that are adapted to native plant communities. ~~They~~ can change the entire composition of vegetation over time and ~~change the nature of what a feature is~~. Invasive plants can reduce forest regeneration through direct competition with tree seedlings, resulting in reduced density and slowed growth rate. Reduction in forest regeneration results in the loss of wildlife habitat, and decreases the diversity of a stand, making it more vulnerable to insects and disease as well as to the incursion of other invasives. Ultimately, invasive plants affect the intricate linkages that make ecosystems strong and resilient.

Protecting the City's Natural Heritage Features from the threats of invasive plant species is imperative to maintaining the overall ecological integrity and ecosystem health of the Natural Heritage System.

3.2 Danger to Human Health and Safety

Some invasive plants cause human health concerns because their sap is toxic to skin. Other plants can cause injuries to the body. ~~Human safety may also be impacted by fast-growing invasive plants, as is the case with *Phragmites australis* which may reduce visibility at rights of way, increasing the risk of car accidents.~~ Dead, dry stalks of these plants are also highly combustible and can become a fire hazard. Many native plant species can pose similar risks to human health and safety, but a key difference with invasive plants is they become widespread

and prevalent much faster than native plants. This makes preventing their spread and controlling them and the risks they pose to humans more difficult and important.

3.4 Socio-economic

Invasive plants can have a large economic impact on individual landowners, businesses and municipalities. Due to the invasive leafy spurge (*Euphorbia esula*), Manitoba has experienced a $30 million reduction in land values (CFIA, 2008). Leafy spurge infests 340,000 acres of land in Manitoba, costing taxpayers an estimated $19 million per year to protect grazing land, public land, and rights-of-way (CFIA, 2008). In Ontario, the MNRF has been involved with *Phragmites* control pilot projects since 2007 and to date control costs range between $865 and $1,112 per hectare (OMNRF, 2012). Invasive species have an impact on approximately 20% of Species at Risk on Ontario (OMNRF, 2012).

The Trinational Commission for Environmental Cooperation reported that economic losses and the costs of environmental impacts caused by invasive species exceed $100 billion annually in the U.S. alone (OMNRF, 2012). In Ontario, over $30 million has been spent by the Canadian Food Inspection Agency (CFIA) to slow the spread of emerald ash borer (EAB) (OMNRF, 2012). On a municipal scale, the City of Toronto has estimated emerald ash borer (*Agrilus planipennis*) management costs for 2013-2020 to be $71.2 million for tree removal, wood disposal, pesticide injection, replacement plantings and staff resources (City of Toronto, 2012). The City of London has perhaps passed its peak operational costs of the emerald ash borer invasion. The total cost of responding to that outbreak will eventually total about $35 million and the “opportunity lost” due to this genus being lost from the landscape will continue for generations.

Of particular concern to London is the presence and spread of the invasive plant species *Phragmites australis*. See *Appendix A: Phragmites australis (European Common Reed) – Canada’s Worst Invasive Plant* for a more in-depth look at the threat of Phragmites currently present in London’s Natural Heritage System. A stronger focus on this species is necessary and is being addressed by the City of St. Thomas. ~~London’s neighbour,~~ the City of St. Thomas, has recently approved a “Phrag Free City 2020” management plan, which outlines action items to ~~reach the goal to~~ eradicate Phragmites from all public and private lands by the year 2020. See Appendix B *Case Study 1 – City of St. Thomas* for more information.

4.0 Policy Context

Regulatory agencies and legislative authorities have established a number of policies, outlined below, in an effort to protect native ecosystems and minimize the impact of invasive species. ~~The important take-away is that developing a comprehensive strategy is necessary to address invasive species over the long term and that there are numerous supporting policies and tools to support a city-wide strategy.~~

- Council's Strategic Plan for the City of London (2015-2019)
- City of London Official Plan, Office Consolidation, 2006
- The London Plan (2016)
- Invasive Species Act, 2015 (Ontario)
- Provincial Policy Statement, 2014
- Ontario Invasive Species Strategic Plan, 2012
- Thames Valley Corridor Plan, 2011
- ESA Conservation Master Plans
- City of London Urban Forest Strategy, 2014
- City of London Environmental Management Guidelines, 2007

In addition there are numerous sections of federal legislation and policy related to invasives, and although there is no cohesive approach, the federal government has the lead in preventing invasives from arriving and becoming established in Canada.

<u>Council's Strategic Plan (2015-2019)</u>

Strategic Plan for the City of London 2015-2019

The Invasive Species Strategy is consistent with the Strategic Plan, the four areas of focus and directly aligns with many of the implementation strategies.

Strengthening Our Community
• Amazing arts, culture, and recreation experiences • Healthy, safe, and accessible city • Help Londoners understand how we provide safe drinking water and protect the Thames River
Building a Sustainable City
• Strong and healthy environment • Plant more trees and better protect them from deforestation, invasive species, and other threats • Work together to protect all aspects of our natural environment including woodlands, wetlands, river and watercourses, and air quality as our city grows

• Fund innovative ways to adapt to Climate Change • Invest in making London's riverfront beautiful and accessible for all Londoners • Protect and promote London's Thames Heritage River status
Growing our Economy
• Strategic, collaborative partnerships • Partner with the London Community Foundation on the "Back to the River Project" • Diverse employment opportunities
Leading in Public Service
• Proactive financial management • Make sure that financial issues are not created and pushed to the future, creating problems for future generations • Use innovative and best practices in all organizational and management activities

The London Plan (2016)

The environmental policies of the London Plan, approved by council in 2016, build on the current Official Plan policies. The London Plan has a strong focus on protecting and improving the City's Natural Heritage System. Specifically, the goals of the City with respect to Natural Heritage focus on the following:

> 1308_ We will plan for our city to ensure that London's Natural Heritage System is protected, conserved, enhanced, and managed for present and for future generations by taking the following actions:
>
> 1. Achieve healthy terrestrial and aquatic ecosystems in the city's subwatersheds.
> 2. Provide for the identification, protection, rehabilitation, and management of natural heritage features and areas and their ecological functions.
> 3. Protect, maintain, and improve surface and groundwater quality and quantity by protecting wetlands, groundwater recharge areas and headwater streams.
> 4. Enhance, protect and conserve the Natural Heritage System through well planned built form and community design.
> 5. Maintain, restore, monitor and improve the diversity and connectivity of natural heritage features and areas and the long-term ecological function and biodiversity of Natural Heritage Systems.
> 6. Encourage, through education and incentive programs, the cooperation of property owners in the maintenance of, or enhancement to, the naturalization of lands and the sustainable use of our Natural Heritage System.

7. Monitor the potential impacts of climate change to maintain the integrity and resiliency of the Natural Heritage System and adjust management activities accordingly.
8. Provide opportunities for appropriate recreational activities based on the ecological sensitivities of the area.

Furthermore, the London Plan speaks to management, restoration and rehabilitation priorities for the City of London:

> 1417_ The City will encourage rehabilitation and enhancement measures that protect the ecological function and integrity of the Natural Heritage System. The City of London Subwatershed Plans provide guidance for the types of measures that may be identified through secondary plans, environmental impact studies, the Environmental Assessment process or other environmental studies or programs. Rehabilitation and enhancement measures may be implemented through conservation master plans, woodland management plans, or invasive species management plans on publicly-owned land and through stewardship and conservation programs for privately-owned lands.

Once the London Plan is approved by the province ~~and is in force and effect~~, the LIPMS will be updated to replace the current Official Plan policies identified for the LIPMS (as detailed below).

<u>City of London Official Plan, 2006</u>

The City of London's Official Plan aims to balance the goals of economic prosperity, community vitality, environmental responsibility, enriched cultural identity and infrastructure sustainability. Chapter 2, Planning Framework, of the Official plan provides for the direction of long term land use planning. Protection of the natural environment and conservation of heritage resources are identified as strategic priorities:

- 2.1.3 iv) Environmental Leadership – Valuing our natural heritage environment. Our goal is to protect a healthy and sustainable environment and encourage an environmentally-sensitive City

- 2.9 Environmental Planning
    - 2.9.1. Natural Heritage: While very little of the original landscape remains, there is a framework of naturally vegetated areas, natural features, corridors and

ecological functions, mostly associated with the City's valleys, ravines, and moraines, that can form the basis of a natural heritage system for London. It is our Green Infrastructure…equally as important as our built systems of roads, water and power supplies, recycling and waste management.

- 2.9.2. Environmental Goal:
  - i) Promote a healthy natural environment in London;
  - ii) Protect and enhance the Natural Heritage System for the benefit of present and future generations of Londoners
- 2.9.3. Environmental Strategies:
  - i) The City will promote an ecosystem approach to environmental planning… Recognizing that natural heritage areas are valued for the natural features they contain and the ecological functions they perform, the City will utilize area planning processes, environmental impact studies and guideline documents to ensure that natural heritage areas are evaluated and protected both individually and cumulatively as part of an interrelated Natural Heritage System.
  - ii) The City shall encourage a net gain in environmental quality through the implementation of the Official Plan. The City shall develop and implement monitoring programs to measure changes in environmental quality and assess the effectiveness of the Official Plan's environmental goal, objectives and policies.
  - iii) The City shall promote the rehabilitation of degraded ecosystems throughout the municipality and support appropriate rehabilitation works identified through the Subwatershed Planning Studies, community planning processes, or other environmental studies. Rehabilitation works may be undertaken in co-operation with landowners and other agencies and interest groups.
  - iv) The City recognizes the Thames Valley Corridor as its most important natural, cultural, recreational and aesthetic resource.
  - v) The City shall encourage, support and initiate, as appropriate, public education and awareness initiatives for the protection, rehabilitation and enhancement of the Natural Heritage System.

Chapter 15, Environmental Policies, of the Official Plan provides for the recognition, protection, and rehabilitation of significant natural features and ecological function in the City of London through the following applicable objectives:

- 15.1.1 ii) Provide for the identification, protection and rehabilitation of significant natural heritage areas.
- 15.1.1 iv) Enhance the contribution of the Natural Heritage System to urban form and community design.
- 15.1.1 v) Maintain, restore, and improve the diversity and connectivity of natural features, and the long-term ecological function with biodiversity of natural heritage systems.
- 15.1.1 vi) Encourage, through education and incentive programs, the cooperation of property owners in the maintenance of or enhancement to the naturalization of lands.

Section 15.2.2, Purpose of Natural Heritage Policies, of the Official Plan states that the Natural Heritage policies establish the requirements for the refinement and protection of the Natural Heritage System through public ownership/acquisition, stewardship, management and rehabilitation, ecological buffers and the preparation of area planning studies, environmental impact studies, environmental assessments or conservation master plans.

Section 15.3.5, Stewardship, of the Official Plan states that 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 the following techniques:

(a) Stewardship agreements;

(b) Conservation easements;

(c) Education programs to inform landowners of maintenance and stewardship options available to protect or rehabilitate natural features and ecological functions;

(d) Encouraging 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.

Invasive plant species management site priorities will follow the structure outlined in 15.3.7 of the Official Plan:

i) The City's highest priority for rehabilitating and enhancing the Natural Heritage System shall be those areas linking or adjacent to natural heritage areas that are subject to flood or erosion hazard constraints.

ii) With respect to specific components of the Natural Heritage System, the City's management and rehabilitation priorities are:

(a) Environmentally Significant Areas - to protect the existing ecosystem features and functions, to increase the amount of interior forest habitat, and to strengthen corridors.

(b) Wetlands - to protect the natural features and ecological functions of all Provincially and Locally Significant wetlands.

(c) Significant Woodlands and Woodlands - to protect existing ecosystem features and functions, to increase the amount of interior forest habitat, and to retain or restore linkages between isolated natural areas.

(d) River, Stream and Ravine Corridors - to protect existing ecosystem features and functions, maintain water resource functions, and rehabilitate eroded banks and channels.

(e) Upland Corridors - to retain or create linkages between isolated natural areas.

Ontario Invasive Species Act, 2015

The Ontario Invasive Species Act comes into force November 3, 2016. This Act was designed to provide enabling legislative framework to better prevent, detect, respond to and where feasible eradicate invasive species; promote shared accountability for managing invasive species; use risk-based approach that considers the full range of threats, costs and benefits to the environment, society and the economy; and complement the role of the federal government in managing invasive species

In the future, the Act may introduce regulated areas in Ontario as control areas for invasive species, and will work towards establishing measures to prevent introduction and/or control the spread of existing invasive species. Inspectors may make an order declaring land to be an “Invaded Place” if there is evidence that a regulated invasive species is present and the order is required to:

- Prevent the invasive species from spreading to areas outside of the place, or
- To control, remove, or eradicate the invasive species that is on or in the place

The Ontario Invasive Species Act supports the creation of additional plans, as these will enable enhanced partnerships and actions to support the prevention and control of invasive species across the province. The Act also provides tools for preventing the sale and distribution of invasives. The capability of the Act will be limited to dealing with the species that get listed in the regulations as being either “prohibited” or “restricted”.

Provincial Policy Statement, 2014

Section 2.0 of the Provincial Policy Statement recognizes the health of the environment and social well-being of Ontario is dependent on the conservation of biodiversity and the protection of natural heritage systems. This LIPMS deals specifically with policy 2.0, Wise Use and Management of Resources; and 2.1, Natural Heritage.

- Policy 2.1 recognizes the importance of ecological function and interconnectivity of natural heritage features.

- Policy 2.1.1 states “Natural features and areas shall be protected for the long term.”

- Policy 2.1.2 states “The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.”

Ontario Invasive Species Strategic Plan, 2012

The Ontario Invasive Species Strategic Plan was designed to outline objectives emphasizing the need to prevent new invasives from arriving and establishing in Ontario, to slow or reverse existing colonies, and reduce the negative impacts of established species.

There is no single piece of federal legislation that comprehensively deals with the control, prevention, and management of invasive species. Ontario is the only jurisdiction in Canada with such focused legislation. The strategic plan addresses the need for an Ontario perspective on invasive species management, and highlights the need for improved communication and

coordination between federal, provincial, and municipal levels of government, and the integration of industry and non-government organizations

Thames Valley Corridor Plan, 2011

The Thames Valley Corridor Plan addresses key land planning and management issues along the Corridor. The TVCP establishes an overall concept plan for the Thames River and associated corridor lands, and relates to the preservation and protection of the Natural Heritage System in the following manner:

- "The City recognizes the Thames Valley Corridor as its most important natural, cultural, recreational and aesthetic resource."
- 3.1 Natural Heritage, Stewardship, and Protection
    - NH-3: Internally, identify potential private land acquisition areas that may facilitate the restoration and/or expansion of forest cover and contiguous natural vegetation along the length of the Thames Valley Corridor. Priority areas for acquisition are those with a high diversity of Carolinian plant species or SAR as identified on the City's Ecological Land Classification (ELC) database, or that support interior forest habitats, or provide natural connections to the larger system.
    - TR-1: Protect and manage areas with unique or rare plant and animal species.
    - TR-2: Develop and implement a comprehensive restoration and management program focused on existing and new vegetation patches with objectives to protect, maintain and enhance natural areas and habitats.
    - TR-3: Target management efforts on vegetation patches with evidence of invasive species presence. Management initiatives should include invasive species removal, litter clean-up, and management of random trail use. The target habitats for invasive species management are those natural areas in good condition that currently have low abundance of invasive/non-native species. Containment of non-native species is more effective and less costly if control can begin at the first detection of invasion. The sites with heavy abundance are lowest priority unless they are associated with rare species or unusual communities or wildlife habitat that is compromised by their presence.
    - Table 1: Action Plan
        - E-4: Produce an informational brochure such as the 'Living With Natural Areas" pamphlet for residents living near the Thames River and its tributary

creeks, concerning impacts of household products on water quality, illegal dumping, managing yard waste, use of native species in landscaping, responsible use of natural areas.

Conservation Master Plans for Environmentally Significant Areas (ESA)

Conservation Master Plans (CMP) are completed to emphasize the protection and enhancement of the ecological integrity and ecosystem health of the Environmentally Significant Areas in the City of London. Invasive species management and control is addressed in detail for some of the City's ESAs. Recommendations, timelines and potential costs may also be identified in CMPs.

Urban Forest Strategy, 2014

The Urban Forest Strategy is a plan designed to outline the steps the City of London must take to protect, enhance, and monitor the urban forest system. The integration of invasive species management into the management of the urban forest system is a critical step in improving the health of the City's natural environment.

Section 4 focuses on the preservation and enhancement goals to achieve local natural biodiversity.

- 4.2: Manage natural areas to enhance biodiversity (i.e., enrichment planting, retention of wildlife trees and coarse woody debris, uneven distribution of plantings, proactive management of invasive species to enhance native species, etc.)

The importance of addressing the threats associated with invasive species and their influence on the health of the natural environment is outlined in Section 6 Improve urban forest health:

- 6.4: Develop and implement an integrated pest management plan encompassing insects, disease, and invasive species. The plan should address prevention, control and restoration within City-owned natural areas, and identify budgets and measurable targets for implementation. The plan should address pests on private property and provide the authority and empower the City to control pests on private property as required to ensure the overall health of the urban forest.

Best management practices for reducing the risk of invasive species establishment in newly naturalized areas are highlighted in Section 9:

- 9.4: Reduce the area of turf grass in the City through tree planting, with more selective mowing, to reduce costs. Areas with modified mowing require monitoring and management for invasive plants.

5.0 The Need for a Strategic Plan

Due to favourable environmental conditions and the nature of our society including industrialized, urbanized, locally and globally mobile, high population density, the large quantity of imports, the geographical location in close proximity to multiple access points to the American border, and the degraded habitat and ecosystems in the ecological regions; Ontario is home to the largest number of invasive species compared to any other province or territory. The City of London is located ~~within the Carolinian Life Zone, which although only totals <1% of Canada's land mass, is home to over 2,200 species of herbaceous plants. This species diverse life zone is also~~ Ontario's most ecologically threatened region (Carolinian Canada, 2016).

The LIPMS is designed to address the need to identify and prioritize invasive plants posing a direct threat to the City of London's Natural Heritage System. This strategy will provide direction for municipal action currently absent from documentation at the federal and provincial level. Canada's National Strategy, An Invasive Alien Species Strategy for Canada, and the provincial strategy, the Ontario Invasive Species Strategic Plan (2012), are essential tools in developing the framework of a London-specific strategy.

London is in need of additional strategies designed to assist in protecting the health of the Natural Heritage System. The LIPMS will use existing provincially-recognized best management practices for the identification, monitoring, treatment, and eradication of priority invasive plant species within the City of London. This management strategy will "encourage rehabilitation and enhancement measures that protect the ecological function and integrity of the Natural Heritage System," a priority identified in section 15.3.7 of the Official Plan. The maintenance and protection of the Natural Heritage System through the use of the LIPMS will reduce economic costs associated with invasive plant species control in the future, as well as improve social and recreational experiences and opportunities within the City of London.

The LIPMS is a working document that sets clear direction for the management of invasive plants within the City of London, specifically the Natural Heritage System; it includes the identification of priorities for management and control and public and landowner education.

The bottom line from the taxpayer's perspective is that invasive plants require residents to pay multiple times. They pay their share of the City's necessary control actions through their property taxes, they pay to control or respond to invasives on their own property (i.e. removal of killed trees), and they pay their provincial and national share of the increased costs of many amenities such as for electricity, food and clean water.

6.0 London's Vision

"*To improve the City's commitment to managing and protecting the Natural Heritage System from the threats, dangers and costs associated with invasive plant species presence*."

~~As identified in section 15.3.7 of the Official Plan, management of invasive plant species and associated restoration efforts will focus on specific components of the Natural Heritage System including the following:~~

a) Environmentally Significant Areas - to protect the existing ecosystem features and functions, to increase the amount of interior forest habitat, and to strengthen corridors.
b) Wetlands - to protect the natural features and ecological functions of all Provincially and Locally Significant wetlands.
c) Significant Woodlands and Woodlands - to protect existing ecosystem features and functions, to increase the amount of interior forest habitat, and to retain or restore linkages between isolated natural areas.
d) River, Stream and Ravine Corridors - to protect existing ecosystem features and functions, maintain water resource functions, and rehabilitate eroded banks and channels.
e) City of London Parks – to control invasive species and remove vectors into the Natural Heritage System
f) Upland Corridors - to retain or create linkages between otherwise isolated natural areas.

The implementation of the LIPMS will build on the successes achieved by current management practices in the City's ESAs and woodlands. These practices have occurred as outlined in various

Conservation Master Plans and the City of London's Urban Forest Strategy, and should expand into the Thames Valley Corridor and associated features.

The City of London must also consider following in the footsteps of the City of St. Thomas, that have committed to having the City 'Phragmites free' by 2020 (see *Appendix A*). When controlling invasive species it is important to work with regional partners and neighbours, as dispersal of invasive species can occurs from areas beyond a City's control. Co-operation at the local, regional, provincial, and federal levels will provide for the best opportunities to effectively control a species more quickly and reduce the long term economic costs and ecological consequences of priority invasive species.

7.0 Strategic Process

The LIPMS proposes to respond to the City's priority of rehabilitating and enhancing the Natural Heritage System as outlined in Section 15.3.7 of the Official Plan by addressing the spread of priority invasive plants in London through a hierarchical approach prioritizing the following processes:

1) Inventory/Mapping of existing priority invasive plants;
2) Early Detection and Rapid Response to new invasions;
3) Management of established invasive plant colonies (using containment, eradication control measures);
4) Restoration of native communities; and
5) Prevention of new invasions.

This strategic process will act as a guide to highlight invasive species management techniques suggested for implementation above and beyond currently performed by the City of London.

7.1 Inventory/Mapping

Goal: Identify and record specific priority invasive plant species within the Natural Heritage System in London, with a focus on the City's ESAs, Wetlands, and the Thames Valley Corridor.

Purpose: To create a benchmark for future management activities and ability to monitor the spread and reduction of priority invasive plants within the focus areas.

An invasive plant inventory provides the foundation for all management decisions and supplies critical information including the following details:

- What invasive plant species are present
- Where the invasive plant species located
- Potential vectors/pathways of introduction
- Presence of rare species and/or rare community types
- What control activities have already been taken
- How effective previous control activities were and status of the infestation

The LIPMS will ~~primarily~~ focus on addressing priority invasive plants on City-owned lands. Identifying priority invasive plants found within Natural Heritage Features on Schedule B1 on City lands will be the focus for City resources, invasive plant inventories and management.

Early Detection and Distribution Mapping System (EDDMaps) Ontario is a web-based mapping system for documenting invasive species distribution. This existing provincial system is a fast and easy way to map invasive species without requiring any GIS or technical computer experience. Promoting the use of EDDMaps to the public not only helps homeowners become more engaged, but also educates them about invasive species recognition. Using a common reporting tool allows the distribution information to be kept in one central database, using existing framework that can be easily accessed by City staff.

Currently identified invasive plant species of concern in London's Natural Heritage System that will be included in the City of London's "watch-list" will include:

- Phragmites
- Japanese Knotweed
- Common and Glossy Buckthorn
- Goutweed
- Garlic Mustard
- Dog Strangling Vine
- Giant Hogweed
- Periwinkle
- Purple Loosestrife
- Black Locust

~~From the above list, due to both economic reasons and potential significant impacts to the City's Natural Heritage System or human health concerns, efforts must be focused on "priority species".~~ Effective invasive species control can only come from focused and sustained efforts over the long term. Without consistent and sustained efforts, reintroduction into managed areas is likely and the original time, resources, and funds put into the project could be wasted. The City of London will focus on the following species and designate them as "priority species":

- Phragmites
- Japanese Knotweed
- Dog Strangling Vine
- Giant Hogweed

Developing a watch list to highlight particular species of concern in the London area will increase the likelihood of new invaders being caught quickly. Identifying and recording all vectors (or pathways of introduction) is crucial to managing the introduction of future invasive plant species. Vectors can include the following:

Vectors (Pathways of Introduction)

- River, stream and ravine corridors
- Drainage ditches (along roadways)
- Garden escapes/disposal of yard waste in natural areas
- Nursery sales
- Contaminated topsoil/mulch
- Contaminated equipment
- Long lasting seedbank on heavily invaded sites

7.2 Early Detection & Rapid Response

Goal: Identify new, priority listed invasive plant species within the Natural Heritage System as early as possible to prevent establishment and future spread.

Purpose: Initiate Best Management Practices when environmental, social, and economic costs are lowest.

Early Detection and Rapid Response (EDRR) is a proactive approach to managing invasive plant species within the Natural Heritage System by reducing the likelihood that new arrivals will establish. Early detection of newly arrived invasive plants, followed by a well-coordinated rapid response, increases the likelihood of control or eradication. EDRR has proven to be the most cost-effective means of controlling the expansion of invasive species in North America.

An EDRR plan consists of six key steps:

1) Early detection – Observation, preliminary identification and reporting of invasive plants believed to be new to the area
2) Identification – Species verification
3) Alert Screening – Confirms whether the species is new to the area and present at an extent deemed eradicable; evaluated risk and determines if the species is designated as prohibited provincially or federally
4) Risk Assessment – Measures probability of entry, establishment and spread, and the associated economic, environmental and social impacts. Assign assessed species a risk rating of high, medium, or low – this determined how the EDRR process will proceed
5) Rapid Response – Development and implementation of a response plan, including obtaining land access and treatment permits
6) Monitoring & Reassessment – Evaluation of the success of the response and whether the EDRR objectives were achieved; reassessment of the pan as new monitoring becomes available

Areas within the Natural Heritage System with a priority invasive plant species present that are within or in close proximity to rare native species or rare community types should be addressed with a higher priority. Newly established areas that contain priority invasive plant colonies are also important to identify and control as early as possible to prevent spreading and long-term establishment of the priority invasive species in the area.

7.3 Management

Goal: Use published Best Management Practices (BMPs) for invasive species removal and control.

Purpose: Control invasive species in London's Natural Heritage System. Appropriate biological, physical/mechanical, and/or chemical strategies can be determined through the consultation of current BMPs for each identified priority invasive plant species. Control decisions should be made based on the knowledge of potential damage, costs, and environmental impacts.

7.4 Restoration

Goal: Reintroduce native species to management areas following invasive species removal.

Purpose: Restore native vegetation to the Natural Heritage System.

Removing invasive plants can result in the loss of all vegetative cover, creating an ideal condition for new invasive plants to move in. In some areas, native plants will return naturally after treatment. In these cases, there are enough native plants to re-vegetate newly cleared areas through seed germination or plant spread. However, other areas may require restoration through selective planting and/or other methods to reduce the risk of soil erosion and re-invasion by non-native plants.

Suggested restoration methods include:

- Natural colonization or succession
- Seeding with native grasses/herbaceous species
- Planting appropriate native trees and shrubs
- Planting live cuttings
- Use of landscape cloth or heavy mulching

Seeding should also be used in areas where new naturalization plantings occur to reduce the risk of invasive plant establishment on newly disturbed soils. Seed mixes and procedures shall follow the updated City of London's Construction Specification for Seeding and Cover protocol (2015). The use of native, pollinator-friendly seed mixes is required.

Current BMPs for select invasive plant species have been identified and outlined on the OIPC website and associated publically available documents. These BMPs will be the reference for mechanical, chemical, and biological control measures when managing invasive plant species.

7.5 Prevention

Goal: Reduce the risk of reintroduction and spread of invasive species into the Natural Heritage System.

Purpose: Minimize the rehabilitation costs associated with delayed treatment of established and new invasive species colonies.

Risk analysis and technical measures will be utilized to minimize the risk of unintentional invasive plant species introductions. Prevention strategies will include increasing risk assessment capacity, accessing and conducting scientific research and staying up-to-date on the more current BMPs for identified priority invasive plant species, and the development of public education and engagement programs to promote awareness of invasive plant species management to engage local homeowners and volunteers on municipal properties.

Continued promotion of the Clean Equipment Protocol (available on the OIPC website) is essential to preventing additional spreading of invasive plant species from various sites within the Natural Heritage System.

Private landowner education is imperative to the reduction of invasive species presence and dispersal, especially to those homeowners with property within or adjacent to the Natural Heritage System.

Eliminating and/or prohibiting the growth and resale of invasive plant species in nurseries, as well as at non-commercial plants sales and “swaps”, is a necessary future step to reducing the establishment of new invasive plant species in London. Educating homeowners about the risk of impacting environmental health with the introduction of invasive species in private gardens, and promoting native species is also important. The City of London’s existing “Growing Naturally” program is an example of how the City is currently educating homeowners about ways to conserve water, and plant native species at home.

Other municipalities, conservation authorities, Aboriginal communities, and many private and non-government organizations are also active in the management of invasive plant species.

Building an effective communication network with these external stakeholders will be imperative to invasive plant species prevention.

The London Environmental Network (LEN) is currently a not-for-profit organization in London that hosts a variety of workshops and develops resources for local businesses and community partners looking to learn how to make more environmentally friendly decisions. Utilizing local partners like LEN and their existing networks will be extremely beneficial to the City's goal to educate the public about responsible invasive species management practices and reach a larger audience.

8.0 What Have We Done?

a) *Invasive Terrestrial Plant Species* Overview – UTRCA, 2012

The Upper Thames River Conservation Authority (UTRCA) completed a survey in 2012 of invasive terrestrial plant species within the following seven ESAs:

1. Kains Woods;
2. Warbler Woods;
3. Medway Valley Heritage Forest;
4. Kilally Meadows;
5. Sifton Bog;
6. Meadowlily Woods; and
7. Westminster Ponds/Pond Mills.

Priority invasive plant species were identified prior to the observation survey based on species listed by the Ontario Ministry of Natural Resources; species posing a significant threat to Ontario's biodiversity; previous knowledge of London's invasive species presence within ESAs; easily identifiable species; and invasive species with available control methods (UTRCA, 2012).

Eleven invasive terrestrial plant species were surveyed for infestation level (compared to native species presence), and density (in relation to total ground cover of the observation area).

b) *Environmentally Significant Areas (ESAs)*

The City of London has been consistently implementing ecological restoration projects in ESAs since 2006. With a focus on invasive species removal, these restoration projects are essential to protecting the ecological integrity of ESAs. The City is an identified leader in demonstrating a proactive approach to the management and control of invasive species in protected natural areas and the policies, actions, and best management practices implemented by the City are under review by the MNRF as they work to determine how to implement the Ontario Invasive Species Act when it comes into force on November 3, 2016.

Habitat protection, restoration and stewardship work is a priority in London's public Environmentally Significant Areas (ESAs) in order to protect and enhance their ecological integrity. This restoration work is consistent with the Conservation Master Plan recommendations for ESAs. The City and members of the Upper Thames River Conservation Authority (UTRCA) ESA team complete most of the restoration work through their contract with the City. Trained volunteers with the City's Adopt an ESA program also participate in restoration projects demonstrating their commitment to local stewardship.

Conservation Master Plans have been completed for many ESAs within the City of London. These council-supported documents outline recommendations that highlight the importance of actively managing the natural features and functions of an ESA, including the management of invasive species, recording and monitoring invasive plant species presence, and recognizing that the removal of aggressive invasive species is a priority. The City of London developed and successfully implemented an Invasive Species Management Plan for the Medway Valley Heritage Forest (MVHF) ESA to mitigate impacts to Species at Risk (SAR) and Conservation Concern species.

c) *Community Engagement*

The City's Adopt-A-Park, Adopt-An-ESA and "Friends of" groups have been donating volunteer time over the past decade to assist in the physical removal of various invasive plant species from parks and ESAs. Community "Buckthorn Busting" events are promoted

by the City in ESAs and parks in partnership with the City of London Urban Forestry section and UTRCA. In addition to this, the City holds dozens of naturalization planting events in partnership with ReForest London and various community groups, the majority of which are business or volunteer oriented, to promote the growth of native vegetation on public lands.

d) *Woodland Management*

The City has been treating invasive plants in parks and woodlands across London for years. Since 2012, $60,000-$70,000 has been spent in 13 parks and woodlands treating buckthorn, English ivy, garlic mustard, periwinkle, Japanese knotweed, and Norway Maple across 30 hectares of City-owned land.

On average, reactive invasive plant species management is costing $2000 per hectare to treat. This includes spot treatments, patch work, and up to three follow-up visits per site.

e) *Parks Operations*

The City of London is actively looking for areas to naturalize and reduce the amount of mowing that is required in City Parks. Parks Operation staff are being trained to identify invasive species while out in the field.

9.0 Next Steps

9.1 Incorporate Invasive Plant Management into Land Use Planning

Municipalities are responsible for land use planning, which ensures that natural heritage features and resources are considered in community development. It also helps to plan for the incorporation of goals such as an increase in urban forests, and a reduction in urban sprawl. There are considerations around development and the spread of invasive plants. The incorporation of invasive plant management strategies into development plans will help to address this issue. It is also important to look at the sources of topsoil/infill brought into development sites and what they could contain.

The OIPC has created the Grow Me Instead Guide which lists a number of alternative plants to many common garden invaders. This guide is geared towards individual landowners and can be incorporated into new housing developments as information to new homeowners.

9.2 Promote the use of EDDMapS in Ontario

Preventing invasive plants from arriving and becoming established in Ontario is critical in the fight against this growing threat. EDDMapS is a fast and easy way to map invasive species without requiring any GIS or technical computer experience. By promoting the use of EDDMapS to the public, this can help engage them in learning more about invasive plants. Promoting the web-based and smartphone app will improve tracking across the province, resulting in better species distribution maps. If more people are using the program, there is a higher change that detection of new species will occur, which will enable rapid response.

Although it is important to track the distribution of all invasive plants within the province, the focus within this municipal strategy will be on public tracking of species on the pre-determined Watch list. Tracking Watch List species using EDDMapS increases the likelihood of new invaders being caught quickly.

9.3 Contaminated Materials and Equipment (Clean Equipment Protocol)

Invasive plants and their seeds can be dispersed by many vectors including wind, water, animals, illegal dumping, vehicles, and contaminated material. It is not feasible to control all of these vectors; however, there are strategies that can be adopted to reduce the spread of invasive plants through those pathways.

One of the most common and preventable pathways through which invasive plants spread into natural areas is the illegal dumping of green waste. Natural areas, parking lots, borders shared by residential neighbourhoods sometimes becomes dumping sites that may lead to new invasions. Education and promotion of proper disposal techniques, including green waste that targets both residents and landscape contractors may help reduce this problem.

Control of potentially contaminated materials (e.g. fill, soil, gravel, excavated materials from construction sites, etc.) at the source also helps to prevent the spread of invasive plants. Raising

awareness of the problem among target audiences (e.g. construction, demolition and landscape contractors) is a first step towards addressing this issue. Simple measures such as inspecting and cleaning equipment and vehicles after they come in contact with contaminated materials will reduce the likelihood of spread.

9.5 Staff Training and Education

Municipal staff play an important role in invasive plan prevention and management. With adequate training, staff can assist with tracking and mapping invasive plants, as well as communicating with the public.

Most staff training and education can take place through workshops in partnership with local non-profit organizations that are specialized in invasive plants. Workshops can focus on a number of things including invasive plant identification, using EDDMapS Ontario, Invasive Plant Best Management Practices for control, tips on communicating with the public and the Clean Equipment Protocol. Staff should be updated regularly on new information regarding invasive plants and the strategy through emails, meetings or newsletters. Engage staff through encouraging participation in invasive plant volunteer events.

9.6 Public Education and Community Based Social Marketing

Engaging landowners and the general public is a key component in the prevention, introduction, spread, and management of invasive plants. Comprehensive outreach and education provides residents with information and tools to take appropriate action against invasive plants on their own property; and can include encouragement to support the work of local stewardship groups and non-profit organizations. Effective communication with residents and the public can be done in a number of ways (e.g. websites, social media, mail-outs, workshops, signage, etc.).

Taking advantage of the City of London's existing corporate communication strategies to educate and inform London residents of the threats and harms of invasive plant species will be an extremely valuable tool to managing the city-wide invasive plant species issue. In future, it would be an added benefit for the City of London to develop a communication plan solely focused on invasive plants.

An important component of this public awareness is effectively communicating the "before-and-after" appearance of the landscape in areas undergoing large-scale invasive plant species work. This will also be an excellent method of introducing the concept of replanting native vegetation to the site to prevent colonization of invasive plants in recently disturbed environments.

Using the City's EnviroWorks pamphlets that are currently distributed multiple times throughout the year to London residents, updating the City website, utilizing existing social media platforms, and hosting landowner workshops in partnership with local non-profits (like the London Environmental Network) and community groups are all examples of how the City can improve the promotion of invasive species management at a private landowner level.

In addition to more traditional programs on public education, Community Based Social Marketing (CBSM) emphasizes direct contact with community members and removal of barriers that are preventing behavioural change. It is one method of fostering behavioural change that is sustainable. Implementing a CBSM strategy in London will help to better understand what influences behaviour.

With a CBSM strategy based around invasive plant species management in London, the following five steps can be taken:

1. *Selecting desired behaviours* – preventing the spread of invasive plant species in London as a result of irresponsible private home owner and/or construction and contracting crews' activity.
2. *Identifying the barriers and benefits to an activity*

Barriers	Benefits
- Reaching a large-scale audience - Addressing challenges faced by private homeowners vs. construction crews	- Higher success rate of invasive species removal across London

3. *Developing a strategy that utilizes "tools" that have been shown to be effective in changing behaviour* – collecting existing resources to present to the public community (examples: clean equipment protocol, EDDMapS, species identification, reporting process).
4. *Piloting the strategy* – holding workshops, training sessions, webinars and community events in pilot neighbourhoods in London.

5. *Evaluating the strategy* – measuring the popularity and/or demand of continuing workshops, training sessions, webinars and community events and how effective these techniques were at physically removing and preventing the spread of invasive plant species in London.

9.8 Storm Water Management

As part of the LIPMS, it is critical to involve other departments in order to address invasive species from multiple angles and utilize various resources. The Stormwater management unit will help to conduct invasive species inventories of SWMFs (specifically for the priority species Phragmites) and look to implement invasive species control works on SWMFs adjacent to the Natural Heritage system or when conducting maintenance of their facilities.

9.10 Parks Operations

The Parks Operations unit will play a central role in the LIPMS. A new dedicated team will be conducting invasive species inventories of natural areas located within the parks and green space system. The next step for this team is to be directly implementing EDRR protocols for priority invasive species. This will greatly improve addressing invasive species invasions within City Parks and adjacent Natural Heritage features by eliminating vectors and promoting native species in naturalized areas.

Parks Operations in conjunction with Environmental and Parks Planning will look into developing a specific plan addressing Phragmites control along roadways and drainage ditches (these areas are maintained by Parks Operations), which is the primary vector for this priority invasive species. It would be greatly beneficial for Parks Operations to have licenced pesticide applicators as part of their team. This would increase the efficiency of this team, the implementation of the EDRR protocols, and allow for increased invasive species control options to effectively implement the LIPMS.

10.0 Recommendations

The LIPMS is the first to set out a vision for controlling multiple invasive species across the entire City. The following recommendations are direct applications needed to implement the strategy. Each recommendation will require specific funding to fully and effectively implement:

1) Develop a Phragmites control program according the strategic process (Section 7.0) outlined in the LIPMS. This is the City's highest priority species as it poses the biggest threat to the ecological integrity and long term health of the City's Natural Heritage System. This program is to be developed in conjunction with other City departments outside of Environmental and Parks Planning to make it a city-wide control program. This program will include reaching out to City of London neighbors and provincial and federal partners with the intent of creating a larger regional approach to controlling this species as quickly as possible.

2) Further expand what the City is already implementing in our ESAs. The UTRCA's ESA team funded by the City has been paramount in the City's invasive plant control activities for many years. Further expanding their capability to implement additional control measures following the Strategic Process (Section 7.0) on a regular basis throughout the ESAs will provide a significant net benefit to the City's ESAs over the long-term.

3) Implement the Council approved Thames Valley Corridor Plan, including the invasive species control and restoration works along the Thames River corridor.

4) Develop further control programs for listed priority species over time, once recommendations 1-2 have been implemented and their effectiveness has been tracked, monitored, and verified.

APPENDIX A: *Phragmites australis* (European Common Reed) – Canada's Worst Invasive Plant

Phragmites is an aggressively spreading grass that can reach heights of more than 5 metres (16.4 feet) and densities of over 200 plants per square metre. In 2005 it was recognized as Canada's worst invasive plant by scientists at Agriculture and Agri-food Canada. Since then it has spread throughout Ontario and become a significant threat to London's wetlands and riparian corridors where it has the potential to drastically reduce plant and animal diversity and threaten a high number of Species at Risk (SAR).

The known negative impacts of Phragmities include:

- Blocking recreational access and aesthetic enjoyment of riparian corridors and wetlands
- Standing dead biomass is a significant fire hazard to hydro corridors & residential areas
- Blocks sight lines along roads and at intersections
- Damage to asphalt roads from Phragmities rhizomes
- Plugging agricultural drainage ditches and tiles, impacting crop yields
- Native plant species cannot effectively compete against Phragmites
- Phragmities stands are monocultures that effectively become wildlife dead-zones
- Reduces or eliminates habitat for high number of Species at Risk

Recent studies have identified roads, rail lines and the movement of infested heavy equipment as the main vectors for the spread of Phragmities. Currently Ontario lacks the coordinated approach required to effectively deal with Phragmites and curtail its spread.

Local control programs are underway in many of Ontario's municipalities including London where Phragmities is managed in a number of our Environmentally Significant Areas and Parks. While this is an important first step, a Phragmities Management Plan should be developed for London while it is still feasible to protect our City and our Natural Heritage System from Canada's worst invasive plant. In 2015 the City of St. Thomas began implementing their Phragmities Management Plan to become a "Phragmities Free City by 2020" through an annual budget of $13,000.

The knowledge obtained through these control efforts is summarized in Best Management Practices (BMPs) endorsed by the MNRF and OIPC to provide guidance for the most effective and efficient way to manage Phragmities. City of London staff has experience in implementing BMPs and recently contributed to the development of a BMP for Controlling Invasive Phragmities in Ontario's Roadside Ditches.

The most important message is that **Phragmites must not be ignored**. Established Phragmites cells can expand at an exponential rate and will eventually become problematic. The quicker an infestation is dealt with, the easier and less costly it will be to manage.

Appendix B Case Study – City of St. Thomas "Phrag Free City 2020"

What is the geographic scope of your project?

- All lands located within the incorporated City of St. Thomas, Ontario

What type of project is this?

- Direct management
- Education and Outreach
- Planning

Why is Phragmites an issue in your area?

- Phragmites growing around lakes, along streams and rivers, along the road, hydro corridors, and at intersections is posing a public safety risk and is also impacting recreation opportunities and ecosystem-health.

What is your organization's approach to invasive Phragmites management?

- Mapped Phragmites (Fall 2014 and updated Fall 2015 update annually)
- Year 1 – Phragmites Management Plan created
- Budget provided by Council
- 5 year Letter of Opinion - MNRF (Pesticide Act & Ontario Regulation 63/09) & Council
- Eradication program implemented
- Eradication along shoreline of lake, meadow and two storm water management ponds
- Severe fire hazard areas eradicated as priority one
- Selected road corridors, ditches sprayed
- Years 2 to 5 - Visual check and re-spray as necessary
- Eradicate identified Phragmities cells in the City to limit of budget annually to 2020

Who are your partners in this effort?

- City of St. Thomas and Doug Tarry Homes – year 1
- City of St. Thomas – subsequent years
- Parks and Rec., Roads, Fire and Police Services

What are the funding sources?

- City of St. Thomas and Doug Tarry Homes shared equally – year 1
- City of St. Thomas – subsequent years (13k per year - 5 years)

What are your goals and objectives for the program?

- Phrag Free City by 2020

What type of land does your program target?

- All public and private lands within the city including those held by Conservation Authority

What is the status of the program and are you seeing results?

- Year 1 tremendous success around lakeshore even with no spraying over water
- Year 2 was equally successful in hydro and road corridors based on visual evidence
- Respray of Year 1 area indicates full eradication in those locations

Can you share important lessons learned - both about what worked and what did not work?

- Lobbying Federal Health Ministry to approve a safe over water pesticide for Phragmites
- Absolutely imperative to partner with the City Council
- At this time the Phrag Free City plan shows no down side

1577 and 1687 Wilton Grove Road – Forest City Industrial

dated August 26, 2016, received at EEPAC October 20, 2016

Reviewers: Sandy Levin and Randy Trudeau
November 4, 2016

EEPAC is generally supportive of the outcome of the City's work on this site as it relates to buffers and the land use changes to recognize the extent of the Provincially Significant Wetland and Environmentally Significant Area.

THEME #1 – Hydrogeological Study

EEPAC supports the recommendation in the SLSR that a Hydrogeological Study be required. The question for EEPAC is who should do this. We believe it should be the city doing it as an addendum to the Forest City Industrial Park SWM Works Municipal Class Environmental Assessment (EA) Study, Schedule 'B' and an Addendum to this Class EA study in 2002. (The study recommended two ponds, the second of the two is to be built on this site). The greatest impact to the Provincially Significant Wetland will be the Stormwater Facility, so it makes sense for the City to be the lead on this.

EEPAC notes that the 2002 Class EA and the EIS determined that provided that the Environmental Management Plan and its recommendations were adhered to, the proposed stormwater works project would positively benefit the surrounding features and functions of Westminster-Wetland Complex and Tenant's Pond.
The recommendations included:

. Construction of mitigation measures
. Planting recommendations
. Environmental Management Plan
. Environmental monitoring

However, EEPAC is unaware of any such work being carried out. For example, EEPAC notes that the north side of this City-owned site is infested with Phragmites, a threat to wetlands.

Recommendation 1: The SWM Unit of the city should conduct and be charged with implementing the recommendations of the recommended Hydrogeological Study and work with Environment and Parks Planning to ensure they are carried out this time.

Theme #2 – Disposition of lands and portion of site to be zoned LI with a special provision

EEPAC in general believes that ESAs should be managed by the City. Under an Invasive Species Strategy and with the contracted assistance of the UTRCA, sensitive

lands can be protected. Hence, we are unclear as to why the non-developable PSW and ESA lands would be included in the sale.

Recommendation 2: The city should not include the PSW, ESA and related buffers in the sale of land.

EEPAC questions why the "bay" at the southern end of the site is zoned Light Industrial with a Special Provision. While we appreciate the Special Provision would not permit development or site alteration, we do not understand why it is not designated and zoned Open Space and within the ESA boundary. It is EEPAC's opinion that in this case, this bay should form part of the ESA. Guideline 9 of the Council approved "Guidelines for Assessing Ecological Boundaries of Vegetation Patches" is broad enough to see this land included. It is also correctly surrounded on all sides by buffer. Much of it forms part of the buffer to the PSW. EEPAC suggests that it remain in City hands as per the previous paragraph.

If Recommendation 2 is not accepted and all of these lands are included in the Terms of Sale, provide an incentive to the new purchaser. We have this recommendation for Realty Services:

Recommendation 2a: If Ecological Lands are included in the sale, the new owner should be encouraged to donate them back to the City under the Canadian Ecological Gifts Program.

Theme #3 – Species at Risk (Barn Swallows)

The abandoned barns on the northwest corner of the property are home to a large colony of Barn Swallows. EEPAC believes that compensation for the loss of the habitat should be a requirement of the Site Plan approval process.

Recommendation 3: The City or the proponent construct a small "barn" in the lands presently recommended to be Light Industrial – Special Provision to provide compensatory mitigation for the loss of Barn Swallow habitat. This would be instead of the "standard" barn swallow kiosks which have a mixed record of success.

Theme #4 – Site Plan

Recommendation 4: The site plan and design elements include:

- green roof
- Low Impact Development (Stormwater)
- provision for Barn Swallow habitat (and educational signage)
- the use of porous instead of impermeable surfaces wherever possible

Theme #5 – London Plan

Recommendation 5: The amendments to Schedule B-1 be included in the London Plan without the City initiating another land use change.

Stantec Sifton Bog Report 2015

Part II: Vegetation Monitoring and Vascular Flora Inventory

The Sifton Bog ESA Conservation Master plan 2009-2019 was established to guide the management of this ESA until 2019. Conservation, maintenance and, if possible, the enhancement of the ecological health this important ESA were identified as the principal goals of this master plan. The 2015 Vegetative Monitoring and Vascular Flora Inventory represents the most recent response to this master plan and provides qualitative and quantitative assessments of the present biodiversity represented within in the thirteen 10m x 10m monitoring plots in the Sifton Bog. In addition to the compilation of a comprehensive list of vascular flora, the Stantec Report also provided an assessment of the aquatic plant composition of Redmond's Pond, an assessment of cattail species and three-way Sedge within the kettle bog as well as incidental wildlife observations. The important comparisons with past reports provide some historical perspectives with respect to the natural and anthropogenic-induced changes to the Sifton Bog.

In 2015, a total of 17 surveys were conducted: 6 in the spring between May 20 and June 30; 6 in the summer between July 3 and September 1 and 5 in late summer and early autumn (September and September 30). Of the 352 vascular plant species recorded, 76% are native Ontario species and 23% are introduced or exotic species. However, the Stantec report notes that according to the MacLeod report of 1991, the total number of species recorded in 2015 has decreased by 17% to that recorded in 1991. The Stantec report suggests that this discrepancy may, in part, be due to the displacement of native species by invasive species such as Glossy Buckthorn and European Buckthorn. Apparently, Buckthorns were less dominant in the Sifton Bog 25 years ago. In addition, as stated in the Stantec report, Hawthorns were not monitored "because it is a taxonomically challenging genus".

This report indicates that 50 new species were recorded that had not been recorded for the bog previously of which 37 are native, 13 exotic, 4 provincially rare of which 2 are endangered. Most of these new records occurred in the forest and swamp communities.

Thirty two different plant species were observed and identified in this specific area surrounding Redmond's pond. In addition, 4 aquatic plant species including the rare large yellow pond lily , 17 species of Odonata and Snapping Turtle which is listed as Special Concern under the Endangered Species Act. However, the Stantec survey indicates that the population of large yellow pond lily is healthy at Sifton Bog and that no turtle nesting habitat was found near the viewing platform or the boardwalk leading to the platform.

Of great concern is the apparent decline in kettle peatland flora. Twenty-five floral species recorded in the McLeod survey in 1991 were not observed in the 2015 survey. This inconsistency may be a consequence of the differences in time frames for the McLeod survey (3years) versus the Stantec survey which was conducted over one growth year (May-Sept).

Strength of Stantec Report: This 2015 report provides a detailed, updated survey of the vegetation and vascular flora inventory for the Sifton Bog.

Weakness of the Stantec Report: This 2015 report failed to compare their data to the most recent report on the Sifton Bog submitted to the City of London by Bradwill Ecological Consulting in April 2010 and revised in July 2013. The Bradwill report also identified the problem of invasive Buckthorn in the Sifton Bog. The lack of comparison with the Bradwill Report undermines the historical relevance of the new data presented in the Stantec report of 2015. No reason for the omission of the Bradwill Report is provided. Perhaps they were unaware of the Bradwill Report?

The Stantec survey was conducted over one growth year only.

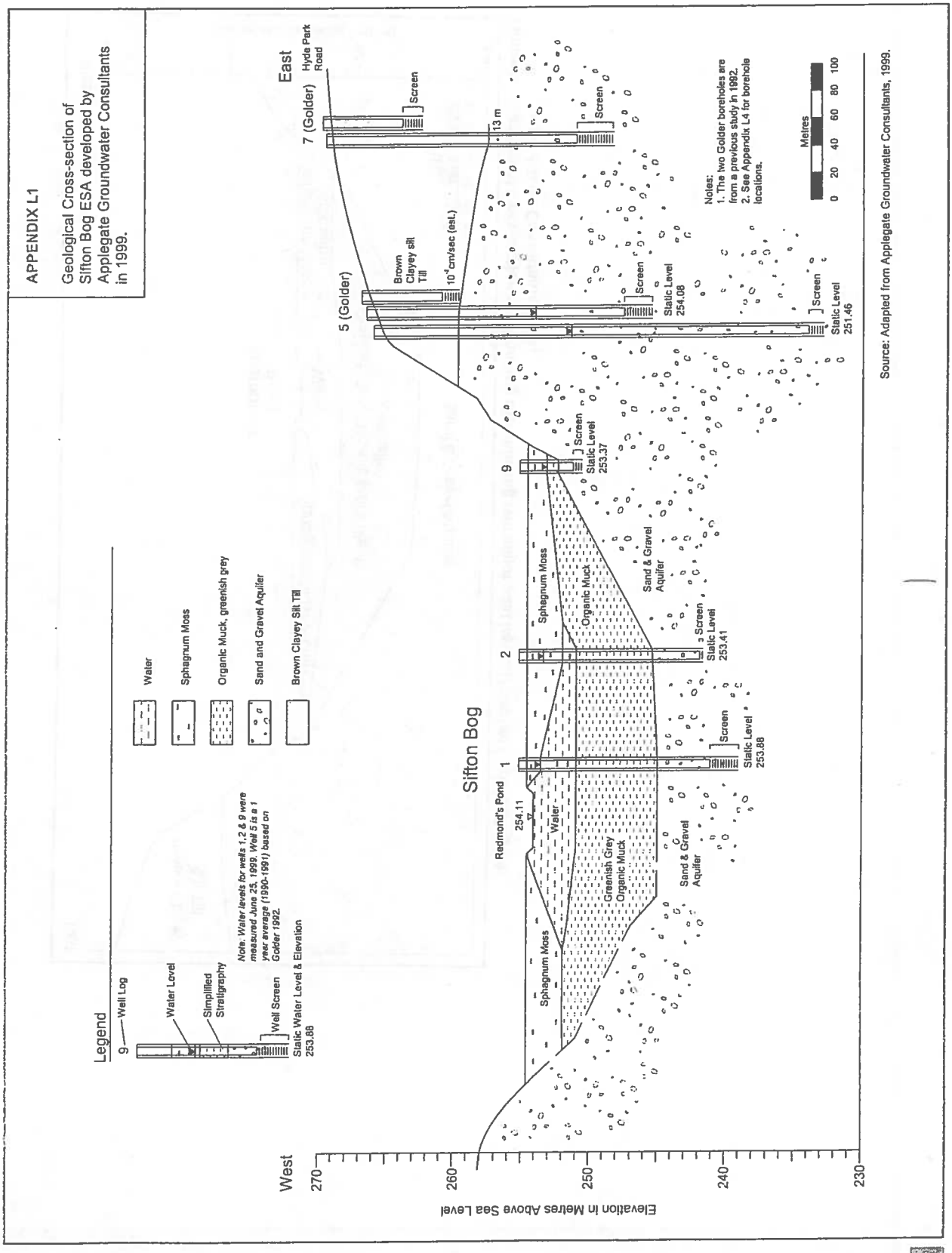
Recommendations:

1. Continued annual vegetation monitoring and vascular flora inventory.

2. Ensure that consultants have access to all of the most recent reports to ensure a comprehensive, historical perspective of the changes in vegetation and vascular flora.

3. Historical comparisons should be mandatory. The Stantec survey was over one year growth period (May to September) while previous reports provided data from surveys that were conducted over a period of several years. To ensure greater historical consistency between surveys, we recommend that consistent time frames be imposed for all future surveys such that meaningful historical comparisons can be made.

Appendix L1. Geological Cross-section of Sifton Bog ESA (Applegate Groundwater Consultants, 1999)



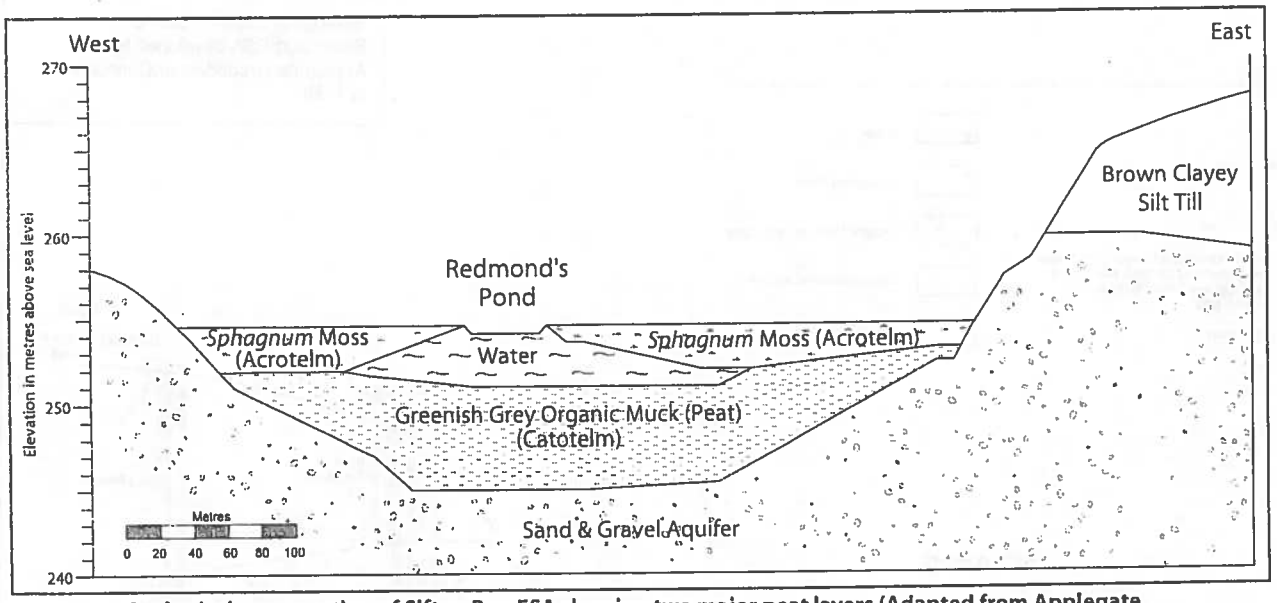


Figure 6. Geological cross-section of Sifton Bog ESA showing two major peat layers (Adapted from Applegate Groundwater Consultants, 1998)