Report to Planning and Environment Committee

To: **Chair and Members**
Planning and Environment Committee
From: **Scott Mathers, MPA, P.Eng.**
Deputy City Manager, Planning and Economic Development
Subject: **Post-Development Environmental Impact Study Monitoring Update**
Date: **May 23, 2023**

Recommendation

That, on the recommendation of the Deputy City Manager, Planning and Economic Development, the following report regarding the Post-Development Environmental Impact Study Monitoring Update **BE RECEIVED** for information.

Executive Summary

The Post-Development Environmental Impact Study (EIS) Monitoring program conducts assessments of natural features adjacent to subdivisions following assumption. Select subdivisions are evaluated to determine the success of the pre-development EIS report's recommended mitigation measures in achieving a net benefit to the natural heritage areas.

Dougan & Associates were retained to complete the review of 12 sites throughout 2021. This report completes the first year of a long-term ecological monitoring program that investigates the implementation of mitigation methods recommended in previously accepted EIS reports. Findings of the 2021 fieldworks confirm the need for buffers on all sites with natural heritage features.

Linkage to the Corporate Strategic Plan

A well planned and growing community - London's growth and development is well-planned and considers use, intensity, and form.

Analysis

1.0 Background Information

1.1 Previous Reports Related to this Matter

Planning and Environment Committee, December 13, 2021, Agenda Item 3.8, Environmental Management Guidelines

Planning and Environment Committee, March 29, 2021, Agenda Item 2.12, Post Development Environmental Impact Study Monitoring

Strategic Priorities and Policy Committee, May 06, 2019, Agenda Item 2.3, Approval of the 2019 Development Charges By-law and Background Study

Planning and Environment Committee, July 16, 2018, Agenda Item 2.6, Environmental Impact Study (EIS) Compliance

1.2 Environmental Impact Study Compliance Review

Environmental impact studies (EIS) are required to determine whether, or the extent to which, development may be permitted in areas within, or adjacent to, specific components of the Natural Heritage System. They confirm or refine the boundaries of natural heritage features and include conditions and mitigation measures to ensure that development does not negatively impact the natural features and ecological functions

for which the area is identified. The preparation of an environmental impact study is guided by the Council adopted Environmental Management Guidelines.

Historically, the monitoring of EIS mitigation measures in London was the responsibility of developers with consultants being retained by these individuals to assess outcomes for each subdivision. On July 16, 2018, a report was presented to Planning and Environment Committee that identified EIS compliance issues at the time and next steps as summarized below:

1. **Improve the EIS compliance process** by operationalizing recommended monitoring clauses through draft plan approval and subdivision agreements.
2. **Review active subdivisions**.
3. **Enhance compliance and enforcement** by undertaking continuous improvement initiatives.
4. **Explore options for a city-wide monitoring contract** to be led by city staff to conduct monitoring at regular intervals.
5. **Conduct post-development "audits"** to complete systematic long-term reviews of post-development impacts on natural heritage areas.

As Post-Development EIS Monitoring was included as a program in the 2019 Development Charges, the City is now able to undertake a city-wide monitoring contract approach to conducting audits. This report completes the first year of a long-term ecological monitoring program that investigates the implementation of mitigation methods recommended in previously accepted EIS reports. This approach allows for consistent monitoring (i.e., repeatable methodology), at regularized intervals over the long-term, and the ability to benchmark with other similar subdivisions. The results of the post-development monitoring program will inform if any remedial works are to be done or if any policy changes are to be made.

2.0 Discussion and Considerations

2.1 2021 Project Overview

The Post-Development EIS Monitoring program aims to evaluate the effectiveness of the implementation of recommended pre-development EIS mitigation measures in achieving a net benefit, or no negative impact, to the natural features and functions. The development of a repeatable monitoring program will allow staff to evaluate long-term (year-over-year) trends related to developments adjacent to natural areas.

In late 2020 staff undertook a competitive procurement process to retain an environmental consulting firm. Dougan & Associates were retained to conduct the first year of the Post-Development EIS Monitoring program.

The project involved conducting background reviews on EIS reports to determine the site's pre-development condition, natural heritage features and any associated recommendations for monitoring and mitigation measures.

Twelve (12) study sites were selected for the initial study from the set of subdivisions assumed by the City between 2014 and 2019, and where the limits of the development contain or were adjacent to Open Space zones (OS4 and/or OS5). Dougan & Associates prepared site-specific monitoring plans for each that included:

- updates to existing Ecological Land Classification (ELC),
- establishing surveys of vegetation plots to monitor across multiple years,
- encroachment and disturbance monitoring for areas directly adjacent to development,
- baseline breeding bird and nocturnal amphibian calling surveys,
- turtle basking surveys (for select sites), and
- aquatic habitat and monitoring surveys (for select sites).

The methods used were aimed at answering several questions about the potential impacts of development on the vegetation communities, hydrology, aquatic habitat, and the disturbance of natural heritage features. General recommendations on matters such as restoring natural heritage feature integrity and future monitoring intervals were also included.

2.2 Study Sites

Table 1 below outlines the locations reviewed in 2021 as part of the Post-Development EIS Monitoring program. A map showing the locations of the study sites has been included in Appendix A for reference.

TABLE 1 – FEATURES STUDIED IN 2021 AND ASSOCIATED SUBDIVISION FILE NUMBER

File Number	Feature Name
39T-00514	Talbot Village Wetland
39T-03512	Cresthaven Woods
39T-03518	Kilally Woods
39T-04513	Pebblecreek
39T-05506	Pincombe Drain
39T-05510	Uplands North Wetland & Powell Woods
39T-06503	Ballymote Trail
39T-08502	Maple Grove Woods
39T-10501	Forest Hill Woods
39T-10502	Medway Valley Heritage Forest ESA
39T-98512	Gibbons/UWO Wetland
39T-99522	Northbrook Valley

2.3 Findings

Factsheets have been prepared for each of the 12 study sites summarizing the 2021 findings and are included in Appendix B.

2.3.1 Vegetation Resources

Vegetation plots were established to replicate (as best as possible) the study location from the pre-development EIS. Updated Ecological Land Classification (ELC) mapping was undertaken for each study site and the results compared to the pre-development ELC to detect changes in the feature (i.e., size, shape, and/or composition of the communities). Key findings include:

- Eleven (11) sites saw changes in vegetation compositions adjacent to the areas of development.
- Seven (7) of the sites experienced significant changes in their ELC composition from pre-development. A total of 4.65 hectares of area changed from natural to cultural communities from pre- to post-development.
- Eight (8) of the sites experienced a change in their wetland cover. A total of 7.89 hectares converted from wetland to non-wetland communities from pre- to post-development.

Changes to wetland communities potentially indicates a change in hydrology or other conditions on site. It should also be noted that some of the changes in ELC communities from pre- to post-development may be due to a refinement of the mapping and surveying differences for the vegetation communities. Therefore, some of these community changes may have occurred regardless of development proceeding on the adjacent lands.

The purpose of the pre-development EIS report is to ensure that no negative impacts occur to the natural area adjacent to developments. Based on the 2021 observations, if these changes were directly correlated to the adjacent developments, then that would suggest that the EIS mitigation measures were not successful in protecting the natural area. However, given the time between preparation of the pre-development EIS and the post-development audit, other unknown factors may have contributed to these impacts. More frequent monitoring and reporting throughout the buildout of the developments

would've been required to pinpoint the primary cause of the observed changes in vegetation communities.

2.3.2 Wildlife Resources

The 2021 field season included breeding bird surveys, nocturnal amphibian calling surveys, and the recording of incidental wildlife sightings for all sites, with only specific sites being targeted for turtle basking surveys. Monitoring stations were established to replicate (as best as possible) the pre-development EIS study locations and their proximity to significant features (e.g., wetlands or water features). The 2021 surveys identified a total of 66 bird species and 6 amphibian species, of which 14 species (13 birds and 1 reptile) were significant (species of special concern, endangered or threatened).

Where available, comparisons were made to documented pre-development conditions (both formally and incidentally recorded). However, these comparisons were inconsistent across the study sites. Occasionally data was incomplete due to the variable nature of pre-development data and the availability of background reports, which affects the ability to draw conclusions about impacts. Therefore, for some sites the data collected in 2021 will serve as a new baseline (i.e., of the post-development condition) for use in future studies to allow for comparison of long-term trends within the study areas. When comparing diversity of species across the sites (not the abundance), eleven (11) of the sites saw a reduction in the number of species present from pre- to post-development.

2.3.3 Aquatic Monitoring

Aquatic transects were established for eight (8) sites (Kilally Woods, Ballymote Trail, Maple Grove, Medway Valley, Northbrook, Pebblecreek, Pincombe, Uplands North) to replicate (as best as possible) the study location from the pre-development EIS to monitor aquatic and fish habitat. Sampling stations were determined during the 2021 fieldworks based on observed channel and flow conditions. Two (2) of the sites (Medway Valley and Ballymote Trail) are experiencing stable or improved watercourse conditions based on their compensation habitat. The remaining sites were observed to be experiencing varying levels of disturbance. On one site (Kilally Woods), an erosion scar was observed along the Thames River bank as a result of uncontrolled rear-yard overland flows from the adjacent development, while on another site (Maple Grove) the stormwater management facility was overrun with hundreds of invasive goldfish. The results of the 2021 fieldworks tend to suggest that the recommended pre-development mitigation measures did not prevent impacts to these sites.

It should also be noted that the pre-development EIS reports did not provide a sufficient level of detail regarding the baseline conditions of the aquatic systems within the natural heritage areas, which limits the extent of comparison between pre- and post-development conditions.

2.3.4 Disturbance Monitoring

Monitoring transects were established to determine the levels of site disturbance post-development. The 2021 field works categorized disturbance level as either low, medium, or high, assessed the types of encroachment, and for comparison across sites, recorded disturbances at pre-determined distance intervals from the edge of the feature. The types of encroachment include:

- site alteration (e.g., dumping of yard waste, filling, and grading, etc.),
- structures (e.g., play equipment, forts, sheds, lighting, bird feeders, etc.),
- recreational impacts (e.g., informal trail access points, bike jumps, draining of backyard pools into the natural area/buffer, etc.), and
- landscaping (e.g., removal of native vegetation, food crop gardening, planting of non-native trees/shrubs, introduction of invasive species, etc.).

Results of the 2021 field works are summarized below in Table 2 and Table 3.

TABLE 2 - SUMMARY OF DISTURBANCES AND OCCURRENCES

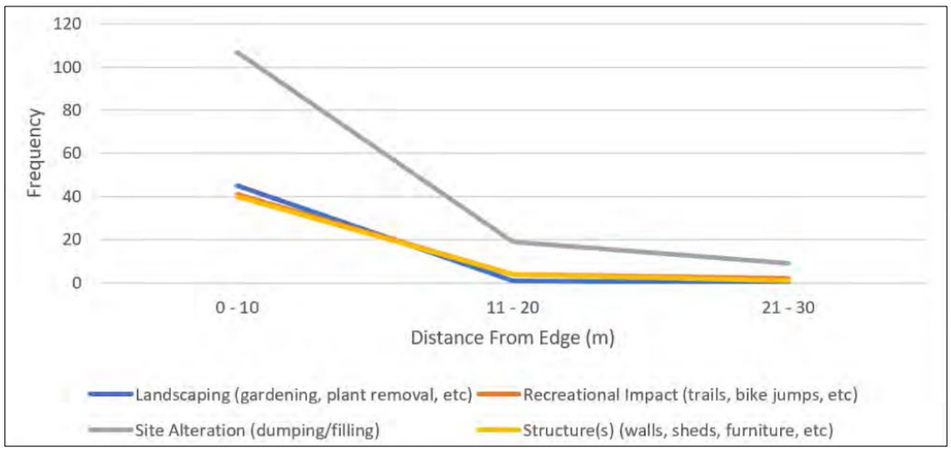
Disturbance Type	Occurrences
Site Alteration Impacts	133
Landscaping Impacts	50
Recreation Impacts	47
Structures	46
Total	**276**

TABLE 3 - SUMMARY OF DISTURBANCES RELATIVE TO THE FEATURE

Location of Disturbance	Occurrences
Within the natural feature	130
Within the buffer area (where one was proposed in the pre-development EIS)	88
Outside of the natural feature or the buffer area	58
Total	**276**

Most disturbances were detected within the natural feature; however, for many of the sites, disturbances were found to be occurring within a buffer area (where one was provided), suggesting that buffers are effective as a mitigation measure. When looking at the distribution of disturbances in Figure 1 below, the majority of encroachments were found to occur within 0-10 m of the edge of the natural feature; this would further suggest that buffers should be a minimum of 10 metres wide.

FIGURE 1 - FREQUENCY OF DISTURBANCE AT A DISTANCE FROM THE EDGE OF FEATURE[1]



Furthermore, when upon comparing the average number of disturbances per metre of transect surveyed, it was found that disturbances occurred most frequently on sites with just fencing (with or without gates) implemented as a mitigation measure. Sites with a combination of buffers and fencing (with or without gates) had less disturbances than just fencing but, experienced more disturbances than sites with just buffers (which was likely due to dense vegetation in the natural area making the feature difficult to access).

2.3.5 Mitigation Measures

Through review of the pre-development EIS reports it was found that ten (10) of the sites recommended formal buffers around sensitive features (e.g., wetlands, watercourses and woodlots) with the range in buffer size being between 5 to 20 metres. The 2021 field works noted variation in buffer sizes (implemented versus recommended); however, it is difficult to determine if the variation is caused by the encroachments (e.g., mowing the buffer area), an expansion of the natural area boundary, or insufficient setbacks at the time of development.

[1] Figure 4 from City of London Post Development EIS Monitoring: Final Annual Report – 2021 (Dougan & Associates, 2022)

While only four (4) of the pre-development EIS reports recommended fencing for rear-yards of residential lots adjacent to the natural area, it was found that rear lot fencing was present on eight (8) of the sites. However, it was also determined that sites with both buffers and fencing had more instances of encroachments per metre of monitoring transect than sites with only buffers. Where rear-yard fencing had private gates allowing easy access into the natural area, the fencing was doing little to protect the natural feature from encroachment activities.

2.4 Recommendations

A summary of the recommended actions per site have been included in Table 4 below.

2.4.1 Remediation of Disturbed Areas

The most common impact observed across surveyed sites were disturbances to the buffer and natural features from the dumping of waste, the placing of fill, and grading. These actions can result in negative impacts to wildlife, local vegetation communities and quantity and quality of runoff reaching wetlands and watercourses. Suggested remediation actions to mitigate further encroachments include:

- Removal of yard waste, compost, dirt, and garbage found in the buffers and natural areas.
- Installation of fencing and signage where none are present to discourage additional dumping.
- Planting of the buffer areas to restore vegetative cover, reduce potential for erosion and mitigate sediment laden runoff entering wetlands and watercourses.

2.4.2 Invasive Species Management

Most sites experienced some form of landscaping disturbance in the buffer or natural feature (e.g., horticultural gardening, planting of non-native species, and disposal of yard waste) which may have contributed to the introduction of invasive species. It is recommended that invasive species are managed following The City of London's "Invasive Plant Management Strategy" (2017), with targeted species removal and specific management plans being developed, as required.

2.4.3 Targeted Educational Campaigns

Typically, landowner stewardship is promoted through distribution of educational pamphlets that discuss the adjacent natural area, its sensitivities and how to mitigate impacts caused by residential activities. This educational campaign is typically a one-time occurrence, with only the original landowners receiving the information. To mitigate future impacts, it was recommended that landowner education continues to occur to discourage further encroachments, such as:

- mowing/maintenance within the buffer,
- landscaping adjacent to natural area,
- dumping of yard waste into the feature,
- bird feeders and other structures (e.g., lighting) that can disrupt local wildlife,
- creation of informal trail access points (e.g., gates in rear-yard fencing), and
- dumping, or draining of swimming pools into the natural area.

Furthermore, it was suggested that any additional landowner engagement and stewardship strategies follow the recommendations outlined in the "EIS Performance Evaluation for the City of London" report (Beacon, 2014).

2.4.4 Proactive Actions

The majority of sites experienced some form of disturbance in the buffer or natural feature resulting from informal trail access point creation, which can result in trampling of vegetation, habitat disturbance, and introduction of invasive species. Updating the managed trail system was recommended including discouraging informal access points, decommissioning informal trails, erecting fencing and signage to discourage informal access in the future, and that the trail system continue to be monitored according to the City of London's "Guidelines for Management Zones and Trails in ESAs" (2016).

TABLE 4 – SUMMARY OF SITE-SPECIFIC RECOMMENDATIONS BASED ON 2021 MONITORING RESULTS

RECOMMENDATIONS	Kilally Woods	Ballymote Trail	Cresthaven Woods	Forest Hill Woods	Gibbons/UWO Wetland	Maple Grove Woods	Medway Valley Heritage Forest ESA	Northbrook Valley	Pebblecreek	Pincombe Drain	Talbot Village Wetland	Uplands North Wetland Powell Woods
Remediation of Disturbed Areas												
Remove structures, dumping and/or fill	●	●	●	●	●	●	●	●	●		●	●
Plant the buffer area		●	●	●								
Plant native species for re-naturalization	●											
Install fencing along trail to limit amount of wind-blown garbage and waste entering the feature						●						
Invasive Species Management												
Monitor invasive species	●		●		●	●	●	●	●		●	●
Develop site-specific invasive species management plan (if needed)	●		●		●	●	●	●	●		●	●
Remove invasive species from buffer				●								
Targeted Educational Campaigns												
Educational campaign to inform nearby residents of features and encourage stewardship	●	●	●	●	●	●	●	●	●		●	●
Discourage mowing/maintenance in buffer	●										●	
Discourage landscaping adjacent to natural area			●	●								
Discourage dumping of yard waste into the feature			●	●							●	
Discourage bird feeders and other structures (e.g., lighting) that can disrupt local wildlife			●	●								
Discourage informal trail access point creation, dumping, or draining of swimming pools into the natural area							●					
Proactive Actions												
Update the managed trail system to discourage informal trail access points	●				●		●	●	●		●	●
Additional Monitoring												
Attempt to re-detect SAR that were recorded in pre-development EIS, where suitable habitat is still present	●	●	●	●	●	●	●	●	●		●	●

2.4.5 Additional Monitoring

While some significant and at-risk species (SAR) were observed during the 2021 fieldworks, the surveys were not designed to specifically reconfirm the presence of SAR. Therefore, SAR should not be considered absent and may still be present within the area. It was recommended that additional monitoring be undertaken, where suitable habitat is still present, to re-detect SAR that were present during the pre-development EIS.

2.5 Long-term Monitoring Program

Continued monitoring of the study sites will allow for detection of additional changes in future years and will aid in determining the effectiveness of the above recommended mitigation measures in restoring the buffers and natural areas. A long-term suggested frequency of monitoring based on the study done by Dougan and Associates is shown below in Table 5.

TABLE 5 – ALTERNATIVE MONITORING PROGRAM BASED ON YEARS SINCE DEVELOPMENT

Time Since Development	Sites	Studies	Suggested Frequency	Next year of monitoring
18-23 years	Northbrook Valley Gibbons Wetland Kilally Woods	ELC	10 years	2031
18-23 years	Northbrook Valley Gibbons Wetland Kilally Woods	Vegetation plot, Wildlife surveys, Aquatic habitat, Encroachment	3-5 years	2024
15-16 years	Ballymote Trail Uplands N Powell Woods Pincombe Drain Cresthaven Woods Pebblecreek	ELC	10 years	2032
15-16 years	Ballymote Trail Uplands N Powell Woods Pincombe Drain Cresthaven Woods Pebblecreek	Vegetation plot, Wildlife surveys, Aquatic habitat, Encroachment	3-5 years	2025
12-13 years	Maple Grove Woods Medway Valley Forest Hill Woods Talbot Village Wetland	ELC	10 years	2033
12-13 years	Maple Grove Woods Medway Valley Forest Hill Woods Talbot Village Wetland	Vegetation plot, Wildlife surveys, Aquatic habitat, Encroachment	3-5 years	2026

2.6 Environmental Management Guidelines Update (2021)

Each of the 12 sites were developed prior to 2021 when the City of London's Environmental Management Guidelines (EMGs) were updated. This recent update provides clearer expectations for the completion of environmental studies and requires applicants to apply consistent approaches when compiling pre-development data. Also required is post-construction data collection and monitoring to be undertaken by the developer until the end of the assumption development stage.

3.0 Financial Impact/Considerations

The Post-Development EIS Monitoring program is currently 100% growth funded by Development Charges (DC).

Natural Heritage areas are dedicated to the City at the time of subdivision registration, therefore the City assumes the long-term costs associated with any remedial efforts. Remedial actions identified through the monitoring program will inform future workplans which would be carried out by the applicable management program; Upper Thames River Conservation Authority for lands adjacent to the City's ESA or Forestry for lands adjacent to Woodland Parks.

3.1 Bill 23 Impacts

The Government of Ontario's Bill 23, the *More Homes Built Faster Act* (2022), received Royal Assent on November 28, 2022, which had impacts to several Acts, including the *Development Charges Act*. The recent changes have excluded recovery for the cost of growth-related studies through DCs. While London's DCs have always ensured that 'growth pays for growth', this change to legislation would shift the burden for funding future Post-Development EIS Monitoring efforts to existing taxpayers.

3.2 Multi-Year Budget (MYB)

As part of 2024-2028 MYB preparation, Staff will be undertaking a detailed review of City led environmental initiatives to ensure funding and resources adequately addresses future monitoring and rehabilitation efforts.

3.3 Development Securities

Under the City's 'Subdivision and Development Agreement Security Policy' the City may increase the amount of security required for "Erosion and Sediment Control Measures" when there are site specific conditions that can contribute to an increased possibility of a sediment discharge and/or possibility of increased costs for necessary remedial works (e.g., adjacent to a watercourse, Environmentally Sensitive Area, etc.). Through a future update to the Policy, Staff should explore the option of taking additional securities or a holdback specific to the natural areas to ensure restoration can occur prior to assumption for observed changes in habitat and/or negative impacts to natural area as a result of development activity.

4.0 Next Steps

4.1 Updates to the Environmental Management Guidelines

Based on the findings of the 2021 post-development monitoring fieldworks it was found that most encroachments occur within 10 metres of the edge of the natural feature, which could be within a 10 metre wide buffer (if one was present). Staff should undertake a review of buffer requirements and their recommended minimum widths and adjust Table 5-2 of the City's Environmental Management Guidelines (2021) where buffers less than 10 metres are proposed.

4.2 Managing Encroachments

City Parks and Forestry divisions and the Upper Thames River Conservation Authority carryout specific land management programs based on the land use classification of the natural area. Given the variation of sites within this 2021 study, Staff will engage with each land management team by July 1, 2023, to highlight the study findings so that they can determine the remedial efforts required through their workplans.

Outside of planned annual works, Staff could explore opportunities to partner with external organizations to complete restoration plantings post-assumption to leverage additional tree planting opportunities.

City By-law staff should also be engaged to discuss enforcement mechanisms to deter future encroachments into the natural areas.

4.3 Update the Managed Trail System

Based on the recommendations provided, Staff should undertake an update to the managed trail system to discourage informal access points, decommission existing informal trails, and erect fencing and signage to discourage informal access in the future. These updates can be addressed through the Phase 2 Conservation Master Plan process within ESAs.

4.4 Education

Most of the encroachments observed are a direct result of the proximity of residential development to the natural area. It was recommended that additional targeted educational campaigns be undertaken to reach landowners who may not have received

initial stewardship packages that would have been distributed at the time of subdivision construction. Staff should explore opportunities for educational efforts, which could include placing notices within the annual garbage collection calendars, community engagement events, targeted mailings, etc., and work with Corporate Communications to develop an outreach strategy subject to the availability of existing budgets.

4.5 Next Post-Development Monitoring Review

Staff will advance the subsequent round of post-development EIS monitoring and look for opportunities to expand the scope of the monitoring program to include recently assumed subdivisions and other recently completed development applications where development has occurred adjacent to natural areas. It is anticipated that fieldworks will commence by Fall 2023 and carry through to summer of 2024, with reporting to occur by year end 2024.

Conclusion

Twelve (12) study sites were selected for the first year of the Post-Development EIS Monitoring program to determine the success of the pre-development EIS report's recommended mitigation measures. Fieldworks undertaken in 2021 demonstrated that no site was free from disturbances or encroachments in to the buffer or natural feature. It was found that most encroachments were occurring within 10 metres from the edge of the feature, suggesting that all sites with natural heritage features should have a minimum buffer of 10 meters. Furthermore, sites tended to experience more impacts where fencing (with or without gates) was included, indicating that fencing alone is not a sufficient mitigation measure.

Comparison of pre-development EIS data to post-development data collection highlighted a need for better data recording. For most sites, the 2021 monitoring data was the first sample collected since development of properties adjacent to the natural heritage areas. The data gathered through the 2021 fieldworks will support long-term monitoring of the natural sites, which are now in the care and control of the City.

Ultimately, the Post-Development EIS Monitoring program serves as an important feedback loop. The results of the monitoring program outline the need for remedial works, allowing for the assessment of long-term trends, and aid in identifying updates to policy to better protect features across the city as land development continues to progress.

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Submitted by:	**Scott Mathers, P.Eng.** **Deputy City Manager, Planning and Economic Development**

CC: Ecological Community Advisory Committee (ECAC)
Bruce Page, Manager, Subdivision Planning
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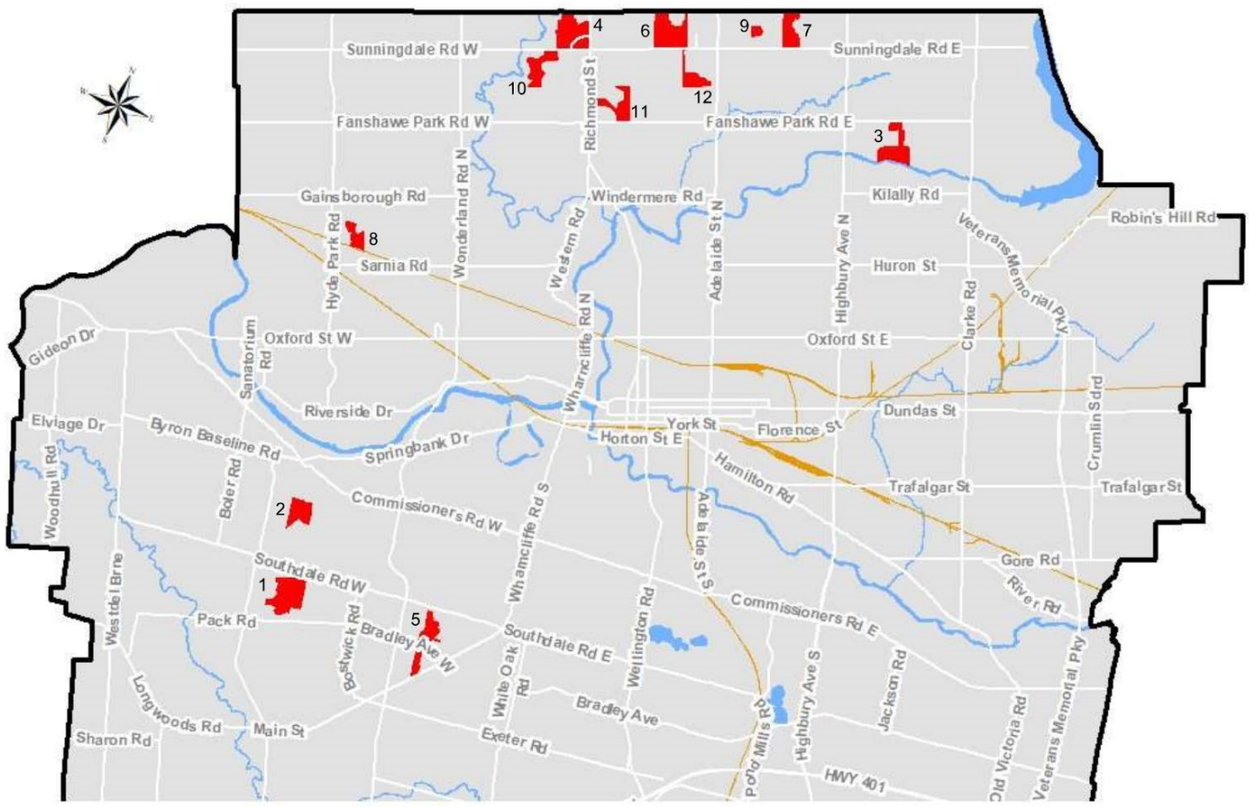
Appendix A: Map
Appendix B: Fact Sheets

Appendix A – Map

Map of the City of London showing the location of the twelve (12) study sites.



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10	39T-10502	Medway Valley Heritage Forest ESA
11	39T-98512	Gibbons/UWO Wetland
12	39T-99522	Northbrook Valley

Appendix B – Factsheets

Talbot Village Wetland

FACTSHEET

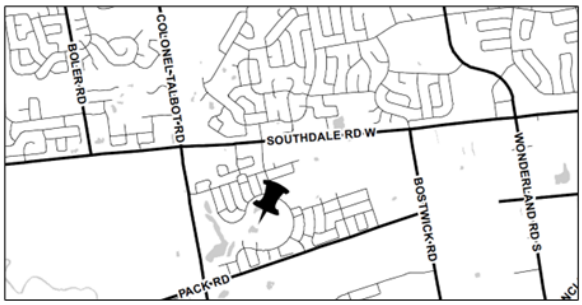
39T-00514

Mitigation Measures

- 10m buffer around the wetland
- no fencing was recommended as a mitigation

Recommendations

- Remediate disturbed areas
- Update the managed trail system to discourage informal trail access points
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)

Bank Swallow, Barn Swallow, Prothonotary Warbler

Breeding Bird Surveys

POST 37 species (3-SAR, 4-AS, 2-LR, 18-LU)
PRE 53 species (4-SAR)

Nocturnal Amphibian Call Surveys

POST 4 species
PRE 4 species

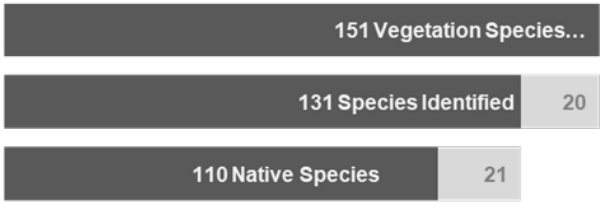
Incidental Wildlife

POST 1 bird, 1 turtle
PRE

Basking Turtle Surveys

POST 0
PRE N/A

Vegetation Surveys



Average coefficient of conservatism across the site: **3.6**
Average coefficient of wetness across the site: **0.0**

Ecological Land Classification Changes

(from pre- to post-development)

1.30 ha Natural area to Cultural

Site Disturbances

Location

11 Outside Buffer and Feature
11 Within Buffer
12 Within Feature

Distance from Edge of Natural Feature

70% 0 m - 10 m
15% 11 m - 20 m
15% 21 m - 30 m

Type

13 Dumping and Fill/Grading
10 Landscaping
8 Structures
3 Recreational

Invasive Species Observed

Garlic Mustard, Multiflora Rose, Honeysuckle (non-native species), Miscanthus Grass

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Cresthaven Woods

FACTSHEET

39T-03512

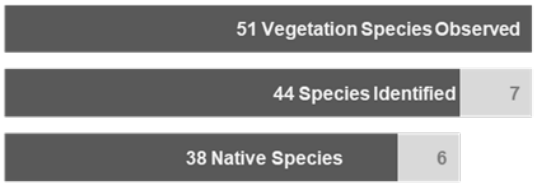
Mitigation Measures

- no formal buffer was recommended
- no fencing was recommended

Recommendations

- Remediate disturbed areas
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Plant area between natural feature and homes
- Educational campaign to inform residents of stewardship
- Discourage landscaping adjacent to natural area
- Discourage dumping of yard waste into the feature
- Discourage bird feeders that disrupt local wildlife
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present

Vegetation Surveys



Average coefficient of conservatism across the site: **3.0**
Average coefficient of wetness across the site: **1.3**

Breeding Bird Surveys

POST 10 species (1-AS, 7-LU)
PRE N/A

Nocturnal Amphibian Call Surveys

POST 2 species
PRE N/A

Incidental Wildlife

POST 5 birds, 1 mammal
PRE N/A

Ecological Land Classification Changes

(from pre- to post-development)

0.06 ha Cultural to Natural
0.01 ha Reduction in Wetland

Site Disturbances

Location
14 Edge of Feature (No Buffer)
29 Within Feature

Distance from Edge of Natural Feature
86% 0 m - 10 m
9% 11 m - 20 m
5% 21 m - 30 m

Type
17 Dumping and Fill/Grading
14 Structures
12 Landscaping

Invasive Species Observed

Common Buckthorn, Miscanthus Grass, Japanese Barberry, Privet, Yellow Iris, Autumn Olive

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Kilally Woods

39T-03518

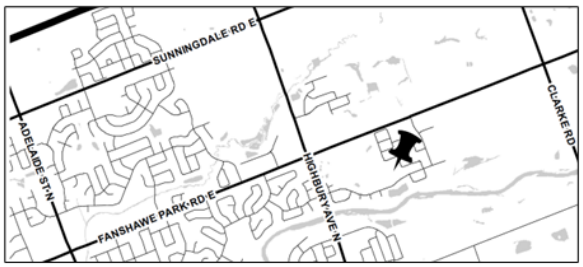
FACTSHEET

Pre-Development Mitigation Measures

- 5-6 metre wide buffer adjacent to ESA
- Orient human traffic to trails to mitigate potential disturbance
- Rear-yard runoff to ESA and direct all stormwater flows to stormwater management pond

Recommendations

- Update the managed trail system to discourage informal trail access points
- Cease mowing/maintenance in buffer
- Plant native species for re-naturalization
- Remediate disturbed areas
- Monitor invasive species and develop site specific management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Eastern Wood-Pewee

Aquatic Monitoring

Channel Stability: surface runoff from development directed towards the Thames River has caused bank erosion
Change: increased bank erosion due to overland flows directed towards the river

Breeding Bird Surveys

POST 15 species (1-SAR, 6-LU)
PRE 53 species (4-SAR)

Nocturnal Amphibian Call Surveys

POST 4 species
PRE 4 species

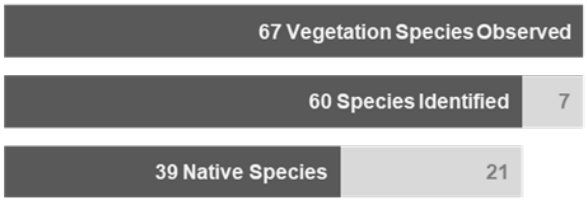
Incidental Wildlife

POST 4 birds, 3 mammals
PRE

Basking Turtles

POST 0
PRE 0

Vegetation Surveys



Average coefficient of conservatism across the site: **2.3**
Average coefficient of wetness across the site: **0.6**

Ecological Land Classification Changes

(from pre- to post-development)

1.67 ha Wetland to Upland/Cultural
0.60 ha Natural area to Cultural

Site Disturbances

Location
9 Outside Buffer and Feature
2 Within Buffer
17 Within Feature

Distance from Edge of Natural Feature
82% 0 m - 10 m
18% 11 m - 20 m
0% 21 m - 30 m

Type
14 Informal Trail Access
8 Dumping and Fill/Grading
6 Invasive Species

Invasive Species Observed

Common Buckthorn, White Poplar, English Ivy, Periwinkle, Dog-strangling Vine, Garlic Mustard

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Pebblecreek

FACTSHEET

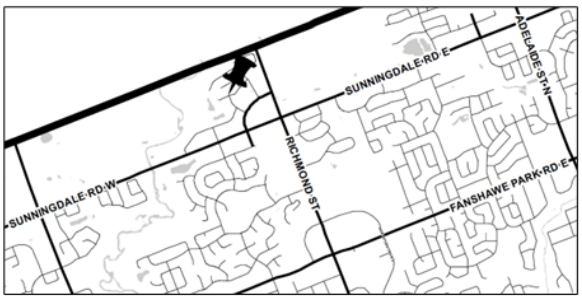
39T-04513

Mitigation Measures

- 10 m buffer was recommended
- 15 m setback from the tributary
- no fencing was recommended

Recommendations

- Remediate disturbed areas
- Update the managed trail system to discourage informal trail access points
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Barn Swallow

Aquatic Monitoring

Substrate: silty with deep sediment
Channel Stability: stable channel with a few actively eroding banks
Fish Community: no fish observed
Change: deposits of fine sediment possibly from construction; lack of flow likely reduces the flushing of sediments resulting in poor fish habitat conditions

Breeding Bird Surveys

POST 13 species (1-SAR, 5-LU)
PRE 35 species (3-SAR)

Nocturnal Amphibian Call Surveys

POST 5 species
PRE 1 species

Incidental Wildlife

POST 1 bird
PRE N/A

Vegetation Surveys

78 Vegetation Species Observed
67 Species Identified | 11
47 Native Species | 20

Average coefficient of conservatism across the site: **2.0**
Average coefficient of wetness across the site: **0.6**

Ecological Land Classification Changes

(from pre- to post-development)

0.27 ha Reduction in overall Natural Area
0.09 ha Reduction in Wetland

Site Disturbances

Location
1 Outside Buffer and Feature
4 Within Buffer
Within Feature

Distance from Edge of Natural Feature
100% 0 m - 10 m
11 m - 20 m
21 m - 30 m

Type
4 Dumping and Fill/Grading
1 Informal Trail Access

Invasive Species Observed
Garlic Mustard, Privet

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Pincombe Drain

FACTSHEET

39T-05506

Mitigation Measures

- Ecological buffers required for adjacent development proposals to protect surface water quality, enhance riparian cover and bird habitat
- Restore riparian cover by planting existing slopes
- Maintain existing vegetation were feasible to reduce surface water temperatures

Recommendations

- None

At-Risk Species (SAR)
Eastern Wood-Pewee

Aquatic Monitoring

Substrate: silty clay organic muck with cobbles and woody debris
Channel Stability: stormwater management facility outlet channel is eroding around the energy dissipation pad
Fish Community: brook stickleback, creek chub, fathead minnow, green sunfish, northern longear sunfish, white sucker
Change: overall poor channel condition

Breeding Bird Surveys

POST 15 species (2-LR, 4-LU)
PRE 26 Species

Nocturnal Amphibian Call Surveys

POST 3 species
PRE N/A

Incidental Wildlife

POST 6 birds, 1 mammal
PRE N/A

Vegetation Surveys

34 Vegetation Species Observed

32 Species Identified | 2

20 Native Species | 12

Average coefficient of conservatism across the site: **1.5**
Average coefficient of wetness across the site: **-0.5**

Ecological Land Classification Changes

(from pre- to post-development)

1.34 ha Natural area to Cultural
0.23 ha Wetland to Cultural

Site Disturbances

No formal disturbance / encroachment surveys were proposed to be completed for this site. The natural feature (deciduous forest) is not directly adjacent to residential development but the stormwater management pond.

Invasive Species Observed

Common Buckthorn, White Poplar, English Ivy, Periwinkle, Dog-strangling Vine, Garlic Mustard

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Uplands North Wetland & Powell Woods FACTSHEET

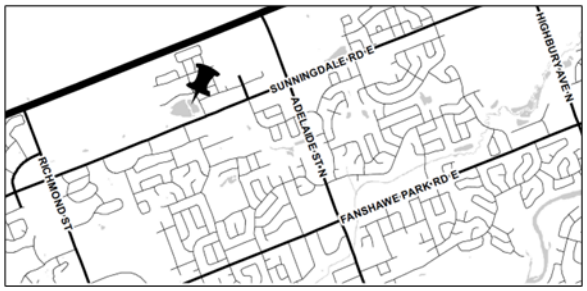
39T-05510

Mitigation Measures

- Vegetated buffers:
- 10m buffer at the northern edge of wetland
- 10m to 25m buffers at the southern edge of the wetland
- fencing was recommended along the edge of the ESA

Recommendations

- Remediate disturbed areas
- Update the managed trail system to discourage informal trail access points
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Barn Swallow, Eastern Wood-pewee

Aquatic Monitoring

Channel Stability: if additional flow is released in a controlled manner, it will improve baseflow conditions of the receiving watercourse
Fish Community: several fish, ducks, and a great egret observed in the SWM facility
Change: stormwater management pond is likely providing a greater volume of water than the reed canary grass community. A berm was constructed downstream of the willow thicket swamp and appears to have increased the water elevation in the wetland, which is resulting in the death of the trees and shrubs in this community.

Breeding Bird Surveys

POST 25 species (2-SAR, 1-AS, 2-LR, 11-LU)
PRE 39 species (1-AS, 1-LR)

Nocturnal Amphibian Call Surveys

POST 6 species (1-AS)
PRE N/A

Incidental Wildlife

POST 2 butterflies, 1 dragonfly, 1 reptile
PRE N/A

Basking Turtles

POST 1 species
PRE N/A

Vegetation Surveys

92 Vegetation Species Observed
88 Species Identified | 4
59 Native Species | 29

Average coefficient of conservatism across the site: **2.2**
Average coefficient of wetness across the site: **0.5**

Ecological Land Classification Changes

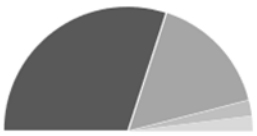
(from pre- to post-development)

1.45 ha Natural area to Cultural
3.35 ha Wetland to Upland/Cultural

Site Disturbances

Location
4 Outside Buffer and Feature
14 Within Buffer
7 Within Feature

Distance from Edge of Natural Feature
100% 0 m - 10 m
11 m - 20 m
21 m - 30 m



Type
15 Dumping and Fill/Grading
8 Informal Trail Access
1 Structures
1 Landscaping

Invasive Species Observed
Glossy Buckthorn, European Common Reed, Reed Canary Grass, Common Buckthorn

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Ballymote Trail

39T-06503

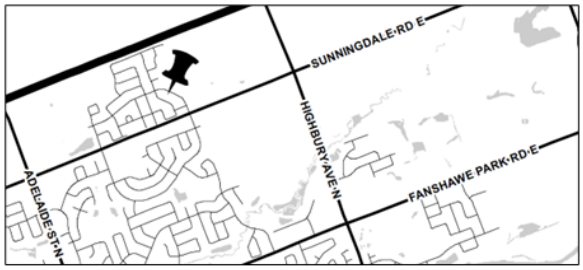
FACTSHEET

Mitigation Measures

- 10 m buffer was recommended along edges of all wetland communities
- Majority of the natural feature not directly adjacent to residential houses, separated by a public trail
- Stormwater runoff to ESA through rear-yard infiltration swales and pipes

Recommendations

- Remediate disturbed areas
- Plant buffer area
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present

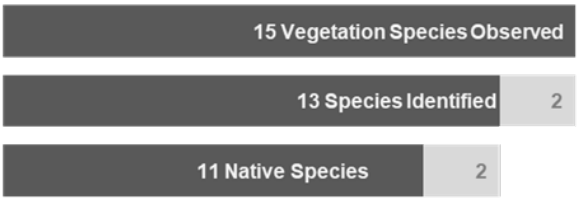


At-Risk Species (SAR)
Chimney Swift, Eastern-wood Pewee

Aquatic Monitoring

Substrate: fine sediment dominated
Channel Stability: stable, shallow, slightly confined
Fish Community: no fish observed
Change: no change determined, overall stable

Vegetation Surveys



Average coefficient of conservatism across the site: **3.6**
Average coefficient of wetness across the site: **-0.5**

Breeding Bird Surveys

POST 16 species (2-SAR, 2-LR, 6-LU)
PRE 36 species (2-SAR)

Nocturnal Amphibian Call Surveys

POST 2 species
PRE 5 species

Incidental Wildlife

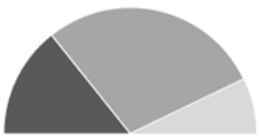
POST N/A
PRE N/A

Ecological Land Classification Changes

(from pre- to post-development)

0.16 ha Increase to Wetland

Site Disturbances



Location
2 Outside Buffer and Feature
4 Within Buffer
1 Within Feature

Distance from Edge of Natural Feature
57% 0 m - 10 m
43% 11 m - 20 m
21 m - 30 m

Type
4 Dumping and Fill/Grading
3 Structures

Invasive Species Observed
Glossy Buckthorn

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Maple Grove Woods

FACTSHEET

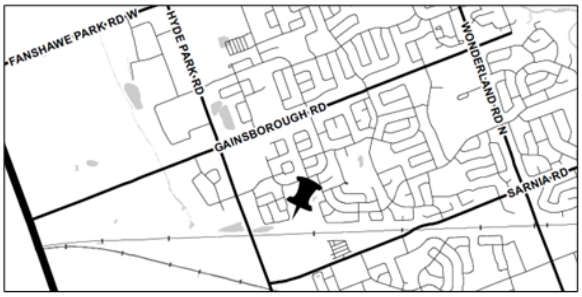
39T-08502

Mitigation Measures

- 15 m buffer was recommended
- Fencing recommended

Recommendations

- Remediate disturbed areas
- Consider fencing along trail to limit wind blown garbage and waste from entering the feature
- Invasive species monitoring and management plan to limit spread of English Ivy
- Educational campaign to inform residents and nearby school of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Eastern Wood-Pewee, Goldfish

Aquatic Monitoring

Fish Community: several hundred goldfish (non-native)
Change: water quality appears low due to the constant churning of the sediment by the goldfish

Breeding Bird Surveys

POST 16 species (1-SAR, 1-LR, 5-LU)
PRE 29 species

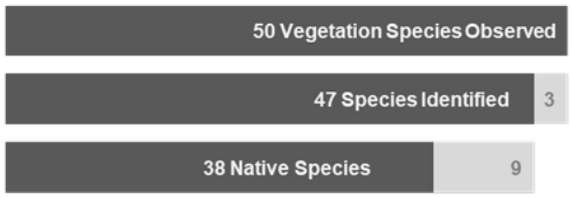
Nocturnal Amphibian Call Surveys

POST 3 species
PRE 1 species

Incidental Wildlife

POST N/A
PRE N/A

Vegetation Surveys



Average coefficient of conservatism across the site: **2.7**
Average coefficient of wetness across the site: **0.8**

Ecological Land Classification Changes

(from pre- to post-development)

0.49 ha Natural area to Cultural
1.35 ha Wetland to Upland Forest

Site Disturbances

Location
Outside Buffer and Feature
Within Buffer
13 Within Feature

Distance from Edge of Natural Feature
46% 0 m - 10 m
23% 11 m - 20 m
31% 21 m - 30 m

Type
5 Dumping and Fill/Grading
4 Structures
4 Invasive Species

Invasive Species Observed
Common Buckthorn, English Ivy

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Forest Hill Woods

FACTSHEET

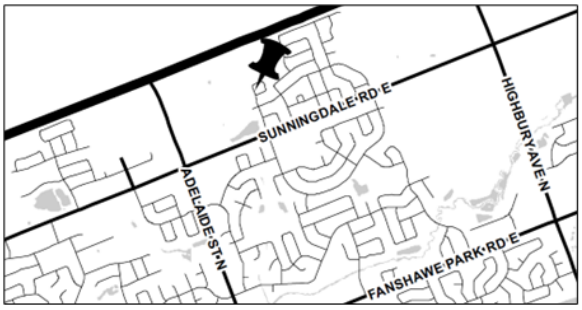
39T-10501

Mitigation Measures

- 10 m buffer was recommended
- Fencing was recommended at the rear
- of residential yards to protect the natural area

Recommendations

- Remediate disturbed areas
- Remove invasive species from the buffer
- Plant buffer area
- Educational campaign to inform residents of stewardship
- Discourage landscaping adjacent to natural area
- Discourage dumping of yard waste into the feature
- Discourage bird feeders that disrupt local wildlife
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Eastern Wood-Pewee

Breeding Bird Surveys

POST 25 species (1-SAR, 2-AS, 1-LR, 14-LU)
PRE N/A

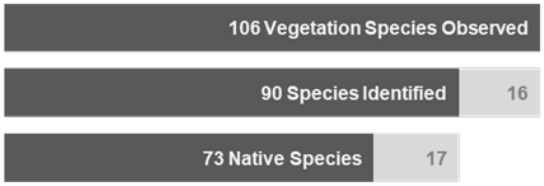
Nocturnal Amphibian Call Surveys

POST 2 species
PRE N/A

Incidental Wildlife

POST 1 mammal, 1 bat
PRE N/A

Vegetation Surveys



Average coefficient of conservatism across the site: **3.25**
Average coefficient of wetness across the site: **-0.6**

Ecological Land Classification Changes

(from pre- to post-development)

0.10 ha Gain to overall Natural Area
2.52 ha Loss of Wetland Cover

Site Disturbances

Location
7 Outside Buffer and Feature
37 Within Buffer
5 Within Feature

Distance from Edge of Natural Feature
90% 0 m - 10 m
8% 11 m - 20 m
2% 21 m - 30 m

Type
19 Dumping and Fill/Grading
16 Landscaping
12 Structures
2 Informal Trail Access

Invasive Species Observed
Reed Canary Grass

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Medway Valley Heritage Forest ESA FACTSHEET

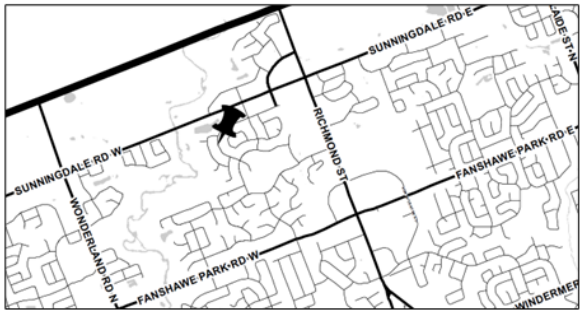
39T-10502

Mitigation Measures

- 30m setbacks around wetland
- No buffer was recommended
- Fencing was recommended at the rear of residential yards

Recommendations

- Remediate disturbed areas
- Update the managed trail system to discourage informal trail access points
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



At-Risk Species (SAR)
Barn Swallow, Eastern Wood-pewee

Aquatic Monitoring

Substrate: Armourstone channel with stone bottom, clay and cobbles in southern reaches
Channel Stability: single channel with new pond (rehabilitation area)
Fish Community: no fish observed
Change: reduction in channel length, wetland pocket offsetting well established and functioning as intended

Breeding Bird Surveys

POST 17 species (2-SAR, 1-AS, 5-LU)
PRE 38 species (8-SAR, 4-AS)

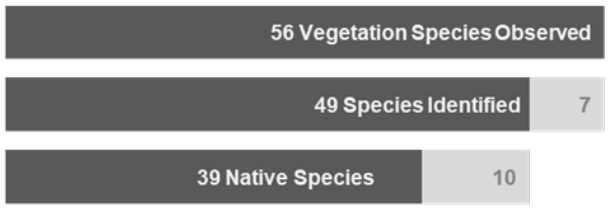
Nocturnal Amphibian Call Surveys

POST 5 species
PRE 4 species

Incidental Wildlife

POST 2 birds
PRE N/A

Vegetation Surveys



Average coefficient of conservatism across the site: **3.2**
Average coefficient of wetness across the site: **0.4**

Ecological Land Classification Changes

(from pre- to post-development)

2.57 ha Natural area to Cultural
0.94 ha Cultural to Wetland

Site Disturbances

Location
2 Outside Buffer and Feature
Within Buffer
21 Within Feature

Distance from Edge of Natural Feature
87% 0 m - 10 m
9% 11 m - 20 m
4% 21 m - 30 m

Type
8 Informal Trail Access
15 Dumping and Fill/Grading
Invasive Species

Invasive Species Observed
Common Buckthorn, White Poplar, English Ivy, Periwinkle, Dog-strangling Vine, Garlic Mustard

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

Gibbons/UWO Wetland

FACTSHEET

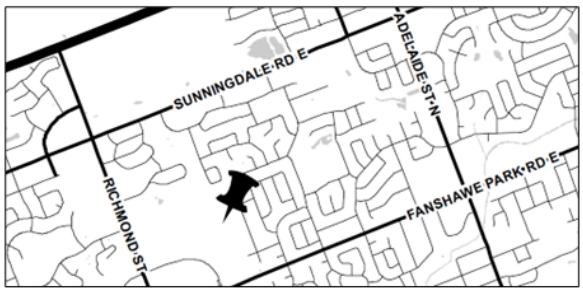
39T-98512

Mitigation Measures

- 10 m buffer was recommended
- No fencing was recommended at the rear of residential yards

Recommendations

- Update the managed trail system to discourage informal trail access points
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Remediate disturbed areas
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present



Breeding Bird Surveys

POST 10 species (2-LU)
PRE 14 species

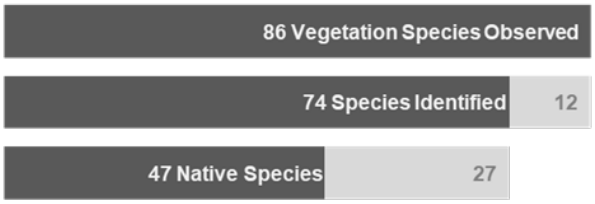
Nocturnal Amphibian Call Surveys

POST 2 species
PRE N/A

Incidental Wildlife

POST 1 mammal
PRE N/A

Vegetation Surveys



Average coefficient of conservatism across the site: **2.3**
Average coefficient of wetness across the site: **0.3**

Ecological Land Classification Changes

(from pre- to post-development)

0.19 ha Cultural to Natural
0.13 ha Wetland to Upland/Cultural

Site Disturbances

Location
4 Outside Buffer and Feature
9 Within Buffer
16 Within Feature

Distance from Edge of Natural Feature
86% 0 m - 10 m
14% 11 m - 20 m
0% 21 m - 30 m

Type
21 Dumping and Fill/Grading
5 Informal Trail Access
3 Structures

Invasive Species Observed

Common Buckthorn, Periwinkle, Black Alder, Privet, Non-native Honeysuckle, Glossy Buckthorn

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)

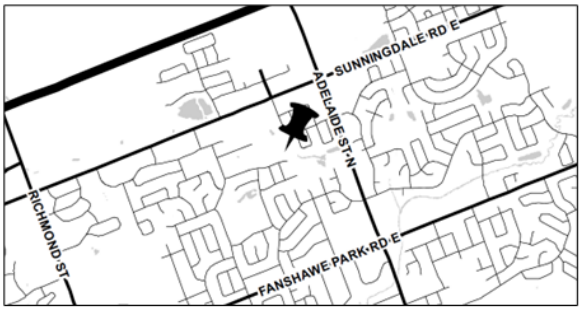
Northbrook Valley

FACTSHEET

39T-99522

Mitigation Measures

- 5 m buffer was recommended
- No fencing was recommended
- Remove fish passage barrier at Adelaide Street
- Lower Powell Drain channel for improved fish migration



Recommendations

- Update the managed trail system to discourage informal trail access points
- Remediate disturbed areas
- Monitor invasive species and develop site specific invasive species management plan, as needed
- Educational campaign to inform residents of stewardship
- Attempt to re-detect SAR that were recorded in EIS, where suitable habitat is still present

Aquatic Monitoring

Substrate: fine silt and large woody debris
Channel Stability: good stability with localized areas of bank erosion and deep fine sediment deposits
Fish Community: brook stickleback, pumpkinseed, brown bullhead, creek chub, fathead minnows
Change: increased sediment, removal of barrier at Adelaide has improved the fish community diversity

Breeding Bird Surveys

POST 12 species (6-AS)
PRE 63 species (5-AS)

Nocturnal Amphibian Call Surveys

POST 4 species
PRE 7 species

Incidental Wildlife

POST 1 bird
PRE N/A

Vegetation Surveys

42 Vegetation Species Observed	
37 Species Identified	5
28 Native Species	9

Average coefficient of conservatism across the site: **2.5**
Average coefficient of wetness across the site: **0.5**

Ecological Land Classification Changes

(from pre- to post-development)

2.86 ha Increase to overall Natural Area
0.36 ha Increase in Wetland

Site Disturbances

Location
5 Outside Buffer and Feature
7 Within Buffer
9 Within Feature

Distance from Edge of Natural Feature
95% 0 m - 10 m
5% 11 m - 20 m
21 m - 30 m

Type
12 Dumping and Fill/Grading
5 Informal Trail Access
4 Landscpaing

Invasive Species Observed

Common Buckthorn, Periwinkle, European Common Reed

Legend: Species at Risk (SAR), Area Sensitive (AS), Threatened (THR), Locally Rare (LR), Locally Uncommon (LU)

Summary of results from City of London's *Post-Development EIS Monitoring: Final Annual Report – 2021* (Dougan & Associates, 2022)