

Environmental and Ecological Planning Advisory Committee

Report

1st Meeting of the Environmental and Ecological Planning Advisory Committee
December 13, 2018
Committee Rooms #1 and #2

Attendance PRESENT: S. Levin (Chair), E. Arellano, A. Boyer, C. Dyck, S. Hall, B. Krichker, K. Moser, S Sivakumar, R. Trudeau and I. Whiteside and H. Lysynski (Secretary)

ALSO PRESENT: S. Chambers, C. Creighton, D. Gough, J. MacKay, L. Pompili and A. Rammeloo

ABSENT: P. Ferguson

The meeting was called to order at 5:00 PM

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Mud Creek Channel Design for Phase 1

That the attached presentation from S. Chambers, Division Manager, Stormwater Engineering, and T. Hood and J. McDonald, Matrix Solutions Inc., was received.

2.2 One River Master Plan

That it BE NOTED that B. Krichker will review the Forks of the Thames Environmental Impact Study and S. Hall will review the Springbank Dam Decommissioning Environmental Impact Study; it being further noted that the Environmental and Ecological Planning Advisory Committee reviewed and received the attached presentation from A. Rammeloo, Division Manager, Engineering, Rapid Transit Implementation Office and A. McKay, Engineer, Matrix Solutions Inc.

3. Consent

3.1 12th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the 12th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on November 15, 2018, was received.

3.2 Municipal Council Resolution - Recruitment and Appointment of Advisory Committee Members for the upcoming term

That it BE NOTED that the Municipal Council resolution adopted at its meeting held on November 20, 2018, with respect to the recruitment and appointment of Advisory Committee members for the upcoming term, was received.

3.3 Byron Gravel Pits Secondary Plan - Community Information Meeting

That it BE NOTED that the Community Information Meeting notice for the Byron Gravel Pits Secondary Plan to be held on December 20, 2018, was received.

4. Sub-Committees and Working Groups

4.1 A Wetland Conservation Strategy for London: Guideline for Best Practices

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee held a general discussion with respect to the Wetland Conservation Strategy for London: Guideline for Best Practices; it being noted that the Working Group will continue to amend the Guideline document.

5. Items for Discussion

5.1 Appointment to the Trees and Forests Advisory Committee

That consideration of the appointment of a representative from the Environmental and Ecological Planning Advisory Committee (EEPAC) to the Trees and Forests Advisory Committee BE POSTPONED to the January 17, 2019 EEPAC meeting.

6. Deferred Matters/Additional Business

6.1 (ADDED) Election of Chair and Vice Chair for the term ending June 1, 2019

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee elected S. Levin and S. Hall as the Chair and Vice-Chair, respectively, for the term ending June 1, 2019.

6.2 (ADDED) Notice of Study Commencement - Rehabilitation of the Riverside Bridge over the CN Railway

That it BE NOTED that the Notice of Study Commencement for the Rehabilitation of the Riverside Bridge over the CN Railway, was received.

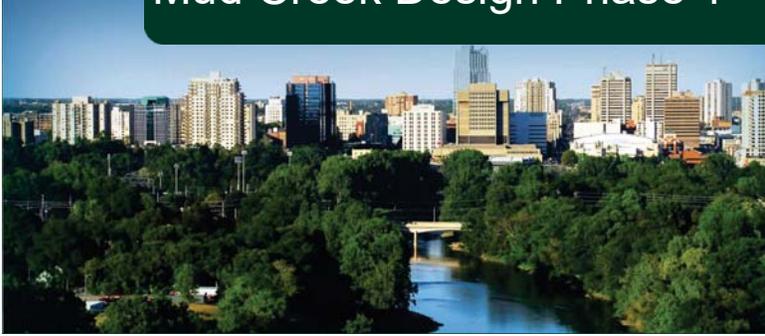
7. Adjournment

The meeting adjourned at 8:00 PM.



London
CANADA

Mud Creek Design Phase 1



Presentation to the Environmental and Ecological
Planning Advisory Committee

December 13, 2018



London
CANADA

Outline

- Mud Creek EA (Review)
 - Study Area
 - Preferred Alternative
- Mud Creek EIS
 - Findings
 - Recommendations
 - Conclusions
- Mud Creek Detailed Design
 - Project Phasing
 - Data Gaps
 - Field Investigations
 - Discipline Findings
 - Constraints and opportunities
 - 30% Designs
 - Next steps



London
CANADA

Mud Creek Schedule B EA



London
CANADA

EA Problem Statement

Mud Creek currently experiences frequent flooding, which overtops the Oxford Street arterial road and abutting properties; as well as high levels of erosion and creek sedimentation; and represents a generally degraded aquatic habitat that includes perched culverts, which prevent fish migration. However, it also provides habitat for many species of wildlife (birds, amphibians, mammals) and contains several valuable terrestrial features, particularly large trees and animal refuge areas.

2015 to 2017



London
CANADA

Frequent Flooding

Flooding at Oxford Street
and Proudfoot Lane

July 15, 2018



September 11, 2014



London
CANADA

EA Objectives

- To mitigate flooding on public and private lands, especially Oxford Street Corridor.
- To rehabilitate sections of Mud Creek, improving aquatic and terrestrial habitat
- To provide mitigation and compensation per Official Plan Policy 15.3.3. (London, 2006)



Study Area



Upper Subwatershed



Upstream of Oxford



Parallel to Oxford



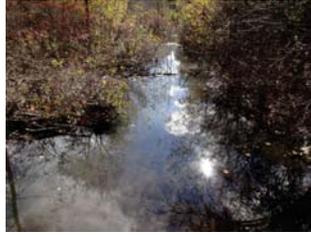
Existing Oxford culvert





London CANADA

Proudfoot and Downstream



London CANADA

CN Culvert Upstream



London CANADA

CN Culvert Downstream



London CANADA

Upstream of Wonderland



London CANADA

Culvert under Wonderland



London CANADA

Discharge to Thames





Alternative Development

- Alternative 1: Do Nothing
- Alternative 2: improve conditions of existing system; no flood relief
- Alternative 3: flood relief
- **Alternative 4: flood relief and creek realignment**



Alternative 4

- Lowered and enlarged CNR culvert
- Upstream and downstream channel rehabilitation
- Oxford St. crossing relocated east
- Realignment of Mud Creek from Oxford St. to Proudfoot Ln.



Environmental Impact Study

- Field investigations:
 - Spring anuran calling survey;
 - Breeding bird and incidental wildlife surveys;
 - Ecological Land Classification and botanical survey;
 - Aquatic habitat survey;
 - Benthic macro-invertebrate survey;
 - Species at Risk bat survey; and,
 - Butternut screening.



EIS Findings

Vegetation:

- 289 vascular plant species; 71% native
- 1 endangered species: dead butternut tree
- 10 locally significant plant species
- Defined Ecological Land Classifications



Photo 60: Butternut extensive root decay.



EIS Findings

Aquatic Habitat:

- Urban tributary; highly altered
- Oxygen levels: 3.5 mg/L to 7.5 mg/L (**4.0mg/L required to sustain aquatic life**)
- Biotic Index: Poor to very poor quality



Photo 23: Sediment deposition downstream of Proudfoot Lane. The culvert is also full of sediment.



EIS Findings

Wildlife Species:

- 8 mammals, 32 birds, & 2 frog species
- 4 Species at Risk (SAR) detected:
 - 2 bat species:
 - Little Brown Bat (endangered)
 - Northern Long Eared Bat (endangered)
 - Snapping Turtle (special concern)
 - Wood Thrush (special concern)



EIS Findings

Assessment of Significance:

- Vegetation communities:
 - All meet 5-7 criteria for Significant Woodlands
 - None of the patches meet criteria to classify as ESA

“The woodlots in the study area are highly disturbed, have poor water storage capabilities, low species diversity, and poor connectivity to other natural areas, making them unsuitable candidates for Environmentally Significant Areas.” (LGL 2016, pg 54)



Mitigation Strategy

- Protect valuable trees and vegetation
- Re-vegetate/restore areas with native species
- Bioengineer stable slopes, natural channel design
- Detailed design will determine exact number of trees and extent of disturbance



Compensation Plan

- Tree replacement at a 3:1 ratio with native species; maximize plantings in disturbed areas
- Buckthorn removal and eradication strategy for the woodlot south of Oxford Street;
- Approximately 1600 m of enhanced aquatic habitat including vernal pools, riffles, woody vegetation with removal of fish barriers by lowering existing culverts;
- Creation of compensatory habitat to support impacted wildlife species; and,
- Long-term ecological adaptive monitoring plan.



EA EIS Conclusions—Objectives Met

Preferred Alternative 4 satisfies all objectives:

- Enlarged and lower CNR culvert reduces flood frequency to protect public and private lands
- Natural channel design improves aquatic habitat (short-term) and terrestrial habitat (intermediate/long-term).
- Mitigation and compensation plan creates opportunity to enhance existing Significant Woodlands



Mud Creek Detailed Design Project Phasing

- The preferred alternative as determined in the EA will be designed and implemented as two phases:
- Phase 1 – CNR culvert to Wonderland Road
- Phase 2 –Oxford to CNR corridor



Mud Creek Detailed Design Data Gaps

Discipline	Data Gap – Some gaps identified at EA stage by EEPAC
Geomorphology	<ul style="list-style-type: none"> • detailed geomorphic survey of Reaches MC-2 and MC-3 • detailed topographic LiDAR data (City of London 2017) • channel tie in and infrastructure (e.g. culverts, outfalls, etc.) inverts to be confirmed • lateral and vertical location of buried infrastructure in proximity to the creek to be confirmed
Hydrology/ Hydraulics	<ul style="list-style-type: none"> • final PCSWMM and HEC RAS modelling completed by CH2M during the EA • HEC RAS model and conceptual plans for channel works upstream of Oxford Street (TMIG 2017) • detailed topographic surveying of channel and floodplain to augment available SWOOP data
Terrestrial	<ul style="list-style-type: none"> • complete significant wildlife habitat assessment • consultation with MNR to identify SAR permitting and guidance on Bat boxes • consultation with City and UTRCA to discuss whether wetland compensation is required
Aquatics	<ul style="list-style-type: none"> • conduct fisheries studies for input into compensation plan and provide habitat design guidance • formulate a plan for salvage and relocation of fish. • confirm Department of Fisheries and Oceans (DFO) Approval and Compensation requirements



Mud Creek Detailed Design Field Investigation

Discipline	Field Investigation
Geomorphology	<ul style="list-style-type: none"> Reach Walks/Photography Detailed survey between CNR and Proudfoot Lane (MC-2 and MC-3)
Hydrology/ Hydraulics	<ul style="list-style-type: none"> LiDAR Catchment walks – City of London staff
Terrestrial	<ul style="list-style-type: none"> detailed tree inventory verifying vegetation communities and boundaries Incidental observations of wildlife (including SAR) documenting the location of snag trees
Aquatics	<ul style="list-style-type: none"> Fish community assessment Fish habitat assessment



Mud Creek Detailed Design Discipline Findings

Geomorphology:

- The fluvial geomorphic character of the design channel must consider the flow regime, fine boundary materials, and low gradients present along the corridor.
- The type of channel that evolves naturally in this type of setting is a meandering riffle-pool to dune-ripple channel. The design objective is to establish a channel that demonstrates dynamic stability.
- This channel form includes planform, bedform and substrate variability along the design profile to establish a stable system that is self-sustaining in the long-term.
- Channel hardening only required around culverts
- Other treatments to include vegetated rip rap and bioengineering (e.g. brush mattress, buried wood)



Mud Creek Detailed Design Discipline Findings

Hydrology:

- Updated drainage subcatchments in PCSWMM model to reflect current LiDAR
- Reviewed and updated hydrologic parameterization (imperviousness, Curve Number, length, slope)

Hydraulics:

- Updated HEC-RAS model to reflect 30% design geometry
- Assessed various proposed culvert dimensions at Oxford Street, and CNR to achieve EA objectives



Mud Creek Detailed Design Discipline Findings

Terrestrial:

- Tree inventory within accessible lands, limited areas upstream of CNR. Over 400 trees documented >10cm DBH.
- Ecological Land Classification (ELC) mapping confirmed, includes forest and wetland communities
- Multiple distinctive trees were noted throughout the project site (e.g. large oaks >90cm dbh). Coordinates documented for each.
- Snag trees located throughout the project site, counted, and coordinates documented.



Mud Creek Detailed Design Discipline Findings

Aquatics:

Location	Fish community	Fish habitat
North of CNR	<ul style="list-style-type: none"> Brook Stickleback (95% of sample) Creek Chub White Sucker 	lacked geomorphic diversity (majority backwatered, fine material, no variability). 
South of CNR	<ul style="list-style-type: none"> Brook Stickleback (55% of sample) Creek Chub White Sucker Blacknose Dace 	greater diversity of geomorphic features such as pool, runs, and riffles, and substrates (coarser, sorted)



Mud Creek Detailed Design Constraints and Opportunities

Discipline	Constraints/Issues	Opportunities
Geomorphology	<ul style="list-style-type: none"> Crossing Structure locations and inverts Buried Infrastructure (sanitary sewer) Property acquisition Construction considerations Upstream designs 	<ul style="list-style-type: none"> varied bedforms and substrate types Diverse channel will be developed including placement of low-gradient riffles and shoal features. Smooth transition through culverts and better flow conveyance Prevention of erosion and scour
Hydrology & Hydraulics	<ul style="list-style-type: none"> Road/Property flooding Culvert sizing and elevations Upstream designs 	<ul style="list-style-type: none"> Smooth transition through culverts and better flow conveyance Prevention of flooding, erosion and scour

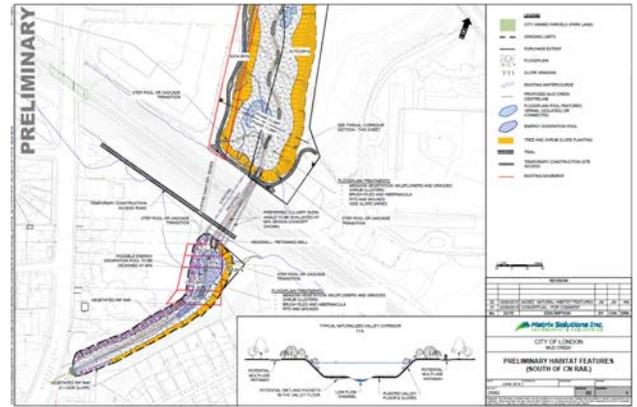


Mud Creek Detailed Design Constraints and Opportunities

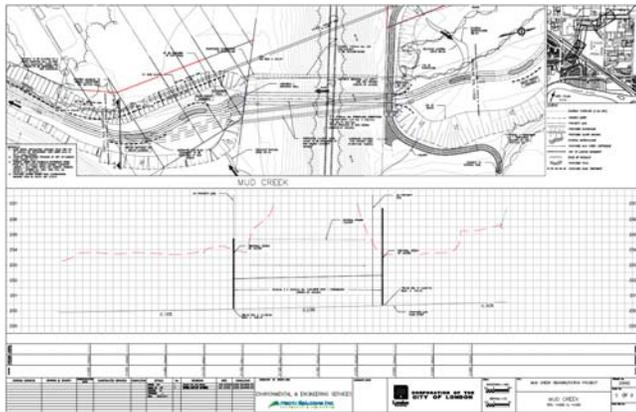
Discipline	Constraints/Issues	Opportunities
Terrestrial	<ul style="list-style-type: none"> temporary disturbance loss of wildlife habitat 	<ul style="list-style-type: none"> Compensation to include 3:1 tree removals newly designed floodplain to replicate the function of the backwatered area and enhance habitat for herptiles Installation of Bat houses Additional floodplain habitat features and invasive species management
Aquatic	<ul style="list-style-type: none"> loss of approximately 100 m of aquatic habitat Temporary disturbance 	<ul style="list-style-type: none"> Instream and riparian habitat elements (woody debris) Removal of existing barriers to fish migration Increase aquatic habitat diversity (pools, riffles; cobbles, sands) Stable channel to improve water quality



Mud Creek Detailed Design 30% Design



Mud Creek Detailed Design 30% Design



Mud Creek Detailed Design 30% Design

- Bioengineering - Brush Layering



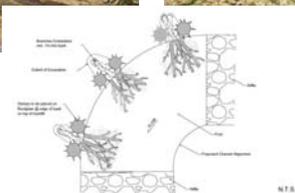
Mud Creek Detailed Design 30% Design

- Bioengineering - Brush Layering



Mud Creek Detailed Design 30% Design

- Bioengineering - Woody Bank Treatment





Mud Creek Detailed Design 30% Design

- Bioengineering – Coir/Seed/LiveStake & Floodplain woody treatments



Mud Creek Detailed Design 30% Design

- Bioengineering – Vegetated Rip Rap



Mud Creek Detailed Design 30% Design

- Bioengineering – Vegetated Rip Rap



Next Steps 60%-to tender





One River EA: EEPAC Presentation

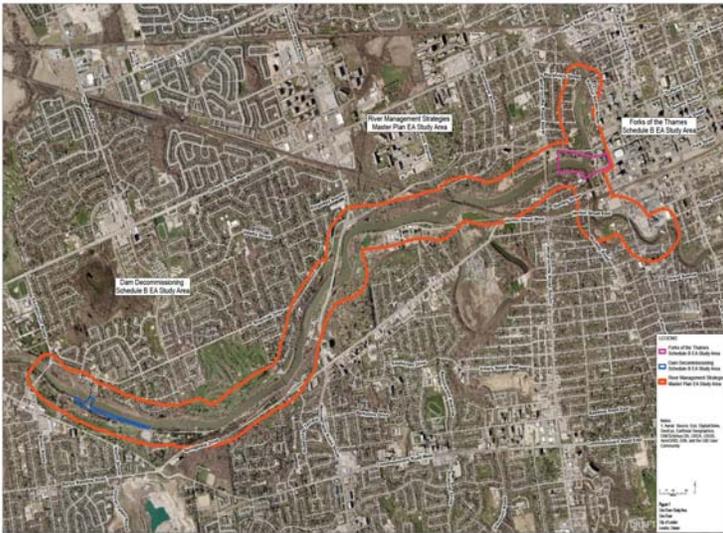


December 13, 2018



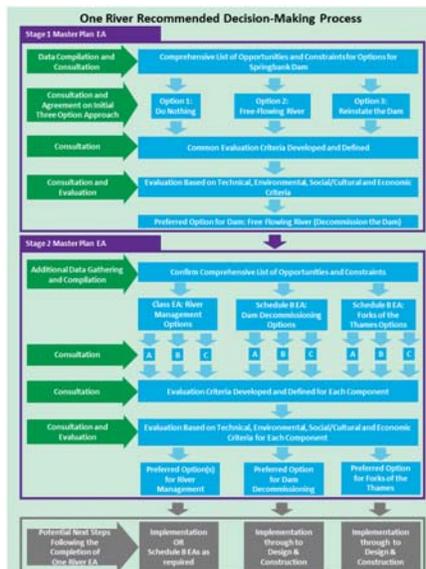
Outline Today's Discussion

- Opening Remarks and Introductions
- EA Approach Summary Stage 1 and 2
- Preferred Alternatives Stage 1 and Stage 2
- Springbank Dam Decommissioning Potential Impacts and Mitigation
- River Management Plan Potential Impacts and Mitigation
- Forks of the Thames Potential Impacts and Mitigation
- Next Steps/Questions



EA Approach Summary

- Master Plan EA
- Carried out in Two Stages
- Stage 1 – Future Status of Springbank Dam
 - Re-instate
 - Free Flowing river
- Stage 2
 - River Management Plan
 - Dam Decommissioning
 - Forks of the Thames



Stage 1 Approach

- Master Plan Level EA
- Future Use of Springbank Dam:
 - Do Nothing
 - Reinstatement of the Dam
 - Leave River Free Flowing



Outcome of Stage 1

- Leave the Thames River Free Flowing



Stage 2 Approach

- Three Main Components to the One River Strategy:
 - Dam Decommissioning Schedule B EA
 - Forks of the Thames Schedule B EA
 - River Management Strategies Master Plan EA



Dam Decommissioning Alternatives

- Do Nothing
 - Dam maintained in current condition
 - Preventative rehabilitation program and safety inspection
- Partial Removal
 - Remove or salvage parts such hydraulics, gates, control room, etc.
 - Stabilize structure and restore riverbank with habitat improvements
 - Preventative rehabilitation program and safety inspection
- Full Removal
 - Remove all components and structures, including erosion control works
 - Riverbank and riverbed would be fully restored with habitat improvements



Dam Decommissioning Alternatives



Do Nothing

Partial Dam Removal

Full Dam Removal



Springbank Dam Preferred Alternative

- Preferred Alternative is Partial Removal of the Dam
- While the Full Removal is better for the natural environment, Partial Removal is more technically and financially feasible
- Full Removal could be completed at a later date



River Management Plan Alternatives

The River Management Plan has 4 Alternatives; defined through levels of access and levels of environmental remediation/protection.

- Access includes;
 - pathways, fishing and boat launching areas and lookouts
- Environmental remediation/protection includes;
 - Improvements to erosion and riverbank instability areas
 - Protection and improvement of natural heritage features, such as mitigation of non-native species



River Management Plan Alternatives

Alternative 1: Existing Conditions (Do Nothing)

- Maintain existing access locations (informal trails, formal pathways, fishing and boat access, and lookouts)
- No action regarding existing areas of erosion and sedimentation, Dykes and SAR Habitat areas



River Management Plan Alternatives

Alternative 2: Naturalized River Corridor

- Maintain and/or improve the quality and safety of the existing access locations with no new access locations to be constructed
- Improve/repair erosion and riverbank instability areas
- Protect and improve natural heritage features, such as mitigation of non-native species
- Limit access to sensitive habitats, and decommission access points near sensitive habitats, where possible



River Management Plan Alternatives

Alternative 3: Strategic River Corridor Use and Access

- Maintain and/or improve the quality and safety of existing access with new strategic access points constructed to avoid sensitive habitat infringement
- Improve/repair erosion and riverbank instability areas
- Protect and improve natural heritage features, such as mitigation of non-native species
- Stage the implementation of new access points as sensitive habitat locations potentially change as the river stabilizes





River Management Plan Alternatives

Alternative 4: Enhanced River Corridor Use and Access

- Maintain and/or improve the quality and safety of existing access with multiple new access points constructed
- Improve/repair erosion and riverbank instability areas
- Protect and improve natural heritage features, such as mitigation of non-native species



River Management Plan Preferred Alternative

Alternative 3: Strategic River Corridor Use and Access

- Maintain and/or improve the quality and safety of existing access with new strategic access points constructed to avoid sensitive habitat infringement
- Improve/repair erosion and riverbank instability areas
- Protect and improve natural heritage features, such as mitigation of non-native species
- Stage the implementation of new access points as sensitive habitat locations potentially change as the river stabilizes
- Long term vision is to incorporate additional access and environmental improvement/protection following The London Plan and the TVCP, as river matures under new flow regime



Forks of the Thames Alternatives

- Different Options for the Forks of the Thames:
 - Ribbon structure
 - Terracing layout
 - Pathway orientation
 - Lookout locations
 - Hard vs soft surfaces
 - Shoreline treatments
- 4 Ribbon Alternatives (Plus Do Nothing)
- 2 Terracing Alternatives



Forks of the Thames Alternatives

Ribbon Alternative 1- Walkway supported by Piers in River



Forks of the Thames Alternatives

Ribbon Alternative 2- Suspended Walkway





Forks of the Thames Alternatives

Ribbon Alternative 3- Kensington Bridge Extension and Lookout



Forks of the Thames Alternatives

Ribbon Alternative 4- Land Based Walkway



Forks of the Thames Alternatives

Terrace Alternative 1- Hardscape



Forks of the Thames Alternatives

Terrace Alternative 2- Softscape



Forks of the Thames Preferred Alternative

- Preferred Alternative is Ribbon Alternative 2- Suspended Walkway



- Eliminates encroachment into river while still providing opportunities to interact with river
- Provides river vista and exciting feature to the Forks of the Thames



Forks of the Thames Preferred Alternative

- Preferred Alternative is Terrace Alternative 2, Softscape



- Provides more green spaces and habitat for terrestrial species
- Natural shoreline provides additional habitat for erosion protection



Environmental Effort Stage 1



Environmental Effort Stage 1

The existing conditions report included a review of available environmental data as well as new aquatic field studies within the Master Plan Study Area.

- Review of 50+ background documents
- Database and Atlas review
- MNRF consultation
- Two season fisheries assessment and aquatic habitat mapping
- High level geomorphic assessments



A major result of the review and assessments was an indication that SAR species had moved upstream of the Springbank Dam in areas that they did not occur before dam failure. Evidence that the river's morphology was also adjusting to a new free flowing system.



Environmental Effort Stage 2

Environmental Efforts for Stage 2 consisted of the following:

- Detailed inventories and field studies surrounding the **The Forks of the Thames** project area.
 - Completed an EIS to support the preliminary preferred alternative.
- Detailed inventories and field studies surrounding the **The Springbank Dam Decommissioning EIS** project area.
 - Completed an EIS to support the preliminary preferred alternative.
- Updates to the Stage 1 Existing Conditions Report to support the River Management alternatives and implementation plan. The updates lead to the development of two reports:
 - **Natural Heritage Summary** – background summary report updated with information collected in the EIS studies and additional desktop analysis.
 - **River Characterization** – detailed analysis of hydrology, hydraulics and geomorphic. Included and erosion and outfall inventory summary



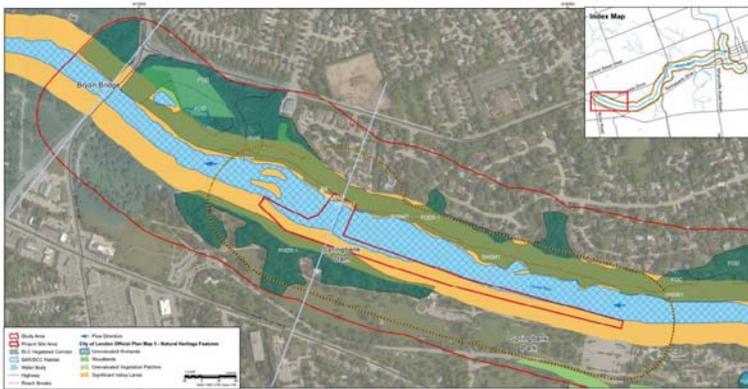
Environmental Effort Stage 2 Environmental Impacts Studies

EIS Studies Approach

- Vegetation Characterization
 - ELC
 - Botanical Inventories
 - Invasive Mapping
 - Tree Inventory
- Breeding Birds Surveys
- Fish Sampling
- Aquatic Habitat Mapping
- Incidental Observations



Environmental Effort Stage 2 Springbank Dam Decommissioning EIS



Environmental Effort Stage 2 Springbank Dam Decommissioning EIS

Project Activities	<ul style="list-style-type: none"> • Vegetation clearing, earthworks/grubbing & disposal • Construction access, staging and laydown areas. • Removal of concrete apron along the southern bank. • Removal of the hydraulic gate(s) 	
Potential Impacts	<ul style="list-style-type: none"> • Habitat Loss and/or Alteration • Disturbance/Avoidance of Habitat • Injury or Incidental Take 	
Mitigations	<ul style="list-style-type: none"> • Best Construction Practices • Prevention of Wildlife Mortality and Disturbance • Prevention of Terrestrial Disturbance • Prevention of Fish Mortality • Erosion and Sedimentation Control 	
Residual Effects	<ul style="list-style-type: none"> • Removal of the Concrete Apron and Bank Restoration <ul style="list-style-type: none"> • area to be restored with diverse native vegetation, and the concrete apron will be replaced with a more naturalized erosion control structure, such as vegetative riprap • Removal of the Springbank Dam gate(s) <ul style="list-style-type: none"> • removal of the gate(s) will improve fish passage for a variety of species 	



Next Steps

- Complete draft of One River Report contents
- Review by City
- Council Approval
- Notice of Completion
- 30 Day Public Review Period



EEPAC Roundtable

Questions