

7. Implementation Plan

The One River implementation plan lays out the recommended phasing of works for the integrated elements of the One River Strategy along with the supporting studies, investigations, permitting and approval requirements necessary to implement each element of the strategy.

The implementation plan is presented by the major components of the One River Strategy as follows:

- **Springbank Dam:** The Springbank Dam component of the One River Strategy was completed as a Schedule B EA, therefore, the selected alternative (Partial Dam Removal) can proceed to detailed design and construction without further EA effort.
- **The Forks of the Thames:** The Forks of the Thames component of the One River Strategy was completed as a Schedule B EA, therefore, the selected alternative (Suspended Walkway with softscape terraces) can proceed to detailed design and construction without further EA effort.
- **River Management Plan:** The River Management Plan elements are completed as a Master Plan EA, Schedule A projects may proceed to implementation without further EA effort, Schedule B or C projects will require further EA efforts prior to proceeding to implementation.

7.1 Springbank Dam

7.1.1 Supporting Studies

The following studies have been completed through the Schedule B and Master Plan efforts related to the Springbank Dam:

- River Characterization, located in Appendix A-1
- Natural Heritage, located in Appendix A-2
- Springbank Dam EIS, located in Appendix A-5
- Springbank Dam Inspection TM, located in Appendix A-6
- Stage 1 and 2 Archeological Investigations, located in Appendix A-3

7.1.2 Additional Requirements

Detailed design will require several additional supporting efforts and studies to provide basic data for the design activities, including but not limited to:

- Creation of base map at sufficient scale (1:2000) and level of detail
- Field and legal surveying of information not provided on the base map, such as spot elevations, critical elevations, and property boundaries
- Circulation to the various utilities to obtain locates and incorporate into construction plan
- Geotechnical and hydrogeological field program to evaluate soil, bedrock, and groundwater conditions, and provide design recommendations for bank improvements
- Provision of all supporting documentation for permitting

Detailed design and construction will also require the following activities:

- Stage 3 Archeological Investigation in the case that the bank restoration encroaches on the pre-contact Indigenous site found on the southern boundary of the study area
- Recommended Monitoring Plans:
 - **Construction Monitoring Plan** to monitor for construction-related impacts, and to provide feedback on the success or failure of the sediment and erosion control plans implemented during

this phase of the project, and the best management practices for prevention of wildlife disturbance and mortality, prevention of terrestrial disturbance, prevention of fish mortality.

- **Long-Term Post Construction Monitoring plan** to monitor the dam repairs/maintenance activities and the restoration efforts following the removal of the concrete apron on the southern shoreline.
- Compensation and adaptation planning
 - **Compensation Plan** to include the restoration and enhancements to areas disturbed through construction activities. It is recommended that the compensation plan include replacing removed trees at a ratio of three to one.
 - **Adaptive Management Plan** will be developed for the repair, maintenance and restoration efforts that integrates the findings of the two monitoring programs. The management plan will include both the terrestrial and aquatic habitats and dam structure components. The monitoring strategy will incorporate triggers that are a predetermined response based on observed impacts that will promote an adaptive restoration program and a reduction of the temporal impacts. Items that will be monitored include:
 - Dam repair elements
 - Tree and shrub planting survival
 - Invasive species
 - Streambed or bank erosion
 - Fine sediment aggradation

7.1.3 Permits and Approvals

The environmental permitting and approval requirements to partially remove the dam are outlined in detail in the Springbank Dam EIS Report in Appendix A-5. The following permits will be required, at a minimum, to carry out in water works and/or any works within SAR habitat:

- UTRCA Permit - Under O. Reg 157/06, a permit is required before any site alteration to a watercourse, water body, or wetland.
- ESA, 2007 Permit - Under Section 17 (2) (c) of the ESA, 2007, it identifies permits for activities which may contravene the Act. Permits related to habitat destruction would require an Overall Benefit Permit. The potentially effected species include Eastern Spiny Softshell and Silver Shiner.
- DFO Authorization - Fish and fish Habitat are regulated by DFO under the *Fisheries Act*. The *Fisheries Act* requires that projects avoid causing serious harm to fish unless authorized by the Minister or a designated representative. The determination of risk for serious harm to fish is typically done through a self-assessment process.
- SARA Permit - Under Section 73 of SARA, a permit may be issued authorizing a person to engage in an activity affecting a listed wildlife species, any part of its critical habitat, or its residences. The potentially effected species includes the Round Pigtoe. This permit will be required if in-water works are anticipated.

Additional consultation is recommended and should include the following:

- consultation with the City’s Parks department to obtain a Park occupancy permit
- consultation with UTRCA to identify any additional studies or permits needed for this project

Additional permitting and approval considerations include:

- **MECP** – It is not anticipated that Environmental Compliance Approvals (ECA) be required for the implementation of the Springbank Dam partial removal.

The MECP should be consulted on the proposed soil management approach and should be consulted if excess soils are generated. There are pending changes drafted to O.Reg. 153/04 impacting the management of excess soils.

- **City** – Some tree removals are expected during construction. Under the City *Tree Conservation By-law* (City, 2014) a contractor requires a permit to remove trees in an Environmental Protection Area (that is, open space). The contractor will comply with the projects Compensation Plan.

7.1.4 Schedule

Recommended works related to the Springbank Dam Partial Removal are described in short-term, long-term and on-going timeframes. Table 7-1 presents the recommended schedule for the implementation of the selected Springbank partial dam removal and recommended preventive maintenance items as well as scheduling constraints on construction activities. The Springbank Dam Schedule B EA is valid for 10 years from the time of its completion. It is recommended that the design and construction of the selected alternative is scheduled to commence within this time frame before an addendum to the EA is required.

Table 7-1. Springbank Dam Implementation Schedule

Description	Comment	Schedule
Partial Dam Removal Detailed Design		Q4 2019 through Q1 2020
Partial Dam Removal River Bank Restoration	It is recommended that construction be implemented before the valid period for the EA.	Q4 2020 – Q1 2021
Short-Term Preventive Maintenance Items	It is recommended that these items be completed with the wider construction activities, however, if river bank construction is delayed beyond the schedule presented here, it is recommended that these items be implemented separately.	2020
Seal top deck with epoxy overlay		
Replace expansion joints		
Remove north bank crib wall face vegetation		
On-going Maintenance Items		
Visual inspection and repairs	Routine inspections are to include inspecting structures for debris accumulation upstream of pier noses, public safety	2-year intervals
Vegetation removal	Remove vegetation on the north crib wall to prevent vegetation from prying crib wall elements apart.	1-year or 2-year intervals
Long-Term Preventive Maintenance Items		
Cathodic Protection	The detailed design phase of the Partial Dam Removal should consider including cathodic protection.	2020
Safety Upgrades	These are required if the structure is repurposed to allow public access.	TBD
Petrographic inspection	Inspection of the concrete elements would assess the condition of the concrete structures. The detailed design phase of the Partial Dam Removal should consider if there is a benefit to the design of including this inspection.	2020

Note:

TBD = To be determined

The construction of the Partial Removal of the Springbank Dam will be impacted by seasonal restrictions. These restrictions include:

- Tree Removal outside of the breeding bird window – April 1 to August 25 (Government of Canada, 2017) or complete a detailed bird survey of the construction impacted areas
- In-water work must occur during the allowable window – July 1 to March 31 (DFO, 2013)

The construction of individual phases will be impacted by these seasonal restrictions. Fall through late winter is the preferred timeframe for the in-stream components due to low flows, generally easier ground conditions, and less environmental disruption.

7.1.5 Future Considerations

An objective of the Springbank Dam alternative development and evaluation was to (1) be consistent with the City’s existing planning (2) allow the City some flexibility in the use of the remaining dam superstructure. Future use of the dam superstructure could include uses such as an observation platform.

It is anticipated in the far future that the Springbank Dam structure will be removed with shoreline and riverbed restoration occurring at that time.

7.2 Forks of the Thames

7.2.1 Supporting Studies

The following studies have been completed through the Schedule B and Master Plan efforts related to the Springbank Dam:

- River Characterization, located in Appendix A-1
- Natural Heritage, located in Appendix A-2
- Forks of the Thames EIS, located in Appendix A-4
- Stage 1 and 2 Archeological Investigations, located in Appendix A-3

7.2.2 Additional Requirements

Detailed design will require a number of additional supporting efforts and studies to provide basic data for the design activities, including but not limited to:

- Creation of base map at sufficient scale (1:2000) and level of detail
- Field and legal surveying of information not provided on the base map, such as spot elevations, critical elevations, and property boundaries
- Circulation to the various utilities to obtain locates and incorporate into construction plan
- Geotechnical and hydrogeological field program to evaluate soil, bedrock, and groundwater conditions, and provide design recommendations for bank improvements
- Provision of all supporting documentation for permit

Detailed design and construction will require the following activities:

- Recommended Monitoring Plans:
 - **Construction Monitoring Plan** to monitor for construction-related impacts, and to provide feedback on the success or failure of the sediment and erosion control plans implemented during this phase of the project, and the best management practices for prevention of wildlife disturbance and mortality, prevention of terrestrial disturbance, prevention of fish mortality.

- **Long-term Monitoring plan** to monitor the shoreline restoration efforts and success of any plantings that are part of the site improvements as well as any required monitoring of terracing and structural elements of the suspended walkway.
- Compensation and Adaptation Planning
 - **Compensation Plan** to include the restoration and enhancements to areas disturbed through construction activities. It is recommended that the compensation plan include replacing removed trees at a ratio of three to one.
 - **Adaptive Management Plan** will be developed for the construction and restoration efforts that integrates the findings of the two monitoring programs. The monitoring strategy will incorporate triggers that are a predetermined response based on observed impacts that will promote an adaptive restoration program and a reduction of the temporal impacts. The management plan will include both the terrestrial and aquatic habitats and terrace/suspended walkway structural components. Items that may be monitored include:
 - Terrace and suspended walkway structural elements
 - Tree and shrub planting survival
 - Invasive species
 - Streambed or bank erosion

7.2.3 Permits and Approvals

The permitting and approval requirements to implement the Forks of the Thames construction activities are outlined in detail in the Forks of the Thames EIS Report (Appendix A-4). The following permits will be required to carry out in water works and/or any works within SAR habitat:

- UTRCA Permit - Under O. Reg 157/06, a permit is required before any site alteration to a watercourse, water body, or wetland.
- ESA, 2007 Permit - Under Section 17 (2) (c) of the ESA, 2007, it identifies permits for activities which may contravene the Act. Permits related to habitat destruction would require an Overall Benefit Permit. The potentially effected species include Eastern Spiny Softshell and Silver Shiner.
- DFO Authorization - Fish and fish Habitat are regulated by DFO under the *Fisheries Act*. The *Fisheries Act* requires that projects avoid causing serious harm to fish unless authorized by the Minister or a designated representative. The determination of risk for serious harm to fish is typically done through a self-assessment process. This process will need to take place if in-water works are anticipated.
- SARA Permit - Under Section 73 of SARA, a permit may be issued authorizing a person to engage in an activity affecting a listed wildlife species, any part of its critical habitat, or its residences.

Additional consultation is recommended and should include the following:

- consultation with the City's Parks department to obtain a Park occupancy permit
- consultation with UTRCA to identify any additional studies needed for this project

Additional permitting and approval considerations include:

- **MECP** – It is not anticipated that Environmental Compliance Approvals (ECA) be required for the implementation of the Forks of the Thames walkway and terraces. An ECA would be required if stormwater facility or sewer design are incorporated in the design. Currently, the existing subsurface infrastructure are defined as a constraint on the design and will not be modified.

The MECP should be consulted on the proposed soil management approach and should be consulted if excess soils are generated. There are pending changes drafted to O.Reg. 153/04 impacting the management of excess soils.

- **City** – Some tree removals are expected during construction. Under the *City Tree Conservation By-law* (City, 2014) a contractor requires a permit to remove trees in an Environmental Protection Area

(that is, open space). The City should clarify if a contractor working on a City project is exempt. The contractor will comply with the projects Compensation Plan.

7.2.4 Schedule

Table 7-2 presents a suggested phased schedule for the implementation of the selected Forks of the Thames preferred alternative (Suspended walkway with softscaped terraces). The Forks of the Thames Schedule B EA is valid for 10 years from the time of its completion. It is recommended that the design and construction of the selected alternative is scheduled to commence within this time frame before an addendum to the EA is required.

Table 7-2. Forks of the Thames Suggested Phased Implementation Schedule

Description	Schedule
Engineering and Design	Design start 2020
Construction of shoreline restoration works	Construction start: 2021
Construction of terracing	Construction start: 2022
Construction of ribbon	Construction start: 2024

The construction of the suspended walkway with softscaped terraces and bank remediation at the Forks of the Thames will likely be impacted by seasonal restrictions. These restrictions may include:

- Tree Removal outside of the breeding bird window – April 1 to August 25 (Government of Canada, 2017) or complete a detailed bird survey of the construction impacted areas
- In-water work must occur during the allowable window – July 1 to March 31 (DFO, 2013).

These timing constraints will have little impact on the overall project implementation schedule but will be important during the phasing of construction. At this time some limited in-water work is anticipated for the removal of the gabion baskets and bank stabilization at the toe of the Thames River. Vegetation and tree removal will be necessary along the bank as part of the bank restoration. It is expected that some tree removals will be required for the implementation of the terracing and walkway. The design phase will identify specimen trees to be maintained.

7.3 River Management Plan

7.3.1 Supporting Studies

The following studies have been completed through the Schedule B and Master Plan efforts related to One River Master Plan:

- River Characterization, located in Appendix A-1
- Natural Heritage, located in Appendix A-2
- Springbank Dam EIS, located in Appendix A-5
- Forks of the Thames EIS, located in Appendix A-4
- Stage 1 and 2 Archeological Investigations, located in Appendix A-3

Table 7-3 summarizes the recommended study EA Schedules that will be necessary to implement the River Management Plan elements. It is recommended that the Schedule requirements be reviewed prior to the development of any recommended projects once additional details are known.

Table 7-3. River Management Plan Future Studies

Description	EA Schedule	Supporting Studies
Improved Existing Access Locations		
Springbank Dam boat access	Included in Schedule B work completed in this EA	None Springbank Dam EIS
Wonderland Road / Riverside Drive boat access	Schedule A	None
Harris Park boat access	Schedule A	None
Charlie Hunt Weir boat access	Schedule A	None
Greenway Park fishing access and lookout	Schedule A	None
Ivey Park fishing access and lookout	Included in Schedule B work completed in this EA	None Forks of the Thames EIS
New Access Points		
Pathway from Hyde Park Drive to northern shoreline including fishing access and a new lookout	Schedule A	None
Pathway from Mackellar Ave before the Maurice Chapman Walkway Bridge including a Lookout	Schedule A	None
Boating access from Springbank Gardens	Schedule A	None
Fishing access at the Springbank Dam	Included in Schedule B work completed in this EA	None Springbank Dam EIS
Lookout on Cavendish Trail in Cavendish Park	Schedule A	None
Repair Areas of Bank Erosion and Instability	Schedule B	Schedule B EA(s) Environmental Impact Study

7.3.2 Permits and Approvals

UTRCA – Under O.Reg. 157/06 a permit is required before any site alteration to a watercourse, water body, or wetland. As many of the elements in the River Management Plan involve interaction with the Thames River, many of the elements identified in the River Management Plan will require a permit. This permit is required for any in water works or carried out within SAR habitat. The UTRCA should be consulted during the implementation of elements of the River Management Plan to identify any additional requirements.

ESA, 2007 Permit - Under Section 17 (2) (c) of the ESA, 2007, it identifies permits for activities which may contravene the Act. Permits related to habitat destruction would require an Overall Benefit Permit. This permit will be required for any elements requiring in water work or work within SAR habitat.

MECP – The MECP should be consulted for works generating excess soils. A soil management plan will be required for works generating excess soils, MECP should advise if formal permitting is required. There are pending changes to O.Reg. 153/04 regarding the management of excess soils which may apply to these projects in the future.

DFO – DFO Authorization is required for in-water works. Fish and fish habitat are regulated by DFO under the *Fisheries Act*. The *Fisheries Act* requires that projects avoid causing serious harm to fish unless authorized by the Minister or a designated representative. The determination of risk for serious harm to fish is typically done through a self-assessment process.

SARA Permit - Under Section 73 of SARA, a permit may be issued authorizing a person to engage in an activity affecting a listed wildlife species, any part of its critical habitat, or its residences. It is likely that many of the elements identified in the River Management Plan could be subject to SARA permitting requirements.

City – The City parks department should be consulted to obtain Park Occupancy Permits where required. If tree removals are expected during implementation of River Management Plan the City *Tree Conservation By-law* (City, 2014) a contractor requires a permit to remove trees in an Environmental Protection Area. The City should clarify if a contractor working on a City project is exempt. Compensation planning will be required for the implementation of project which require the removal of trees and vegetation.

Private Landowners – It is not anticipated that elements identified in the River Management Plan will affect private landowners. If this is the case, permanent easements or property acquisitions will be required. Construction easements may be required on private property to access the work. The need for easements will be determined during detailed design.

OMNRF – no formal approvals from MNRF area anticipated, natural heritage concerns are typically addressed through UTRCA approvals in conjunction with the MNRF.

7.3.3 Implementation Priorities

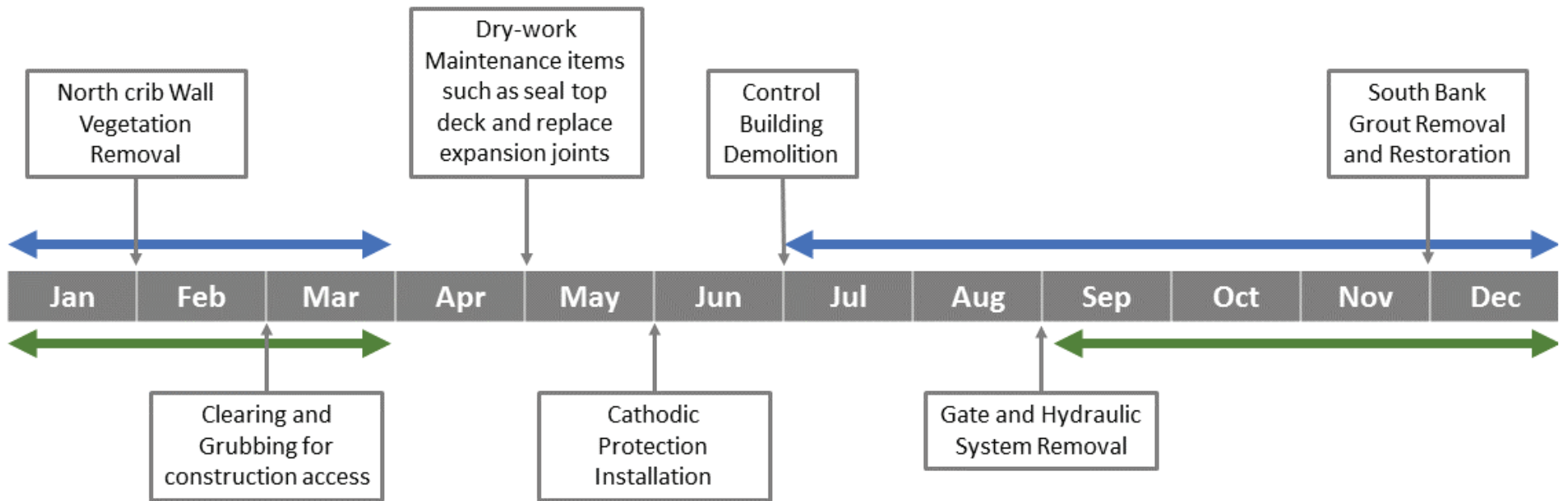
Table 7-4 lists the priority areas identified for erosion repair. These areas are illustrated in Figure 7-2. Figure 6-7 provides concepts of the type of repair for selected erosion sites.

Table 7-4. River Management Plan Schedules

Description		Comment	Priority	Timeline
<i>Repair Areas of Bank Erosion and Instability</i>				
Site 1	South Thames, right bank, furthest downstream extent of reach ~400m	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank to form point bar with finer materials and small cobbles 	Low	5-10 years
Site 2	South Thames, right bank, downstream extent or reach	<ul style="list-style-type: none"> Remove existing gabion baskets Place stacked armourstone wall along lower bank Add vegetated stone to upper bank. Place partially submerged boulders along toe for increased roughness and habitat enhancement 	Low	5-10 years
Site 3	South Thames, right bank near Horton St. E	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank with finer materials and small cobbles 	Low	5-10 years

Description		Comment	Priority	Timeline
Site 4	South Thames, right bank under bridge	<ul style="list-style-type: none"> Remove existing debris from bank and channel bed as required Use self-supporting vegetated buttress at existing eroded bank Key stone base below channel bed Relocate or stabilize existing trail. If trail is to remain in place, install study behind row of shrub plantings. 	Medium	<2 years
Site 5	South Thames, right bank between York St and King St Bridge	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Add an embedded stone toe with embedded woody habitat feature Place vegetated stone bank against existing exposed bank Limit disturbance to upper bank and existing tree roots 	Low	5-10 years
Site 6	North Thames, left bank at the confluence with main branch	<ul style="list-style-type: none"> Remove existing debris and concrete as required Add stacked armourstone wall along lower bank Place partially submerged boulders along toe for increased roughness and habitat enhancement 	Low/Medium	2-5 years
Site 7	Main Thames, left bank at confluence with main branch	<ul style="list-style-type: none"> Remove existing debris and concrete as required Add vegetated stone along the bank. Place boulder wing deflectors in channel to redirect thalweg to center of channel 	Low	5-10 years
Site 8	Main Thames, Riverview Dyke	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank with finer materials and small cobbles 	Medium	<2 years
Site 9	Main Thames, left bank, parallel to CNR Bridge	<ul style="list-style-type: none"> Place vegetated stone wedge at toe of existing undermined concrete retaining wall Embed stone wedge below existing channel bed Potentially place boulder wing deflectors to redirect channel thalweg 	Low	5-10 years
Site 10	Main Thames, right bank, downstream of CNR Bridge	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Limit disturbance to existing mature trees and vegetation on upper bank Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank with finer materials and small cobbles 	Low	5-10 years

Description		Comment	Priority	Timeline
Site 11	Main Thames, left bank downstream of CNR Bridge, extends to the bank opposite of the Mud Creek Outfall	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Limit disturbance to existing mature trees and vegetation on upper bank Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank with finer materials and small cobbles 	Low	5-10 years
Site 12	Main Thames, left bank, downstream of Wonderland Road – London rowing Club	<ul style="list-style-type: none"> Remove existing gabion baskets Place vegetated stone bank up to existing stairs at rowing club location Extend treatments upstream and downstream from outfall, tie into wingwalls Fill and re-grade finer material and cobbles to connect existing bar with vegetated stone bank. line scour pool below outfall with boulders 	Medium	<2 years
Site 13	Main Thames, left bank, upstream of pedestrian bridge	<ul style="list-style-type: none"> Remove existing concrete and debris from bed and bank as required. Place vegetated stone on bank to protect existing tree roots and vegetation on mid bank. Re-grade existing cobbles along lower bank. Complete one of the upper slope options: <ol style="list-style-type: none"> Move trail beyond stable top of slope limit. Re-grade slope towards watercourse or towards valley. 	Low	5-10 years
Site 14	Main Thames, downstream of Pedestrian Bridge, upstream of old pumphouse	<ul style="list-style-type: none"> Remove existing concrete and debris from bed and bank as required Add vegetated stone along undermined lower bank area Place embedded stone toe below channel bed Avoid disturbance to upper vegetated bank 	Low	5-10 years
Site 15	Main Thames, right bank, downstream of Springbank Dam	<ul style="list-style-type: none"> Remove existing concrete and debris from bank and channel bed Add vegetated stone to upper bank along with embedded toe protection Re-grade lower bank to form lateral bar with finer materials and small cobbles 	Low	5-10 years
Site 16	Main Thames, left bank, downstream of Springbank Dam	<ul style="list-style-type: none"> Remove existing concrete pillow apron Add vegetated stone along entire bank slope Embed a stone toe for stability and to avoid future bank undermining Maintain existing pool if possible 	Low	5-10 years



In-Water Work Window (Jul 1 to Mar 31) ↔

Tree Removal Window (Aug 26 to Mar 31) ↔

Figure 7-1. Springbank Dam Partial Removal
 Potential Work Sequencing
 One River EA
 City of London
 London, Ontario

Easting (m)

473000

474000

475000

476000

477000

478000

479000

480000

4759000

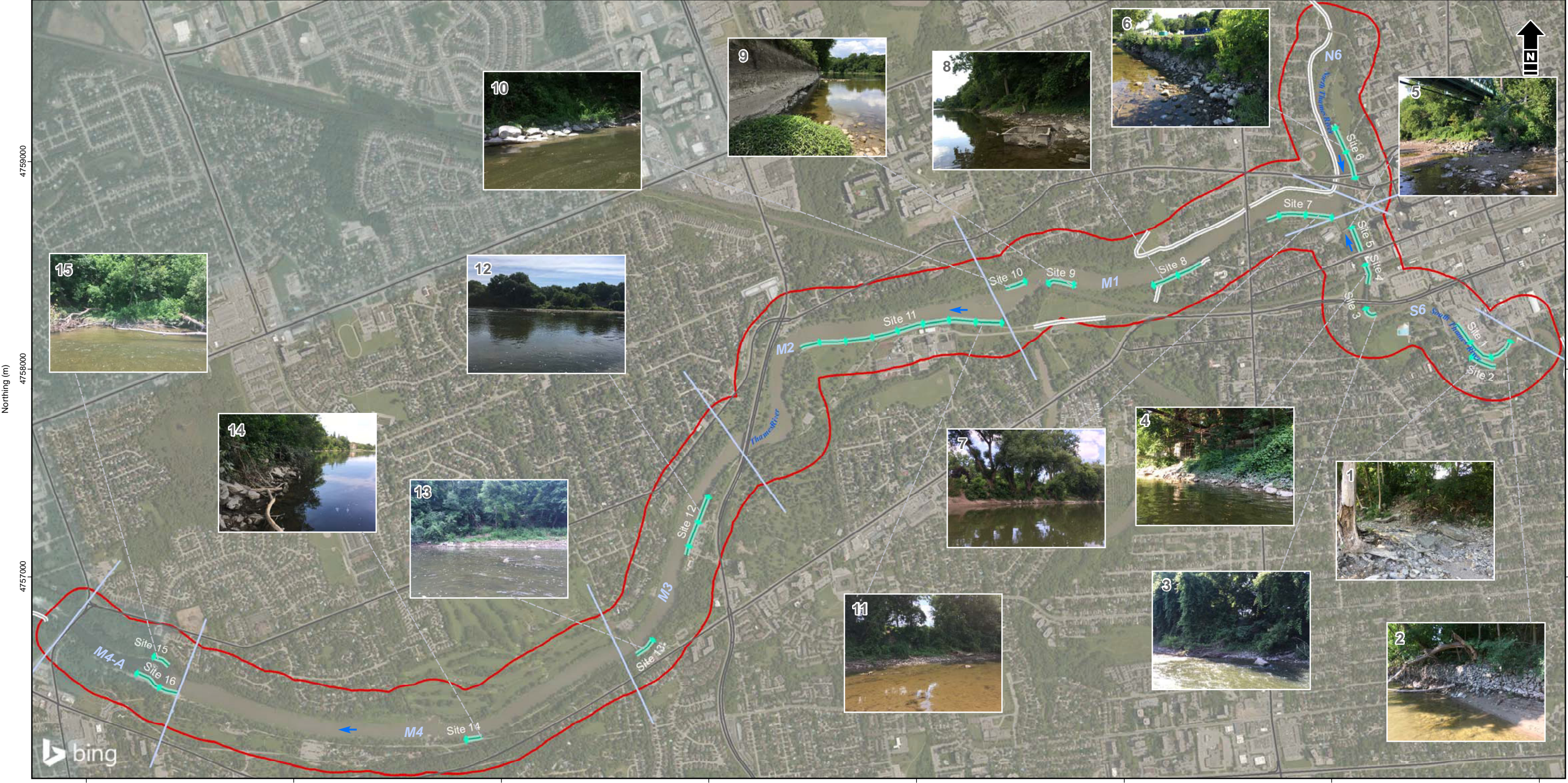
4758000

4757000

4759000

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- Study Area
- Highway
- Reach Breaks
- Dyke
- Erosion Inventory Site
- Flow Direction

Note:
 1. Source: Matrix Solutions, Inc., 2018.

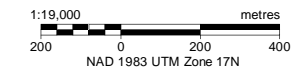


Figure 7-2. Erosion Inventory Overview
 One River EA
 City of London
 London, Ontario

