

Executive Summary

The attached plan outlines the goals, objectives and implementation strategy to pilot the Coves Aquatic Rehabilitation Program. This pilot project will be used to improve the effectiveness of implementing a similar rehabilitation program for the entire Coves ponds.

The pilot phase outlines a plan to improve water quality and enhance biodiversity in the East Pond. The program plan includes public consultation and education; a technical implementation plan for carp management, surface water treatment, Eurasian milfoil control; and a monitoring plan. The plan references management options and provides a rationale for the selected approach.

Management of carp involves lowering water levels in the East Pond in order to corral carp so they can be netted and removed more effectively. This will be achieved by partially draining water from the East Pond to the South Pond. Water pumping will be conducted over 5-7 days. A fish basket/ screen will be used at pump intakes in order to screen out fish and other aquatic wildlife. The water will be drained to an area downstream of the Edward Street Outfall. Shoreline stabilization is ensured because this area has recently been redesigned to accept large volumes of stormwater. Draining is currently scheduled to take place prior to spring spawning. Depending on when permits are issued, the start date may be deferred until after the spring spawning period in late June or July. These implementation dates will also ensure that draining corresponds with normal period of low precipitation. Impact to aquatic wildlife will be minimized by ensuring sufficient water remains in the East Pond to accommodate existing non-target fish, turtles and aquatic species. Draining will also be scheduled to avoid impact to frog spawning period.

The pathway of potential reintroduction of carp to the East Pond will be monitored using a temporary structure placed between the East and South Ponds. A rock screen will be created upstream of the Edward Street Stormwater Outlet. This area will be monitored by the Friends of the Coves. Carp and goldfish will be returned to the South Pond and non-target species will be transferred to the East Pond.

Assuming the results of a Fish Contamination Analysis indicate it is acceptable, carp will be netted and transferred downstream of the Coves flap gate to enter the Thames River. If fish are not healthy (i.e. contaminated), disposal in the W12 Landfill will be a last resort.

It is anticipated that 100% removal of carp will not be achieved through this plan. The Friends of the Coves is committed to ongoing management of carp populations to facilitate the establishment of an ecosystem that supports native fish and aquatic vegetation.

Coves Aquatic Rehabilitation Program East Pond Pilot Project

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The Coves

The Coves is an ecological refuge in the heart of London. Once a meander of the Thames River, the Coves is now a series of 3 ponds that form an Oxbow. Oxbows tend to be places of high biological diversity and the Coves is designated an Environmentally Significant Area in recognition of this diversity. Water flows in the direction from East Pond, to South Pond, to West Pond and out to the Thames River through a one-way flapgate. Water from the Thames does not enter the Coves system (see Appendix A for map).

In 2004, the Friends of the Coves released the Coves Subwatershed Plan. The plan and its 59 recommendations have been adopted by the City of London, Upper Thames River Conservation Authority and Old South Community Organization. Plan recommendations can be categorized into four focus areas: increasing public access; education and awareness; monitoring; and rehabilitation and restoration. The Coves Aquatic Rehabilitation Program is consistent with plan recommendations.

Goal:

- Restore habitat conditions that support a healthy ecosystem, including native aquatic vegetation and native fish populations.
- Restore natural diversity to the Coves aquatic ecosystem.

Objectives:

- Improve water quality by managing carp populations and controlling algae blooms.
- Enhance growth of aquatic vegetation by controlling carp populations.
- Facilitate the establishment of aquatic vegetation and native fish populations by increasing oxygen levels and water clarity through surface water treatment, reduction in total phosphorus and algae production.
- Establish a native warm water fish population that will compete with and keep the carp population in check. Introduce native fish species.
- Stabilize the shore/water interface and facilitate nutrient absorption by planting native riparian and aquatic vegetation.

East Pond Pilot Implementation site

The Friends of the Coves engaged Gertrud Nurnberg, a limnologist with Freshwater Research to explore management options and develop a recommended treatment plan to improve water quality in the Coves. The proposed treatment plan is based upon recommendations made in “Current Water Quality and Remediation Options for the Coves, London, Ontario”, Gertrud Nurnberg, Freshwater Research, May 13, 2006 (see Appendix B for report).

The Nurnberg report recommends a remediation plan that addresses all three ponds simultaneously. For the following reasons, the Friends of the Coves proposes to initiate remedial action on the East Pond at this time:

- By focusing on only one area as a pilot project, the rehabilitation program can be refined and improved for the remaining area of the Coves.
- Landowners backing on to the East Pond have voiced support for a program to manage carp and reduce algae.
- The East Pond is the upper most pond in the water way. It makes sense to initiate at the upstream end of the Coves hydrological system.
- The East Pond is a relatively small subcatchment area and phosphorus inputs can be more effectively controlled through education and awareness amongst landowners.
- There is evidence of riverbed in the East Pond and sediment accumulations are limited (Dillon Coves Drainage and Remediation Master Plan, 2004).
- The East Pond is the most distinct pond and the healthiest of the three ponds. Remediation efforts will have the greatest likelihood of success.
- Successful remediation results in the East Pond will garner community support for further remediation in South and West Ponds.
- The East Pond is separated from the South and West Pond by a culvert under Cove Road. Through much of the year there is no water movement between the ponds. The location of the newly constructed Edward Street Stormwater outlet and the narrow channel that connects the South and East ponds provides the opportunity to install a device that will permit fish migration between the South Pond and the East Pond to be monitored. This will confirm the extent to which further management and control of carp populations entering the East Pond will be required.
- Because the East Pond is the healthiest of the three ponds, it would benefit from a moderate rehabilitation program, rather than completely dewatering this pond, as proposed in Nurnberg report. The East Pond is also more suited to an ongoing management program to control carp populations. The carp population is smaller in this pond and can likely be managed through an ongoing netting program.
- The goal of a rehabilitation program is to promote the establishment of an ecosystem that favours native plants and fish. This pond currently reflects some of these characteristics and by undertaking a partial dewatering, we will be able to maintain existing native fish, aquatic wildlife and plant populations.

East Pond

The East Pond is 3.2 hectares and is the healthiest of the 3 ponds. The bed of the pond is owned by the Crown (Ministry of Natural Resources) and the shoreline is mostly privately owned. The majority of the shoreline is owned by 2 property owners (Tippel and Chata). There is public access at 3 locations on the East Pond.

The East Pond receives stormwater from 3 outlets. Stormwater from Springbank Drive widening enters the pond at the north end. There is an outlet at the end of McAlpine Ave. Surface water collects here and drains into the East Pond. A third outlet at the south end of the East Pond that has recently been configured to receive stormwater from Orchard Street (see Appendix C for Stormwater Outlet map).

At the south end of the East Pond there is a culvert that passes under Cove Road. At high water levels, there is flow through this culvert to the channel entering the South Pond. There are long periods when there is no hydrological connection between the two ponds. This project will be implemented when water levels are lower than this culvert.

Pilot Implementation Plan

1. Community consultation and awareness – Ongoing

a) Consultation to date (See Appendix D for related documentation)

- May, 2006 Door-to-door to invite people to Friends of the Coves annual meeting. Introduced concept of Coves Aquatic Rehabilitation Program with many households. Detailed discussion of possible carp and algae control measures with interested residents.
- Presentations to community groups such as Wortley Village Business Association, Knollwood Neighbourhood Association, Kiwanis Club, Fish and Game Club, Rotary Club, YMCA women's group, University of Western Ontario, Ridgetown College, church groups.
- Information in newsletters, web site
- Events where attached information (see Appendix D) was on display includes:
 - January 7, 2006 Open House
 - February 23, 2006 Evening of Wine and Seeds
 - April 6, 2006 Thames Talbot Land Trust Annual General Meeting
 - April 22, 2006 Earth Day Clean-up
 - April 29, 2006 Environmental Networking Forum
 - May 7, 2006 Friends of the Coves Annual General Meeting
 - May 8, 2006 Civic Garden Complex garden tour
 - June 3, 2006 Gathering on the Green
 - June 21, 2006 Solstice Event at Covent Garden Market
 - October 20, 2006 Thames Talbot Land Trust and Diana Befesford Koeger talk.

b) Future community consultation

Additional information and invitation to participate and comment will be offered through the following methods:

- Community announcements in media and media interviews;
- Announcements in newsletters and e-mail;
- More door-to-door consultation with neighbours of East Pond;
- Presentations/ consultation with key landowners, community groups and potential partner groups such as the Thames River Anglers, Carp anglers; and
- Friends of the Coves volunteers and appropriate signage will be on site during pumping to ensure community concerns and questions can be addressed.
- Letters to private landowners.

c) Agency referral (See Appendix E for related documentation).

Agency referral and involvement has taken place as follows:

- Coves Subwatershed Plan Implementation Committee bi-monthly meetings attended by UTRCA, City, MOE;
- February 13, 2006 letter that describes proposed project and invites comment sent to MNR, MOE, UTRCA, DFO and City;
- Response letters from MNR, MOE, DFO;
- April 13, 2006 “Coves Walk and Talk” with agency representatives to discuss Coves Aquatic Rehabilitation Program in the field;
- June 1, 2006 agency meeting;
- September 7 and 18 meetings at UTRCA;
- September 19, 2006 field trip with agencies;
- October 19, 2006 meeting at MOE; and
- Numerous telephone calls with each agency.

d) Education

It will be important to ensure that the community does not re-introduce non-native fish and vegetation to the Coves. A community awareness program will take place that will include the following elements:

- Signage at the ponds to advise people not to dump fish or vegetation from aquariums, backyard ponds or bait boxes;
- The Friends of the Coves Backyard Habitat Program will further emphasize this message to homeowners during Go Green consultations;
- Similar messaging will be incorporated into media releases, events and displays;
- Meet with angling groups to raise awareness about proper disposal of bait fish;
- The Friends of the Coves backyard habitat program further supports the Coves Aquatic Rehabilitation by promoting awareness of ecologically friendly practices amongst homeowners adjacent to the ponds. This includes promotion of native plants which have lower fertilizer needs and the use of phosphorus-free alternatives such as compost, erosion control measures, shoreline planting to control erosion and in the future will incorporate a septic awareness program; and
- Disseminate information about best management practices in newsletters, articles and brochures.

2. Carp Management

The common carp is not native to our area. It was introduced in the mid 1800s as a commercial food fish. The omnivorous carp continually disturb the pond bottom as it forages for food. This behaviour introduces phosphorus and particles from the pond bottom into the water and degrades water clarity and quality. This disturbance of sediment in the ponds prevents aquatic vegetation from establishing, and discourages other fish species from inhabiting the area. Carp directly harm our native fish species by eating and uprooting plants and eating fish eggs and young fish.

The Friends of the Coves recently commissioned John Schwindt of UTRCA to undertake Fish Monitoring. The results indicate that carp are present in the East Pond but to a lesser degree than is present in the South and West Ponds (see Appendix F for Fish Monitoring results). John indicates that the monitoring focused on the shoreline and that the carp

population may be higher in the centre of the ponds. A carp x goldfish variety exists in the ponds. Removal of goldfish is also proposed. Anecdotal communications from neighbours indicates that carp is a significant presence in this pond. One advantage to a partial dewatering is that it will allow non-target species of fish as well as amphibians and reptiles to remain in, or be transferred to the watered areas of the East Pond.

Research and review of other carp management programs indicates that successful management of carp populations includes the following elements:

- ability to manage pathway of introduction;
- lowering of water levels; and
- ongoing commitment to subsequent netting and control measures.

Numerous carp management programs and projects were reviewed. Almost all project managers advised that lowering water levels prior to netting carp was the only way to achieve success (Brian Royal, Ducks Unlimited at Second Marsh 1-888-402-444 b_royal@ducks.ca; Ed Pietrzak – Catfish Creek Conservation Authority; Dave Featherstone, Nottawasaga Conservation Authority re: Milton Millpond 705-424-1479 X242; Confederation Park Ponds carp removal report).

The use of Rotenone, a piscicide/ fish poison, was reviewed and considered. Rotenone has had some degree of success in managing invasive populations (Jason Borwick – 905-713-7404 jason.borwick@mnr.gov.on.ca applied Rotenone in Pefferlaw Brook). There is conflicting information about whether the use of Rotenone would reduce potential impacts to non-target species. Potential negative impacts of rotenone were not thoroughly explored. Rotenone is a Level 1 restricted chemical in Ontario and is not proposed for this pilot project. There is a concern that the use of rotenone would be perceived as inconsistent with messages the City of London and the Friends of the Coves are delivering about pesticide reduction.

a) Draining water: Mar-Apr, 2007 or June-Aug, 2007.

The East Pond contains approximately 36,000m³ of water (based upon average dimensions of 500m long, X 60 m wide X 1.2 m deep). In order to net carp, it will be necessary to lower water levels by draining water from the East Pond to the South Pond. This will corral the carp into localized areas where they can be more readily netted. Use of a boat will be needed in order to facilitate netting of carp and sufficient water must be maintained in the ponds to allow for boat movement.

Over a maximum of 5-8 days, two pumps will run moving a maximum volume of 16,800m³/day (2 pumps @ 350m³/hr per pump@24hrs/day). When draining is complete, the deepest part of the ponds will have a depth of slightly less than 0.5 m. It is anticipated that pumping can be completed in 3 days. The additional time requested in the permit will provide flexibility to accommodate rain events and/ or peak times when noise may be an issue.

The pump will use a floating intake placed in an area with low sediment. If necessary, sandbags will be placed around the intake valve to prevent sediment from entering intake. The water will be pumped through a hose that will transfer the water across City-

owned land to a location downstream of the Edward Street Stormwater outfall. A ramp over the hose will ensure traffic on Cove Road is not impeded. Water levels will be below the Cove Road culvert during pumping. There will be no opportunity for downstream transportation of sediment. The outfall area is designed to receive large volumes of water. Erosion barriers and rock walls constructed for the Edward Street Stormwater Outlet will ensure bank stability is maintained. A fish basket and filter will be used at the pipe intake to protect aquatic wildlife and to avoid sediment uptake in the pump. By running the pump for a 24 hour period, the possibility of water freezing in the hose will be avoided. If freezing is not an issue, pumping may be limited to day time Pumping will coincide with a period of low precipitation (see Appendix G for project map).

There is an area identified as a marsh on the 1992 Ontario Base Map. The 2004 Coves Subwatershed Plan identifies this area a cultural thicket which would not be sensitive to short term drawdown. Draw down will be timed to avoid potential conflict with temporal spawning activity in May to June 15. Draining will be carried out before the end of April or after June 15. This will also avoid draining during the wetter season.

While the pond levels are low, garbage and debris will be removed. The pond is largely stormwater fed and will fill back up naturally.

b) Carp Removal – concurrent with dewatering

Carp removal will occur simultaneously with, or shortly after, dewatering. A combined system of netting and electrofishing will be used.

Elmira Fish Farm Supply designs custom seine nets. A net that is custom fitted to the depth and width of the pond will ensure highest capture-rate while netting. The net will be pulled out from shore with the assistance of a small boat. The lower pond levels will corral the fish and facilitate the netting process. Debris on the pond bottom may impede net movement. It is possible that a combined process of netting and electro-shocking will be required. Consideration will be given to using a dual net system to increase capture rate and to allow for two different size mesh nets that will assist in capturing smaller fish. Dip nets will be available to capture smaller carp once they are corralled by seine nets. Sherry Wiseman of Halton Conservation Authority indicates that this method was successful in carp management project at Confederation Ponds. Many volunteers have voiced an interest in assisting with carp removal.

Assuming the results of a Fish Contamination Analysis indicate carp are sufficiently healthy (i.e. not contaminated to a level that differs significantly from Thames River contaminants), the carp will be transferred downstream of the Coves flapgate to the Thames River, under a MNR “Permit to Stock Fish”. As a last resort, the City has confirmed that carp can be transported to W12 landfill. Options such as use as fertilizer or compost or live transfer to Thames River will first be explored.

c) Ongoing management

The Friends of the Coves is committed to ongoing management and control of invasive carp.

d) Monitor reintroduction of Carp - Ongoing

It will be necessary to confirm whether, and to what extent, carp travel from the South pond to the East pond. This will be confirmed by placing a stone barrier to the west of the Edward Street Outfall structure. The Friends of the Coves will monitor this area daily monitoring at peak periods of fish movement and weekly at other times. Carp will be transferred back to the south pond and other fish species will be transferred to East Pond. Depending on the results, additional measures may be proposed to control this potential pathway.

3. Water Clarity – Surface Water Treatment August - September, 2007

Based on recommendations in the Nurnberg report, monthly water quality monitoring has occurred at 4 sites in the Coves from June – November, 2006. Upper Thames River Conservation Authority was commissioned to collect the samples and the results were analysed at Greenway Lab. Preliminary results indicate that total phosphorus levels in the East Pond are consistent with a highly eutrophic pond (see Appendix H for water quality results). This is consistent with conclusions drawn in the Nurnberg report that referenced available water quality data from previous studies.

The carp disturb the sediment. Disturbance of sediment reintroduces phosphorus into the water column. The application of a flocculent will adsorb particles (including phosphorus) and settle them on the pond bottom. This deposition creates a layer that intercepts the release of phosphorus from the underlying sediments. It effectively seals the sediments. Alum is the recommended flocculent. Dosage will be prescribed with reference to recent monitoring results on total phosphorus levels in East Pond. Alum will also be added to stormwater discharge areas to deal with phosphorus contributions at the source.

4. Eurasian Watermillfoil control – concurrent with dewatering

Where the pond bottom is exposed, consideration will be given to mechanical removal of Eurasian watermillfoil. Mechanical treatment will involve removal from the roots and will only be considered where operationally and safely feasible.

5. Monitoring - Ongoing

Baseline data exists from a number of reports and inventories (see Nurnberg report). Pre-monitoring took place over a 6 month period from June to November. Monitoring included monthly water quality samples taken by Upper Thames River Conservation Authority and analysed by Greenway Pollution plant. A fish inventory was also conducted by John Schwindt of UTRCA. Water quality and fish monitoring will also be conducted in 2007 over the same time period. Findings in 2007 will be compared with 2006 results to assess whether objectives are met.

6. Other proposed rehabilitation initiatives

Current and proposed rehabilitation efforts that support this initiative include the following:

- Adding woody debris to provide habitat for birds, turtles and fish;
- Planting shoreline vegetation to offer shade, increase water circulation and oxygen;
- Plant aquatic species where possible. Aquatic plants will help to absorb nutrients and reduce algae;
- Research into introducing invertebrate populations; and
- Fish stocking with warm water native fish species.

Appendices

Appendix A	Coves Subwatershed map
Appendix B	Nurnberg Report
Appendix C	Stormwater Outlet map
Appendix D	Community Consultation materials
Appendix E	Agency referral materials
Appendix F	Fish monitoring results
Appendix G	Project map
Appendix H	Water Quality Monitoring results