

HARPER PARK OPPORTUNITIES AND CONSTRAINTS STUDY



Final Report
January 2004

prepared for
City of Peterborough
prepared by



OTONABEE
CONSERVATION

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Photo Credits:

Gerry Sullivan and Justin Fisher

1. INTRODUCTION

The Harper Creek Opportunities and Constraints Study was initiated by the City of Peterborough in order to identify recreational opportunities and environmental constraints on the City-owned properties in the Harper Park area and surrounding lands. The intention of the City is to utilize Harper Park as a natural environment recreation area, through the use of properties currently owned by the City, and continued land acquisition.

The City is the owner of approximately sixty (60) hectares of undeveloped lands in the Harper Creek Subwatershed. These lands were assembled for the establishment of a large urban natural park. The Harper Park area is one of the only remaining large, naturally vegetated areas in the City of Peterborough and includes a large woodland, and a wetland that covers an area of 17.8 hectares. At this time, the Ontario Ministry of Natural Resources has evaluated the Harper Creek Wetland as a locally significant wetland.

The City of Peterborough has recently acquired additional lands in the Harper Creek Watershed in the vicinity of Harper Park and requested the assistance of Otonabee Conservation to prepare an inventory of the natural heritage features and conditions of the City-owned properties. The data collected was used by Otonabee Conservation staff to identify areas that are appropriate for active and passive recreational uses, areas that require protection, and areas where restoration or rehabilitation are recommended.

2. PURPOSE OF STUDY

The purpose of this study is to provide the City of Peterborough with:

- 1) An overview of the natural features and natural heritage components present in the study area
- 2) Identify areas where recreational uses may be permitted, areas where recreational uses may not be permitted
- 3) Identify areas that have been negatively impacted and recommend opportunities for rehabilitation and restoration

The result of the study is the identification of areas of opportunities for recreational use and ecologically sensitive areas of constraint. Areas identified for further study and restoration are also included in this report and may be incorporated into the Harper Creek Park Management Plan.

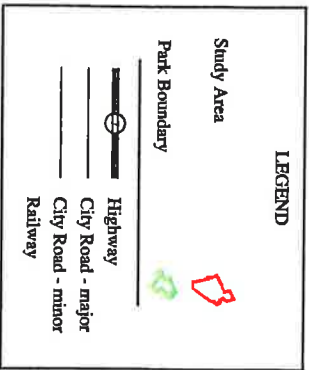
3. STUDY AREA – LOCATION AND DESCRIPTION

The Study area is located within the Harper Creek Subwatershed, in the City of Peterborough. The Harper Creek Subwatershed covers an area of approximately two hundred and thirty-five (235) hectares. Please refer to Figure 1 for a Map of the Study Area, and Figure 2 for a Map of the City owned properties within the Study Area. The Study area includes the City owned properties within the Harper Creek subwatershed and adjacent lands bordered by Spillsbury Drive to the west, Harper Road to the east, Sir Sandford Fleming Drive to the south and Lansdowne Street to the north. These properties cover an area of approximately sixty (60) hectares. The City owned property identified as Harper Park is located within the study area, but does not occupy it completely.

The land use bordering the study area is comprised of residential development to the west and north, industrial and institutional to the north, the CNR line to the east, and undeveloped land to the south. The study area is comprised of wetlands, forested areas, open meadow, and an area currently used for industrial purposes, including the City Composting facility and leased land. The central portion of Harper Park is heavily wooded, and encompasses an area of approximately fifty (50) hectares. The area also includes a locally significant wetland, which is approximately five (5) hectares in area.

Tributaries of Harper Creek flow through both the privately owned and City owned properties in the vicinity of Harper Park. The study area is traversed by Harper Creek and many areas of groundwater upwellings and tributaries. Harper Creek flows through the study area in a northeast direction, through the Harper Creek Wetland and under Harper Road. Harper Creek eventually discharges into the Otonabee River, after its confluence with Byersville Creek, in the vicinity of the Kingsway and the CPR tracks. There is a northern tributary of Harper Creek which drains an area of approximately fifty (50) hectares and flows along Rye Street before it's confluence with Byersville Creek and eventual discharge to the Otonabee River.

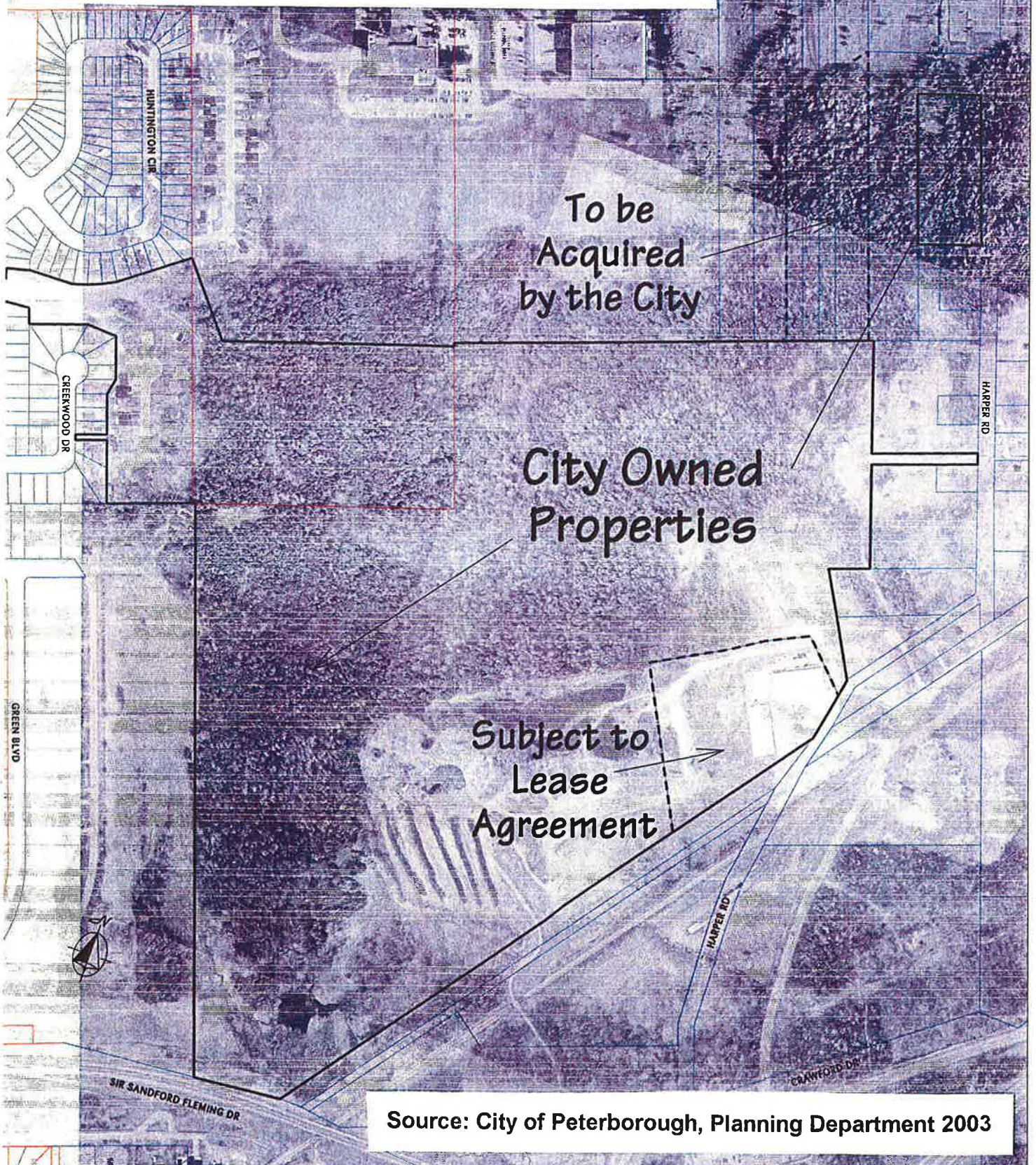
Figure No.1
Harper Creek Park
Opportunities & Constraints Study
STUDY AREA



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Aerial photography data: 1996



Figure 2 – Map of City Owned Properties Within Study Area



Source: City of Peterborough, Planning Department 2003

4.0 STUDY PROGRAM

This study will provide the City of Peterborough with the information necessary to guide the development of Harper Creek Park, while achieving their goals of protecting the natural heritage and natural hazard features within the Harper Park area.

In order to achieve the Objectives of the Study, the methodology used involved four steps, Literature Review, Field Observations, Data Compilation and Analysis, and Reporting. The tasks associated with the four steps of the Study Program are as follows:

4.1 Step One – Literature Review – Harper Creek Subwatershed

A Literature review of existing background information was undertaken. Resources reviewed included:

- Aerial photos and Ontario Base Map (OBM) topographic maps
- Physiography
- Soils Reports
- Areas of Natural and Scientific Interest (ANSIs) Mapping
- MNR Wetland Evaluations
- ORCA Engineered Floodlines
- Areas regulated under Ontario Regulation 282/97
- Harper Creek Subwatershed Study
- Peterborough Natural Area Inventory

4.2 Step Two – Field Observations

Otonabee Conservation staff conducted several field visits to confirm the natural heritage features identified in previous studies and to inventory properties that have been acquired by the City since the last inventory was undertaken. Tasks undertaken during site visits included:

- Confirmation of natural heritage features identified in previous Ecological Land Classification (ELC) of vegetation communities
- Evaluation of terrestrial and aquatic linkages and corridors
- Assessment of stream, riparian zone and fisheries habitat
- Identification of resident wildlife and wildlife habitat
- Evaluation of current wetland conditions
- Hydrologic feature identification (seeps, springs, perennial and

- intermittent watercourses)
- Identification of dominant vegetation types
- Identification of areas requiring restoration
- Identification of areas requiring further study
- Digital photo documentation of study

4.3 Step Three – Data Compilation and Analysis

The information gathered during the literature review and the field investigations was analyzed to determine which portions of the study area were appropriate for active and passive recreational use, which areas should be protected from use, which areas require restoration and where further study would be beneficial. The following steps were undertaken to identify the areas of opportunity and constraint.

- Identification and mapping of natural features including aquatic habitat, wetland areas, and hydrologically sensitive areas,
- Confirmation of current and historical land use

4.4 Step Four - Reporting

The final step was the completion of the Final Report which identifies the areas that should be protected, are appropriate for recreational use and those that are in need of restoration. This report also documents current site conditions, impacts from past development and current management techniques. This information may be used by City staff in the development of the Master Plan for Harper Creek Park.

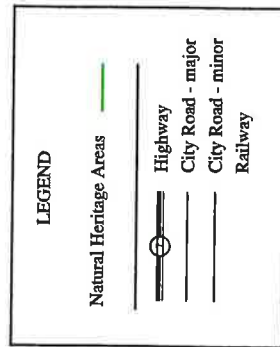
5.0 NATURAL HERITAGE FEATURES

In 2003, Otonabee Conservation staff conducted field assessments of the Harper Park area to determine which areas were appropriate for recreational use, and which areas should have limited access or no access to protect sensitive natural heritage features.

The Harper Park area was divided into the following regions to facilitate field investigations and identification of areas of recreational opportunity and constraint. Please refer to Map 3 for the location of each area and Appendix A for photographs of each area.

- Area One: City Composting Facility
- Area Two: Land Leased to Armond Modular Manufacturing
- Area Three: South West Block
- Area Four: East Meadow
- Area Five: Harper Creek Wetland
- Area Six: North West Block
- Area Seven: North East Block

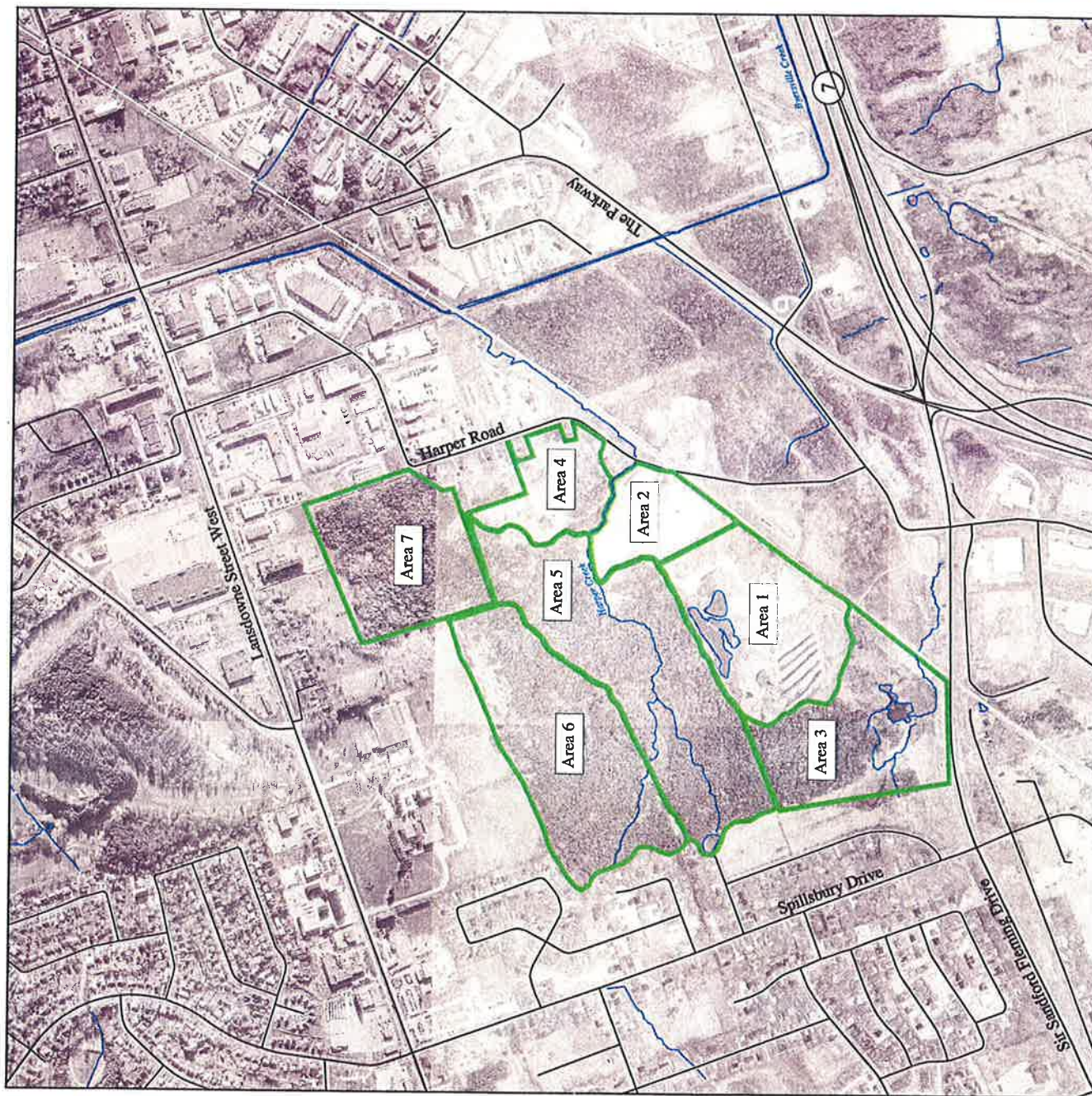
Figure No. 3
Harper Creek Park
Opportunities & Constraints Study
NATURAL HERITAGE AREAS



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Airphoto photography date: 1996

Natural Heritage Areas

- Area 1 City Compost Facility
- Area 2 Beaver Lumber
- Area 3 East Meadow
- Area 4 South West Block
- Area 5 Harper Creek Wetland
- Area 6 North West Block
- Area 7 North East Block



5.1 Area One: City Composting Facility

This property has been used as the City Composting Facility for over 10 years. The entrance to this facility is located adjacent to Harper Creek at Harper Road. The actual compost rows are located to the west of the property currently leased to Armond Modular Manufacturing and there is an access road connecting the two properties. There are two ponds located between the area containing the compost rows and the land leased to Armond Modular Manufacturing. The Harper Creek Wetland is located at the northern border of the composting facility and extends to the north, east, and west.

The western portion of this area, where the composting rows are located has been significantly altered from its natural state. This area is of a higher elevation than the surrounding land and there is a steep slope from the composting area down to the wetland. The soils are highly compacted from truck traffic and are predominantly comprised of fill.

Fill has been placed on the northern border to expand the area available for the storage of compost. This fill is now encroaching on tributaries of Harper Creek and the wetland. Vegetation was observed to be buried in several feet of fill around the boundary of this area. Currently, green waste is being stored here before it is put into rows for composting. Due to the higher elevation of the compost rows, and lack of vegetation, this area provides excellent viewing opportunities of the ponds and the wetland in the distance.

There are three man-made ponds in the north eastern portion of the area currently occupied by the City composting facility. These ponds provide habitat for waterfowl, fish and amphibians. There is an access road between the ponds that is wide enough for a truck but appears to be seldom used. The composting facility has been in this location for more than ten years and during this time, some restoration work has already occurred, primarily through the creation of a vegetated buffer around the ponds. The vegetation around the ponds includes white birch, poplar and eastern white cedar while the shoreline is predominantly red osier dogwoods, shrub willow and a variety of grasses.

As you move east from the ponds, more fill has been placed to expand the area which is currently used to store sand, gravel and other materials. The

stockpiled fill in this area is encroaching on the wetland boundary to the north, and the main channel of the creek.

The southern portion is also highly disturbed and has an access point from Crawford Drive as well as from Harper Road. No wildlife was observed in this area. Vegetation was sparse and included shrubs, grasses, and highly compacted soils with no evidence of groundwater or a high water table. This area is currently used by local residents for passive recreation activities, particularly walking. There were no indications of any groundwater springs or seepage areas in the vicinity of the City Composting Facility.

Recently, the City has initiated a wet/dry waste management program which along with the success of the green waste composting program has increased the area required by the city for its composting facility. The current site has reached its maximum capacity, which the photographs in Appendix C confirm (plates 5-10). The only option for expansion of composting activities is a new location for the city composting facility to avoid negative impacts on Harper Creek and the wetland.

5.2 Area Two: Land Leased to Armond Modular Manufacturing

This property is under a 10 year lease agreement with Armond Modular Manufacturing (October 31, 2003 – October 31, 2013). It is zoned M2.1 (Prestige Industrial). It is used for the construction and storage of temporary structures, vehicles and construction materials. This site has been significantly altered from its natural state and contains little vegetation, no evidence of groundwater, and highly disturbed, compacted soils.

Harper Creek flows along the north and east boundary of this property and is being encroached upon by the placement of fill and the storage of sand, gravel and other materials. The vegetated buffer between the wetland and the creek has been removed enabling the sand and gravel to encroach on the watercourse and the wetland.

5.3 Area Three: South West Block

The South West Block is a mature mixed woodlot comprised of a variety of tree species including white birch, willow, eastern white cedar, poplar, hemlock, balsam fir and white spruce. Soils in this area exhibited moist, hydric characteristics. Groundwater upwellings, and small coldwater tributaries were observed in this area. Watercress was also observed in this area.

The southern portion of this area contains a small unevaluated wetland and two beaver ponds. The ponds have portions of open water and a cattail marsh. Given that there is minimal open water within the Harper Creek Wetland, these ponds provide valuable habitat for waterfowl, wildlife, amphibians, insects, aquatic plants and invertebrates. The two ponds and wetland are not hydrologically connected to the Harper Creek Wetland and drain in a southern direction into the provincially significant Peterborough Airport Wetland. This area provides an excellent terrestrial linkage to areas to the south and is one of only two areas where there is significant open water that can be used for migratory birds, turtles and amphibians.

5.4 Area Four: East Meadow

The area identified as the East Meadow was cultivated in the past and is now dominated by grasses and sedges. The majority of this area is an open meadow with scattered areas of red osier dogwood and eastern white cedar. The soils in this area exhibited moist, hydric characteristics. Watercress, flowing water and small tributaries were observed on the western edge of the meadow near the wetland boundary. White-tailed deer were observed in this area during both field visits. The East Meadow acts as a vegetated buffer for the wetland to the west and increases the diversity of habitat found within the Harper Park area.

5.5 Area Five: Harper Creek Wetland

The Harper Creek Wetland is locally significant based on the evaluation completed in 1996 using the Ontario Wetland Evaluation System for Southern Ontario (3rd Edition). The Harper Creek Wetland is a palustrine wetland and is comprised of both swamp (90%) and marsh habitat (10%) and covers approximately 17.8 hectares. The swamp portion consists of deciduous, coniferous, mixed treed stands along with shrub thickets. Marsh communities exist along Harper Creek and in wet, low lying areas.

The Harper Creek Wetland is considered to be hydrologically significant as it contains many areas of groundwater seepage and springs, and contributes to the coldwater fish habitat found downstream in Harper and Byersville Creeks. There has been very little disturbance within the wetland itself, which is of added significance given that the wetland is surrounded by residential, commercial and industrial development. This wetland is considered a very sensitive area, and disturbances will have a negative impact on the wetland itself, and on the natural heritage features of surrounding areas.

The Harper Creek Wetland occupies a low lying area, and the surrounding terrain is of a higher elevation to the north, south and west. The land to the east is relatively low lying and contains the main channel of Harper Creek which drains into the Byersville Creek subwatershed. Field investigations undertaken in 2003 by Otonabee Conservation staff confirmed that the Harper Creek Wetland area was primarily comprised of a variety of hydric soils, which are indicative of wetland conditions and a high groundwater table.

Many different wildlife species inhabit the wetland including Muskrat (*Ondatra zibethicus*), Raccoon (*Procyon lotor*) and Beaver (*Castor canadensis*), White Tailed Deer (*Odocoileus virginianus*) and Eastern Cottontail (*Sylvilagus floridanus*). Otonabee Conservation staff observed White Tailed Deer (*Odocoileus virginianus*), Grey squirrel (*Sciurus niger*) and Eastern Cottontail (*Sylvilagus floridanus*) and many species of songbirds during field visits. Tracks of Red fox (*Vulpes vulpes*) and Raccoon (*Procyon lotor*) were also observed. The Harper Creek Wetland is locally significant for deer, and is of regional significance as a waterfowl staging and production area.

5.5.1 Wetland Vegetation Communities in Study Area

Otonabee Conservation staff confirmed the vegetation communities identified by Gartner Lee in the most recent wetland evaluation completed in 1997. The following dominant vegetation communities classified by Gartner Lee are as follows:

- S1: white cedar (*Thuja occidentalis*), white birch (*Betula papyrifera*), field horsetail (*Equisetum arvense*), sensitive fern (*Onoclea sensibilis*)
- S2: Balsam poplar (*Populus balsamifera*), white cedar (*Thuja occidentalis*), three-leaved solomon's seal (*Smilacina trifoliata*), cinnamon fern (*Osmunda cinnamomea*)
- S3: white cedar (*Thuja occidentalis*), tamarack (*Larix laricina*), yellow sedge (*Carex flava*), field horsetail (*Equisetum arvense*), marsh marigold (*Caltha palustris*)
- S4: willow (*Salix* spp.), red-osier dogwood (*Cornus stolonifera*), field horsetail (*Equisetum arvense*), purple-stemmed aster (*Aster puniceus*)
- S5: trembling aspen (*Populus tremuloides*), black ash (*Fraxinus nigra*), Balsam poplar (*Populus balsamifera*), white spruce (*Picea glauca*), sensitive fern (*Onoclea sensibilis*), jewelweed (*Impatiens capensis*)
- S6: trembling aspen (*Populus tremuloides*), black ash (*Fraxinus nigra*), mountain maple (*Acer spicatum*), jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*)
- S7: white cedar (*Thuja occidentalis*), sensitive fern (*Onoclea sensibilis*)
- S8: white cedar (*Thuja occidentalis*)
- S9: white cedar (*Thuja occidentalis*), white birch (*Betula papyrifera*), red-osier dogwood (*Cornus stolonifera*), yellow sedge (*Carex flava*), marsh fern (*Thelypteris palustris*), goldenrod (*Solidago* spp.)

S10: white cedar (*Thuja occidentalis*), lowland pussywillow (*Salix discolor*), yellow sedge (*Carex flava*), field horsetail (*Equisetum arvense*), goldenrod (*Solidago* spp.)

M1: red-osier dogwood (*Cornus stolonifera*), pussy willow (*Salix discolor*), common cattail (*Typha latifolia*), field horsetail (*Equisetum arvense*), sensitive fern (*Onoclea sensibilis*)

M2: common cattail (*Typha latifolia*), reed canary grass (*Phalaris arundinacea*), sedges (*Carex* spp.), purple-stemmed aster (*Aster puniceus*), marsh marigold (*Caltha palustris*)

(Gartner Lee, 1996).

5.6 Area Six: North West Block

The North West Block contains the main channel of Harper Creek and adjacent wet areas. Many areas of groundwater seepage were identified in this area, which contribute the baseflow of the stream. Soils were wet and hydric in southern area, well drained sandy loam in northern area. The creek is braided in this area due to upstream disturbances and uncontrolled flows. The southern portion of this area is extremely wet with many small tributaries and evidence of groundwater upwellings that flow into the creek. The vegetation in the area is comprised of a variety of wetland species including sedges and horsetails.

On the north side of the creek, the land slopes upwards and is dominated by a mixed upland forest of mature eastern white cedar, hard maple, red pine and white spruce. Many deer were observed in this area.

5.7 Area Seven: North East Block

The North East Block is classified as a mixed swamp, dominated by eastern white cedar with white birch. Patches of grasses, sedges and red osier dogwood were also observed in this area. The soils exhibited wet, hydric conditions. Many areas of groundwater upwelling were observed, characterized by patches of watercress. Many tributaries and channels of flowing water were observed throughout the northwest portion of this block, draining to the Harper Creek Wetland and the northern tributary of Harper Creek. This area is frequently used by wildlife including white tailed deer, which were observed during field visits.

In the north west portion of this block, there are many areas of groundwater seepage, causing the forest cover to be less dense. The vegetation in this areas is dominated by pussy willow shrubs, sedges, horsetail, and sensitive fern.

The northernmost portion of this block is a heavily vegetated area adjacent to the commercial properties with frontage on Lansdowne Street . This area contains moist, hydric soils, and is comprised of dense shrub species including eastern white cedar, shrub willow, grasses, sedges and cattails. There is a narrow buffer of meadow between the heavily vegetated area and the commercial properties.

6. AREAS OF OPPORTUNITY AND CONSTRAINT

The Harper Park Area has been divided into Seven Areas for the purposes of this study. The seven blocks are not entirely within the boundaries of Harper Park, but are primarily City-owned properties and are adjacent to the existing park boundaries. The seven areas include:

- Area One: City Composting Facility
- Area Two: Land Leased to Armond Modular Manufacturing
- Area Three: South West Block
- Area Four: East Meadow
- Area Five: Harper Creek Wetland
- Area Six: North West Block
- Area Seven: North East Block

As a result of the study, four areas were identified as having opportunities for recreational uses and three areas were identified as constrained and unsuitable for access or development due to the ecological sensitivity of the natural heritage features.

The four areas of recreational opportunity are: Area One: City Composting Facility, Area Two: Land Leased to Armond Modular Manufacturing, Area Three: South West Block and Area Four: East Meadow. Please refer to Figure 4 for a Map of Areas of Recreational Opportunity.

The three areas of constraint are: Area Five: Harper Creek Wetland, Area Six: North West Block and Area Seven: North East Block. Please refer to Figure 5 for a Map of Areas of Constraint.

Figure No. 4
Harper Creek Park
Opportunities & Constraints Study
AREAS OF OPPORTUNITY

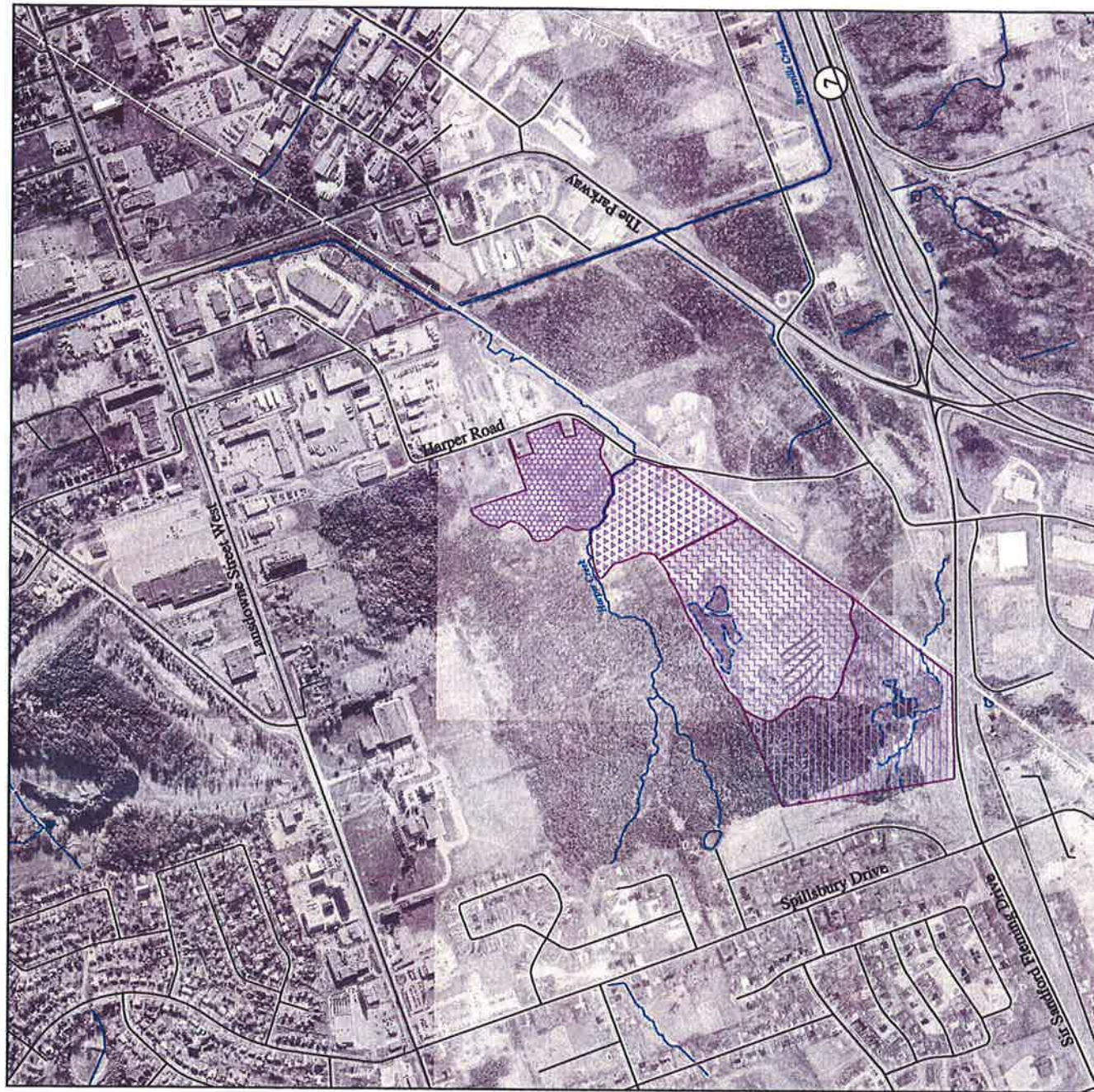
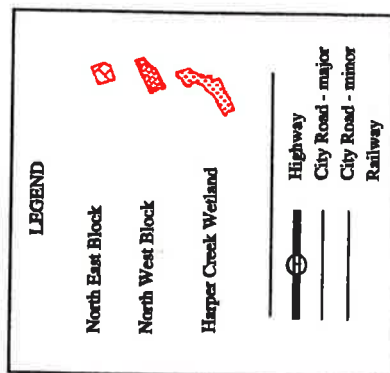
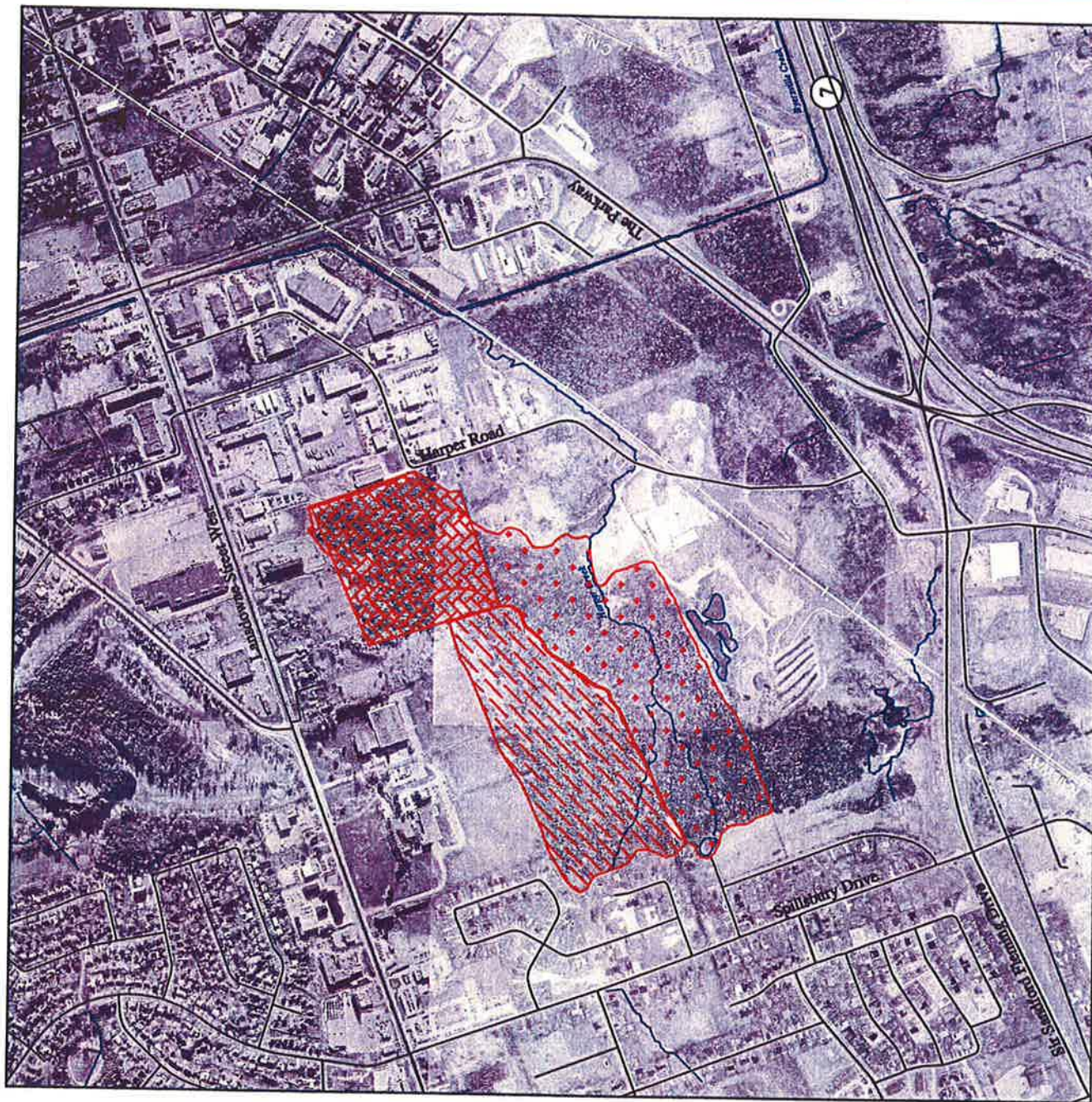


Figure No. 5
Harper Creek Park
Opportunities & Constraints Study
AREAS OF CONSTRAINT



SOURCE:
 Base map obtained from City of Scarborough, 2003
 Aerial photography date: 1996



6.1 Areas of Recreational Opportunity

Two areas were identified as being suitable for active recreational use such as the construction of walking trails, and picnic areas, and two areas were identified as being suitable for passive recreational use such as walking, but no trail construction, and wildlife viewing activities such as birdwatching.

The two areas identified as providing opportunities for active recreational activities are: Area One: City Composting Facility and Area Two: Land Leased to Armond Modular Manufacturing. The two areas identified as being suitable for passive recreational use such as a walking, birdwatching, and the installation of a viewing tower are: Area Three: South West Block and Area Four: East Meadow.

Further study is recommended prior to choosing the exact locations to ensure that the natural heritage features are not negatively impacted.

The following areas within the Study Area were identified as being suitable for active recreation:

- Area One – City Composting Facility: Suitable for Active Recreational Uses
- Area Two – Land Leased to Armond Modular Manufacturing: Suitable for Active Recreational Uses

The following areas within the Study Area were identified as being suitable for passive recreation:

- Area Three – South West Block: Suitable for Passive Recreational Uses (with restrictions for protection of intermittent watercourse)
- Area Four – East Meadow: Suitable for Passive Recreational Uses

6.1.1 Area One – City Composting Facility

The City Composting Facility has been used for a number of years as a location for the storage of fill, compost, sand and gravel. Harper Creek flows east along the northern boundary of this block. Rehabilitation has already been undertaken in the area around the ponds, but due to the highly altered condition of this site, further rehabilitation is recommended. (Please refer to Section 7 for details) This is a suitable location for active recreation activities including a picnic area, viewing tower, parking and access to the park. The northern portion of this area contains two ponds which would be suitable locations for a variety of passive use activities including walking trails, the construction of a wetland viewing tower, picnic area, and the installation of benches and interpretive signage. Please refer to Figure 6 at the end of this section for a Map of this area.

6.1.2 Area Two – Property Leased to Armond Modular Manufacturing

The property currently leased to Armond Modular Manufacturing has been significantly altered and would be appropriate for active recreation at the end of the lease agreement. The creation of buffers along the creek and the wetland to separate active recreational uses is important. This area could also be used as an access point, but a minimum 30m buffer should be established between the creek and the roadway as soon as possible. Please refer to Figure 7 at the end of this section for a Map of this area.

6.1.3 Area Three – South West Block

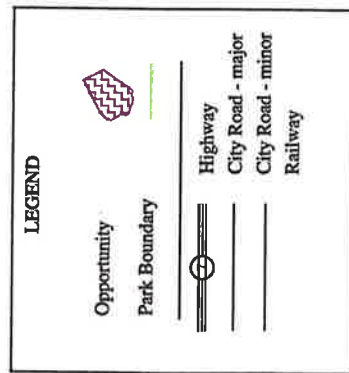
The South West Block is a mature woodlot comprised primarily of poplar and eastern white cedar. The southern portion of this block contains an unevaluated wetland and two beaver ponds. This wetland is separate from the Harper Creek Wetland and drains in a southern direction into the Peterborough Airport Wetland. This area provides excellent terrestrial linkage for connecting wildlife to areas to the south and is one of only two areas where there is significant open water that is used by migratory birds, turtles and amphibians. The area would be suitable for passive use in the upland forest area. The low lying wet areas in the southern most portion of this block are sensitive to disturbance and should not be used as a recreation area. Please refer to Figure 8 at the end of this section for a Map of this area.

6.1.4 Area Four – East Meadow

The area identified as the East Meadow has been cultivated in the past and is now dominated by grasses and sedges. Red Osier dogwood, and eastern white cedar were also identified during field investigations. This area acts as a buffer for the eastern portion of the Harper Creek Wetland, and provides habitat for wildlife including White tailed deer which were observed during field investigations.

This area would be suitable for passive recreational uses such as walking and birdwatching, but it is important to protect Harper Creek and the Harper Creek Wetland from disturbance and degradation. The proximity of this area to the wetland would make it an excellent location for the construction of a viewing tower and the installation of interpretive signage at the access point from Harper Road. This area may be suitable for the installation of boardwalks as it does contain areas of groundwater upwellings and tributaries of Harper Creek. Further study would be recommended to determine the most appropriate location for this type of structure. Please refer to Figure 9 at the end of this section for a Map of this area.

Figure No. 6
Harper Creek Park
Opportunities & Constraints Study
AREA OF OPPORTUNITY -
CITY COMPOST FACILITY



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Airphoto photography date: 1996

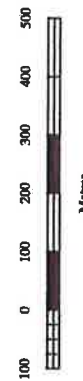
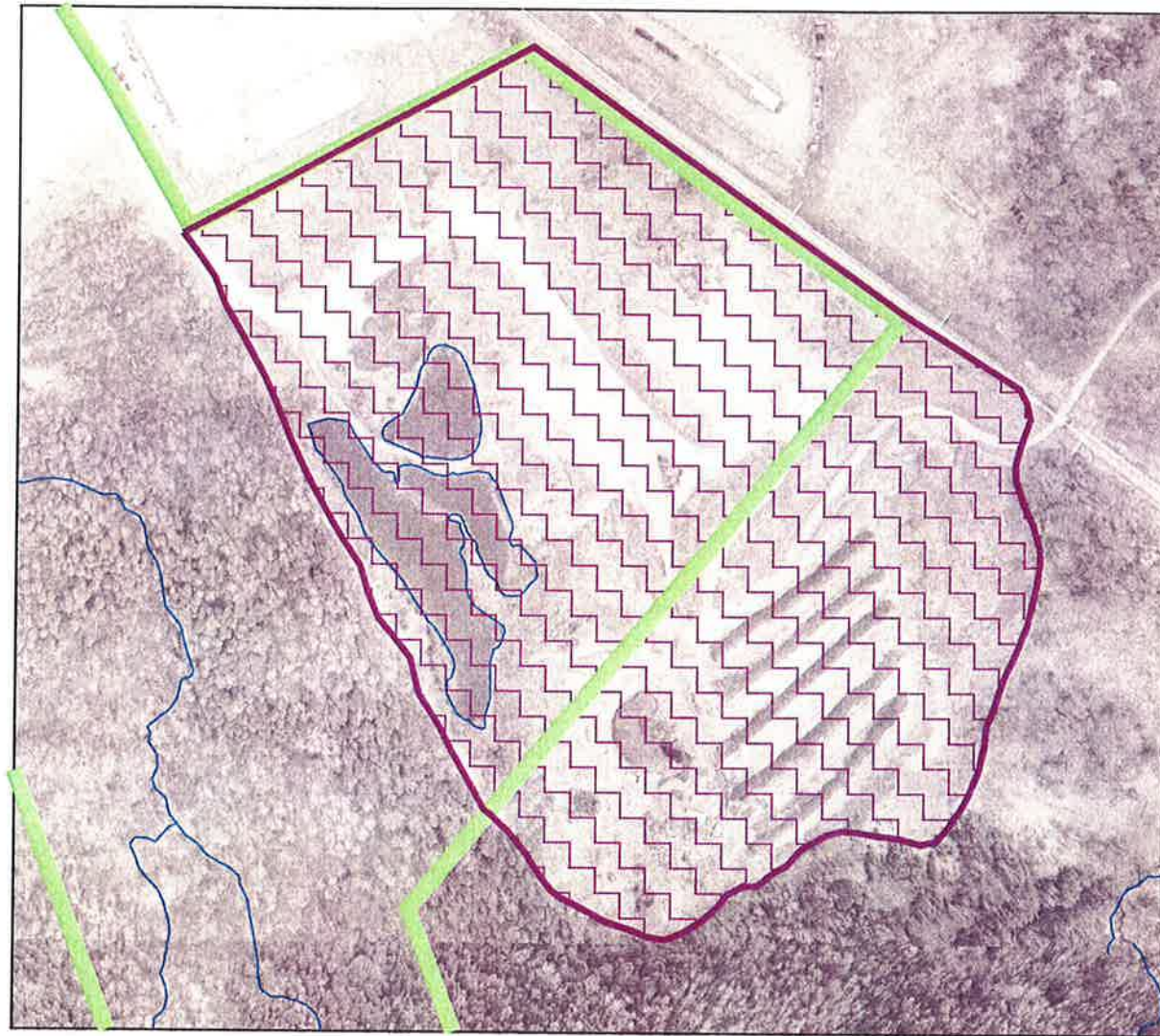
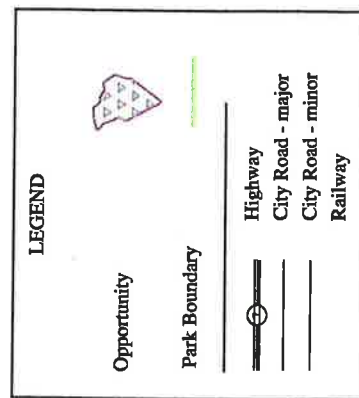


Figure No. 7
Harper Creek Park
Opportunities & Constraints Study
AREA OF OPPORTUNITY -
LAND LEASED TO ARMOND
MODULAR MANUFACTURING



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Aerial photography date: 1996

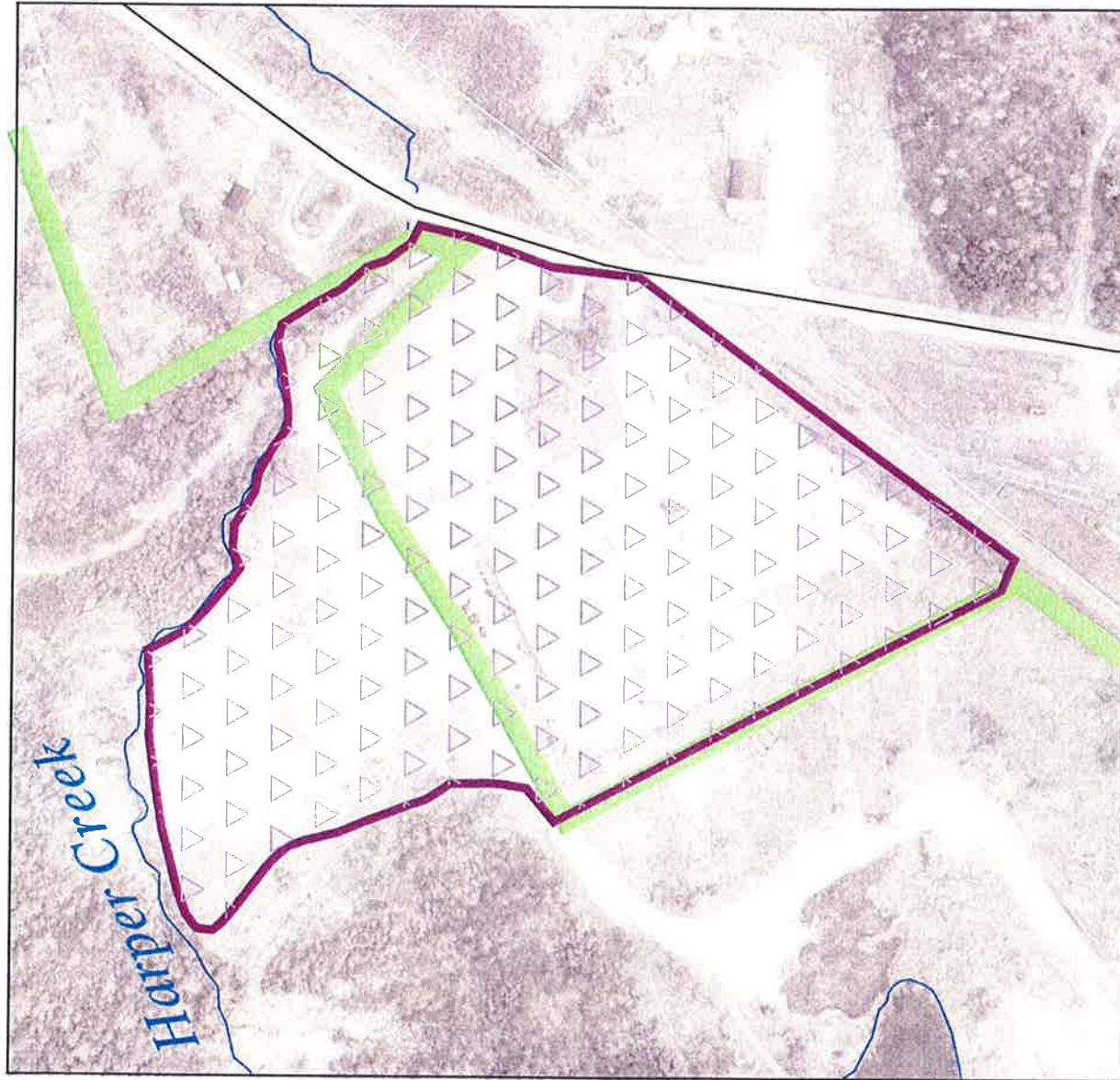
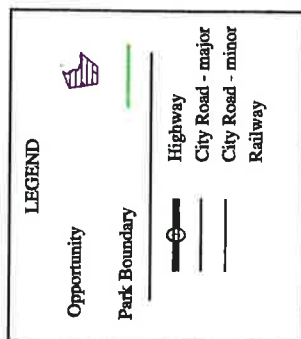


Figure No. 8
Harper Creek Park
Opportunities & Constraints Study
AREA OF OPPORTUNITY -
SOUTH WEST BLOCK



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Airphoto photography date: 1996

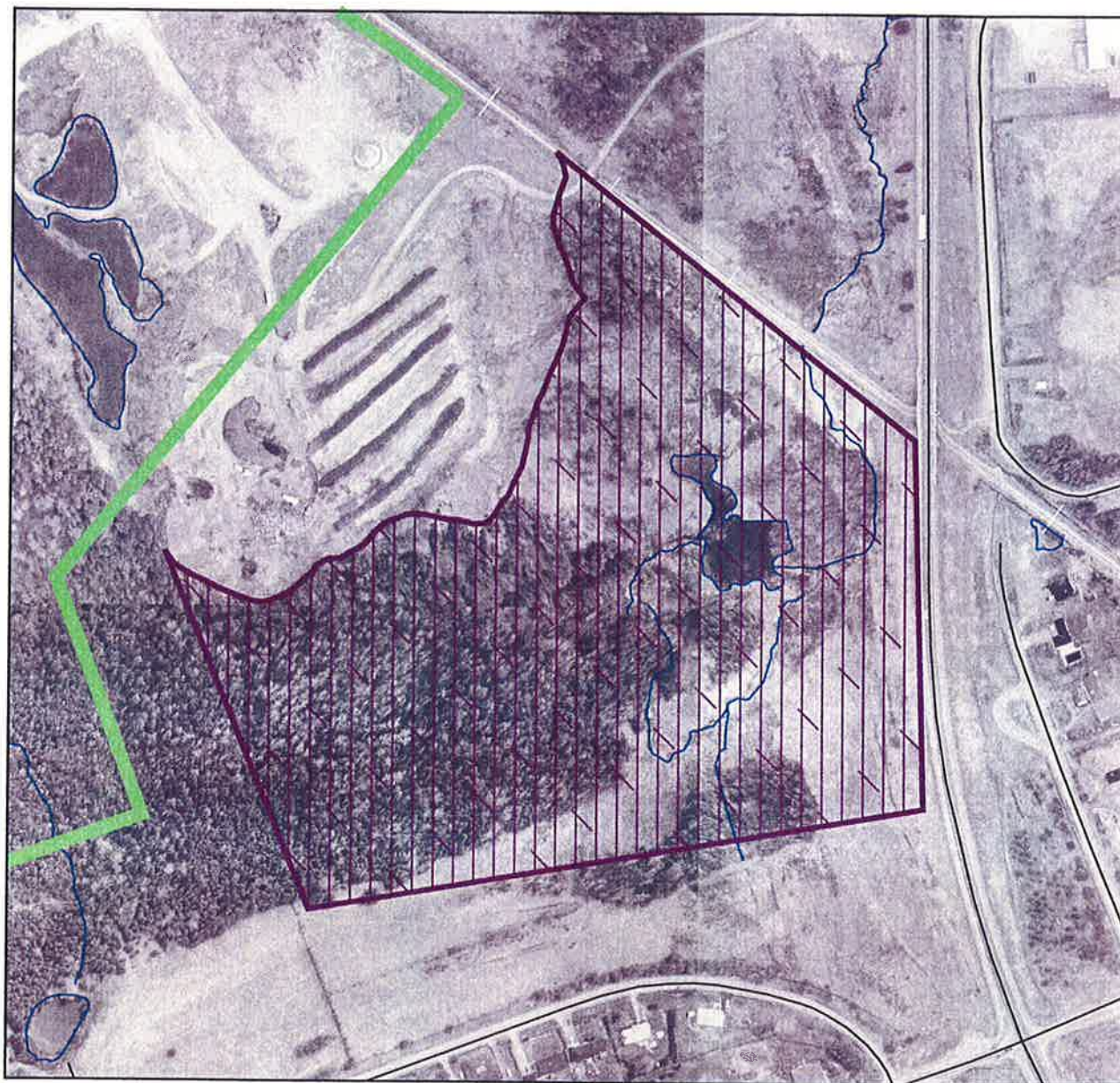
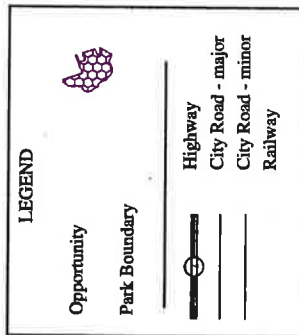
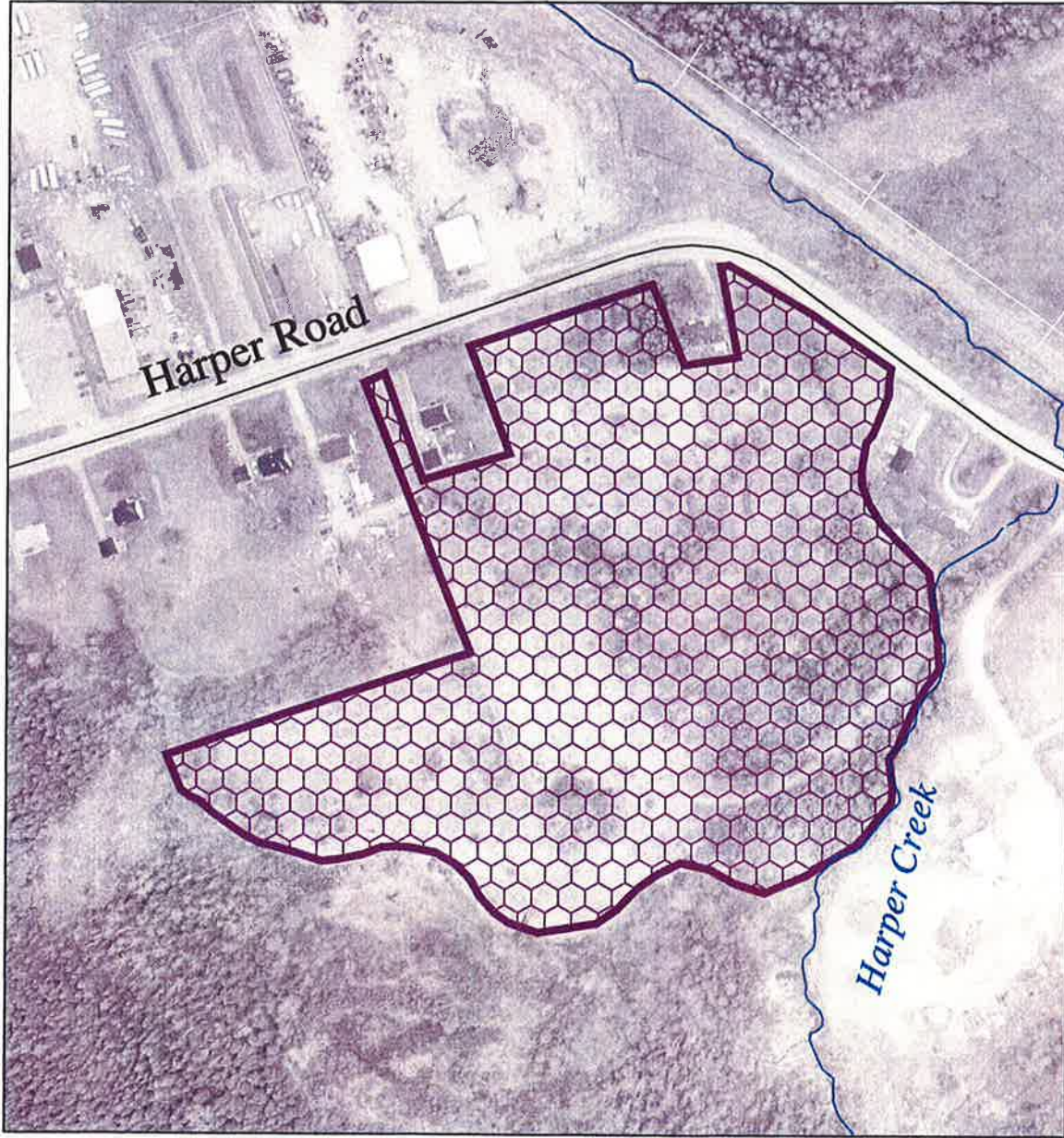


Figure No. 9
Harper Creek Park
Opportunities & Constraints Study
AREA OF OPPORTUNITY -
EAST MEADOW



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Aerial photo photography date: 1996



6.2 Areas of Constraint

Three areas of constraint have been identified within the Study Area where access and recreational use is not appropriate due to the sensitive ecological features present. These areas are:

- Area Five – Harper Creek Wetland
- Area Six – North West Block
- Area Seven – North East Block

6.2.1 Area Five – Harper Creek Wetland

The Harper Creek Wetland is already recognized as a very sensitive area. Disturbances to the wetland will not only have an affect on the wetland itself but will also have an affect on the natural heritage features of surrounding areas. No recreational use or access should take place within this sensitive area. Please refer to Figure 10 at the end of this section for a Map of this area.

6.2.2 Area Six – North West Block

The North West Block is classified as a mixed swamp, dominated by eastern white cedar with white birch. Patches of grasses and sedges and red osier dogwood were also observed in this area. The soils exhibited wet, hydric conditions. Many areas of groundwater upwelling were observed, characterized by patches of watercress. Many tributaries and channels of flowing water were observed throughout the northwest portion of this block, draining to the Harper Creek Wetland and the northern tributary of Harper Creek. This area is frequently used by wildlife including white tailed deer which were observed during field visits. Please refer to Figure 12 at the end of this section for a Map of this area.

6.2.3 Area Seven - North East Block

The North East Block is classified as a mixed swamp, dominated by eastern white cedar and paper birch. The northern portion of this block also contains areas of groundwater seepage which are dominated by pussy willow shrubs, sedges horsetail, and sensitive fern. The southern portion of this block also contains many areas of groundwater seepage and marsh dominated by cattails, dogwoods and

willow. White tailed deer were observed in this area during field visits. Although this area is not within the Harper Park boundary it is necessary to include it in the study, as it is adjacent to the Harper Creek Wetland. Please refer to Figure 11 at the end of this section for a Map of this area.

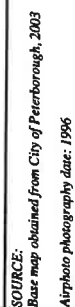
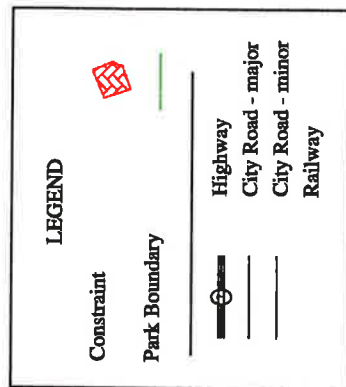


Figure No. 11
Harper Creek Park
Opportunities & Constraints Study
AREA OF CONSTRAINT -
NORTH EAST BLOCK



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Airphoto photography date: 1996

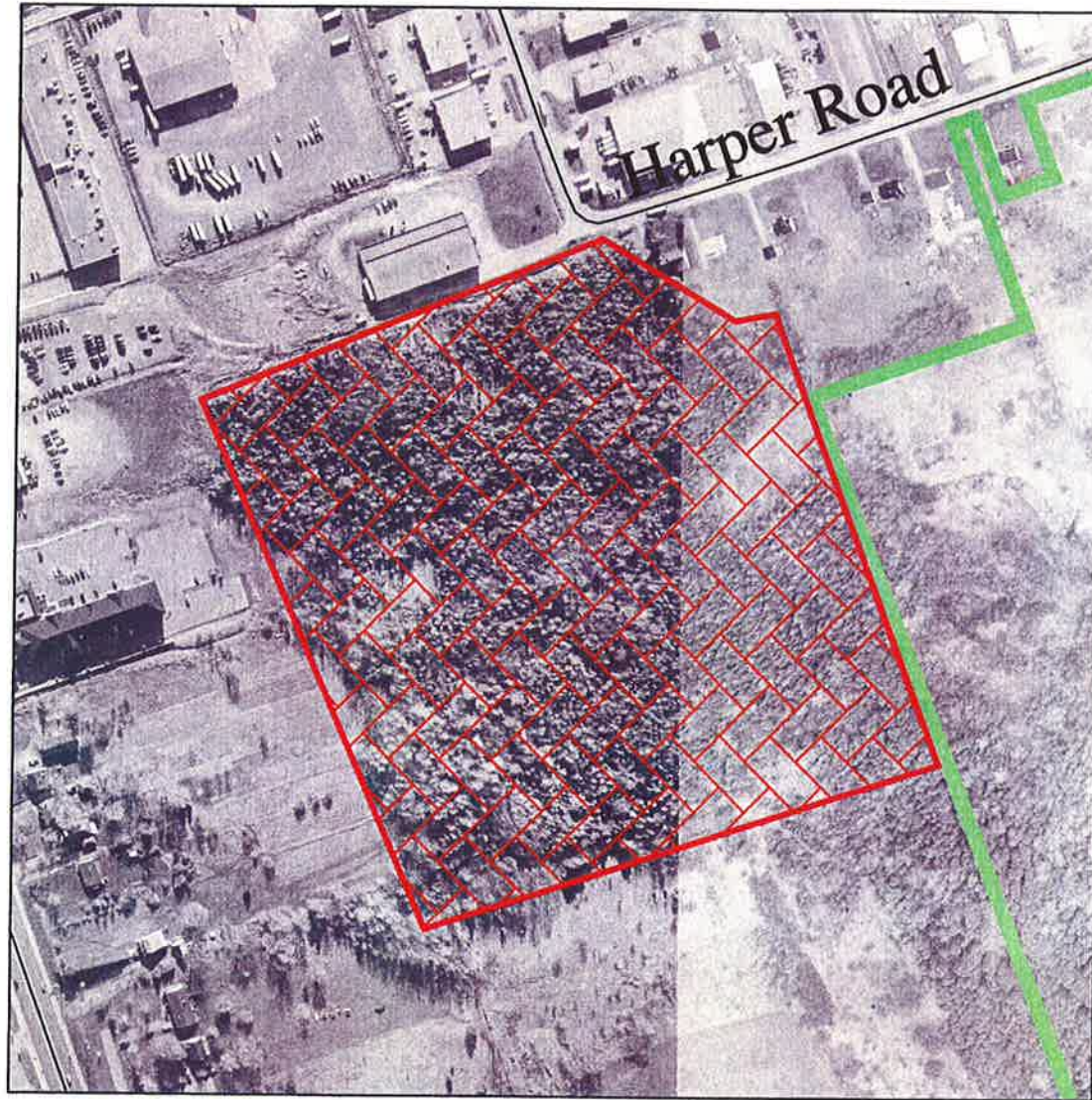
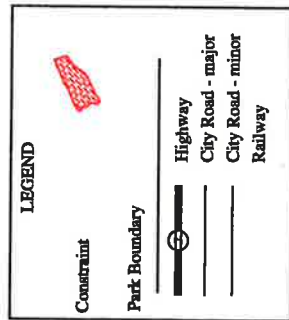
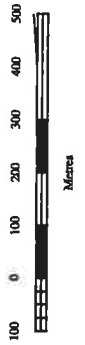
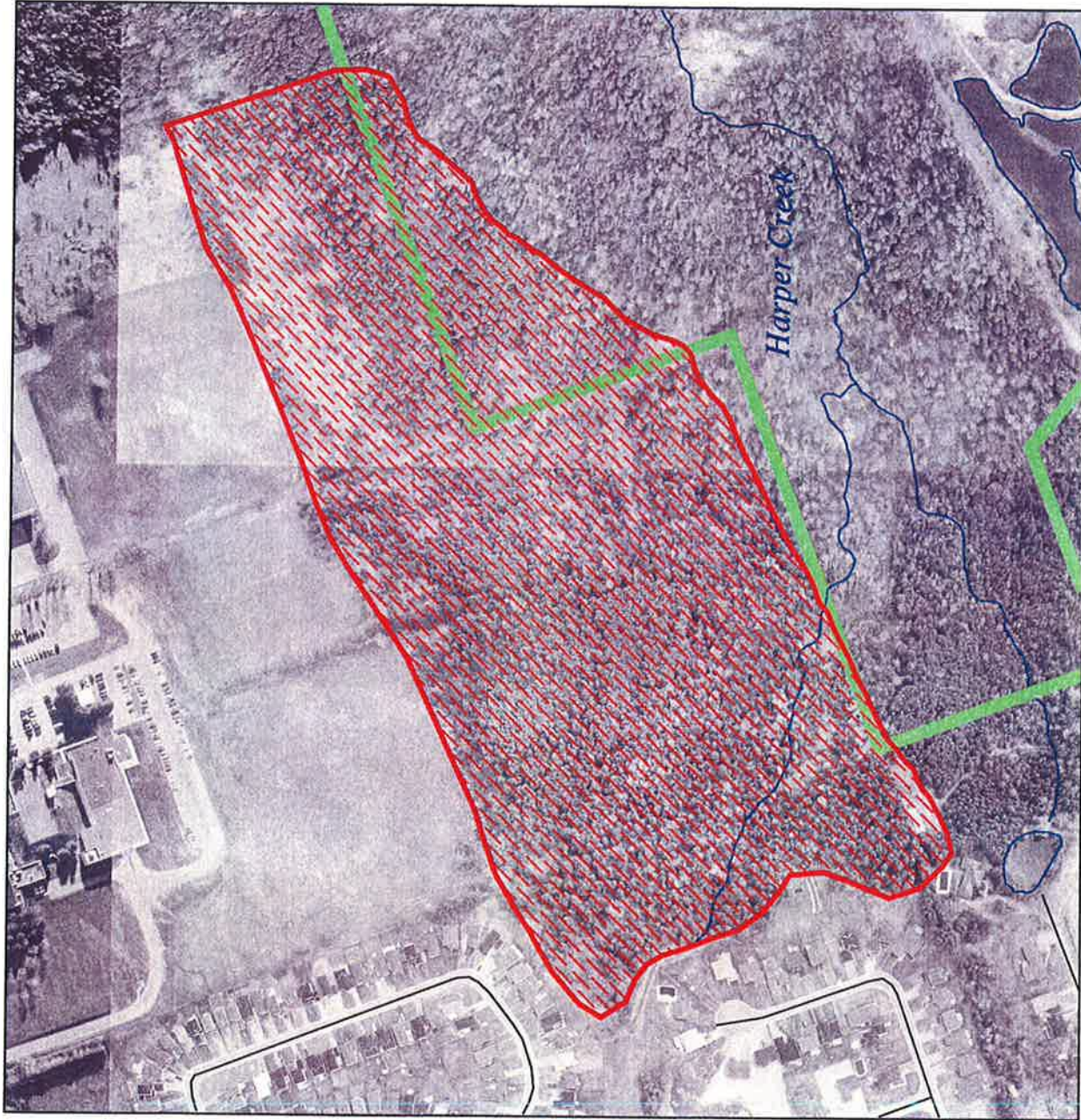


Figure No. 12
Harper Creek Park
Opportunities & Constraints Study
AREAS OF CONSTRAINT -
NORTH WEST BLOCK



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Aerial photography date: 1996



7. RESTORATION AND REHABILITATION OPPORTUNITIES

Six areas were identified in the vicinity of Harper Park as opportunities for restoration and rehabilitation. Please refer to Figure 13 for a Map of the sites identified as Restoration and Rehabilitation Opportunities and Appendix C for photographs of these sites.

7.1 Restoration in Area 8: Harper Creek– West of Ramblewood Drive (outside of study area)

This area is located West of Ramblewood Drive, between the College Park storm water detention pond and Spillsbury Drive. This portion of the creek has been significantly altered, and would benefit from naturalization to replace riparian vegetation that has been removed. The planting of native species of trees and shrubs would create a vegetated buffer to filter contaminants from run-off, and provide shade to maintain coldwater temperatures. In areas where the creek channel has been dredged and straightened, natural channel design techniques could be used to improve and restore aquatic habitat by creating pools, riffles and a more natural meander pattern. Please refer to Appendix B for a list of native species of trees and shrubs that would be appropriate for use in this area.

7.2 Restoration in Area 6: North West Block Harper Creek – East of Ramblewood Drive

The portion of Harper Creek, located east of Ramblewood Drive, between Creekwood Drive and Huntington Drive has been significantly altered and is contributing a large amount of sediment to the Harper Creek system due to run-off and erosion. This sedimentation is having a negative impact on fish habitat in the immediate area, and may be contributing to the elevated levels of total dissolved solids and conductivity in downstream water samples. An intensive riparian naturalization program would reduce the erosion by stabilizing the banks, provide shade to maintain coldwater temperatures and create a vegetated buffer to filter contaminants from run-off. Any riparian planting should be undertaken using native species of trees and shrubs.

There are sections of the main channel downstream of Ramblewood Drive where a heavy buildup of sand and silt was observed on the creek bed. This sediment is covering up the natural stream bottom, which consists of gravel and cobbles. The

resident brook trout (*Salvelinus fontinalis*) population requires this substrate for spawning and feeding on invertebrates. The amount of sediment in this portion of the creek should be monitored, as restoration of erosion problems upstream should reduce the amount of sediment transported downstream.

7.3 Restoration in Area 5: Harper Creek Wetland Main Channel of Harper Creek in Harper Creek Wetland

Deposition of sediment was observed in portions of Harper Creek within the Harper Park boundary. The source of this sediment is likely upstream erosion. High levels of sediment can have negative impacts on fish habitat and water quality, clogging fish gills, smothering fish eggs during spawning season and transporting bacteria and other contaminants.

Restoring upstream areas should reduce the amount of sediment being deposited in this area. Any riparian areas with exposed soils should be immediately revegetated using native species of trees and shrubs. There are also areas of Harper Creek within Harper Park that would benefit from in-stream aquatic habitat improvements such as the installation of boulder clusters to create scour pools and log debris to provide additional habitat.

7.4 Restoration in Area 7: North East Block Harper Creek – Rye Street Northern Tributary

The northern tributary of Harper Creek flows along the northeast boundary of the wetland before entering the Rye Street Industrial Park and flowing along the north side of Rye Street. This tributary eventually flows south at Webber Avenue before its confluence with Byersville Creek. This tributary has been significantly altered, and would benefit from naturalization to replace riparian vegetation that has been removed. Riparian plantings would provide shade to maintain coldwater temperatures and create a vegetated buffer to filter contaminants from run-off. Any shoreline naturalization should be undertaken using native species of trees and shrubs. There are many areas of groundwater seepage which contribute to the baseflow of this tributary and are crucial in maintaining cool temperatures in the stream. The northern tributary has been identified as an area of high quality fish habitat and a resident brook trout population has been identified in this reach of Harper Creek.

7.5 Restoration in Area 1: City Composting Facility (Sites A,B,C)

Since the current site of the composting facility has been in operation, the City has been attempting to minimize the impact of the current use on the natural environment. The ponds were formerly used as a dumpsite for asphalt and concrete, but this is no longer occurring as all concrete and asphalt are recycled by the city. Since the composting facility has been operating in its current location, the city has initiated several successful rehabilitation projects, primarily in the area adjacent to the ponds.

The amount of space required by the City of Peterborough for composting activities has increased significantly in the past few years as a result of the wet/dry Pilot Program and the success of the green waste collection program. This site has reached its maximum capacity and it is recommended that the composting facility be relocated as it is no longer adequate in size, and is not compatible with a natural environment recreational area.

It is also recommended that a 30 metre buffer be established as soon as possible along the creek and the wetland using a variety of native species of trees and shrubs. This buffer will reduce the negative impacts from runoff and erosion and protect the water quality of the creek and the aquatic habitat that supports a brook trout (*Salvelinus fontinalis*) population in this area.

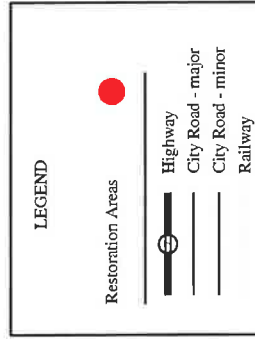
The ponds located within this area have the potential to provide excellent recreational opportunities. This area would benefit from additional shoreline naturalization using native species of trees, shrubs and grasses in areas with evidence of erosion. The eastern portion of the ponds is being encroached upon by the placement of fill. The fill should be removed from this area, and any exposed soils be stabilized by planting native shoreline vegetation species.

7.5 Restoration in Area 2: Armond Modular Manufacturing Property Sites: A,B,C,D

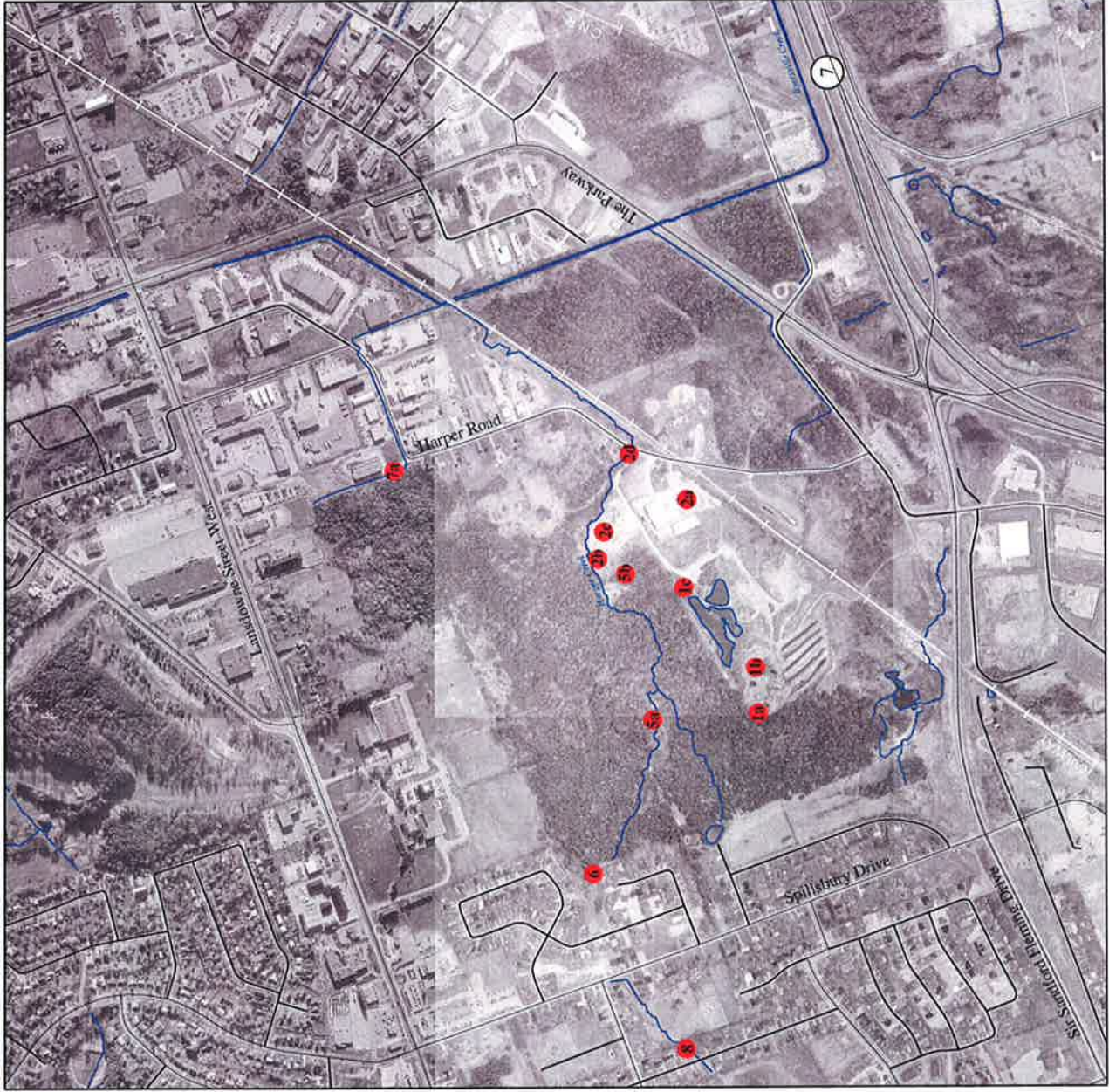
It is recommended that this site should be incorporated into Harper Park as soon as possible or when the lease agreement expires in 2013. Until this happens, there are several sites that would benefit from immediate restoration. The access road should be moved as soon as possible, and the former location revegetated using native species of trees and shrubs to create a minimum 30 metre buffer for the creek. The portion of this site near the crossing of Harper Creek and Harper Road

would also benefit from a culvert replacement and shoreline naturalization. The area currently used as storage for gravel, vehicles etc, should be moved away from the creek, and a 30 metre vegetated buffer created using native species of trees and shrubs to prevent runoff and sediment from entering the creek. Please refer to Appendix B for a species list of appropriate plant materials.

Figure No. 13
Harper Creek Park
Opportunities & Constraints Study
RESTORATION AND REHABILITATION
AREAS



SOURCE:
 Base map obtained from City of Peterborough, 2003
 Airphoto photography: date, 1996



8. SUMMARY

The identification of opportunities and constraints for the effective management of City-owned lands in the vicinity of Harper Park was undertaken by Otonabee Conservation during the summer and fall of 2003. This largely undeveloped area affords opportunities for recreational use, as well as areas which have environmental constraints and are best left undisturbed due to their environmental sensitivity. This area is not appropriate for playing fields, and every attempt should be made to maintain this as a natural environment recreation area, as intended by the City of Peterborough.

The technical assessment of the Harper Park Area began with an examination of literature, existing research and technical reports. Based on the desk-top analysis, staff developed a field program to further explore and assess natural heritage features within the study area. As a result of the investigations undertaken by Otonabee Conservation, the following seven areas were identified:

- Area One: City Composting Facility
- Area Two: Land Leased to Armond Modular Manufacturing
- Area Three: South West Block
- Area Four: East Meadow
- Area Five: Harper Creek Wetland
- Area Six: North West Block
- Area Seven: North East Block

Within Areas One and Two, opportunities for the development of recreational use such as picnic areas, a viewing tower, as well as a parking area and access road was identified. Areas more suited to passive use activities including walking trails, the construction of a wetland viewing tower, picnic area, and the installation of benches and interpretive signage were identified in the northern part of Area One and in areas Three and Four.

Areas Five and Six contain sensitive natural heritage features, including the Harper Creek Wetland and a second unevaluated mixed swamp. These areas are considered to be areas of constraint and are best left undisturbed. In addition, six areas in the vicinity of Harper Park have been identified as candidate areas for habitat restoration and rehabilitation.

Recommendations as a result of this study include the relocation of the composting facility as soon as possible, and the development of a restoration strategy that could be completed in phases leaving the property in an appropriate state to be incorporated into Harper Park upon the closure of the composting facility. It is also recommended that investigations start immediately regarding the relocation of the access road adjacent to Harper Creek at Harper Road to facilitate the creation of a buffer along the creek to protect water quality and aquatic habitat. It is also recommended that the city begin development of a restoration strategy for the lands leased to Armond Modular Manufacturing. As the current lease does not expire for ten years, the restoration could be completed in phases leaving the property in an appropriate state to be incorporated into Harper Park upon the expiration of the lease.

The City has identified several parcels of land for acquisition that are adjacent to properties currently owned by the City. Otonabee Conservation recommends that the City continue to acquire land in this area to increase the area of the park and protect the natural features within the existing park boundary.

It is also recommended that the zoning be changed in areas 3,4,5,6,7 to OS.1 (Conservation Zoning District) to further protect the natural heritage features found within these areas.

In summary, the City-owned lands within the Harper Park area afford many opportunities for a variety of recreational activities. The lands contain many sensitive natural heritage features, which are protected as a result of their acquisition by the City. The restoration of degraded areas will further enhance the City's land holdings in this area, improve aquatic habitat and water quality, and provide recreational opportunities for local residents.

The Harper Park area is an important natural area, as it is one of the last large undeveloped areas in the city and contains a variety of habitat. The City of Peterborough made an excellent decision to purchase these lands and preserve a locally significant wetland, cold water stream and natural area within the City boundaries. Through careful planning and management this area will continue to provide social and ecological benefits to the community.

9. REFERENCES

Aerial Photography (1954, 1996)

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Section C5.3 – “Policies and Procedures for Fill, Construction, and Alteration to Waterways” Otonabee Region Conservation Authority.

Appendix A:

Photos of Natural Heritage Features

Natural Heritage Features



Plate 1: Harper Creek Wetland

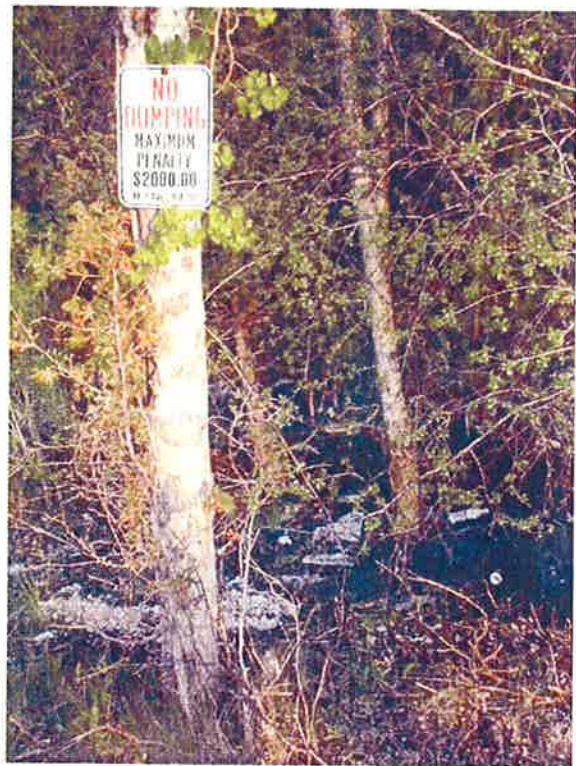


Plate 2: Signage Near Harper Creek



Plate 2: Harper Creek Wetland/Groundwater Seeps



Plate 3: Harper Creek Wetland



Plate 4: Fallen Tree near Harper Creek Wetland



Plate 5: Standing Tree near Harper Creek Wetland



Plate 6: Land Leased to Armond Modular Manufacturing



Plate 7: City Composting Facility – Southeast Area



Plate 8: Ponds near City composting Facility



Plate 9: Road near ponds



Plate 10: Southwest Block – North Section



Plate 11: Southwest Block



Plate 12: Northwest Block – Groundwater seepage area



Plate 13: Northern Border of Northwest Block



Plate 14: East Meadow



Plate 15: Red Osier Dogwood near area of groundwater spring

Appendix B:

Native Species of Trees and Shrubs

Native Plants of Peterborough County

TREES				
Common Name	Site Requirements	Road Salt Resistance	Shade Tolerance	Wildlife Value
Eastern Hemlock	dry soil conditions	low	very tolerant	mostly cover and some food for wildlife
Red Pine	dry soil conditions	low	intolerant	cover and nesting
Eastern White Cedar	moist/wet soil conditions	low	tolerant	winter shelter, nesting material for squirrels
Eastern White Pine	dry soil conditions	low	semi-tolerant	food for a variety of wildlife; Ontario tree
White Spruce	dry soil conditions	low	tolerant	good cover species for small mammals
Basswood	moist/wet soil conditions	moderate	tolerant	excellent food source and cavity tree
Black Cherry	dry soil conditions	moderate	intolerant	excellent food source for wildlife
Bur-Oak	moist/wet soil conditions	high	semi-tolerant	acorns provide an excellent food source
Red Maple	moist/wet soil conditions	moderate	tolerant	food source for birds and small mammals
Red Oak	dry soil conditions	high	semi-tolerant	provides one of the best sources of food
Silver Maple	very moist sites/wet soil conditions	moderate	semi-tolerant	excellent food source for squirrels
Sugar Maple	dry soil conditions	moderate	tolerant	food for squirrels
Tamarack	very moist sites/wet soil conditions	high	intolerant	food source for red squirrels
White Ash	dry soil conditions	high	semi-tolerant	food source for small mammals and birds
White Birch	dry soil conditions	moderate	intolerant	browse for hares, food chickadees

Native Plants of Peterborough County

Shrubs				
Common Name	Soil	Site Requirements	Plant Form	Value
Alternate-leaved Dogwood	well-drained soils	hillsides, ravine slopes, open forests	multi-stemmed shrub, height up to 6m	wildlife food, erosion control, naturalization
Chokecherry	well-drained to moist soils	wide variety of sites	multi-stemmed shrub, height up to 3m	wildlife food, erosion control, naturalization
Common Elderberry	sandy to loamy acidic soils	forest edges, roadsides, wetlands,	multi-stemmed shrub, height up to 4m	food and cover for wildlife
Common Juniper	dry soil conditions	hillsides, ravine slopes, open forests	grows up to 10m high	berries are a winter food supply for birds
Fragrant Sumac	dry soil conditions	open fields, ridges, streambanks	erect suckering shrub, height up to 3m	wildlife food, erosion control, naturalization
Grey Dogwood	dry to moist sandy soils	roadsides, fence rows, stream banks	multi-stemmed shrub, height up to 3m	wildlife food, erosion control, naturalization
Highbush Cranberry	fertile moist soils	streambanks, around wetlands	multi-stemmed shrub, height up to 4m	wildlife food, erosion control, naturalization
Nannyberry	dry to moist sandy soils	wetlands, forest edges, streambanks	erect suckering shrub, height up to 6m	wildlife food, erosion control, naturalization
Red Osier Dogwood	moist to wet sites	variable moist to wet sites	multi-stemmed shrub, height up to 3m	wildlife food, erosion control, naturalization
Serviceberry	moist to dry sandy soils	wide variety of sites	multi-stemmed shrub, height up to 3m	wildlife food, erosion control, aesthetics
Silky Dogwood	moist to wet sites	variable moist to wet sites	multi-stemmed shrub, height up to 3m	wildlife food, erosion control, naturalization
Staghorn Sumac	grows in dry poor conditions	open fields, ridges, streambanks	erect suckering, shrub height up to 3m	wildlife food, erosion control, naturalization

Wildflowers and Grasses

Common Name	Description
Anemone	creeping shoreline ground cover
Blackeyed Susan	drought tolerant, orange flowers
Bloodroot	early blooming woodland plant
Blue Iris	common shoreline plant
Butterfly Milkweed	brilliant orange blossoms
Cardinal Flower	red blooms, damp soil or shade
Foamflower	needs shade, white blossoms early spring
Goldenrod	common fall bloomer, many species
Great Blue Lobelia	damp soil or shade, blue blossoms
Heath Aster	white blossoms, drought tolerant
Helen's Flower	tall, fall bloomer, wet or dry soil
Jack in the Pulpit	woodland plant
Joe-Pye Weed	wetland plant, pink/purple blooms
Marsh Marigold	early spring, wetland plant
New England Aster	fall bloomer, purple flowers
Swamp Milkweed	pink blooms, wetland plant
White Beardtongue	drought tolerant, June bloomer
White Trillium	familiar woodland plant
Wild Bergamot	pale mauve blossoms, drought tolerant
Wild Columbine	woodland wildflower, June blooms
Wintergreen	woodland groundcover for acidic soil
GRASSES	
Big Bluestem	indicator of tallgrass prairie, full sun
Indian Grass	beautiful golden seed heads
Little Bluestem	low grass reddish in fall
Side-oats Grama	very drought tolerant, full sun
Switch Grass	tall, decorative airy seed heads

Non-native Species Management

Non-native species are species that have been introduced into environments in which they didn't evolve. They are also referred to as exotics, aliens, weeds and invasive species. These non-natives have the potential to spread rapidly and displace the native species. This can seriously disrupt the local ecosystems by changing the composition, structure and function of the native plant communities¹. To control this problem avoid exotic species if at all possible. The following is a list of exotics to avoid.

Ornamentals	
Species To Avoid	Alternatives
Norway Maple	Basswood
European Birch	Sugar Maple
European Highbush Cranberry	White Ash
European Mountain Ash	Red Mulberry
White Mulberry	White Pine
Horse Chestnut	Honey Locust
Silver Poplar	Trembling Aspen
Black Locust	Trumpet Creeper
Scots Pine	
Silver Dollar	
Creeping Bellflower	

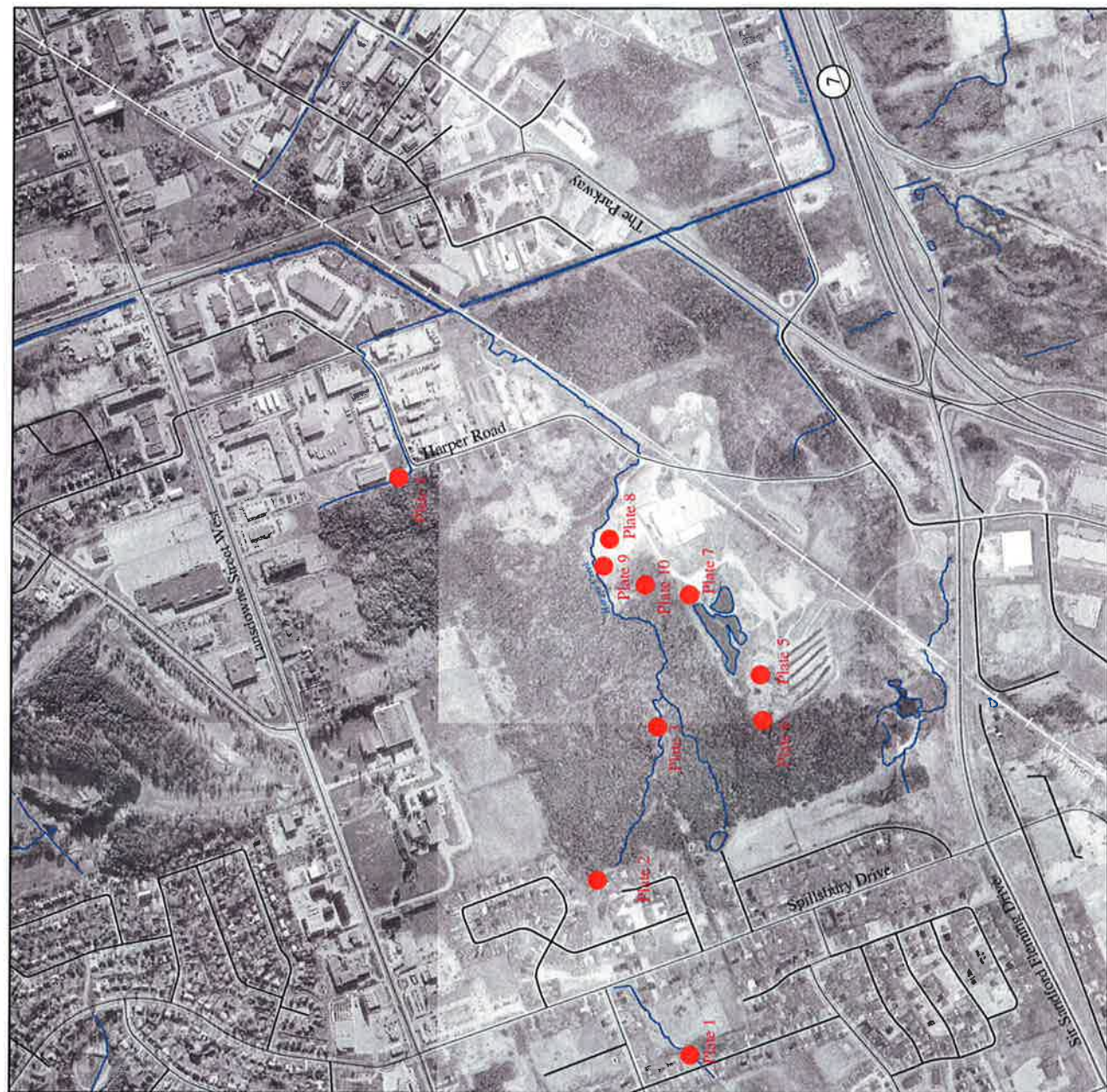
Ground Covers	
Species To Avoid	Alternatives
Sweet Woodruffe	Native Ferns
Crown Vetch	Herb Robert
Lily of The Valley	Virginia Creeper
Moneywort	Bearberry
English Ivy	Wild Strawberry

¹ Taken from "Berman, Laura. How Does Your Garden Grow? A Guide to Community Garden Success. Toronto, Ontario: Foodshare Metro Toronto, 1997.

Appendix C:

Photos of Restoration and Rehabilitation Opportunities

Figure No. 14
Harper Creek Park
Opportunities & Constraints Study
Location of Photos of
RESTORATION AND REHABILITATION
AREAS



LEGEND

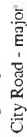
Restoration Areas Photos



Highway



City Road - major



City Road - minor



Railway



SOURCE:
 Base map obtained from City of Peterborough, 2005
 Aerial photograph date, 1996



Restoration and Rehabilitation Opportunities



Plate 1: Harper Creek – West of Ramblewood Drive



Plate 2: Harper Creek - East of Ramblewood Drive



Plate 3: Sediment in Harper Creek – Harper Park Area



Plate 4: Harper Creek – Rye Street Northern Tributary



Plate 5: City Compost Facility – Storage of compost close to wetland



Plate 6: City Compost Facility – Encroachment into the wetland



Plate 7: City Compost Facility – Filling in around ponds



Plate 8: City Compost Facility – Storage of fill next to Harper Creek



Plate 9: Placement of fill encroaching into Harper Creek



Plate 10: Placement of fill encroaching into Harper Wetland