PUSLINCH TRACT CONSERVATION AREA

MASTER PLAN

Grand River Conservation Authority

June, 2004

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Section 1:
The Context

1.1 PROPERTY CONTEXT

The Puslinch Tract Conservation Area property is located in Puslinch Township, in the southern part of Wellington County (Appendix 1, Map 1.1). The site consists of portions of lots 6-10 south of Highway 401 in Concession 2. Wellington County Road 32 borders it on the west, Concession 2 on the south, and Sideroad 10 South on the east. The northern edge of the property is bordered by Highway 401, a McDonald's restaurant, and a service station (Appendix 1, Map 1.2). As such, Puslinch Tract Conservation Area is located approximately 4 km east of the City of Cambridge (Figure 1.1). The property is approximately 107 hectares in size.

Land surrounding Puslinch Tract Conservation Area is increasingly being developed. To the north along Highway 401, a service centre consisting of a Petro-Canada gas bar and a McDonald's restaurant is located adjacent to the property. Properties to the south are generally developed for residential and agricultural purposes. To the east of Sideroad 10 South the land is covered largely by woods and wetlands except where residential lots have cut into these features. Lake Road Country Store and Gas Bar as well as residential homes are located immediately adjacent to the west of Puslinch Tract Conservation Area. The parts of lots 4 and 5 lying west of Wellington Road 32 remain under Crown control and Ministry of Natural Resources management.

The property is currently zoned secondary agricultural according to the Wellington County Official Plan. Section 6.5 of the Wellington County Official Plan states that, "secondary agricultural areas include land within the rural system which are determined to be non-prime farmland but which can sustain certain agricultural activities." Also, portions of Puslinch Tract Conservation Area contain core greenlands. These areas are part of the greenlands system from the Wellington County Official Plan, and are determined by the inclusion of any of the following: provincially significant wetlands, habitat of endangered or threatened species, and floodways and hazardous lands.

1.2 PROPERTY HISTORY

Pre 1970: First Aggregate Extraction

Purchased by the Department of Highways (precursor to the Ministry of Transportation and Communication (MTC)) in March 1963, the property, which was Crown Land before acquisition, was used as an aggregate source during the construction of Highway 401. Lots 6 and 8 were used as the source of aggregate for the construction. While under Crown control, Puslinch Tract Conservation Area was titled the **Puslinch Crown Resource Management Area**.

In March 1966, lots 6, 7, and 10 were transferred to the Ministry of Natural Resources (MNR) to undertake management of hardwood forests. Even though the MNR did not have ownership of the entire property, together with the MTC, they both through an informal agreement managed the tract on a multiple use basis. As part of the multiple use approach, timber and wildlife management techniques were directed towards maximization of resource use. Warped trees and species with little economic or wildlife value were removed to provide for increased growth of more suitable species in economic and

wildlife production terms. Conifers were planted in open areas to improve site conditions for wildlife and to promote the natural regeneration of hardwoods. A variety of fast growing species were planted along Puslinch Tract Conservation Area's northern boundary, adjacent to Highway 401, to buffer the effects of the highway from the low intensity recreational activities on the site. Also, the pit area in part lot 8 was deepened and rehabilitated by the MNR.

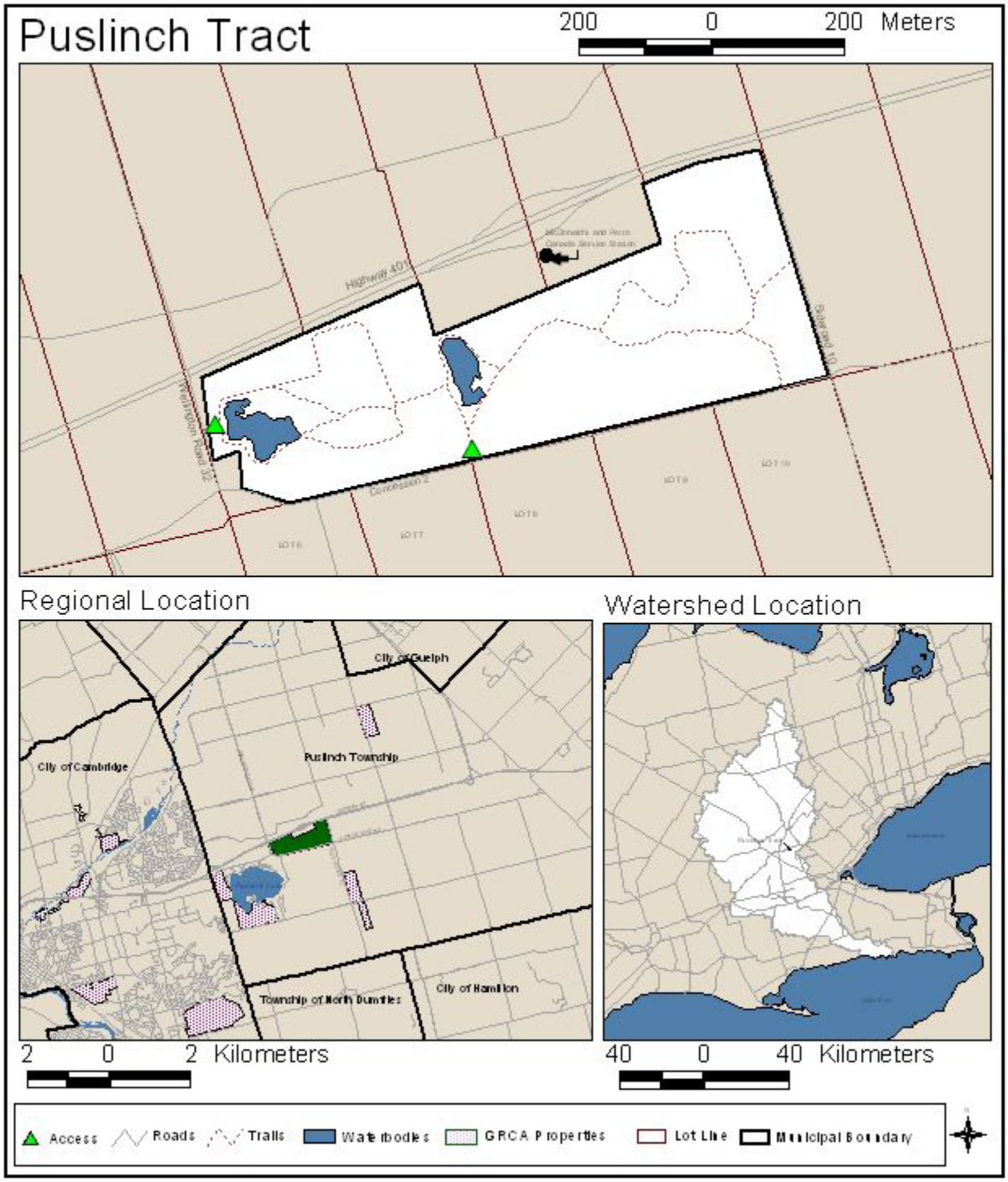

Figure 1.1 Location Map

1971 to 1978

A number of red pine plantations in lots 8 through 10 were established including a sizeable tract in 1971 in the northeast corner of lot 10.

In 1974 and 1975, smaller but substantial plantations were planted east of the service centre in the northeastern portion of lot 9, immediately south of the service centre in northern lots 8 and 9, north of the hardwood stand in eastern lot 10, and in the southeastern corner of lot 9. An experimental western white pine plantation was planted in the northwest corner of the property, and an experimental plantation of both eastern and western white pine was planted north of the hardwood stand in lot 7. A mixed red and white pine plantation (in alternating rows) was planted in the south-central portion of lot 9, east of the hardwood stand along Concession 2.

Meanwhile, between 1974 and 1976, an agreement between the MNR and the MTC regarding management responsibilities and ownership for lots 6 and 7 was conceived and developed when the "MNR identified that their multiple use approach could be enhanced through the development of a fishery by the extraction of the underlying high quality aggregate." This approach was intended to move land in lots 6 and 7 – of low productivity in terms of timber production, wildlife, agricultural, and recreational use – to a higher productivity by increasing recreational use. The low productivity of lots 6 and 7 was due in part to the influence of past extraction in lot 6 (i.e., stripping of the area left it without topsoil), but also to a general low capacity, with the soil in lot 7 being characterized by excessive stoniness and lack of nutrients. These years also saw studies on aggregate potential, development possibilities, research and analysis, and an economic analysis, resulting in an approval of the second extraction project by the MNR and MTC.

Lastly, land in the central portions of lots 8 and 9, in the southeastern corner of lot 9, and north of the hardwood stand in southern lot 7 was used for wildlife food plots (planted with millet, oats and corn), and subsequent lining of the these plots was with white spruce, eastern white cedar, and multi-flora rose in 1974 through 1976.

Sometime prior to 1978, there was deepening and rehabilitation of the pit created by the initial extraction in lot 8 to produce a pond, and subsequent stocking of that pond with trout species. Extensive planting of wildlife trees and shrubs, including Tartarian honeysuckle, Russian olive, autumn olive, multi-flora rose, catalpa, and highbush cranberry, was conducted in localized clusters and rows over much of the property.

1978

In 1978, a formalized management agreement between the MTC and MNR was drafted for the removal of aggregate, along with a development and rehabilitation plan titled "An Environmental Assessment for the Puslinch Crown Resource Management Area." The agreement meant that the MTC would have the rights to all extracted aggregates, while the MNR had the primary role in property management.

1981: Second Aggregate Extraction

In 1981, the 1978 aggregate development and rehabilitation plan was passed. This plan gave the MTC the rights to all extracted aggregate, while giving the MNR a primary role in property management by including it in the Puslinch Technical Advisory Committee. The development plan outlined a seven phase extraction plan. Phase one covered the western third of the central area of lot 6, with phases two and three progressing east. In phase four, the extraction moved to the southern edge of the central area of lot 7, moving north through phases five, six, and seven. In addition to the extraction itself, the plan

outlined that: berms 2 - 2.5 m high be constructed around the pit area; construction of a wetland in the southwest corner of lot 6, and the northeast corner of lot 7; a hardwood woodlot on the southern third of lot 7 be left undisturbed by the extraction; one pond filling the central portion of lot 6 and one pond or wetland in the south central region of lot 7 be created due to the removal of aggregate material.

Although documentation of extraction on the property between the plan's conception and the present is extremely limited, it appears that the seven phases proceeded. Phases one through three of the plan were completed almost immediately after their conceptualization in the spring of 1977, even before the plan and it's environmental assessment received formal approval in 1981.

Later in January 1984, the MNR took full ownership of the remaining lots 8 and 9.

1993 to 1997: Round Two of Second Aggregate Extraction

A second round of extraction in lot 6 started in October 1993, moving, as in the first round, in three phases from west to east. Phases four through seven from the first round, in lot 7, are more difficult to document, particularly as there are no air photos of the area between 1979 and 1993 and between 1993 and 1999. It seems that the most recent extraction of Puslinch Tract Conservation Area occurred in the general vicinity of the area planned for phase seven (i.e., just north of the woodlot at the south end of lot 7) in approximately 1997. This coincides with the 1997 expansion of Highway 401.

Associated with the extraction phases during this period is the removal of two plantations. Just north of the woodlot at the south end of lot 7, a white pine plantation in this area is intact in a 1993 air photo, but is not present in 1999. Another plantation of unknown species that was planted west of the white pine plantation in lot 7 also appears in the 1993 air photos but has since been removed. These two plantations were removed because of the aggregate extraction in the area.

Past twenty years

Other than the second aggregate extraction, Puslinch Tract Conservation Area seems to have undergone few changes between 1979 and 1999. Lots 8, 9, and 10 have been left largely unchanged since 1979. Documentation shows improvement practices on the three hardwood stands and selective cutting of fuel wood around the major wetland along the eastern edge of the property. Judging by the air photos, it also appears that additional red pines were planted in the southeastern corner of lot 9 and white pines in two locations south of the service centre to expand already exiting plantations.

In 1999, the Grand River Conservation Authority (GRCA) purchased the entire property from the Ministry of Natural Resources. Since then, the GRCA managed the property in regard to security, trail maintenance, and forest management.

1.3 PURPOSE OF THE PLAN

As the Grand River Conservation Authority purchased Puslinch Tract Conservation Area in 1999, this is the first GRCA Master Plan for this property. The Master Plan is intended to provide "big picture" context and direction for the future management of the property. It outlines the primary goals and objectives for the property, and recommends new and current management practices that try to accomplish those goals and objectives.

1.4 GOALS AND OBJECTIVES

Goals:

1. To conserve, protect and enhance the natural environment of the site, while providing passive recreational opportunities that do not impact that environment.

Objectives:

1. To maintain a "conservation area reserve" for potential future recreational development by the Conservation Authority.
2. To continue to provide passive recreation opportunities.
3. To identify all natural and sensitive features, and establish appropriate buffers around them.
4. To reserve the option of subsequent establishment of an active conservation area with campground.

1.5 PLANS REPORT STRUCTURE

The Puslinch Tract Conservation Area Master Plan is a "Focused Site Specific" Master Plan. The Plan identifies the overall objectives for the property, with respect to social, economic, natural heritage and environmental attributes. These objectives are accomplished by covering a number of important issues through eight different sections. The sections include: (1) The Context; (2) Grand River Conservation Authority Policies and the Master Planning Process; (3) Physical Conditions and Biophysical Resources; (4) Existing Uses; (5) Issues, and Stakeholder Input; (6) Management Practices; (7) Recommendations; and (8) Plan Implementation.

Section 2:
Grand River Conservation Authority and the Master Plan Process

2.1 INTRODUCTION

Two themes are presented in Section 2, an introduction of the Grand River Conservation Authority (GRCA), and an overview of the Master Plan Process. A brief history of the GRCA is given, including the organization's mission, vision, and values, strategic plan and focus. Secondly, the Master Plan Process is outlined, including how a Master Plan is developed through various stages.

2.2 THE GRAND RIVER CONSERVATION AUTHORITY

In the 1800s, the Grand River provided transportation, water supply, and waterpower, attracting settlement to the valley. Deforestation and urban settlement combined to aggravate flood and drought conditions. Water quality in the river deteriorated to the point where it was a public health concern. To deal with these problems a group of eight municipalities banded together to form the Grand River Conservation Commission in 1932. In 1942, the Commission completed the Shand Dam, the first multi-purpose dam in Canada, built for flood control and low flow augmentation to improve water quality during the dry summer months. It also started planting trees around reservoir sites to help restore the watershed.

Resource problems were not unique to the Grand River watershed. Prior to World War II, renewable natural resources were exploited to encourage industrial expansion and economic growth. As a result of public concern about the state of the environment in Ontario, the Province passed the Conservation Authorities Act in 1946. The Act was based on three principles:

- Initiative for the establishment and support of a conservation authority must come from the local people (all watershed municipalities).
- The best unit for dealing with renewable resource conservation is the watershed.
- If initiative and support were shown locally, the Ontario government would provide technical advice and financial assistance in the form of grants.

The GRCA is a corporate body established to enable municipalities to jointly undertake water and natural resource management on a watershed basis - for the benefit of all. The broad goal of all conservation authorities in Ontario is specified in Section 20 of the Conservation Authorities Act: *The objectives of the Authority are to establish and undertake in the area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals.*" (RSO 1990, c. 27). Under the terms of the Act, the Grand Valley Conservation Authority was formed in 1948. The practicality of two conservation organizations operating in the same watershed was closely scrutinized in the 1960s. To avoid potential conflict over roles and responsibilities and to eliminate duplication of programs the Grand River Conservation Authority was established in 1966 through the amalgamation of the Grand River Conservation Commission and the Grand Valley Conservation Authority.

Since 1966, the GRCA, its member municipalities, and the community, have accomplished much in bringing back environmental health and sustainability to the watershed. Brown Trout populations in the upper Grand River have been revitalized due to better water quality and fish habitat and spawning restoration projects. Streams have been improved by projects focused on stream runoff and bank erosion, tree planting, and water quality. The GRCA has promoted educational and recreational activities that allow people to experience the Grand River and its watershed. The combination of programs undertaken by the GRCA and its partners over the last 60 years has created a story of recovery in the Grand River from years of degradation and industrialization. In 1991, the GRCA established its mission, vision, and values (listed below).

Vision

"To be a leader in ensuring a healthy and sustaining relationship between the natural environment of the Grand River watershed and the demands on this environment by all forms of life."

Mission

"To work with partners to conserve the natural processes and resources that support a safe and healthy environment for future generations in the Grand River watershed."

Values

"Openness, clarity, understanding, sensitivity, action, holism, integrity, accountability, trust, flexibility, fairness, preparedness, creativity, innovation."

2.3 MASTER PLAN PROCESS

A Master Plan describes an overall development concept including present uses and future land development plans for a property. All Master Plans are related to an authority's watershed plan or conservation and recreation land management plan, while also contributing to subsequent stages of planning by specifying site development and operations planning guidelines for the area of land in question.

Different levels of Master Plan detail will be required for different properties. They can be prepared on a site-specific basis, or alternatively, one plan can be prepared for an entire class of properties. Furthermore, site specific Master Plans can be comprehensive or focused. A *comprehensive* Master Plan is a strategic document that identifies the overall objectives for a property, with respect to social, economic, natural heritage and environmental attributes. A *focused* Master Plan would be less comprehensive. It would not consider a large number of alternative uses, and would not require significant public input.

There are a number of key components included in most Master Plans. They include a general introduction and history of the property, followed by a detailed ABC inventory (Abiotic, Biotic, and Culture), some information about past, present and potential future uses, and then proposed plans that are followed by a suggested implementation process. An approach to developing a Master Plan is outlined below. Depending on the size and nature of the property, this process can often times take a couple of years.

Developing A Master Plan

Steps involved in developing a Master Plan are outlined below.

1. Determine the class of plan applicable to the subject property.
2. Gather existing relevant data, management records, Master plans, relevant sections from thematic and/or subwatershed plans, reports, and policies.
3. Identify information gaps that need to be addressed for the appropriate class of plan.
4. Develop and implement a work plan to address information gaps.
5. Develop and implement a strategy for staff and community involvement in the planning process appropriate to the subject Master Plan.
6. Establish the goals and objectives for the management of the subject property.
7. Describe the property's physical, natural, and cultural heritage attributes and context, its history and past management, and its current use.
8. Identify management opportunities and constraints presented by the subject property's physical, social, environmental and cultural attributes.
9. Identify and reconcile potential or current conflicts related to goals/objectives, constraints/opportunities, current or potential use.
10. Create, and show in map form, zones of land use; develop and apply generic and/or specific land use policies to the various zones.
11. Identify threats to the long-term sustainability and ecological health of the property, and recommend mitigating strategies.
12. Recommend policies, strategies, and actions that protect the sustainability and ecological integrity of the property and optimize benefits to the watershed and its community.
13. Compile all of this information according to the appropriate template into an informative and readable Master Plan.
14. Ensure that the plan is compatible with adopted plans or strategies of the Grand River Conservation Authority; the expectations of staff, the board, and the community; and, relevant municipal, provincial, national, and international strategies.
15. Present the Master Plan to the board of the Grand River Conservation Authority for approval.

Historically, most Master Plans provided a twenty year horizon for management activities and development, as well as to set the context for routine property operations. Generally, a Master Plan's time frame is dependent upon its recommendations. A plan usually will take five, ten or twenty years to implement all recommendations.

Key to developing any Master Plan is the involvement of multiple internal professionals, as well as private and public stakeholders. In general, society has a growing demand for outdoor recreation, and therefore, is visiting and using parks more often than in the past. Also, in general, society has a higher expectation of being involved in community matters. There is much knowledge in the community to be brought to the planning process. Therefore, it is vitally important to have their input into the Master Plan Process. Input from citizens is required, whether municipal representatives, school board councils or representatives, and sometime, private companies. Also, GRCA staff with backgrounds in planning, forestry, parks management, business, and ecology, provide input to the Master Plan Process.

Section 3:
Physical Conditions and Biophysical Resources

3.1 INTRODUCTION

Section 3 outlines the physical and biophysical resources present at Puslinch Tract Conservation Area. From these two sections, the following specific topics will be reviewed: climate, topography, geology, hydrology, soils, mammals, fish, amphibian and reptiles, and birds.

3.2 PHYSICAL CONDITIONS

The physical conditions of the Puslinch Tract Conservation Area are briefly reviewed using the following five topics: climate, topography, geology, soils, and hydrology.

3.2.1 CLIMATE

Puslinch Tract Conservation Area lies at the northern boundary of the South Slopes Climatic Region (Brown et al, 1974). Mean daily minimum and maximum temperatures for January in this region are –8.9 to –10.0°C and –1.1 to –2.2°C respectively. July mean daily minimum and maximum temperatures are 13.3 to 14.4°C and 26.7°C respectively. The mean annual precipitation is close to 812.8 mm (Brown et al, 1974).

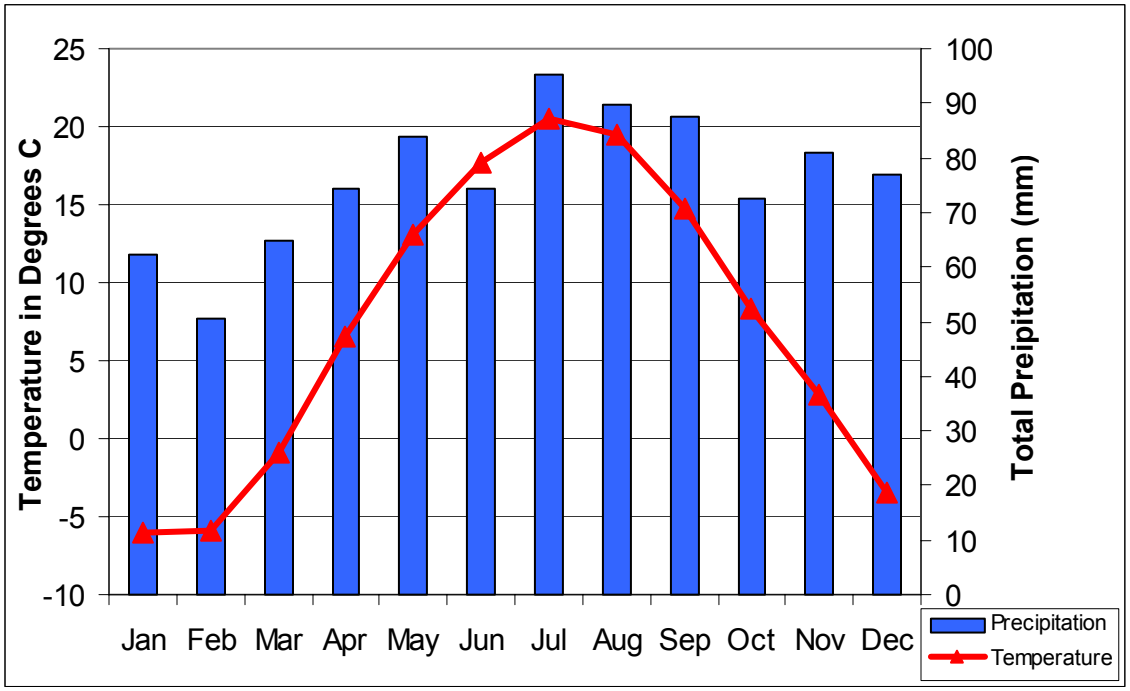

Figure 3.1 General Local Climate for Puslinch Tract Conservation Area (1971-2001 Climate Normals, Environment Canada, 2004).

Table 3.1 General Local Climate Summary for Puslinch Tract Conservation Area (1971-2000 Climate Normals, Environment Canada, 2003).

Temperature:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Mean (°C)	-6.0	-5.9	-0.9	6.5	13.1	17.7	20.5	19.5	14.8	8.3	2.8	-3.4	7.2
Precipitation:													
Precipitation (mm)	62.2	50.6	65.0	74.2	83.9	74.5	95.2	89.7	87.4	72.4	81.0	76.9	912.9

3.2.2 GEOLOGY

The bedrock underlying Puslinch Tract Conservation Area (and much of Puslinch Township) is the mid-Silurian Guelph Formation (Appendix 1, Map 3.1), a sequence of white to light brown dolomites deposited over the more ancient Precambrian rock of Northern Ontario in a marine environment over a lengthy period (Chapman and Putnam, 1966). The formation lies at an approximate depth of 30 metres under the Paris and Galt Moraines.

Closer to the surface are surficial geologic formations. These features include glaciofluvial ice-contact deposits, glaciofluvial outwash deposits, organic deposits, and Wentworth till (Appendix 1, Map 3.2). These deposits are the result of the mid-Silurian Guelph Formation, and it is these deposits that influence the present soils.

Puslinch Tract Conservation Area is associated with the Horseshoe Moraine physiographic region and is characterized by a series of clay ridges flanked by sand and gravel spillways. Within the hilly, moraine landscape, local plains of smoother lacustrine deposits and limestone plains occur, but cover a much smaller proportion of the area. Puslinch Tract Conservation Area contains examples of till moraines, eskeroid deposits, and spillway terraces typical of the region.

3.2.3 SOILS

Soils in the Puslinch Tract Conservation Area are of the Grey-Bruce Podzolic Order. Three soils types exist within the Puslinch Tract Conservation Area: the Dumfries soil type, the Burford loam type, and the Donnybrook sandy loam type (Appendix 1, Map 3.3). Dumfries soils develop from the coarse, calcareous, open, stony till, composed largely of dolomite and traces of red shale (Chapman and Putnam, 1966). Water readily penetrates through the stoney materials of the Dumfries soils and thus it is well drained. The Burford loam soil type, associated with the terraced spillways developed by glacial meltwater streams, covers almost the entire northwest corner of the property. The Burford loam soils is well drained, consisting of loam over stratified gravel deposits. The third soil type is found in the northeast corner of the property, where Donnybrook sand loam soils are present. The Burford, Dumfries, and Donnybrook soils are all well drained soils.

3.2.4 TOPOGRAPHY

The topography is characterized by gently undulating to rolling terrain, and open fields. As well, the landscape produced by the interaction of the surficial geology and soils can be, in some areas, very hilly with steep irregular slopes and small kettles. A topsoil berm, built prior to the second extraction project in the early 1980s, encircles the west side of the property.

The Puslinch Tract Conservation Area is essentially located on the Galt Paris Moraine. The moraine stretches approximately 80-90 km north to south from Mono Road Station to Paris. Due in part to its size, this moraine is a key physiographic feature in the area.

3.2.5 HYDROLOGY

Ponds

The present surface hydrology consists mainly of two small ponds, provincially significant and locally significant wetlands, and vernal pools. However, the most conspicuous hydrologic features at Puslinch Tract Conservation Area are the two ponds, the west pond and the east pond (Appendix 1, Map 3.4). The west pond is located in the Lot 6 portion of the property, covering an area of approximately 2.5 hectares (Figure 3.2). This pond is the result of the 1977 gravel extraction, and as a secondary result of the gravel extraction, the pond is surrounded by abrupt, steep, short banks. The northern and southern ends of the pond contain deep pools, while the central portion is underlain by a higher gravel bar. Average depth is 0.93 metres, and maximum depth is 2.5 metres. The east pond is located in Lot 8, near the middle of the property, and covers an area of approximately 1.7 hectares (Figure 3.3). This pond dates back to the first gravel extraction in 1959. It is generally deeper than the west pond, and wetland vegetation surrounding the shoreline is more developed. Like the west pond, the banks are abrupt and short but slightly steeper. The northeastern part of the lake is the deepest, with raised gravel forms across the south half, and a small bar along the north edge. Average depth is 1.59 metres, and maximum depth is 4 metres.

Figure 3.2 West Pond (2003-11-10)

Figure 3.3 East Pond (2003-11-10)

Drainage

There are no watercourses on the property. Drainage is primarily through ground infiltration, overland flow to wetlands, kettles, and vernal pools, and via road ditches into Little Lake.

Groundwater Recharge

Areas of significant groundwater recharge are displayed in Appendix 1, Map 3.4. The majority of Puslinch Tract Conservation Area is highly significant in regard to groundwater recharge. The water table is relatively high throughout the property, and this has an influence in the amount of vernal pools and standing water. Since this is an area of highly significant groundwater recharge any future development of the property must be consistent with this level of groundwater significance.

3.3 BIOPHYSICAL RESOURCES

Section 3.3 is divided into two subsections, Flora and Fauna. In each section, a general understanding of species based on various surveys is presented. As previously mentioned, in 1999 a detailed Natural Heritage Inventory was completed for Puslinch Tract Conservation Area. Therefore, the majority of information in section 3.3 is from that report, which is available upon request from GRCA.

3.3.5 FLORA

A detailed plant species inventory was conducted for the 1999 Natural Heritage Inventory. Appendix 1, Map 3.5, expresses the vegetation communities delineated in the 1999 inventory. A total of 221 vascular plant species were identified at Puslinch Tract Conservation Area. These species are presented in Appendix 2, Inventory A.

While none of the plants at Puslinch Tract Conservation Area are considered nationally or provincially rare, a number of species are regionally significant. Nearly all species on the property have a Global Rank (GRANK) of G5, which denotes a species that is "very common; demonstrably secure under present conditions." Provincial Rank (SRANK) for all native species is either S5, which denotes "very common and demonstrably secure in Ontario" or S4, which denotes "common and apparently secure in Ontario, usually with more than 100 occurrences in Ontario." Despite this, a number of plants identified are considered significant according to the Regional Municipality of Waterloo Native Vascular Plants List of Significant Species. These species are listed in Table 3.2.

Table 3.2 Plants listed as regionally significant by the "Regional Municipality of Waterloo Significant Species Native Vascular Plants List"

Specific Name	Common Name
Anemone cylindrical	Long-headed Anemone
Ranunculus flabellaris	Yellow Water-crowfoot
Rubus flagellaris	Northern Dewberry
Vitis aestivalis	Summer Grape
Carex brunnescens	Brownish Sedge
Cyprpedium calceolus	Small Yellow Lady's Slipper
Equisetum pretense	Meadow Horsetail *
Viola renifolia	Kidney-leaved Violet *
Viola selkirkii	Selkirk's Violet *
Vaccinum corymbosum	Highbush Blueberry *
Gallium tinctorium	Clayton's bedstraw *
Calla palustris	Wild Calla *
Sisyrinchium augustifolium	Stout Blue-eyed Grass *

* future research may change this status

Plantations

There are 19 plantations within Puslinch Tract Conservation Area. Nine of these contain eastern white pine, eight are red pine, one is both red and eastern white pine, and one eastern white cedar. The vast majority of the planting occurred between 1971, when the largest and oldest red pine plantations was planted, and 1979. A border of white spruce surrounds many of the plantations. The plantation communities are by far the least diverse in terms of plant species. Vegetation under the conifer canopy is sparse, and with frequently scattered white ash seedlings, field hawkweed, wild basil, and Canada goldenrod. In breaks in the plantation, summer grape and bladder campion also proliferate.

Wetlands

According to the Natural Heritage Inventory, there are twelve individual wetlands, and four wetland complexes. These wetlands range from open water ponds to kettle wetlands, and from vernal pools to

woodland swamps. Located along the southwestern border of the property is a portion of the Puslinch Lake Irish Creek Provincially Significant Wetland Complex. Tree cover in this wetland is only about 10%, but encompasses a wide variety of species such as white birch, larch, eastern white cedar, black ash, and balsam poplar. Marsh marigold, cinnamon fern, water and meadow horsetails, spotted jewelweed, spotted joe-pye weed, swamp milkweed, and various sedges are typical ground species. This wetland is one of the larger wetland areas on the property and is of significant interest in regard to the management of the property. Other individual wetlands and wetland complexes require evaluation to determine their level of significance. These wetlands are located across the property in low lying areas.

Vernal Pools

Within the central upland deciduous forest, a series of four vernal pools has developed at the base of steep slopes. Together, these four pools form a vernal pool complex. Vernal pools are ephemeral ponds in a deciduous forest that do not contain fish and are not connected to any source of surface water. The pools are generally open areas surrounded by trees with some shrubby thickets. As well, vernal pools can provide key sources of habitat for a variety of herptofaunal species.

Invasive Exotic Plants

Of the 221 plant species identified at Puslinch Tract Conservation Area, 70 species, or almost 32% of all species are exotic. The most invasive species belong to the Fabaceae family, which includes the clovers, sweet clovers, alfalfa-like plants, and vetches. Also plants species from the Brassicaceae family are very common, such as Yellow Rocket, Black Mustard and Field Pennycress. All invasive plants identified on the property are listed in Appendix 2, Inventory A.

3.3.2 FAUNA

Mammals

Four mammal species are common to the property, including: Eastern chipmunk, Grey squirrel, Cottontail rabbit, and the White-tailed deer. Chipmunk and the Grey squirrel are common sights in the two woodlots on the south edge of the property. Cottontail rabbits are seen in the hedgerows and brushy areas of meadow communities. White-tailed deer are occasionally observed in the early morning on the western edge woodlot; tracks have been noted elsewhere. Table 3.3 lists mammal species recorded during the 1999 inventory.

Amphibians and Reptiles

The substantial amount of wetland on Puslinch Tract Conservation Area is certainly reflected in its reptile and amphibian populations. Midland painted turtles, and frogs are common to the wetland areas and ponds. Various frog species and American toads are frequently heard calling in the spring, and are seen congregated around the two ponds. Also Eastern gartersnake are often spotted on the property.

Table 3.3 Mammals Present in the Vicinity of Puslinch Tract Conservation Area

Specific Name	Common Name
Didelphis virginiana	Virginia Opossum
Blarina brevicauda	Northern Short-tailed Shrew
Condylura cristata	Star-nosed Mole
Myotis lucifuga	Little Brown Bat
Eptesicus fuscus	Big Brown Bat
Sylvilagus floridanus	Eastern Cottontail
Tamias striatus	Eastern Chipmunk
Marmota monax	Woodchuck
Sciurus carolinensis	Grey Squirrel
Tamiasciurus hudsonicus	Red Squirrel
Castor canadensis	Beaver
Ondatra zibethicus	Muskrat
Rattus norvegicus	Norway Rat
Ezrethizon dorsattum	Porcupine
Canis lattrans	Coyote
Vulpes vulpes	Red Fox
Procyon lotor	Raccoon
Mustela vison	Mink
Mephitis mephitis	Striped Skunk
Odocoileus virginianus	White-tailed Deer

Table 3.4 Herptofaunal Observed at Puslinch Tract Conservation Area

Specific Name	Common Name
Chrysemys picta	Midland Painted Turtle
Chelydra serpentina	Snapping Turtle
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana pipiens	Northern Leopard Frog
Hyla crucifer	Spring Peeper
Hyla chysoscelis	Gray Treefrog
Bufo americanus	American Toad
Thamnophis sirtalis	Easter Garter Snake

Fish

Since the two ponds are a closed system, meaning they do not have a river or creek providing and taking water, fish species present in the lakes have been stocked. From research in the 1990s, a list specific fish species in the ponds is presented in Table 3.5. According to Table 3.5, fish populations seem to be declining. This is likely due to people fishing in ponds, and because the ponds are a closed system.

Table 3.5 Fish Species Survey from the West Pond

Specific Name	Common Name	Number in 1993	% Total	Number in 1998	% Total
Lepomis macorchirus	Bluegill	461	40	7	12
Lepomis gibbosus	Pumpkinseed	110	9	14	23
Hybrid	Bluegill-pumpkinseed	0	0	35	58
Ambloplites rupestris	Rock Bass	5	0.5	1	2
Pomoxis nigromaculatus	Black Crappie	572	49	3	5
Micropterus salmoides	Largemouth Bass	7	0.75	0	0
Perca flavescens	Yellow Perch	2	0.25	0	0
Esox lucius	Northern Pike	1	0.25	0	0
Notropis cornutus	Common Shiner	1	0.25	0	0
Total		1159		60	

Birds

In total, 50 bird species were seen and/or heard at Puslinch Tract Conservation Area. These species, as well as some others that were recently identified by GRCA staff, are list in Table 3.6. Four species, the Canada Goose, the Great Blue Heron, the Turkey Vulture, and the Herring Gull, were observed passing over the site. Of the remaining 46 species assumed to be breeding on the property, the majority are inhabitants of scrub and brush areas and forest edges. 14 species that typically inhabit open areas such as old fields and grassy tracts were observed, as well as ten species that usually inhabit the forest edge. 15 woodland bird species and seven wetland species were found at Puslinch Tract Conservation Area. For further information refer to the 1999 Natural Heritage Inventory.

Table 3.6 Bird Species Observed at Puslinch Tract Conservation Area

Family	Specific Name	Common Name	Regional Conservation Priority	Common Habitat
Anatidae	*Aix sponsa*	Wood Duck	Level 4	Woodland
	Anas platyrhynchos	Mallard		Wetland
	Branta canadensis	Canada Gooese		Wetland
Phasianidae	*Bonasa umbellus*	Ruffed Grouse	Level 3	Woodland
Ardeidae	*Ardea herodias*	Great Blue Heron		Wetland
Cathartidae	*Cathartes aura*	Turkey Vulture	Level 3	Open Field
Charadriidae	*Charadrius vociferus*	Killdeer		Open Field
Laridae	*Larus argentatus*	Herring Gull		Wetland
	Larus delawarensis	Ring-billed Gull		Wetland
Scolopadicae	*Scolopax minor*	American Woodcock	Level 4	Wetland
Columbidae	*Zenaida macroura*	Mourning Dove		Forest Edge
Picidae	*Colaptes auratus*	Northern Flicker		Forest Edge
	Picoides pubescens	Downy Woodpecker		Woodland
	Picoides villosus	Hairy Woodpecker		Woodland
	Dryocopus pileatus	Pileated Woodpecker	Level 2	Woodland
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird		Wetland
Bombyllicidae	*Bombycilla cedrorum*	Cedar Waxwing		Forest Edge
Cardinalidae	*Cardinalis cardinalis*	Northern Cardinal		Forest Edge
	Passerina cyanea	Indigo Bunting		Forest Edge
Fringillidae	*Carduelis tristis*	American Goldfinch	Level 3	Forest Edge
	Carpodacus mexicanus	House Finch		Forest Edge
Tyrannidae	*Contopus virens*	Eastern Wood-pewee		Woodland
	Sayornis phoebe	Eastern Phoebe	Level 3	Woodland
	Tyrannus tyrannus	Eastern Kingbird	Level 3	Open Field
	Vireo olivaceus	Red-eyed Vireo		Woodland
Corvidae	*Corvus ossifragus*	American Crow		Open Field
	Cyanocitta cristata	Blue Jay		Open Field
Paralidae	*Dendroica petechia*	Yellow Warbler		Forest Edge
	Dendroica virens	Black-throated Green Warbler	Level 2	Woodland
	Geothlypis trichas	Common Yellowthroat		Open Field
	Setophaga ruticilla	American Redstart	Level 2	Forest Edge
	Seiurus aurocapillus	Ovenbird	Level 4	Woodland
Mimidae	*Dumetella carolinensis*	Gray Catbird	Level 4	Forest Edge
	Toxostoma rufum	Brown Thrasher	Level 1	Forest Edge
Hirundiridae	*Hirundo rustica*	Barn Swallow	Level 3	Open Field
	Tachycineta bicolor	Tree Swallow		Open Field
Turdidae	*Hylocichla mustelina*	Wood Thrusth		Woodland
	Turdus migratorius	American Robin		Open Field
Icteridae	*Ictarus galbula*	Northern Oriole		Forest Edge
	Quiscalus quiscalus	Common Grackle		Open Field
	Sturnella magna	Eastern Meadowlark	Level 2	Open Field
Emberizidae	*Melospiza georgiana*	Swamp Sparrow	Level 1	Wetland
	Melospiza melodia	Song Sparrow		Forest Edge
	Passerculus sandwichensis	Savannah Sparrow	Level 1	Open Field
	Pipilo erythrophathalmus	Eastern Towhee	Level 2	Forest Edge
	Spizella passerina	Chipping Sparrow		Open Field
	Spizella pusilla	Field Sparrow	Level 3	Open Field
Paridae	*Parus atricapillus*	Black-capped Chickadee	Level 4	Woodland
	Pheuticus ludovicianus	Rose-breasted Grosbeak		Woodland
Troglodytidae	*Trogolodytes aedon*	House Wren		Open Field

Priority levels assessed by Couturier, 1999.

Couturier, 1999. Conservation Priorities for Birds of Southern Ontario. Bird Studies Canada, Ministry of Natural Resources and Environment Canada.

Section 4:
Existing Uses

4.1 INTRODUCITON

This section outlines various existing uses within Puslinch Tract Conservation Area by the public.

4.2 PUBLIC USE

Puslinch Tract Conservation Area attracts a variety of public activities. Permitted uses historically have been hiking, dog walking, mountain biking, Nordic skiing, snowmobiling, horseback riding, swimming, and hunting. Since the GRCA took ownership in 1999 permitted uses have changed to include hiking, leashed dog walking, and Nordic skiing (Figure 4.1). Public activities that are not permitted by the GRCA include hunting, swimming, use of any motorized vehicles, and camping and/or organized events without a permit.

Figure 4.1 Permitted and Non Permitted Uses at Puslinch Tract Conservation Area

Trails are a key component of public uses on the property. A variety of trails are found throughout the property (Figure 4.2). Trails are used by the public for a number of permitted and illegal activities. Hikers and mountain bikers are frequently seen using the trails. However, based on the number of tracks, many trails are illegally used by motorized vehicles such as dirt bikes and ATVs.

As well, the two ponds seem to be a major draw to the property. Seasonally, they are frequented by swimmers and fishers at all hours of the day. Around the lunch hour on hot days, in the summer of 1999, as many as 16 vehicles were clustered in the pull off on Concession 2, just south of the east pond in lot 8 (Figure 4.3). Fish can be found in both ponds and it is assumed that tract users once stocked them by transporting fish from nearby Little Lake and/or Puslinch Lake.

Occasionally, regional university students use the property for academic research. For example, recent projects from Wilfrid Laurier University have focused on fish habitat restoration in a gravel pit (Phillion, 1999, and Ribey, 1994).

Puslinch Tract Conservation Area is also used by different interest groups for their activities. In 1999, the property was used by the German Shepard National Specialty Tracking trial. More recently, in 2003, a portion of the property was used as a parking lot for the Lake Alive Festival held at Puslinch Lake. This event attracted 1,500 people, and over six hundred cars were parked in the open meadow on the west side of the property. In 2004, the festival is using the property again for parking, as well as for overnight camping.

Figure 4.2 Trails present at Puslinch Tract Conservation Area (2003-11-10)

Figure 4.3 Vehicles parking along Concession 2 south of Puslinch Tract Conservation Area (2003-11-10)

Section 5:
Issues, and Stakeholder Input

5.1 INTRODUCTION

Understanding the issues and stakeholder opinions allows for adaptive management to adjust to new circumstances. Section 5 reviews a number of key issues facing the Puslinch Tract Conservation Area.

5.2 ISSUES

The main issue at the Puslinch Tract Conservation Area property is security in regards to trespassing, motorized vehicles, and parties. Also, an on going issue associated with properties near urban centres is garbage.

5.2.1 TRESPASSING AND RELATED ACTIVITIES

Prior to acquisition by GRCA, the property became popular for a number of activities. Many people initially did not realize that the GRCA had taken ownership of the property, and that certain uses of the property were no longer allowed. For example, motorized vehicles are now prohibited on the site by GRCA, however, motorbikes remain a common site and sound on the property. These vehicles have created elaborate trail systems and associated vegetation damage across the property. As well, snowmobiling is popular in the winter, and has resulted in damaged vegetation. Although vehicles have only been observed on the property once, they are apparently accessing it regularly. A new gate and cement blocks were installed, as they were meant to deter vehicles from entering the property at the main parking. Still, people have cut trees to provide new access points.

Perhaps the most serious problem from a management perspective is the use of the site for night time parties resulting in dozens of campfire pits and associated damage (Figure 5.1). Some of these pits have fallen into disuse; the problem is that new ones continuously appear. One such campfire area located in a plantation in lot 8 obviously received a good deal of use in 1999, as it resulted in the felling of eight trees. Also in the same location bleachers constructed of milk crates and tables of old electrical wire bales were set up. In 1999, the Ontario Provincial Police monitored the property on the last two weekends of May, and they counted 124 cars along the roadway and 150 people trespassing at night. As a result of good management practices by conservation area staff, such activities have decreased since 1999, but it is still a concern, and requires continued management.

5.2.2 GARBAGE

Garbage is an issue throughout the entire property, but especially along the southern boundary where people throw their garbage from Concession 2 (Figure 5.2). Occasionally ammunition casings and broken bottles are found in both woodlots and open areas. Broken glass has been found at the bottom of the ponds, posing a hazard to the swimmers that use them. Some dumping has occurred on the property, including old car parts and fence bales common particularly along overgrown fencerows. There are no garbage cans found on the property, because in the past they have been destroyed and thrown into bushes.

Thankfully, community members have organized clean up days to try to reduce the amount of waste on the property.

Figure 5.1 Campfire near East Pond (2003-11-10)

Figure 5.2 Household waste dumped along Concession 2 (2004-05-04)

5.3 STAKEHOLDER INPUT

Some stakeholders feel that the property has a great deal of potential for development. Since GRCA took ownership in 1999, GRCA has received a few unsolicited proposals for development of the property, usually involving golf. The GRCA has also received unsolicited proposals from KOA, and for an exotic animal farm.

Generally, due to the nature of this type of Master Plan, stakeholder input has not been sought. This type of Master Plan does not consider a large number of alternative uses and does not require significant public input. Therefore, no public survey was conducted.

Section 6:
Management Practices

6.1 INTRODUCITON

Section 6 reviews the GRCA's management practices of Puslinch Tract Conservation Area. Management practices include such items as trail management, forest management, and security. These and other practices are discussed in section 6.2.

6.2 MANAGEMENT PRACTICES

Historically, a variety of management activities have been practiced on the Puslinch Tract Conservation Area. Such examples include aggregate extraction, fishery development, and plantation management. When the GRCA purchased the property in 1999, it was important to continue effective environmental management of the property. Since the purchase, the GRCA has conducted some studies on the property. Due to the property's resource value, the GRCA produced a detailed natural heritage report in 1999, and a Managed Forest Plan in 1999. The plan identified 71 hectares (two thirds of the property) as managed forest, and that portion of the property is now subject to reduced assessment of 75%. Both documents outline a variety of management related concepts and suggestions, and were important steps that have helped develop this Master Plan.

6.2.1 STAFF

The Shades Mill Conservation Area Superintendent supervises Puslinch Tract Conservation Area. During the winter months this person weekly monitors the property for management related concerns, such as garbage removal, cutting and trimming trails, and for security. During the summer months, a security guard is hired to patrol the property daily.

6.2.2 ACCESS AND PARKING

Public access to the property is gained from County Road 32, and Concession 2. Official parking is provided at County Road 32 for visitors to the property (Figure 6.1). Parking is common along Concession 2 at the access point, even though there are no parking signs posted. Access to the property is also available near the picnic area beside the McDonald's Restaurant. A trailhead is connected to the picnic area for people who wish to take a walk or some other form a trail use. Parking and entrance locations are monitored by the Shades Mill Superintendent, and cleaned regularly.

6.2.3 SECURITY

Security is the most active form of management at Puslinch Tract Conservation Area. Signs outline acceptable/unacceptable activities have been installed at entrance gates and along the property boundary in random locations. Two gates were installed, one along County Road 32 and the other at Concession 2 (Figure 6.2). Due to past unwanted activities, an agreement was reached with the Ontario Provincial

Police (OPP) to assist with enforcement. GRCA staff have only required assistance from OPP on few occasions.

Figure 6.1 Parking area along County Road 32 (2003-11-10)

Figure 6.2 Entrance gate at County Road 32 (2003-11-10)

6.2.4 FOREST MANAGEMENT

In 1999, a Managed Forest Plan for Puslinch Tract Conservation Area was written by GRCA staff. In this plan, forestry compartments were identified and mapped, and tree species were recorded. The plan was written for the Managed Forest Tax Incentive Program (MFTIP), which allows for a tax break on the property, because a certain percentage of the land is manageable forest. In this plan management recommendations set out include: thinning, wetland monitoring within forest compartments, trail maintenance, monitoring for disease and insect infestations, and monitoring for risks.

6.2.5 TRAIL MANAGEMENT

Trails are frequently pruned to keep wide enough to support all forms of trail use. Hazard trees along trails are marked and then removed by GRCA staff. When trails become disturbed by fallen trees, GRCA staff remove the debris as soon as possible.

Section 7: Recommendations

7.1 INTRODUCTION

A list of recommendations has resulted from the Master Plan process for Puslinch Tract Conservation Area. The recommendations listed in Section 7.2 are dependent upon the annual budget.

7.2 RECOMMENDATIONS

Key recommendations include: promotion of strictly passive use, maintenance of a conservation area reserve, identification and protection of natural and sensitive areas, forest management, trail management, security, and appropriate signage. Refer to Appendix 1, Map 7.1 for further information.

7.2.1 PASSIVE USE RECREATION

Focus on passive recreational opportunities for the property. During the life of the Master Plan, recreational activities that fall under the passive use category will be the only form of use promoted at Puslinch Tract Conservation Area. Permitted forms of passive recreation will include: hiking, leashed dog walking, Nordic skiing, bird watching, and other forms of nature appreciation.

7.2.2 CONSERVATION AREA RESERVE

Maintain a conservation area reserve for potential future recreational opportunities operated by the conservation authority. The conservation area reserve refers to the current open areas on the property. Within these areas, no significant investments are suggested in this Master Plan that might later be jeopardized by the possible development of a campground-level conservation area.

7.2.3 NATURAL AND SENSITIVE AREAS

Protect all natural and sensitive features by controlling usage and providing appropriate buffers. Natural forest and sensitive wetland areas will be monitored and protected from future development. As there is a Provincially Significant Wetland (PSW) on the property, and there are other wetland locations, all wetlands are to be evaluated by the Ministry of Natural Resources. In the short term, the buffer around the PSW located in the southwest corner of the property should be enhanced through plantings to become thirty metres wide where feasible. This will help preserve sensitive wetland habitat and conserve a variety of wetland species.

7.2.4 FOREST MANAGEMENT

Conduct appropriate forest management within plantation and natural forest areas. Plantation areas will be routinely thinned on a cycle of about 10 years to promote an indigenous hardwood

understory and ultimately, a more naturalistic forest. Natural forests may also be thinned according to appropriate forestry practices.

7.2.5 TRAIL MANAGEMENT

Promote use of the main trail system and reduce ad hoc trail use. Generally, there are too many ad hoc trails at Puslinch Tract Conservation Area. Use of the property for a variety of banned activities such as motorized vehicles is an on-going concern, although GRCA's security efforts have reduced the problem. The GRCA will work with trail users (allowed activities) in on-going efforts to reduce user conflicts and impacts. An appropriately designated trail system would involve less security and maintenance.

Manage potential tree hazards according to GRCA protocol. Trails will be inspected for hazards on an annual basis, or during the year on an as-needed basis. Tree hazard maintenance will be conducted according to the hazard's priority and the GRCA annual budget.

7.2.6 SECURITY

Promote safe outdoor recreation opportunities and regulate unwanted activities. The Shades Mill Conservation Area Superintendent will organize regular security patrols by GRCA staff or a hired security guard. An agreement with Ontario Provincial Police (OPP) to help monitor the property will continue, thus providing added security.

7.2.7 SIGNAGE

Inform users of acceptable/unacceptable activities and property boundaries through signage. Signs will be displayed at both of the two main entrances, and at strategic locations along the property boundary. Items that will be displayed on the signs will include the following: no swimming, no motorized vehicles, no hunting, and no camping, hiking and Nordic skiing will be allowed according to the signs. As well, signs will show a property map displaying the area owned by the GRCA.

Section 8:
Plan Implementation

8.1 INTRODUCTION

Plan implementation presents the priorities and phasing for the Master Plan.

8.2 IMPLEMENTATION PRIORITIES

The recommendations suggested in Section 7 are here organized according to priority or appropriate phasing. The name of the area should officially become the Puslinch Tract Conservation Area upon GRCA board adoption of this plan. The Ministry of Natural Resources has the mandate for official "evaluation" of wetlands in Ontario; their efforts will be solicited to complete the evaluation of wetlands on the property. On-going forest and trail hazard management will continue. Signage is to be brought into conformance with this plan.

8.3 PHASING

This phasing plan organizes the future management of the Puslinch Tract Conservation Area over a ten year period. Potential time frames are established for each item. Individual time frames are either long (7-10 years), medium (4-6 years), or short (1-3 years) term. These potential time frame periods will be flexible. Items that are considered on going are operational related recommendations and will run the full ten years.

Table 8.1 Phasing Plan

Recommendation		Cost	Time Frame
Major Item	**Minor Item**		
1. Signage		$200 / sign ~ $4,000	Short & On Going
2. Security		$5,000 / year ~ $50,000	On Going
3. Wetland Buffer Planting		$2,000	Short
4. Forest Management			
	Thinning	Cost Recovery	Medium