PROTECTING GREENBELT WETLANDS

How Effective is Policy?

Ducks Unlimited Canada

EARTHROOTS

ecojustice

Ontario Nature

PROTECTING GREENBELT WETLANDS: How Effective is Policy?

February 2012

Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature

This report was made possible through the generous support of the Friends of the Greenbelt Foundation, the Law Foundation of Ontario, the Charles Stewart Mott Foundation, the J.P. Bickell Foundation, and the ongoing support of Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature donors.

Download the 4-page summary at ecojustice.ca/greenbelt

Ducks Unlimited Canada
740 Huronia Road, Unit 1
Barrie, ON L4N 6C6
www.ducks.ca
t: 705-721-4444
f: 705-721-4999
e: du_barrie@ducks.ca

EARTHROOTS
401 Richmond Street West, Suite 410
Toronto, ON M5V 3A8
earthroots.org
t: 416-599-0152
f: 416-340-2429
e: info@earthroots.org

ecojustice
Toronto Office
Centre for Green Cities
401 – 550 Bayview Avenue
Toronto, ON M4W 3X8
ecojustice.ca
t: 416-368-7533
f: 416-363-2746
e: toronto@ecojustice.ca

Ontario Nature
Head Office
214 King Street West, Suite 612
Toronto, ON M5H 3S6
www.ontarionature.org
t: 416-444-8419
f: 416-444-9866
e: info@ontarionature.org

CONTENTS

LIST OF MAPS

LIST OF TABLES

ABBREVIATIONS

EA	Environmental Assessment
GIS	Geographic Information Systems
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ministry of Natural Resources
MOE	Ministry of the Environment
PPS	Provincial Policy Statement, 2005
PTTW	Permit to Take Water

ACKNOWLEDGEMENTS

This report is a collaborative effort, co-authored by Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature.

CORE PROJECT TEAM

Dr. Anastasia M. Lintner, Staff Lawyer & Economist, Ecojustice

Amber Cowie, former Greenway Program Manager, Ontario Nature

Josh Kohler, former Southern Ontario Campaigner, Earthroots

Kevin Rich, Head, Municipal Extension (Ontario), Ducks Unlimited Canada

KEY CONTRIBUTORS

Dr. Anne Bell, Director of Conservation and Education, Ontario Nature

Mark Carabetta, former Conservation Science Manager, Ontario Nature

Josh Garfinkel, Senior Campaigner, Earthroots

Timothy Hayward, Research and Policy Analyst, Ontario Nature

James Holland, Conservation Specialist-Land Use Planning, Ducks Unlimited Canada

Rachele Levin, Staff Scientist, Ecojustice

Leslie Luxemburger, former Conservation Specialist, Ducks Unlimited Canada

Joshua Wise, Greenway Program Coordinator, Ontario Nature

The authors thank: the reviewers of and participants in our pilot planner survey, including Royce Fu, Geoff McKnight and Scott Taylor; the participants in our municipal workshops and public meetings held in spring 2011 for the helpful dialogue regarding our draft findings and recommendations; and Ministry of the Environment staff, including Harald Schraeder, Kathryn Baker and George Karlos, who met with us to discuss the Permit to Take Water program and water taking case studies.

Case studies research: Beacon Environmental

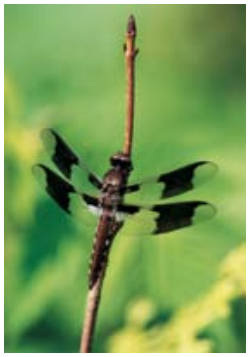
Maps: Chris Brackley, As the Crow Flies Cartography

Geoscientific assistance: Paul Hubley, Hubley Geosciences Ltd.

Editing: Geri Savits-Fine

Graphic design: Nadene Rehnby and Pete Tupah, Hands on Publications

EXECUTIVE SUMMARY



This report examines the strengths and weaknesses of the three provincial land-use plans in effect across the Greenbelt and their intersection with other laws and policies relevant to wetland protection.

Protecting Greenbelt Wetlands: How effective is policy? presents the findings of a two-year study that investigated the extent to which new legislation, policy and stronger legal standards are serving to protect and restore wetlands in Ontario's Greenbelt.

Undertaken by Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature, the study comprised four components: a comprehensive analysis of the legal and policy framework, a planners survey, nine case studies and an analysis of the cumulative impact of water takings. The report examines the strengths and weaknesses of the three provincial land-use plans in effect across the Greenbelt—the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan—and their intersection with other laws and policies relevant to wetland protection. It also considers issues related to policy implementation, including capacity at the municipal level, monitoring of compliance and effectiveness, the sequencing of project approvals and ongoing threats to wetlands and wetland function.

The Greenbelt

Ontario's Greenbelt Plan was created in 2005 to protect sensitive environmental lands and farmlands from urban sprawl. The Greenbelt encompasses lands designated as Protected Countryside as well as the previously protected Oak Ridges Moraine and the Niagara Escarpment, an area totalling 720,000 hectares and covering much of Ontario's Golden Horseshoe region. It embodies a bold systems-based approach to planning that aims to restore and reconnect natural features, and to maintain their benefits for humans and other life in this heavily developed region of the province. Protection and restoration of wetlands across the Greenbelt are crucial to achieving this goal.

Key findings

This report presents clear evidence that land-use policy in effect across the Greenbelt is protecting wetlands from most forms of development. There is more legal protection for wetlands here than most other parts of Ontario due to a higher legal standard applying to land use decisions and a broader category of wetlands being protected from direct impacts. Where municipalities are adequately resourced, they are able to plan for natural heritage systems, ensuring more comprehensive protection of water features generally and wetlands specifically.

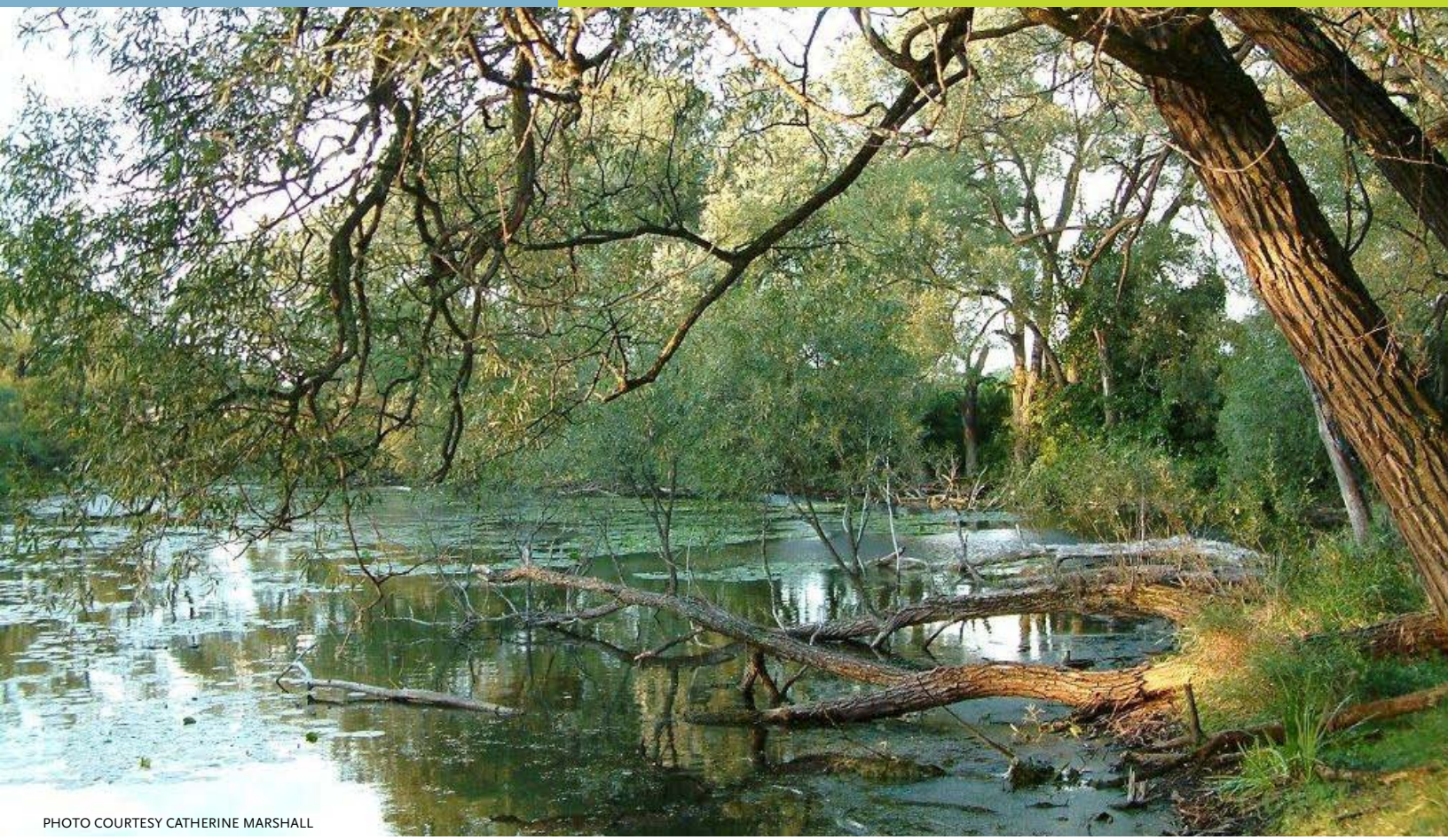


PHOTO COURTESY CATHERINE MARSHALL

The study also revealed, however, threats posed by infrastructure development, aggregate extraction, some existing land uses, peat extraction and water takings still continue to impact wetlands. Other challenges identified were the lack of on-the-ground monitoring of the impacts of development, under-resourced municipalities, inconsistencies and ambiguities among laws and policies, and the need for outreach, education and stewardship strategies to build greater landowner appreciation and support for wetland conservation.

Recommendations

In response to these findings, *Protecting Greenbelt Wetlands* includes the following recommendations for provincial decision makers:

1. Maintain current legal and policy protections for wetlands across the Greenbelt.
2. Amend the *Environmental Assessment Act*, *Aggregate Resources Act* and *Ontario Water Resources Act* approvals mechanisms to include a mitigation sequence that clearly ranks avoidance of wetland impacts as the top priority, minimization of impacts as the second priority and compensation as a last resort (where avoidance and minimization are not feasible or adequate).
3. Amend the legal and policy framework to provide an overarching objective to protect and restore wetlands to achieve a net gain in wetland extent and function.
4. Provide additional guidance to municipalities and Conservation Authorities. The Ministries of Municipal Affairs and Housing and Natural Resources should coordinate their efforts to (1) finalize the draft technical guidelines for existing natural features, and (2) provide additional guidance on natural heritage systems planning.

5. Enhance education and outreach to municipalities and Conservation Authorities. The Ministry of Municipal Affairs and Housing should showcase best practices in municipal policy and enable improved communications and information sharing across Greenbelt municipalities.

6. Adequately fund the Ministry of Natural Resources to provide guidance and mapping support to municipalities.

7. Amend the *Environmental Assessment Act*, *Planning Act*, *Aggregate Resources Act*, *Ontario Water Resources Act* approvals mechanisms and other relevant laws and policies to require rigorous post-construction monitoring and reporting for compliance and mitigation effectiveness.

8. Amend the three provincial land-use plans and the *Ontario Water Resources Act* approvals mechanisms to require that the impacts of water takings, under the Permit to Take Water process, be considered concurrently with land-use planning approvals.

9. Amend provincial land-use plans to require the proponent to demonstrate conformity with all applicable policies as part of the application's supporting materials.

10. Amend provincial land-use plans and related legislation to use one consistent definition of "wetlands."

11. Amend the Greenbelt Plan to clarify policies for recreational uses adjacent to wetlands. For consistency, amend provincial land-use plans to include thresholds for triggering natural heritage protection and environmental studies.

12. Provide stronger support and incentives to landowners (e.g., outreach and stewardship programs) to increase adoption of sustainable wetland management practices and allocate appropriate public resources for these supports.

Nearly three-quarters of southern Ontario's original wetlands have been lost since European settlement. In some areas, such as southwestern Ontario, parts of eastern Ontario, Niagara and Toronto, less than 15 percent of the wetlands remain. The need to strengthen policy to protect and restore the Greenbelt's wetlands is urgent.

Conclusion

The need to strengthen policy to protect and restore the Greenbelt's wetlands is urgent. Wetlands benefit all of us in many ways, including the role they play in flood control, water filtration, erosion control, sediment retention and enhanced landscape resilience in the face of climate change. Despite these benefits, half of the Greenbelt's wetlands and nearly three-quarters of southern Ontario's original wetlands have been lost since European settlement. In some areas, this loss is greater than 90 percent. Minimizing on-going threats by improving policy effectiveness is vital to protect and restore Greenbelt wetlands and sustain their benefits.

INTRODUCTION

Ontario's Greenbelt was created to protect vitally important and sensitive environmental lands and the productive countryside from sprawling development in the most populated region in Canada. From farmlands, to recreational areas, to woodlands and wetlands, the Greenbelt is relied upon directly and indirectly by millions of people and thousands of different species.

The *Greenbelt Act, 2005* created a permanently protected area of 720,000 hectares, stretching north to south from the Bruce Peninsula to Niagara and west to east from Halton Region to Northumberland County. Encompassing the already legally protected Niagara Escarpment and Oak Ridges Moraine, the Greenbelt was designed to include a natural heritage system of about 219,000 hectares where the first priority, according to the Honourable John Gerretsen (then Minister of Municipal Affairs and Housing), would be "protecting, restoring and reconnecting natural features such as wetlands and woodlands and their associated functions. This emphasis on protection and enhancement would be balanced with opportunities for farming, compatible recreational and tourism uses, and resource uses."[1]

Now, almost seven years after the passing of the *Greenbelt Act, 2005,* it is important to examine how change has occurred and whether these protection measures are achieving their purpose.

Stringent, legal protection for wetlands across the Greenbelt is a welcome signal of the government's commitment to address wetland decline. A 2010 report by Ducks Unlimited Canada shows dramatic wetland loss in Ontario since European settlement, with only 28 percent of the original wetlands left as of 2002.[2] In southwestern Ontario, parts of eastern Ontario, Niagara and the Toronto area, less than 15 percent of the wetlands remain, and their ecological function is severely impaired by the impacts of adjacent development, including the volume of impervious surfaces that surrounds them.[3] These numbers are likely under-representative of true wetlands loss, as the report was only able to assess the loss of wetlands greater than 10 hectares in area. Currently, wetlands cover about 96,014 hectares of land across the Greenbelt—or approximately 12 percent.[4]

Now, almost seven years after the passing of the *Greenbelt Act, 2005,* it is important to examine how change has occurred and whether these protection measures are achieving their purpose.

1 *Hansard*, (2005, February 23).

2 Ducks Unlimited Canada. (2010). *Southern Ontario wetland conversion analysis*. Retrieved May 3, 2011, from www.ducks.ca/aboutduc/news/archives/prov2010/pdf/duc_ontariowca.pdf

3 Ducks Unlimited Canada. (2010). *Southern Ontario wetland conversion analysis*. Retrieved May 3, 2011, from www.ducks.ca/aboutduc/news/archives/prov2010/pdf/duc_ontariowca.pdf

4 David Suzuki Foundation. (2008). *Ontario's wealth, Canada's future: Appreciating the value of the Greenbelt's eco-services*, (p. 29). Vancouver, BC.

Protection and restoration of wetlands across the Greenbelt are crucial to maintaining biodiversity and enhancing resilience to climate change. Wetlands provide vital ecological services, such as climate regulation (carbon storage and uptake), flood control, water filtration, erosion control, sediment retention and waste treatment, as well as wildlife habitats and opportunities for recreation. A 2008 study by the David Suzuki Foundation estimated the value of wetlands across the Greenbelt to be $14,153 per hectare per year or $1.3 billion per year ($2005).[5]

Protecting Greenbelt Wetlands is the result of a two-year study of wetlands protection in the Greenbelt conducted by Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature. Our goal was to determine the extent to which wetlands are being protected under the three relevant provincial land-use plans (the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan) and supporting legislation, and to identify if and how wetland protection could be improved.

Our assessment included four components:

- A comprehensive analysis of the legal and policy framework;
- A survey of 12 municipal planners;
- Nine case studies; and
- An analysis of the cumulative impact of water takings on wetlands.

The methods and findings for each of these components are described in subsequent sections.

Protection and restoration of wetlands across the Greenbelt are crucial to maintaining biodiversity and enhancing resilience to climate change.

5 David Suzuki Foundation. (2008). Ontario's wealth, Canada's future: Appreciating the value of the Greenbelt's eco-services. Vancouver, BC.

SCIENCE AND STATUS OF WETLANDS

2.1 What is a wetland?

Wetlands are critical ecosystems that provide numerous ecological functions such as water storage and filtration, habitat for species at risk and the sequestration of carbon. They cover about 96,014 hectares—or approximately 12 percent—of land across the Greenbelt,[6] and have been defined in various ways in Ontario's policy and legislation. One of the most pertinent is provided in the Provincial Policy Statement (PPS), which guides land-use planning and development in the province:

> *lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.*[7]

Swamps are the most common wetland type in southern Ontario. They are wetlands dominated by trees and/or shrubs, often with standing water, limited drainage and a combination of neutral and acidic soils. Marshes are almost always flooded and can be characterized by the presence of cattails, reeds and other aquatic vegetation. Fens and bogs are both peat-accumulating wetlands; the primary difference between them, however, is their water sources. Fens are typically supplied by groundwater, whereas bogs rely on precipitation for their water supply.

Generally, wetlands exist in the landscape where the water balance ensures an adequate water supply at or near the surface. Thus, wetlands are restricted to locations where, on average, precipitation exceeds evaporation loss, or where sustained inflows from surface or subsurface sources alleviate the water deficit.[8]

Wetlands cover about 12 percent of land across the Greenbelt, and have been defined in various ways in Ontario's policy and legislation.

6 David Suzuki Foundation. (2008). *Ontario's wealth, Canada's future: Appreciating the value of the Greenbelt's eco-services*, (p. 29). Vancouver, BC.

7 Ministry of Municipal Affairs and Housing. (2005). *Provincial policy statement*, (p. 37). Toronto: The Queen's Printer for Ontario.

8 Price, J.S., Branfireun, B.A., Waddington, J.M., & Devito, K. J. (2005). Advances in Canadian wetland hydrology, 1999–2003. *Hydrological Processes, 19*, 201.

2.2 Wetlands and water connections

From an ecological and hydrological perspective, wetlands are often connected to other water features. "Water features" is a term used to include all surface water features (such as headwaters, rivers, stream channels, inland lakes, springs) and all groundwater features (such as water tables, aquifers). The water in a wetland can come from a variety of sources. Wetlands can either be precipitation dominated, groundwater dominated or surface-flow dominated.[9] One key factor that determines the primary source of water is local topography and catchment area. For example, wetlands located in depressions with large catchment areas tend to receive most of their water from run-off. Conversely, wetlands located on slopes and/or with small catchment areas generally have greater interactions with groundwater or are precipitation dominated. Unlike streams and lakes, wetlands do not always occupy depressions and low points in the landscape, but can also occur on slopes.[10]

In regions of Canada with deep glacial deposits, such as the Great Lakes and Laurentian region, larger scale groundwater-wetlands interactions occur. In this case, these interactions are heavily influenced by topography and the composition of underlying soil and rock.[11] For example, wetlands located on fine-grained soils, such as clay, have low permeability to water. Instead of being groundwater dominated, runoff from storms dominates the inputs and outputs of water in these wetlands. In wetlands located on coarser soil, however, there is a constant influx and outflux of groundwater.[12]

The water in a wetland can come from a variety of sources. Wetlands can either be precipitation dominated, groundwater dominated or surface-flow dominated.

Streams, lakes and wetlands are integrally linked to groundwater flow systems. The flow of water and chemicals between wetlands and groundwater is affected by the wetlands' position to groundwater flow systems, the geologic characteristics of their beds, the topography of the area and their climatic settings. All these factors need to be taken into account for thorough understanding of the hydrology of wetlands and their interactions with groundwater.

Because of the multitude of factors affecting groundwater-wetlands interactions, and because there are numerous types of wetlands with different water flow systems and chemistry, it is difficult to generalize about groundwater-wetlands interaction.

A 2003 study on northern prairie wetlands concluded that because the diversity of the wetland water regime is important for maintaining biodiversity on the landscape, all wetlands and their drainage basins in a given area should be considered as an interconnected hydrologic unit for integrated wetland ecosystem management.[13]

9 Winter, T.C. (1999). Relation of streams, lakes, and wetlands to groundwater flow systems. *Hydrogeology Journal, 7*, 28.

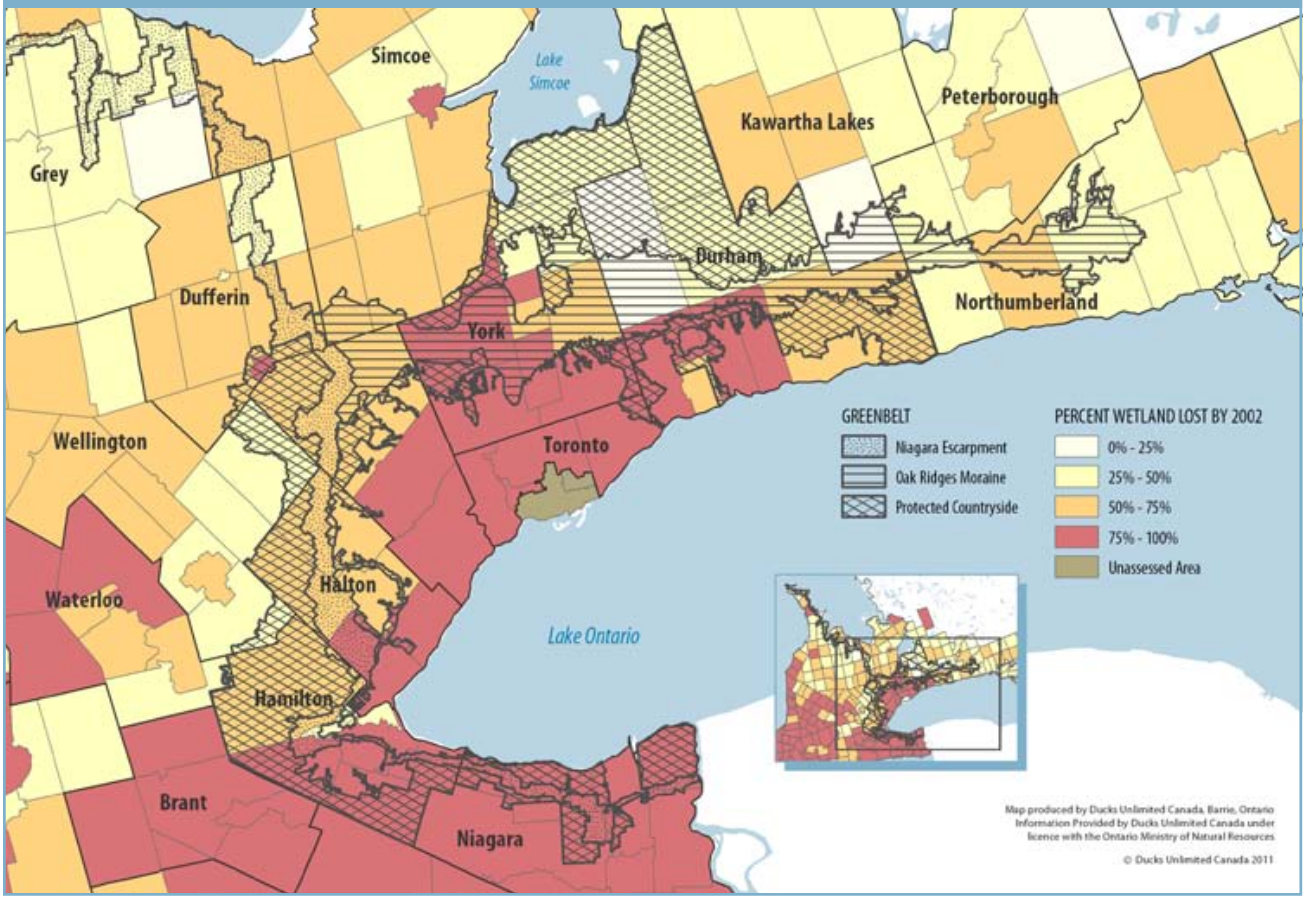
10 Winter, T.C. (1999). Relation of streams, lakes, and wetlands to groundwater flow systems. *Hydrogeology Journal, 7*, 28.

11 Price, J.S., Branfireun, B.A., Waddington, J.M., & Devito, K. J. (2005). Advances in Canadian wetland hydrology, 1999–2003. *Hydrological Processes, 19*, 201.

12 Warren, F., Waddington, J.M., Bourboniere, R.A., & Day, S. M. (2001). Effect of drought on hydrology and sulphate dynamics in a temperate swamp. *Hydrological Processes, 15*, 3133.

13 Swanson, G.A., Euliss, N. H.J., Hanson, B.A., & Mushet, D.M. (2003). Dynamics of a prairie pothole wetland complex: implication for wetland management. In Winter, T.C. (Ed.) *Hydrological, chemical, biological characteristics of a prairie pothole wetland complex under highly variable climate conditions: The Cottonwood Lake Area, east-central North Dakota.* US Geological Survey Professional Paper 1675: 55 – 94.

MAP 1: WETLAND LOSS ACROSS THE GREENBELT FROM PRE-SETTLEMENT TO 2002



Download a full-sized, printable map at ecojustice.ca/greenbelt

2.3 Value of wetlands

Given the diversity of their ecological attributes, wetlands play an important role in the function of natural heritage systems. Wetlands and their surrounding areas can contain dry land, standing water and everything in between, providing a wide range of ecosystem services. These services are defined as "the aspects of ecosystems utilized (actively or passively) to produce human well-being."[14] Wetlands' ecosystem services include climate regulation (carbon storage and uptake), flood control, water filtration, erosion control and sediment retention, waste treatment (removal of excess nitrogen and phosphorous runoff), the provision of habitat (for plants and animals, including species at risk such as the Blanding's turtle, swamp rose-mallow and the king rail), and the provision of opportunities for recreation and aesthetic enjoyment.[15] These free natural services offer increased landscape resilience, lowering the direct financial investment needed for infrastructure developments like water filtration plants and flood control measures. The elimination of these ecosystems will often result in the need for higher investment to replicate these natural functions. A 2011 report commissioned by the Ministry

14 Fishera, B., Turnera, R. K., & Morling, P. (2009). Defining and classifying ecosystem services for decision making. *Ecological Economics*, *68*: 645.

15 David Suzuki Foundation. (2008). *Ontario's wealth, Canada's future: Appreciating the value of the Greenbelt's eco-services*. Vancouver, BC.

of the Environment found that for every dollar invested in protecting wetlands around the Great Lakes, we can expect an economic return of $35.[16] Another report, by Ducks Unlimited Canada, found that wetlands currently remove harmful phosphorus from Lake Simcoe and save local municipalities (in one sub-watershed) about $300,000 every year for just this ecological service alone.[17]

2.4 Status of wetlands in Ontario

In a 2010 report, Ducks Unlimited Canada exposed the alarming wetland loss in southern Ontario.[18] Nearly three-quarters of the region's original wetlands have been lost since European settlement, and during the 1980s and 1990s, approximately 35 square kilometres of wetland were lost every year. Land development (i.e., built-up lands) was a significant cause of the loss within the Golden Horseshoe. In some areas, such as metropolitan Toronto, less than 15 percent of the wetlands remain, and their function is severely impaired by the volume of impervious surfaces that surround them. Across the Greenbelt, the amount of loss is approximately 50 percent (Map 1). The findings from this analysis are most likely under-representative, since the report was only able to assess the loss of wetlands greater than 10 hectares in area.

Given the precarious status of wetlands in Ontario, the enhanced legal protection for wetlands across the Greenbelt is a welcome advancement. The next section provides a description, review and analysis of the legal and policy framework that is in place across the Greenbelt.

Wetlands and their surrounding areas can contain dry land, standing water and everything in between, providing a wide range of ecosystem services. These services are defined as "the aspects of ecosystems utilized (actively or passively) to produce human well-being."

16 Marbek Resource Consultants. (2011). *Assessing the economic value of protecting the Great Lakes ecosystems*. Commissioned study for Ministry of the Environment (with support from the Toronto and Region Conservation Authority, and the Great Lakes and St. Lawrence Cities Initiative).

17 Ducks Unlimited Canada. (2011). A business case for wetland conservation, The Black River watershed. Retrieved December 10, 2011 from www.ducks.ca/blackriver2011

18 Ducks Unlimited Canada. (2010). *Southern Ontario wetland conversion analysis*. Retrieved May 3, 2011, from www.ducks.ca/aboutduc/news/archives/prov2010/pdf/duc_ontariowca.pdf

LEGAL AND POLICY FRAMEWORK

Although wetlands and other water features are generally hydrologically connected, the legal and policy framework associated with wetlands protection is highly fragmented.

For the purpose of this study, Ecojustice conducted a comprehensive review of land and water use (and other relevant) laws, regulations and policies relating to wetlands protection across the Greenbelt. The review relied on the current, publicly available laws, regulations and policies (including provincial plans) and does not reflect the implementation of the framework (e.g., case law, interviews with government staff, etc.), unless otherwise noted. In order to understand the context, general land-use planning law and policy in place in Ontario is contrasted with those that are specific to the Greenbelt. In addition, Ecojustice assessed the laws, regulations and policies that will have an impact on the Greenbelt as they are implemented in the future. The review is pertinent to this report, which provides a more detailed assessment of implementation "on the ground."

There is no consistent definition of "wetland" in Ontario's various environmental laws, regulations and policies. However, all definitions do include the presence of water (seasonally or permanently), hydric soils and hydrophytic plants.

3.1 Legal and policy definitions of wetlands

There is no consistent definition of "wetland" (Table 1) in Ontario's various environmental laws, regulations and policies. However, all definitions do include the presence of water (seasonally or permanently), hydric soils and hydrophytic plants. Some explicitly exclude agricultural lands that may be poorly drained and no longer have the presence of hydric soils and hydrophytic plants, regardless of whether there was once a wetland. Further, wetland is often contained within the definition of surface water (e.g., wetland is included in the definition of "surface water feature" in the PPS[19] and is explicitly part of the definition of "surface water" in the *Nutrient Management Act, 2002*[20]). In both the

19 Ministry of Municipal Affairs and Housing. (2005). *Provincial policy statement*. Toronto: Queen's Printer for Ontario. Retrieved July 5, 2011, from www.mah.gov.on.ca/Page1485.aspx

20 S.O. 2002, c.4.

Oak Ridges Moraine Conservation Plan[21] and Greenbelt Plan,[22] there is a requirement that wetland be "further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time."[23] These plans do not specifically indicate how this differs from evaluation for "provincial significance" (i.e., significance as defined in the PPS). Nor do they specify the identification evaluation procedures.

TABLE 1: SAMPLE LEGAL AND POLICY DEFINITIONS OF "WETLAND(S)"

Act or Plan *(and Reg., if applicable)*	**Definition**
Greenbelt Plan (p.57)	*Wetlands* Means land such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that: a) Is seasonally or permanently covered by shallow water or has the water table close to or at the surface; b) Has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants; and c) Has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.
Oak Ridges Moraine Conservation Plan *(O.Reg. 140/02)*	"wetland" means land such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that, (a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface, (b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants, and (c) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time;
Niagara Escarpment Plan (p.131)	Wetlands – lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants. The four major types of Wetlands are swamps, marshes, bogs, and fens. Lands being used for agricultural purposes, that are periodically "soaked" or "wet", are not considered to be wetlands in this definition. Such lands, whether or not they were wetlands at one time are considered to have been converted to alternate uses.

21 O.Reg. 140/02. Retrieved July 5, 2011, from (unofficial version on Ministry of Municipal Affairs and Housing website) www.mah.gov.on.ca/Page1707.aspx

22 Ministry of Municipal Affairs and Housing. (2005). Greenbelt Plan. Toronto: Queen's Printer for Ontario. Retrieved July 5, 2011, from www.mah.gov.on.ca/Page189.aspx#greenbelt

23 Greenbelt Plan, p. 57 and O.Reg. 140/02, subsection 3(1).

TABLE 1 CONTINUED

Act or Plan *(and Reg., if applicable)*	**Definition**
Provincial Policy Statement (2005) Coastal wetland (p.29), Significant (p.33) and Wetlands (p.37)	Coastal wetland: means a) any *wetland* that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or b) any other *wetland* that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected. Significant: means a) in regard to *wetlands*, *coastal wetlands* and *areas of natural and scientific interest*, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time; Wetlands: means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.
Conservation Authorities Act	"wetland" means land that, (a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface, (b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse, (c) has hydric soils, the formation of which has been caused by the presence of abundant water, and (d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d).
Conservation Land Act	"wetland" means land, (a) that is seasonally or permanently covered by shallow water, or (b) in respect of which the water table is close to or at the surface, so that the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants.

TABLE 1 CONTINUED

Act or Plan *(and Reg., if applicable)*	**Definition**
Environmental Protection Act *O. Reg. 153/04 (Site condition standards, environmentally sensitive areas)*	"area of natural significance" means any of the following: ... 4. A wetland identified by the Ministry of Natural Resources as having provincial significance.
Environmental Bill of Rights, 1993	"land" means surface land not enclosed in a building, land covered by water (which, for greater certainty, includes wetland) and all subsoil
Nutrient Management Act, 2002 *O. Reg. 106/09 (dead animal farm disposal); O. Reg. 267/03 (general regulation)*	"surface water" means, ... (c) a wetland, such as a swamp, marsh, bog or fen, but not land that is being used for agricultural purposes that no longer exhibits wetland characteristics, if the wetland, (i) is seasonally or permanently covered by shallow water or has the water close to the surface of the ground, and (ii) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants,

Generally, the majority of these various wetlands definitions can be considered to be scientifically accurate. However, due to variation in level of detail and the presence of scope-limiting definitions, there is a potential for confusion that may limit intended protection for wetlands. "Scope-limiting" definitions contain terms that limit the scope of the definition to the specific statute or policy (e.g., the definition under the *Conservation Authorities Act,*[24] where it refers to wetlands that are hydrologically connected to a surface watercourse, or in the Greenbelt Plan definition where there is a requirement of further identification). Such scope-limiting definitions produce flexible interpretations, which may lead to disputes. The scope-limiting definitions in the Greenbelt Plan and Oak Ridges Moraine Conservation Plan may also be inconsistent with the purpose of the enabling legislation. Finally, the inconsistency between the Greenbelt Plan/Oak Ridges Moraine Conservation Plan definitions and the Niagara Escarpment Plan definition suggests potential for differing levels of protection across the Greenbelt. (For a further discussion of definitions, based on the case studies, see Section 5.3.2.2.)

24 R.S.O. 1990, c. C.27.

3.2 Land-use law and policy framework relating to Greenbelt wetlands

Land-use planning in southern Ontario is conducted by municipalities pursuant to the *Planning Act*.[25] Under the *Planning Act*, the provincial government is able to set policies for municipal land-use planning.[26] The most recent provincial policies related to municipal land-use planning are found in the PPS. Decisions made under the *Planning Act* (official plans, zoning bylaws, etc.) are required (as of January 1, 2007) to be "consistent with" the PPS.

Provincial influence on land-use planning has been enhanced by specific land-use planning legislation, which includes the *Niagara Escarpment Planning and Development Act,*[27] the *Oak Ridges Moraine Conservation Act, 2001*[28] and the *Greenbelt Act, 2005*.[29] These laws were enacted at different times, with slightly different foci, and each has an associated provincial plan. As of January 1, 2007, all land-use decisions must "conform with" the three provincial plans. This assessment focuses on the Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan and Greenbelt Plan. The most recent legislation, the *Greenbelt Act, 2005*, created an area that joins the Niagara Escarpment with the Oak Ridges Moraine and provides protection from specific activities in specific areas across the entire Greenbelt.

There are detailed policies relating to the protection of wetlands within each of the three provincial plans. In cases where there is a conflict between a provincial plan and a land use planning instrument (such as a municipal official plan or by-law) the pertinent provincial plan prevails over the municipal instrument. In the *Niagara Escarpment Planning and Development Act*, it is possible that a more restrictive municipal by-law could be enacted, but only if the Minister deems the by-law not to conflict with the Niagara Escarpment Plan.[30] Only the *Oak Ridges Moraine Conservation Act, 2001* expressly permits a by-law to be more restrictive than the policies in the Oak Ridges Moraine Conservation Plan, so long as the Plan itself does not expressly prohibit it.[31] In the event of a conflict among the three provincial plans, the earlier plans (Niagara Escarpment Plan or Oak Ridges Moraine Conservation Plan) prevail over the Greenbelt Plan.[32]

The *Greenbelt Act, 2005*, created an area that joins the Niagara Escarpment with the Oak Ridges Moraine and provides protection from specific activities in specific areas across the entire Greenbelt.

Across the Greenbelt, the purpose and objectives of the enabling legislation in the different planning areas have different foci. The overarching objectives of the Greenbelt Plan are to maintain, restore and improve ecological and hydrological function, support rural economies and communities (including opportunities for agriculture, recreation and tourism) and promote sustainable resource use. Specifically related to wetlands, the key objectives are to "establish a network" of green space that supports the Niagara Escarpment and the Oak Ridges Moraine, and "to provide protection to the land base needed to maintain, restore and improve the ecological and hydrological functions" of the Greenbelt. In contrast, the primary objective of the Oak Ridges Moraine Conservation Plan is

25 R.S.O. 1990, c. P.13.

26 *Planning Act*, section 3.

27 R.S.O. 1990, c. N.2.

28 S.O. 2001, c. 31.

29 There is also enabling legislation, the *Ontario Development and Planning Act*, which allows for the provincial government to establish planning areas and create a development plan. The Parkway Belt West Plan (July 1978) and the Central Pickering Development Plan (May 2006) were developed under this legislation. This provincial planning legislation is included in the detailed legislative comparison, available at: www.ecojustice.ca/greenbelt.

30 Subsection 13(2).

31 Section 5 and subsection 8(2).

32 A detailed legislative comparison table is available at: www.ecojustice.ca/greenbelt.

"protecting the ecological and hydrological integrity of the Oak Ridges Moraine Area." Within the Niagara Escarpment, the objectives of the Plan include "to maintain and enhance the quality and character of natural streams and water supplies." Planners and decision makers will interpret all the policies in these provincial plans within the context of these objectives. Policies that are protective of wetlands and intended to meet the objective to restore/protect ecological and hydrological function/integrity may be interpreted quite differently than policies that are intended to enhance the character of natural streams.

Another key difference is the Ministry/Agency that administers the provincial plans. In the case of the Greenbelt Plan and the Oak Ridges Moraine Conservation Plan, the provincial plan is overseen by the Ministry of Municipal Affairs and Housing. In the case of the Niagara Escarpment, the provincial plan is overseen by the Niagara Escarpment Commission.

Within the Niagara Escarpment, the objectives of the Plan include "to maintain and enhance the quality and character of natural streams and water supplies." Planners and decision makers will interpret all the policies in these provincial plans within the context of these objectives.

All three provincial plans contain commitments to create performance indicators/measures and monitoring frameworks in order to assess their effectiveness. These commitments are not legal requirements, with the exception that all upper-tier and single-tier municipalities on the Oak Ridges Moraine were to commence preparation of watershed plans by April 22, 2003. There is no requirement that watershed plans must be completed.

Despite the differences among the three provincial plans, the Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan and Greenbelt Plan provide more protection for wetlands than is available elsewhere in Ontario. Wetlands are included in both the category of "Key Natural Heritage Features" and "Key Hydrologic Features" in the Greenbelt Plan. These features are afforded the most protection in the Natural Heritage System of the Protected Countryside. With respect to wetlands (as Key Natural Heritage Features) that are within the Natural Heritage System of the Protected Countryside, development or site alteration is prohibited in wetlands and any associated "Vegetation Protection Zone."[33] With respect to wetlands (as Key Hydrologic Features) in all of the Protected Countryside, development or site alteration is also prohibited in wetlands and any associated Vegetation Protection Zone.[34] Though Key Natural Heritage Features are not afforded the same protection in all of the Protected Countryside,[35] wetlands are not subject to this distinction due to their status as both Key Natural Heritage Features and Key Hydrologic Features.

Further, the prohibition on development in wetlands across the Greenbelt applies to all "further identified" wetlands. In contrast, wetlands elsewhere in the province must be identified as provincially significant before being afforded the same protection by the PPS. Although it is uncertain how the evaluation for significance differs from the evaluation for being "further identified" (see discussion in previous section), the difference in policy language suggests that the wetlands on the Greenbelt should be provided more protection than those elsewhere in Ontario. With respect to the Oak Ridges Moraine, wetlands are considered both "Key Natural Heritage Features" and "Hydrologically Sensitive Features."[36] All development and site alteration are prohibited in both the wetlands and the "related minimum protection zone."[37] With respect to the Niagara Escarpment, development is to be "located outside wetlands."[38] Although the definition of wetlands in the Niagara Escarpment Plan does not contain a requirement that it "be further identified," it does require that the "limits of the wetland"

33 See Greenbelt Plan, Policy 3.2.4.1.

34 See Greenbelt Plan, Policy 3.2.4.4.

35 Within the Protected Countryside that is not part of the Natural Heritage System, key natural features are clearly exempted from the additional protection of the Greenbelt and are generally to be governed by the policies in the PPS (Greenbelt Plan, Policy 3.2.4.3).

36 O.Reg. 140/02, subsections 21(1) and 26(1).

37 O.Reg. 140/02, subsections 22(2) and 26(2).

38 Niagara Escarpment Plan, p. 66.

be determined "in consultation with the Ministry of Natural Resources and/or the Conservation Authority."[39] Finally, although the Niagara Escarpment Plan does not specify an associated "Vegetation Protection Zone," it is required that development adjacent to wetlands be permitted "only if it does not result in" the following:

a) Loss of wetland functions;

b) Subsequent demand for future development that will negatively affect existing wetland functions;

c) Conflict with existing site-specific wetland management practices; and

d) Loss of contiguous wetland area.[40]

The application of this heightened protection for wetlands may be limiting and perplexing. The clearest protection, when decisions are being made by municipalities, is the prohibitions on development and/or site alteration. Given the differences among the "avoidance" prohibitions, the application of "development or site alteration" (Greenbelt Plan), or to "development and site alteration" (Oak Ridges Moraine Conservation Plan), or to "development" (Niagara Escarpment Plan) may create some confusion.

Policies relating to municipal decisions regarding infrastructure within and near wetlands (e.g., local roads, water/wastewater systems) are slightly less restrictive than those that apply to other development. Infrastructure is exempted from the "avoidance" prohibitions, though there are some restrictions that are intended to minimize the impact. For example, in the Protected Countryside of the Greenbelt, infrastructure is to be subject to an environmental approval (e.g., *Environmental Assessment Act* approval), and must demonstrate that it supports the provincial policies related to the Greenbelt and the Growth Plan.[41] If these conditions are met, the infrastructure is to avoid wetlands, unless there is a need for and no reasonable alternative to avoiding wetlands, in which case the impact is to be minimized.[42] The other provincial plans have similar policies that permit infrastructure if impacts are minimized.[43]

Despite the differences among the three provincial plans, the Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan and Greenbelt Plan provide more protection for wetlands than is available elsewhere in Ontario.

39 Niagara Escarpment Plan, p. 66.

40 Niagara Escarpment Plan, p. 66.

41 Greenbelt Plan, pp. 30–31.

42 Greenbelt Plan, pp. 30–31.

43 O.Reg. 140/02, subsections 11(3), 12(3), 13(3), 26(2), 41(2) and 41(3); Niagara Escarpment Plan, p. 82.

Protections for wetlands from the impact of decisions made regarding resource extraction are less restrictive than those for development. For example, in the Greenbelt Plan, some specific policies protect "significant" wetlands from new mineral aggregate operations and wayside pits and quarries, yet aggregate extraction is clearly exempt from the protection intended for wetlands and associated Vegetation Protection Zones in the Natural Heritage System of the Protected Countryside.[44] In the case of an expansion to an existing mineral aggregate operation, the protection of wetlands is the same as the rest of Ontario (i.e., must be "consistent with" the PPS).[45] In the Oak Ridges Moraine, aggregate extraction is only permitted in some land-use areas (e.g., "Natural Linkage Areas") if specific conditions are met. For instance, a mineral aggregate operation can be permitted in a wetland if it is occupied by "early successional habitat" and the proponent demonstrates that "the long-term ecological integrity of the Plan Area will be maintained, or where possible, improved or restored."[46]

A covered conveyor takes gravel from the source in an Niagra Escarpment open pit aggregate mining operation. PHOTO COURTSEY SIGHTHOUND/FLICKR

"Mineral Resource Extraction Area" is a land-use designation found in the Niagara Escarpment. Provincially significant wetlands must be considered when an application to amend the Niagara Escarpment Plan is made to redesignate an "Escarpment Rural Area" to permit resource extraction.[47] If lands are designated for resource extraction, there are still policies that are protective of wetlands — for example, the operations and haul routes are not to conflict with "protection of sensitive ecological ... areas" and "protection of surface and groundwater resources."[48] For both the Oak Ridges Moraine and the Niagara Escarpment, new and expanding aggregate uses are generally not permitted in the land-use designations associated with protected areas (e.g., Oak Ridges Moraine "Natural Core Area" and Niagara Escarpment "Escarpment Natural Area"), ensuring higher protection for wetlands within these designations. Across the entire Greenbelt, the three provincial plans augment the existing licensing and approvals process associated under the *Aggregate Resources Act* with additional conditions, restrictions or requirements.

Although protection of wetlands from specific activities under particular circumstances is often discussed, in Ontario there is no blanket protection for wetlands (provincially significant or otherwise). There is potential for damage to a wetland from an activity that hasn't been specifically dealt with in the laws and policies described above (and below). Two specific types of wetlands (fens and bogs) are peat accumulating. Extracting the peat from such wetlands is not regulated across the Greenbelt. Though the Niagara Escarpment Plan references peat in the definition of mineral resources,[49] the *Aggregate Resources Act,* which governs licensing resource extraction, does not include peat in the definition of aggregates.[50] Peat is not mentioned at all in the other two provincial plans. As a result, direct extraction of peat is not subject to any legal conditions across the Greenbelt.

As mentioned earlier, there are some situations where the activity that may impact wetlands is subject to an approval that is not specific to the Greenbelt laws and policies (e.g., the environmental approval requirement for infrastructure or the licensing approval for aggregate use). In the next section, a number of additional laws and policies that are relevant to wetlands protection across the Greenbelt are reviewed.

---

44 Greenbelt Plan, Policy 4.3.2.3(a).

45 Greenbelt Plan, pp. 34–37.

46 O.Reg. 140/02, subsection 35(4).

47 Niagara Escarpment Plan, pp. 28–29.

48 Niagara Escarpment Plan, p. 76.

49 Niagara Escarpment Plan, p. 131.

50 *Aggregate Resources Act*, subsection 1(1).

3.3 Other related law and policy impacting wetlands protection

3.3.1 Aggregate Resources Act

The *Aggregate Resources Act*[51] provides for the licensing or approval of aggregate operations in Ontario. The Minister of Natural Resources is responsible for the administration of the licensing/approvals process for aggregate operations, which includes ensuring that this type of development "minimize[s] adverse impact on the environment."[52] Current land-use policy in Ontario prioritizes aggregate operations (in areas where there is aggregate potential) over other potential land uses (including protecting a wetland through a prohibition on development). For example, the "avoidance" prohibition on development or site alteration in all wetlands and associated Vegetation Protection Zones are relaxed for aggregate uses in the Greenbelt Plan's Protected Countryside (discussed above). Since aggregate potential in southern Ontario also has significant overlap with the Greenbelt, and that potential is often in the most sensitive lands across the Greenbelt, wetlands protection is primarily dealt with through a licensing/approval process that involves a legal standard that minimizes "adverse impact." This standard is much less protective than a prohibition on development in and near wetlands. That said, wetlands are not ignored in licensing aggregate operations across the Greenbelt, as there are a number of specific requirements within the three provincial plans that need to be taken into account when such licensing decisions are made.[53] A recent report by the Canadian Institute for Environmental Law and Policy makes a series of recommendations to improve the province's Aggregate Strategy in order to be more protective of sensitive lands in Ontario's Greenbelt.[54] While this report is a province-wide analysis, there are two recommendations that are specifically targeted to the Greenbelt: "Increase producer requirements for monitoring and reporting" and "Introduce sunset clauses on aggregate licences."[55]

Current land-use policy in Ontario prioritizes aggregate operations (in areas where there is aggregate potential) over other potential land uses (including protecting a wetland through a prohibition on development).

3.3.2 Environmental Assessment Act

A variety of public projects are required to undergo environmental assessment prior to development. In particular, municipal infrastructure projects (e.g., drinking water and waste- water systems) are subject to Ontario's *Environmental Assessment Act*.[56] The purpose of the *Environmental Assessment Act* is "the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment."[57] "Environment" is broadly defined to include:

51 R.S.O. 1990, c. A. 8.

52 *Aggregate Resources Act*, section 2, paragraph d.

53 See discussion in previous section.

54 Binstock, M., & Carter-Whitney, M. (2011). *Aggregate extraction in Ontario: A strategy for the future*. Toronto: Canadian Institute for Environmental Law and Policy.

55 Binstock, M & Carter-Whitney, M. (2011). *Aggregate extraction in Ontario: A strategy for the future*, p. 29. Toronto: Canadian Institute for Environmental Law and Policy

56 R.S.O. 1990, c. E. 18.

57 *Environmental Assessment Act*, section 2.

(a) air, land or water,

(b) plant and animal life, including human life,

(c) the social, economic and cultural conditions that influence the life of humans or a community,

(d) any building, structure, machine or other device or thing made by humans,

(e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or

(f) any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.[58]

Within this definition (and related definitions for "land" and "water"), wetlands are not specifically identified. When wetlands are considered in an environmental assessment approval, it is not anticipated they will be given any particular attention.

Under the *Environmental Assessment Act*, proposed projects can be subject to an individual environmental assessment (with terms of reference and the actual environmental assessment happening on a project-by-project basis) or a class environmental assessment (with a specific category of projects being subject to a streamlined environmental assessment process). A proposed project subject to the *Environmental Assessment Act* cannot be given any legal authorization to proceed until environmental assessment approval has been completed.[59] Municipal infrastructure is subject to a class environmental assessment process, specifically the Municipal Engineers Association Municipal Class Environmental Assessment (Municipal Class EA). This process screens projects to determine the significance of the potential impacts on the environment, thereby determining the effort and public participation requirements necessary for environmental assessment approval of the project: The greater the significance of the impact, the greater the environmental and public scrutiny. The most rigorous process requires an Environmental Impact Study. In all cases, the anticipated impact on the environment for each alternative scenario, and mitigation of those impacts, are determined. Avoidance of impacts is not anticipated by the process. However, the project will need to ensure that it is compliant with relevant laws, regulations and policies (e.g., a proponent cannot obtain environmental assessment approval for a project that would be illegal under the *Greenbelt Act, 2005*). Because there are overlaps in the type of assessment done for environmental assessment approval and that done for land-use planning approval, the Municipal Engineers Association has been allowed to amend the Municipal Class EA to integrate land-use planning requirements and the environmental assessment requirements for some municipal infrastructure projects.[60]

Under the *Environmental Assessment Act*, proposed projects can be subject to an individual environmental assessment or a class environmental assessment.

3.3.3 Places to Grow Act, 2005

To accommodate the additional 3.7 million people anticipated in the Greater Golden Horseshoe Region between 2001 and 2031,[61] the provincial government enacted the *Places to Grow Act, 2005*. The legislation and the associated Growth Plan for the Greater Golden Horseshoe, are intended to

58 *Environmental Assessment Act*, section 1.

59 *Environmental Assessment Act*, subsection 12.2(2).

60 Ministry of the Environment. 2011, January 11. Information Notice: Proposed amendments to the Municipal Engineers Association's municipal class environmental assessment, *Environmental Bill of Rights,* Registry Number 011–1391.

61 Ministry of Public Infrastructure Renewal. (2006). Growth plan for the Greater Golden Horseshoe, p. 12. Toronto: Queen's Printer for Ontario.

coordinate and set a long-term vision for growth in the region. They are to be integrated with the Greenbelt, as set out in the Greenbelt Plan:

> *The Greenbelt is a cornerstone of Ontario's proposed Greater Golden Horseshoe Growth Plan which is an overarching strategy that will provide clarity and certainty about urban structure, where and how future growth should be accommodated, and what must be protected for current and future generations.*
>
> *The Greenbelt Plan identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape.*[62]

The *Places to Grow Act, 2005,* may actually provide more protection for the natural environment (including wetlands) from aggregate use than is available under the *Planning Act* (and PPS) and under the Greenbelt laws and policies. As with the three provincial land-use plans, land-use decisions are required to "conform with" the Growth Plan for the Greater Golden Horseshoe. The difference is that the more protective policy prevails in the case of a conflict. The *Places to Grow Act* states: "if there is a conflict between a direction in a growth plan and a direction in a plan or policy ... with respect to a matter relating to the natural environment or human health, the direction that provides more protection to the natural environment or human health prevails."[63] Since the plans and policies listed include the Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan and any provincial policy statement issued under the *Planning Act* (including the PPS), the result may be that a difference of opinion about which policy prevails (for instance, regarding a development application) will favour the most protective to the wetland.

3.3.4 Conservation Authorities Act

Under the *Conservation Authorities Act*[64] Conservation Authorities have been created to "establish and undertake," within the specified watershed a "program designed to further the conservation, restoration, development and management of natural resources."[65] These watershed based organizations are given powers to develop regulations (subject to Minister of Natural Resources approval) that would prohibit, restrict or require permission to impact wetlands.[66] Conservation Authority approval is required for wetlands interference. (See the next section regarding municipal drains under the *Drainage Act.*) There are exceptions, however, to this regulatory-making power. In particular, the Conservation Authority is not able to require approval to interfere with a wetland in the case of licensing under the *Aggregate Resources Act*.

62 Greenbelt Plan, section 1.1.

63 *Places to Grow Act, 2005*, subsection 14(4).

64 R.S.O. 1990, c. C. 27.

65 *Conservation Authorities Act*, R.S.O. 1990, c. C. 27 (as amended), section 20.

66 *Conservation Authorities Act*, R.S.O. 1990, c. C. 27 (as amended), section 28. In 2004, consolidation of all Conservation Authorities' regulations was initiated. Ontario Regulation 97/04 outlines the requirements for all Conservation Authorities' Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations, which were brought into conformity by 2006.

3.3.5 Drainage Act

Ontario has had drainage legislation for more than a century. The *Drainage Act*[67] enables the creation of waterworks that drain land for agricultural purposes. Since wetlands and associated ecosystem services are not acknowledged in this legislation, wetlands protection is impacted. In fact, the only "benefits" that are described in the *Drainage Act* are related to a historical perspective regarding land use—that land is "improved" by removing natural features such as forests and wetlands. Consider the definition of benefit in the *Drainage Act*:

> *"benefit" means the advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures.*[68]

Although the definitions of wetlands in other legislation often include a scope-limiting aspect related to agricultural lands, those definitions suggest that the exemption from wetlands protection is intended only to apply to agricultural lands that are poorly drained (e.g., in the absence of the wetlands' key characteristics—hydric soils and hydrophytic plants), rather than to wetlands in general. There is no wording in the current *Drainage Act* that would reflect this specific distinction. As such, there may be ongoing drainage of wetlands used for agriculture, despite the stewardship efforts of many agricultural owners and operators and specific permit requirements mandated by the Conservation Authority.

3.3.6 Clean Water Act, 2006

Although not fully implemented yet, the evolving planning process under the *Clean Water Act, 2006* is anticipated to influence land-use policy and may therefore allow more protection for some wetlands.

Although not fully implemented yet, the evolving planning process under the *Clean Water Act, 2006*[69] is anticipated to influence land-use policy and may therefore allow more protection for some wetlands. Ontario's *Clean Water Act, 2006* helps protect current and future drinking water sources from becoming contaminated. This legislation is a component of the drinking water "source to tap" protections that were recommended in Justice O'Connor's report following the Walkerton Inquiry.[70] Once fully implemented, each watershed subject to the *Clean Water Act, 2006* will have a Source Protection Plan, containing policies aimed at reducing threats to current and future drinking water sources. These policies may include: education and outreach, incentive programs, monitoring activities, land-use planning approaches, new or amended provincial approvals, risk management plans, prohibitions or restricted land uses. Given the benefits to water quality that are provided by wetlands, it is possible that protection of wetlands will be used as a policy in this framework. Under the *Clean Water Act*, there is a provision that some policies in a Source Protection Plan will supercede other policies and laws.[71]

---

67 R.S.O. 1990, c. D. 17.

68 *Drainage Act*, section 1.

69 S.O. 2006, c. 22.

70 The Honourable Dennis R. O'Connor. (2002). *Part two report of the Walkerton Commission of Inquiry: A strategy for safe drinking water*. Toronto: The Queen's Printer for Ontario.

71 *Clean Water Act, 2006*, section 39. Under this section, municipal land-use planning decisions will be required to "conform with" significant threat policies and "have regard to" other policies in source protection plans. To the extent that there is a conflict between the significant threat policies of a source protection plan and an official plan or zoning bylaw, the significant threat policies prevail. To the extent that there is a conflict between significant threat policies of a source protection plan and any of the provincial plans or the PPS, the policy most protective of the quality and quantity of water shall prevail.

3.3.7 Green Energy Act, 2009

The *Green Energy Act, 2009*[72] is intended to (a) foster growth of, remove barriers to and promote opportunities for renewable energy projects, (b) require that the public sector conserve and ensure efficient use of energy, and (c) promote and expand opportunities for all Ontarians to conserve and ensure efficient use of energy.[73] The Act enabled the streamlined Renewable Energy Approvals, which prohibit a renewable energy generation facility within a provincially significant southern wetland,[74] and a facility within 120 metres of a provincially significant southern wetland, unless an Environmental Impact Study is prepared in accordance with Ministry of Natural Resources procedures to mitigate and monitor the impact.[75] For renewable energy projects on the Niagara Escarpment, drafts of the project plans must be submitted to the Niagara Escarpment Commission prior to applying for a Renewable Energy Approval.[76] For the Oak Ridges Moraine and the Protected Countryside of the Greenbelt, the prohibition discussed above is extended to all southern wetlands and within 120 metres of those wetlands, unless an Environmental Impact Study is prepared in accordance with Ministry of Natural Resources procedures to mitigate and monitor the impact.[77] There may be more protection for wetlands on the Oak Ridges Moraine and in the Protected Countryside as a result of renewable energy projects than for the rest of Ontario. However, this protection is not up to the "avoidance" standard for development or site alternation. Also, municipalities and the public in general have much less say in Renewable Energy Approvals due to the streamlined approvals process (i.e., local land-use planning approval is no longer a requirement).

For renewable energy projects on the Niagara Escarpment, drafts of the project plans must be submitted to the Niagara Escarpment Commission prior to applying for a Renewable Energy Approval.

3.3.8 Endangered Species Act, 2007

The *Endangered Species Act, 2007*[78] contains a clear prohibition against damaging or destroying the habitat of endangered and threatened species, offering additional protection for wetlands.[79]

3.3.9 Ontario Water Resources Act

Under the *Ontario Water Resources Act*,[80] the Ministry of the Environment administers the water-use program.[81] In Ontario, water pumping (from both ground and surface waters) often requires a Permit to Take Water (PTTW).[82] Ontario's PTTW program is not a means of allocating water. In this way, the

72 S.O. 2009, c. 12.

73 *Green Energy Act, 2009*, preamble.

74 *Green Energy Act, 2009*, section 37.

75 *Green Energy Act, 2009*, sections 37–38.

76 *Green Energy Act, 2009*, section 32.

77 *Green Energy Act, 2009*, sections 31 and 43.

78 S.O. 2007, c. 6.

79 *Endangered Species Act, 2007*, section 10.

80 R.S.O. 1990, c. O.40.

81 Although the Ministry of the Environment's water management program regulates only the taking or pumping of water and often not the use directly (e.g., a municipality takes the water through its Permit to Take Water (PTTW), and then is regulated separately for treatment/distribution), there are limitations on the ability to qualify for a PTTW based on the type of use (i.e., certain uses do not require a PTTW at all and other uses are prohibited in particular watersheds).

82 Permits are generally required for water takings that exceed 50,000 litres per day, unless the water taking is for household, some agricultural and emergency (e.g., fire-fighting) uses.

water-use program in Ontario is different from other jurisdictions in Canada. For example, in western Canada, water rights have been vested in the Crown and water is allocated to individuals, often on a prior appropriation basis in which licences are issued on a "first come, first served" manner; and older licences take precedence over newer licences in times of low water flow. In Ontario, the Ministry of the Environment has oversight over water use, but does not have "ownership" of the water as in western Canada. Both riparian rights and the government's PTTW program operate together. The Ministry of the Environment issues PTTW to regulate "fair sharing" and to provide a basis to prevent unacceptable interference with any public or private interest in Ontario's surface water and groundwater resources.

In Ontario, the Ministry of the Environment has oversight over water use, but does not have "ownership" of the water as in western Canada.

The issuance of any PTTW is subject to the Ministry's consideration of an application in accordance with requirements set out in the Water Taking Regulation (O. Reg. 387/04). And, unlike the prior appropriation framework in western Canada, any or all PTTW holders may be required to employ conservation measures during times of low water flow or drought regardless of when the PTTW was issued. Although it is possible for the Ontario Low Water Response program (administered by the Ministry of Natural Resources and Conservation Authorities) to trigger mandatory reductions in water takings, the difficulty and long delays in obtaining provincial authorization for Level 3 conditions (the lowest water level designation) mean that the necessary reductions may not happen when they are needed to protect ecosystems (and potentially wetlands impacted by water takings).

Under the PTTW program, there are limits to water uses in watersheds that have been designated as "high-use" (due to annual and/or seasonal average flow conditions). For example, in a high-use watershed based on annual averages, no new or expanded permits are allowed for "aggregate processing, if the aggregate and the water that is taken are incorporated into a product in the form of a slurry."[83] These high-use watersheds were determined based on information related to flow conditions in 2004, and are not legally required to be reviewed or updated.

When determining whether to issue a PTTW, the following matters must be considered: need to protect the natural functions of the ecosystem; water availability, including whether located within a high-use or medium-use watershed; planned municipal use of water that has been approved (either under an official plan or pursuant to the Municipal Class EA); water use (including conservation measures); and interests of other persons that may be impacted by the water taking.[84]

One of the challenges for the PTTW program is that an application for a PTTW is often needed to allow implementation of an already approved viable undertaking (e.g., environmental assessment approval or aggregate resources licenses or land use planning approval). Although technical support staff in the Ministry of the Environment are engaged in the decision making regarding the undertaking (e.g., through a provincial one-window approach to land use planning approvals), the technical details needed to thoroughly assess an application for a PTTW are not available until after the viability of the undertaking has been determined. At the point of application, outright refusal to issue the PTTW is therefore much more difficult.

The Ministry of the Environment "takes stock" annually on March 31 (the end of its fiscal year) to summarize active permits. It is anticipated that each year the distribution of water-taking permits will be different among the different regions (e.g., there may be an increase in construction/dewatering permits and a decrease in wildlife/wetlands restoration permits).

83 O. Reg. 387/04, section 5.

84 O. Reg. 387/04, subsection 4(2).

3.4 What was learned

In Ontario, the land- and water-use legal and policy framework is a complex and layered system that leads to differing levels of protection for wetlands, despite clear legal commitments to ecological and hydrological integrity in some legislation (the clearest being the purpose and objectives in the *Oak Ridges Moraine Conservation Act, 2001*).

We found that there is more legal protection for wetlands across the Greenbelt from certain municipal land-use decisions than there is elsewhere in Ontario. This additional legal protection results from (a) a higher legal standard for land-use decisions made under the three provincial plans versus the *Planning Act*, (b) the "avoidance" standard (i.e., avoidance of direct impacts on wetlands) applying to a broader category of wetlands, and (c) the designation of wetlands as both Key Natural Heritage Features and Key Hydrological Features under the Greenbelt Plan.

We also found that there may be opportunities for further protection of wetlands with the implementation of the *Endangered Species Act, 2007* and the *Places to Grow Act, 2005*.

We also found that there may be opportunities for further protection of wetlands with the implementation of the *Endangered Species Act, 2007* and the *Places to Grow Act, 2005*.

The enhanced legal protection for wetlands across the Greenbelt is not without challenges. We found that differing legal definitions — of wetlands, purposes/objectives, and in ministries responsible for the three provincial plans — could create confusion and difficulties when interpreting how to apply wetland protections. We found that despite commitments in the three plans to create performance indicators and monitoring frameworks to assess effectiveness, there was no legal requirement to do so.

There are also instances where the "avoidance" standard has been relaxed with respect to certain land-use decision making. For example, within the Greenbelt Plan infrastructure decisions made under the *Environmental Assessment Act* are subject to an "avoid unless" standard (i.e., unless there is a need for and no reasonable alternative to avoiding wetlands). If it is not possible to avoid impacting wetlands, the impact is to be minimized. Under the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan, the standard is to minimize impacts of infrastructure decisions. There is generally the same protection (mitigation of impact) as in the rest of Ontario for aggregate extraction, unless the wetlands are within the areas of highest protection across the three provincial plans (e.g., for the Greenbelt Plan, the greatest protection from aggregate operations is within the Natural Heritage System of the Protected Countryside). There is also an indirect protection for wetlands from aggregate extraction in "high-use" watersheds, where a new or expanded Permit to Take Water will no longer be issued for aggregate extraction operations. The *Green Energy Act* approvals also fall short of the "avoidance" standard.

Two additional potential threats to wetlands have no requirements for approval prior to direct impact on wetlands: (1) *Drainage Act* permits to alter wetlands on agricultural lands do not require approval from a Conservation Authority; and (2) there is a complete exemption from permitting for peat extraction. Finally, due to the sequencing within land-use approvals, it is increasingly difficult to refuse to allow a Permit to Take Water for a project that has already been determined to be viable, which may lead to mitigation of impacts (rather than refusing the permit).

The dynamic nature of the legal system, particularly with a number of legislative changes since the *Greenbelt Act, 2005*, was passed, have further contributed to the complexity of assessing how wetlands are protected across the Greenbelt.

PLANNERS SURVEY

Municipal planners lead the creation and implementation of municipal Official Plans and assess planning applications that may directly and indirectly affect wetlands in the Greenbelt Plan area.

In order to understand how wetland policies are implemented in practice, Ontario Nature interviewed 12 municipal planners across the Greenbelt. Municipal planners lead the creation and implementation of municipal Official Plans and assess planning applications that may directly and indirectly affect wetlands in the Greenbelt Plan area. They represent a rich source of information and insight.

4.1 Method

In designing the planners survey, a primary consideration was to ensure an adequate range of perspectives by interviewing planners representing upper- and lower-tier municipalities in each of the three land-use plans across the Greenbelt. A secondary consideration was to identify planners who could help inform the selection of the case studies.

Interviews were conducted in the following municipalities over the summer and early fall of 2010:

- Town of Bradford West Gwillimbury
- Region of Durham
- City of Burlington
- County of Grey
- Town of Ajax
- Region of Peel
- Town of Newmarket
- City of Thorold
- City of Oshawa
- Township of Cavan Monaghan
- Two additional municipalities (anonymity requested)

The interviews were based on seven themes, with semi-structured questions ranging from a high-level assessment of whether the Greenbelt Plan was achieving its objectives, to specific questions concerning the implementation of Greenbelt Plan policies in the municipality's Official Plan. The themes and questions were as follows:

1. POLICY VERSUS PRACTICE: Are the Greenbelt Plan policies, as written, accomplishing their stated objectives on the ground?
2. TECHNICAL APPLICATION OF POLICY: What supports are available or required for planners to be able to effectively apply the policies (e.g., wetland mapping from government or partners, wetland assessment tools)?
3. THREATS AND OPPORTUNITIES: Are wetlands still threatened by land-use activities? If so, which activities are the most harmful? Has the Greenbelt Plan helped address threats? If so, which ones?
4. CHANGE OVER TIME: What observations can you provide concerning how the Greenbelt Plan has changed land-use planning around or in wetlands?
5. COLLABORATION: Whom do planners work with to help put these policies into action (e.g., coordinated efforts with upper-tier/neighbouring municipalities, Conservation Authorities)?
6. RECOMMENDATIONS: Is there a way to improve the Greenbelt Plan's protection for wetlands?
7. EMBRACING THE GREENBELT: Has the municipality gone above and beyond the legislated requirements in terms of wetlands protection (e.g., a request to expand boundaries, stricter policies, purchase of sensitive lands)?

Planners unanimously agreed that protection for all existing wetlands, including locally and regionally significant features rather than just provincially significant wetlands, has been a significant policy improvement for these ecosystems.

4.2 What was learned

Overall, the planners survey indicated that the Greenbelt Plan has strengthened wetland protection. Planners unanimously agreed that protection for all existing wetlands, including locally and regionally significant features rather than just provincially significant wetlands, has been a significant policy improvement for these ecosystems. In some regions, however, where the few remaining wetlands were already protected through the PPS, the Greenbelt Plan has not resulted in additional wetlands being protected. Nevertheless, planners suggested that even then the Greenbelt Plan could serve as a "policy backstop," if necessary.

Many planners mentioned that specific Greenbelt Plan policies are resulting in significant benefits to wetlands and their adjacent areas. For instance, the mandatory 30-metre buffer around a wetland, and the protection of all wetlands rather than just provincially significant ones, were cited as major strengths. These requirements enabled planners to remove wetlands and adjacent lands from the development envelope in their municipalities.

Many planners mentioned that specific Greenbelt Plan policies are resulting in significant benefits to wetlands and their adjacent areas.

Further, many planners suggested that the emphasis on protecting natural systems in addition to individual features would help their municipalities achieve big picture planning objectives, such as the protection of hydrological systems. They noted that the protection of hydrological systems would significantly contribute to the long-term protection of wetlands. Some jurisdictions had begun to formalize natural heritage system planning before the Greenbelt Plan was in place, and these planners felt that the plan's emphasis on systems as opposed to mere features was leading to a better understanding of, and stronger support for, system-based planning from their municipal council and area residents.

As one planner explained, proactive planners looking to effectively integrate natural heritage systems into Official Plans are able to pursue these goals under the Greenbelt Plan's "broad brush approach," and protect terrestrial and aquatic cores and corridors in their regions. According to one senior planner, introduction of the Growth Plan, the Greenbelt Plan and changes to the PPS in 2005 resulted in "the perfect storm of policy" for those hoping to identify and protect natural heritage systems.

A slightly more tentative perspective was offered by another planner who stated that the Greenbelt Plan "provides building blocks, but relies on the user to put them together." Indeed, not all Greenbelt municipalities are pursuing a well-articulated natural heritage system. Those who are tend to have two characteristics in common:

1. SIGNIFICANT RESOURCES AND CAPACITY—large, well-funded regional municipalities are definitely ahead of the curve. The upper-tier municipalities are often taking the lead and helping their lower tiers move forward.

2. A STRONG PROPONENT ON STAFF—an experienced and respected champion is often necessary for the adoption of recommendations on systems planning.

4.2.1 Capacity for policy implementation

Several smaller municipalities indicated that a lack of capacity (either funding or staff) has prevented them from bringing their zoning bylaws into conformity with their Official Plans, leaving the door open to potentially harmful activities in wetlands. The zoning bylaw of one municipality, for instance, had not been amended since the 1970s. Smaller municipalities usually have minimal in-house technical or ecological expertise, and must rely heavily on Conservation Authorities and consultants for these services. Even in larger municipalities, budgetary constraints often result in a heavy reliance on the

expertise and resources of Conservation Authorities. Participants emphasized that a good working relationship between Conservation Authorities and municipalities was necessary, but also noted that a lack of resources for both parties was sometimes a challenge.

Seven of the 12 survey participants noted that the lack of capacity within the Ministry of Natural Resources has been an issue when trying to delineate the boundaries of a wetland (e.g., to assess where the required 30-metre buffer should begin and end around a Key Hydrological Feature). Many were pleased with the ministry's mapping when it was received, but stated that the wait was often very long.[85]

In response to the capacity challenge, a number of planners interviewed identified strategies for wetland protection that are not required under the Greenbelt Plan, but would support wetland protection. For example, some smaller municipalities lacking on-site Geographic Information Systems (GIS) capability have elected to identify environmental protection areas, rather than delineate specific features—an approach that saves time and money and could be adopted by similarly challenged municipalities.

4.2.2 Implementation benefits and challenges

Although there was widespread support of the Greenbelt Plan's provisions for natural heritage system planning, some respondents were critical of implementation. Specific concerns included: the large "donut holes" in the Greenbelt Plan's coverage that have led to scenarios where municipalities are unable to create ecological corridors due to development constraints; the lack of technical guidelines from the Ministry of Natural Resources; and the Greenbelt Plan's "focus on natural heritage systems at the expense of watershed planning." One participant felt that too often, the interpretation of the Greenbelt Plan, in concert with the PPS, is leading to the systematic protection of terrestrial features (such as woodlands), without protecting the hydrological system.

Although some planners stated that the Greenbelt Plan has helped to increase awareness of the importance of system-based planning, others have encountered resistance as they attempt to establish natural corridors on the landscape.

Although some planners stated that the Greenbelt Plan has helped to increase awareness of the importance of system-based planning, others have encountered resistance as they attempt to establish natural corridors on the landscape. One respondent described the problem as a "lack of understanding" among both their municipal council members and the general public. This individual recommended that the Ministry of Municipal Affairs and Housing take a leadership role in educating the public on the concept of connectivity and the importance of assessing cumulative impacts on the overall function of ecosystems.

The need to better harmonize and address inconsistencies among the various laws and policies governing land use in the Greenbelt was mentioned as another challenge by almost all survey participants. To begin, as was discussed in Section 3 of this report, the definition of "wetland" is not consistent. One planner indicated that the Conservation Authority, the Region and the Ministry of Natural Resources each has its own wetland definition, a situation that leaves the door open for development proponents to use their own definition.

The following three issues, also related to inconsistent policy, came up repeatedly:

1. PROVINCIAL POLICY STATEMENT: Balancing the PPS's economic and environmental interests presents a challenge for planners. One respondent described the inconsistencies as a "constant source of angst." This is particularly true of activities that occur outside the

85 All planners have access to digital mapping in Land Information Ontario (LIO), which is often used for planning if they have the GIS capability. When these data are not detailed enough, planners must approach the MNR for better data.

Two planners felt that the *Endangered Species Act, 2007* represented an opportunity to increase wetland protection, largely through the regulation of habitats for species like the Jefferson salamander.

Greenbelt Plan but still have impacts on wetlands within the Greenbelt, such as aggregate extraction. Individual respondents stated that:

- applying the PPS fully was done "to the detriment of the hydrological backbone" of the area because the PPS focuses much more heavily on protecting terrestrial features than hydrological features.
- the PPS should be rewritten when new land-use plans are released to minimize confusion when implementing both.
- the conflict that currently exists between the PPS's agricultural policies and the Greenbelt Plan's natural heritage policies should be cleared up, including for instance, the mandate to protect both specialty crop areas and flood plains in an area like the Holland Marsh.

2. GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE: Two municipalities noted that their Growth Plan targets prevented them from considering a Greenbelt expansion. Another respondent noted that the mandated targets were going to encourage leapfrog development along the Greenbelt boundary, which would likely undermine the ecological integrity of the area.

3. PERMITS TO TAKE WATER: Several planners suggested that water-taking permits should have a finite term that does not exceed 10 years. Furthermore, the water allocation should be conditional on usage, rigorously monitored and reviewed annually. One planner stated that water takings under existing permits are "like black holes on the landscape." (These issues are discussed more fully in Section 6 of this report.)

Greenbelt policies also need to be better harmonized with the *Endangered Species Act, 2007*. Two planners felt that this legislation represented an opportunity to increase wetland protection, largely through the regulation of habitats for species like the Jefferson salamander. They were eager to get direction on how to incorporate habitat regulations into official plans, and to further integrate the regulations into other land-use policies and practices in their jurisdictions.

When asked to identify the top ongoing threats to wetlands in their municipalities, planners repeatedly mentioned four issues:

1. EXISTING USES, including agriculture, golf courses or cottages/ski hills, were mentioned by five planners as the most frequent threat.

2. INFRASTRUCTURE, either through direct impact from regional and provincial road construction, or indirect impact through salt runoff, was considered the greatest threat in four municipalities.

3. AGGREGATE USE, through direct impact of pits/quarries, as well as permits to take water, was mentioned as the greatest threat in three municipalities.

4. PEAT REMOVAL, an activity that is not regulated under the Greenbelt Plan, was also highlighted as a threat to wetlands by one planner.

4.2.3 Opportunities for improvement

The planners survey clearly indicates that the Greenbelt Plan is enhancing wetland protection, but that wetlands continue to be threatened by infrastructure expansion, existing uses, aggregate extraction and peat removal. Policies need to be better harmonized to address inconsistencies and planners require assistance with policy interpretation, mapping and system-based planning. The need to build awareness and understanding of the importance of wetlands and natural heritage system planning among municipal decision-makers and citizens is critical.

Further, many planners felt that the implementation of an Official Plan was only the first step in achieving a fully functioning natural heritage system. Recognizing the importance of land-use practices on private property, they expressed support for stewardship incentives, either through direct payments for good stewardship, or through programs that encouraged people to protect, restore or maintain wetlands on their property. Several municipalities work in partnership with community groups to provide funds for stewardship on private land. These properties often contain wetlands or areas of ecological significance that contribute to natural heritage systems, and many planners were enthused that they could help protect them. Underlining the importance of stewardship funding, one planner noted that "it is difficult to simply enforce policy on its own and have a positive outcome."

The following are opportunities for the provincial government based on the outcome of the planners' interviews:

- Provide better guidance on system-based planning and finalize the existing draft guidance documents on connectivity and Natural Heritage System planning;
- Finalize the technical guidelines for existing natural features[86] and develop new technical guidelines for connectivity and natural heritage system planning;
- Develop a consistent wetland definition for all agencies that delineate wetlands;
- Ensure that the necessary data and mapping resources are available to planners;
- Strengthen policies to address land-use activities that are still threatening wetlands, and include peat removal as an incompatible activity within and around Key Hydrological Features;
- Implement education programs that clarify Greenbelt Plan agricultural policies for farmers, citizens and municipal decision makers to help them better understand the importance of wetlands and system-based planning;
- Create incentives for wetland restoration and stewardship.

86 Discussion papers for how to interpret Greenbelt policies on woodlands, Key Natural Heritage Features and habitat were posted on the *Environmental Bill of Rights* Registry (www.ebr.gov.on.ca) on September 2008, but have not yet been finalized (see EBR Registry Number 010-4559).

WETLANDS CASE STUDIES

By investigating applications and approvals for specific projects, and the resulting effect on wetlands, the goal was to identify when policies across the Greenbelt were effective in conserving wetlands, when they are not and why.

This component of *Protecting Greenbelt Wetlands* was designed to use on-the-ground case studies to further examine the effectiveness of land-use and related policies in protecting wetlands across the Greenbelt. By investigating applications and approvals for specific projects, and the resulting effect on wetlands, the goal was to identify when policies across the Greenbelt were effective in conserving wetlands, when they are not and why. Based on those findings, the second goal was to identify opportunities to improve land-use and related policies and their implementation.

The method was straightforward: select a series of case studies that reflected the scope of land development and other activities that constitute the greatest threat to Greenbelt wetlands; review the applications for permits/approvals; and assess the outcome in terms of wetland protection. In practice, however, this approach proved to be more challenging than expected for several reasons (see Section 5.1.3). The key steps in the methodology were to:

- Establish criteria for selection
- Identify a pool of potential case studies that met the criteria
- Screen and prioritize the list of potential cases and identify 9 to 12 suitable case studies
- For each case study, identify, collect and review the key documents (e.g., Environmental Impact Studies, environmental assessment reports) associated with the applications for project approval and summarize:
    - The potential ecological impact on the subject wetlands
    - The overall effectiveness of applicable policies to protect wetlands and their ecological functions

A consultant with expertise and experience in both natural heritage evaluation and policy implementation relating to land-use planning and EA approvals was selected through a competitive bid process. Beacon Environmental was selected and retained by Ducks Unlimited Canada, who, in collaboration with the project partners, provided project oversight and direction to the consultant. Beacon Environmental's final report[87] is available as a technical support document to *Protecting Greenbelt Wetlands*.

87 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project.*

The following comment by the Consultant highlights the fact that the case studies were based entirely on reviews of key documents, and that no fieldwork or other analyses were undertaken beyond assessment of applicable policies:

> *Therefore, the wetland impact assessments are largely reliant on the information provided in the relevant reports and supporting maps. Similarly, the assessment of policy effectiveness is based on approved project outcomes as they are presented on paper, but not the extent to which wetlands have actually been protected, enhanced and/or restored on the ground. The information presented in these case studies is also based on information last verified in September 2010. It is possible that some details, such as current project status, may have changed since that date.*[88]

5.1 Case study selection

5.1.1 Case study selection criteria

For consideration in this analysis eligible projects needed to:

- be within Ontario's Greenbelt Plan Area;
- be initiated after the applicable provincial land-use plan was established;
- have the potential to directly affect wetlands within or immediately adjacent (i.e., within 120 metres) to the subject property;
- be a relatively large-scale development within a sector of interest to the project partners;
- be cases where an approval decision has been rendered by the appropriate planning authority (with no known appeals in progress or pending); and
- present no potential conflict of interest for the consultant.

For consideration in this analysis eligible projects needed to, among other things, have the potential to directly affect wetlands within or immediately adjacent (i.e., within 120 metres) to the subject property.

5.1.2 Final case studies

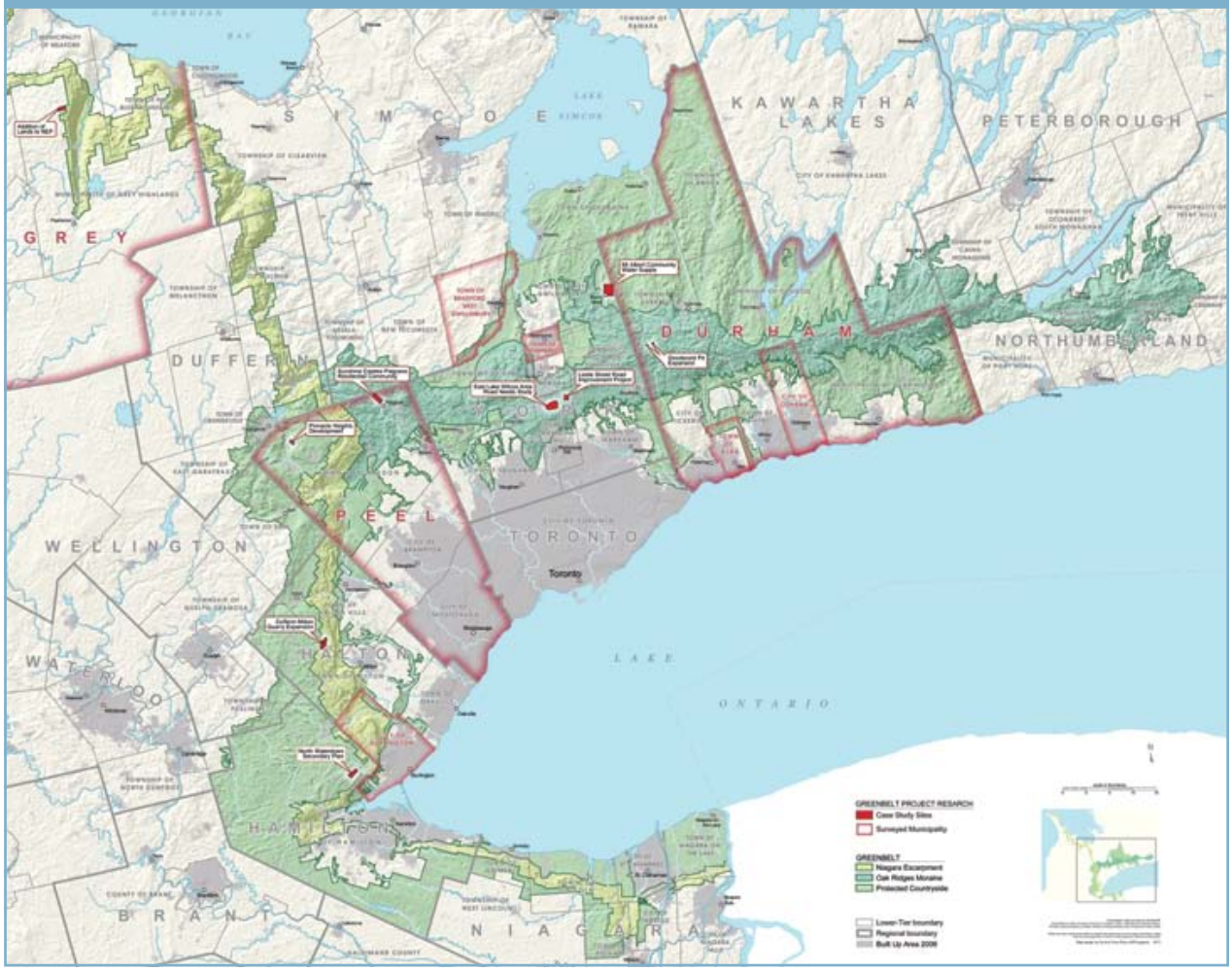
The selection process resulted in a final list of nine case studies, which are listed on page 39 in Table 2 and described in terms of their satisfaction of key selection criteria.

Note that some of case study projects were subject to additional policies or legislation as part of the approval process.

Map 2 on page 38 shows the locations of the nine final case studies across the Greenbelt.

88 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 20.

MAP 2: PROJECT OVERVIEW MAP SHOWING CASE STUDY SITES AND SURVEYED MUNICIPALITIES



Download a full-sized, printable map at ecojustice.ca/greenbelt

TABLE 2: FINAL SELECTED CASE STUDIES, REPRESENTATION FOR DIFFERENT SELECTION CRITERIA AND PRIMARY APPLICABLE POLICIES (FOR PROJECT APPROVAL)

Case Study Name	Representation from Case Study sectors	Representation from ORMCP, NEP and GBP – Protected Countryside	Geographic Distribution	Primary Policy/ Legislation[1]	Responsible Approval Authority
Leslie Street Municipal Class EA	Infrastructure – Roads	Oak Ridges Moraine Conservation Plan	Central – Region of York	*Environmental Assessment Act* (1990), Municipal Class EA	MOE
East Lake Wilcox Area Road Needs Study Master Plan/Class EA	Infrastructure – Roads	Oak Ridges Moraine Conservation Plan	Central – Region of York	*Environmental Assessment Act* (1990), Municipal Class EA	MOE
Mount Albert Community Water Supply Class EA	Infrastructure – Water Supply	Oak Ridges Moraine Conservation Plan, Greenbelt Plan- Protected Countryside	Central – York Region	*Environmental Assessment Act* (1990), Municipal Class EA	MOE
Pinnacle Heights Golf Course Expansion	Land Development – Golf Course	Greenbelt Plan- Protected Countryside	West – Region of Peel	Town of Caledon Official Plan (prior to 2008), and conformity with the Provincial Policy Statement (2005) and Greenbelt Plan (2005)	Town of Caledon
North Waterdown Secondary Plan	Land Development – Med-Large-Scale Residential-Commercial	Greenbelt Plan – Protected Countryside	West – City of Hamilton	City of Hamilton Official Plan Amendment No. 129, conformity with Provincial Policy Statement (2005) and Greenbelt Plan (2005)	City of Hamilton and Ontario Municipal Board
Sunshine Estates Development	Land Development – Med-Large-Scale Residential-Commercial	Oak Ridges Moraine Conservation Plan	West – Peel Region	Town of Caledon Official Plan (2008), conformity with Provincial Policy Statement (2005) and Greenbelt Plan (2005)	Town of Caledon
Goodwood Pit Expansion	Aggregate Extraction – sand and gravel pit	Oak Ridges Moraine Conservation Plan	East – Region of Durham	Aggregate Resources Act (1990)	MNR
Milton Quarry Expansion	Aggregate Extraction – quarry	Niagara Escarpment Plan	West – Region of Halton	Aggregate Resources Act (1990)	MNR
Addition of Lands to the Niagara Escarpment Plan in Grey County	Other – addition to the Niagara Escarpment Plan Area	Niagara Escarpment Plan	North – Grey County	*Niagara Escarpment Planning and Development Act* (1985), Niagara Escarpment Plan (2005)	MNR

5.1.3 Lessons learned from case study selection

The Consultant identified the following "lessons learned" via the case study selection.

Agricultural land-use case studies

> *At the outset of this project, development of lands for agricultural uses was considered for inclusion, but suitable case studies were very difficult to find. Based on the Consulting Team's experience, we surmised that this may be related to the fact that agricultural activities (both existing and new) do not require municipal permissions (e.g., under the Planning Act) for such activities. ... Given the lack of suitable case studies, it was ultimately determined that the potential impacts of agricultural land uses on wetlands in the Greenbelt should be explored separately through a policy review paper, rather than a case study approach, and so this category was excluded from this study.*[89]

Several Ontario Ministry of Natural Resources staff who deal with aggregate applications commented anecdotally that the more onerous and restrictive policies under the *Greenbelt Act, 2005* seemed to be causing a shift in these activities outside these lands.

Aggregate extraction case studies

> *The difficulty in finding case studies meeting the established criteria was also evident for aggregate extraction. The scarcity of these (aggregate) applications appears to be related to the time required to obtain the necessary approvals as well as the increased difficulty in getting approvals since enactment of the Greenbelt Act and the related Oak Ridges Moraine Conservation Act. Nonetheless, the Consulting Team did manage to find two case studies.*[90]

Several Ontario Ministry of Natural Resources staff who deal with aggregate applications commented anecdotally that the more onerous and restrictive policies under the *Greenbelt Act, 2005* seemed to be causing a shift in these activities outside these lands.[91] The difficulty in getting these types of applications approved is supported by the fact that about 90 percent of the aggregate case studies considered had to be disqualified because they are being appealed before the Ontario Municipal Board, Environmental Review Tribunal or Joint Panel.[92]

Land development case studies

> *One additional lesson learned ... was that while projects subject to the Environmental Assessment Act (i.e., infrastructure) and the Aggregate Resources Act have clearly defined processes and study requirements, and must make documentation readily available for external review and scrutiny, the same does not hold true for land development projects under the Planning Act. As a consequence of this, it was more difficult to obtain copies of the environmental background studies for residential/commercial developments.... In one instance, a municipality refused to release documents without an application under the Municipal Freedom of Information and Protection of Privacy Act.*[93]

---

89 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 9.

90 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 9–10.

91 J. Bakker, pers. comm., August – September, 2010.

92 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 10.

93 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 10.

5.2 Case study assessments

For each case study, the Consultant compiled a summary of the expected impacts to the subject wetlands, typically broken down into hydrogeological, hydrological and ecological impacts. This summary was then assessed by Ducks Unlimited Canada to determine whether there was an overall, net positive, negative or neutral impact on the ecological functions of the subject wetlands. It should be noted that for some case studies, it was not possible to come to any conclusion regarding net impact because of a lack of suitable information and/or because differences in the types of positive and negative impacts do not lend themselves to "summing up." For each case study, the Consultant also assessed the effectiveness of key policies and their implementation in terms of protection of wetlands and their ecological functions.

For each case study, the Consultant compiled a summary of the inferred impacts to the subject wetlands, typically broken down into hydrogeological, hydrological and ecological impacts.

The following sections provide a brief summary of expected wetland impacts and overall policy effectiveness in protecting wetlands for each case study, based on research undertaken by the Consultant. For policy effectiveness, the Consultant assigned a rating of high, medium or low with respect to the applicable policies that were triggered; definitions by the Consultant for those three terms are as follows:[94]

High = All wetlands within or within 120 metres of the study area are protected, or actual/anticipated impacts are fully mitigated (at least from a planning perspective).

Medium = Wetlands within or within 120 metres of the study area are reasonably well protected, or actual/anticipated impacts are partially mitigated (at least from a planning perspective).

Low = Wetlands within or within 120 metres of the study area are not well protected, or actual/anticipated impacts are poorly mitigated (at least from a planning perspective).

For each case study, Chris Brackley of As the Crow Flies Cartography was commissioned by Earthroots to create a detailed map showing the location of the case study area, surrounding wetlands and other environmentally important areas, and the surrounding water takings.[95]

Table 3 on page 42 provides a summary of expected impacts (positive and negative) for each case study.

94 These ratings appear under the summary of policy effectiveness in each case study. See, for example, the note below Table 7, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 32.

95 Note that the orientation of each map has been determined to provide the best perspective of the topography surrounding the specific case study area.

TABLE 3: SUMMARY OF EXPECTED POSITIVE AND NEGATIVE IMPACTS FOR WETLANDS FROM THE CASE STUDIES

Case Study Name	Negative Wetland Impacts	Positive Wetland Impacts
Leslie Street Municipal Class EA	– loss of 3,700m² of wetland and 4,800m² of upland woods; – temporary impacts during construction (i.e., runoff, disruption of hydrologic regimes, habitat disruption)	– permanent reduction of runoff contaminants; – improved hydrologic and ecological connectivity; increase in the extent and quality of riparian habitat; – 16,500m² of combined wetland and upland; improved habitat buffering; – replacement of lost trees with native species
East Lake Wilcox Area Road Needs Study Master Plan/Class EA	– temporary construction impacts; – disruption of hydrologic regimes and loss of amphibian breeding habitat; – potential habitat fragmentation; – loss of trees adjacent to wetlands	– permanent reduction of runoff contaminants; increase in extent and quality of riparian habitat; – improved habitat buffering; opportunities for better amphibian crossing; – replacement of lost trees with native species
Mount Albert Community Water Supply Class EA	– no anticipated indirect impacts on local wetlands (i.e. significant changes in hydrology or groundwater inputs) – "minor effects" projected to flows/water levels in local creeks	– none identified
Pinnacle Heights Golf Course Expansion	– infringement into wetland in two locations; – potential increase in fertilizer contamination; – potential hydrologic impact from wells	– none identified
North Waterdown Secondary Plan	– potential that buffer may not ensure habitat sustainability in an urban context	– permanent reduction of runoff contaminants
Sunshine Estates Development	– possible hydrologic impacts from future phases of development; – possible impacts on connectivity	– none identified
Goodwood Pit Expansion	– none identified for Phase I of expansion	– none identified for Phase 1
Milton Quarry Expansion	– possible hydrologic impacts to two provincially significant wetlands and one non-provincially significant wetland	– none identified
Addition of Lands to the Niagara Escarpment Plan in Grey County	– none identified	– none identified

Source: Adapted from Beacon Environmental.(2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 21-116.

Case study assessments on the following pages include:

- Municipal infrastructure project case studies
  - Leslie Street Municipal Class EA (in the Oak Ridges Moraine Conservation Plan area)
  - East Lake Wilcox Area Road Needs Study Master Plan/Class EA (in the Oak Ridges Moraine Conservation Plan area)
  - Mount Albert Community Water Supply Class EA (in the Oak Ridges Moraine Conservation Plan areaand the Greenbelt Protected Countryside)
- Private land development case studies
  - Pinnacle Heights Golf Course Expansion (in the Greenbelt Plan Protected Countryside)
  - North Waterdown Secondary Plan (in Greenbelt Plan Protected Countryside)
  - Sunshine Estates Development (in the Oak Ridges Moraine Conservation Plan area)
- Aggregate extraction project case studies
  - Goodwood Pit Expansion (in the Oak Ridges Moraine Conservation Plan area)
  - Milton Quarry Expansion (in the Niagara Escarpment Plan area)
- Addition of lands to the Greenbelt
  - Addition of Lands to Niagara Escarpment Plan in Grey County

5.2.1 Municipal infrastructure project case studies

1. Leslie Street. Municipal Class EA (in the Oak Ridges Moraine Conservation Plan area)

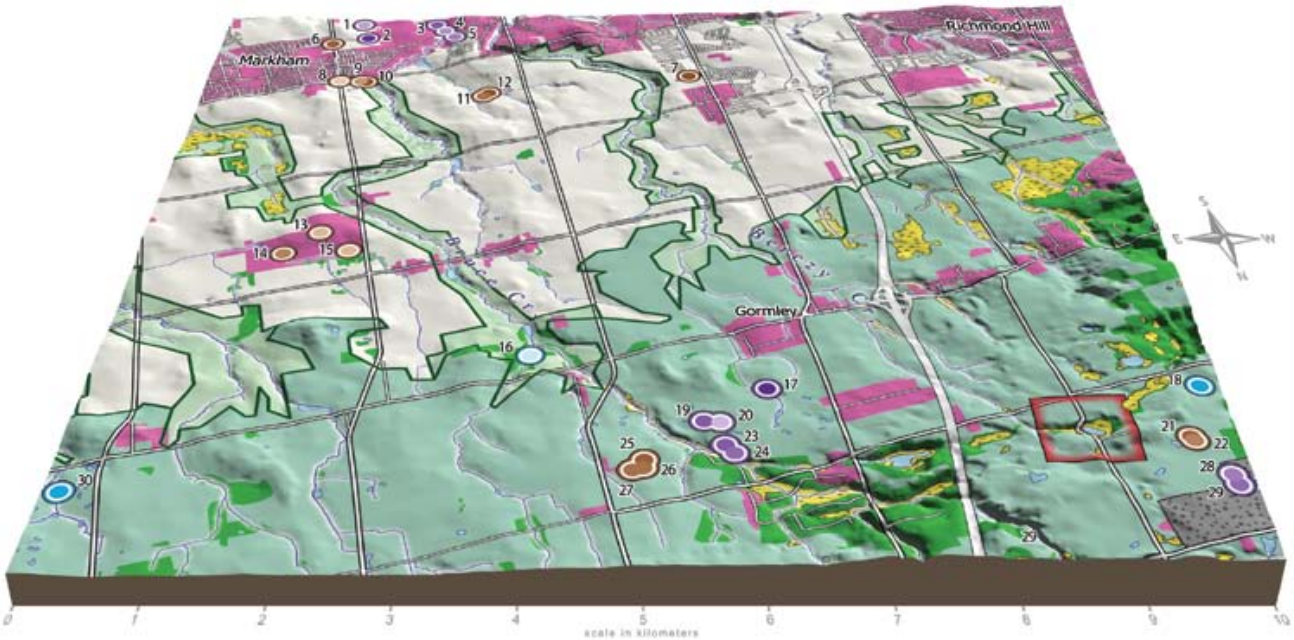
This case study assesses the effectiveness of policies to conserve wetlands in the case of proposed modifications to an existing road that transects a provincially significant wetland in the Town of Richmond Hill.

WETLAND IMPACT ASSESSMENT: In this case study, the net impact on the subject wetlands could be positive or negative, depending on the effectiveness of future wetland compensation measures. Planned compensation for the removal of wetland and upland forest will entail replacing the removed features with an area that is approximately double the area that was to be removed. There are also a number of measures to be employed that should improve and enhance wildlife habitat and hydrologic connectivity, which in turn should improve the ecological health and water quality of Haynes Lake and the associated creek. The overall or net impact to natural areas will most likely be positive, but the net impact to the wetlands specifically is less clear.

POLICY EFFECTIVENESS ASSESSMENT: Due to its potential for significant environmental effects, this project was classed as a Schedule C under the Municipal Class EA, the most stringent of the three Class EA types. In the opinion of the Consultant, "the [Environmental Study Report] for this case study ... fully addresses the Municipal Class EA policy requirements. However, these policies were not very effective in preventing wetland loss, although they did allow extensive wetland habitat mitigation and compensation measures to be recommended and approved."[96] The Consultant also noted that

96 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 28.

MAP 3: LESLIE STREET MUNICIPAL CLASS EA



PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	32 832 000	Commercial	Golf Course Irrigation
2	569 664 000	Commercial	Golf Course Irrigation
3	282 080 000	Commercial	Golf Course Irrigation
4	65 664 000	Commercial	Golf Course Irrigation
5	97 920 000	Commercial	Golf Course Irrigation
6	259 880 000	Dewatering	Construction
7	346 750 000	Dewatering	Construction
8	8 935 200	Dewatering	Construction
9	70 699 500	Commercial	Golf Course Irrigation
10	392 760 000	Commercial	Golf Course Irrigation
11	135 507 600	Commercial	Golf Course Irrigation
12	392 760 000	Commercial	Golf Course Irrigation
13	16 200 000	Commercial	Golf Course Irrigation
14	81 648 000	Commercial	Golf Course Irrigation
15	24 624 000	Commercial	Golf Course Irrigation
16	0	Miscellaneous	Dams and Reservoirs
17	1 833 753 600	Commercial	Golf Course Irrigation
18	604 138 875	Miscellaneous	Wildlife Conservation
19	239 148 000	Commercial	Golf Course Irrigation
20	19 972 800	Commercial	Golf Course Irrigation
21	200 304 000	Commercial	Golf Course Irrigation
22	86 284 800	Commercial	Golf Course Irrigation
23	241 920 000	Commercial	Golf Course Irrigation
24	137 088 000	Commercial	Golf Course Irrigation
25	181 440 000	Commercial	Golf Course Irrigation
26	161 280 000	Commercial	Golf Course Irrigation
27	157 680 000	Commercial	Golf Course Irrigation
28	105 964 000	Commercial	Golf Course Irrigation
29	156 409 000	Commercial	Golf Course Irrigation
30	613 800 000	Commercial	Golf Course Irrigation

Study Area

Permits to Take Water

Millions of litres: 1 419, 843, 443, 262, 168, 110, 72, 46, 29, 16, 7, 0

Ground Water | Surface Water | Surface & Ground Water

WETLANDS
Provincially Significant Wetland
Wetland

AGGREGATE SITES
Active
Surrendered

GREENBELT
Niagara Escarpment
Oak Ridges Moraine
Protected Countryside

Environmentally Important Areas*
Built Up Area 2006
* includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Map design by As the Crow Flies cARTography 2011

Download a full-sized, printable map at ecojustice.ca/greenbelt

all of the alternatives that were considered in the EA would have had some negative impact on other environmentally sensitive features, if not the wetland. The Consultant's rating for policy effectiveness was "High" for all applicable policies.[97]

97 See Table 7, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 32.

PHOTO COURTSEY MIKE SHACKLEFORD

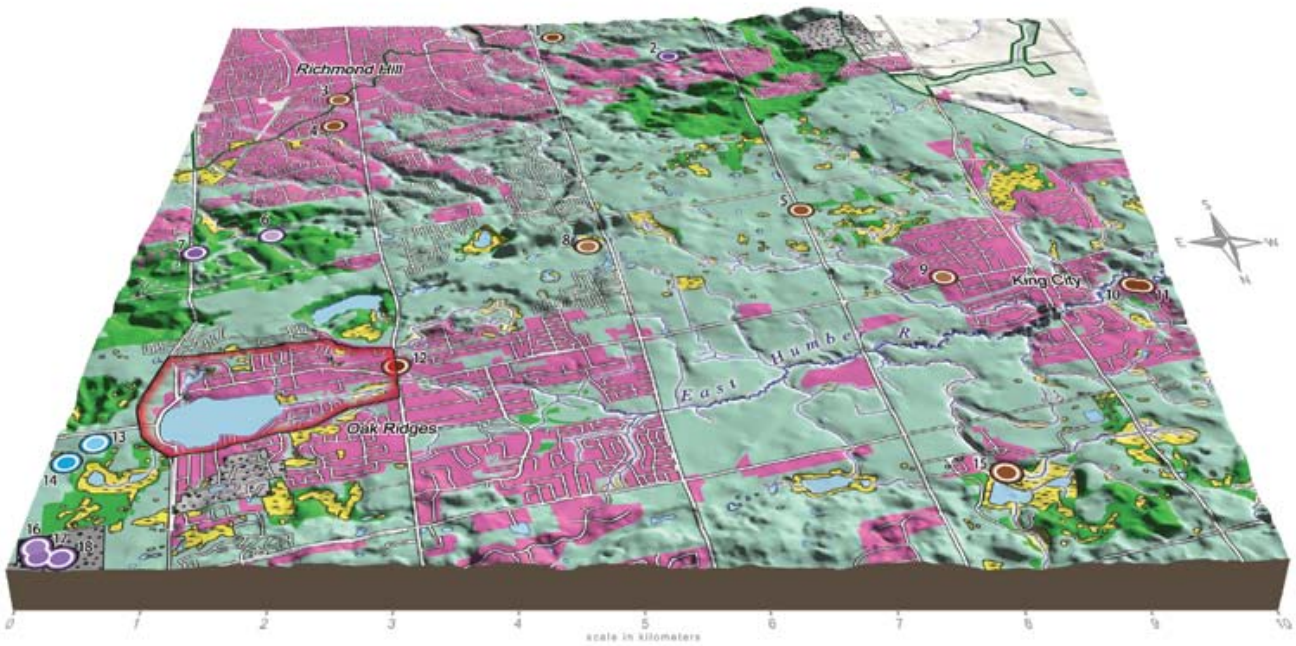
2. East Lake Wilcox Area Road Needs Study Master Plan/Class EA (in the Oak Ridges Moraine Conservation Plan area)

This case study assesses the effectiveness of wetland policies related to changes to the existing road network for the East Lake Wilcox community within the Town of Richmond Hill.

WETLAND IMPACT ASSESSMENT: The Consultant described the overall outcome for wetland features and functions as "generally positive" for this case study. In the opinion of Ducks Unlimited Canada staff, there is uncertainty as to the net impact on the subject wetlands due to lack of information in the Master Plan/EA report (as detailed below). On the positive side, it is expected there will be hydrological and ecological improvements for natural heritage features generally and in some cases for the associated wetlands. Positive ecological impacts are primarily due to increases in extent and quality of riparian habitat. On the negative side, the Consultant identified potential impacts on the hydrology and habitat quality of a "small kettle depression" (which contains some wetland habitat).

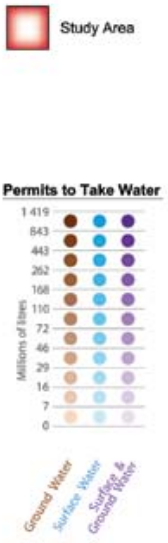
POLICY EFFECTIVENESS ASSESSMENT: The Consultant cited several factors that led to this "generally positive outcome," notably: 1) the integration of a Master Planning and EA process which helped ensure conformity with local municipal land use policies (and supporting documents) and conformity with the *Environmental Assessment Act*/Municipal Class EA process; 2) *Environmental Assessment Act* requirements for a "fairly comprehensive and well-documented public process;" and 3) the presence of a vocal and active community. However, several notable gaps in the Master Plan/EA report reviewed by the Consultant were also identified. A lack of discussion was noted regarding 1) potential hydrological impacts to the wetlands and 2) potential impacts to the small kettle depression (including an

MAP 4: EAST LAKE WILCOX AREA ROAD NEEDS STUDY MASTER PLAN/CLASS EA



PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	518 400 000	Dewatering	Construction
2	357 425 250	Commercial	Golf Course Irrigation
3	176 601 600	Dewatering	Other - Dewatering
4	414 000 000	Dewatering	Construction
5	319 863 200	Dewatering	Construction
6	29 548 800	Commercial	Golf Course Irrigation
7	255 182 400	Commercial	Golf Course Irrigation
8	142 560 000	Commercial	Golf Course Irrigation
9	163 225 800	Dewatering	Construction
10	716 828 975	Water Supply	Municipal
11	955 772 210	Water Supply	Municipal
12	1 113 840 000	Dewatering	Construction
13	55 553 000	Miscellaneous	Wildlife Conservation
14	604 138 875	Miscellaneous	Wildlife Conservation
15	262 800 000	Institutional	Schools
16	105 984 000	Commercial	Golf Course Irrigation
17	156 400 000	Commercial	Golf Course Irrigation
18	128 800 000	Commercial	Golf Course Irrigation



Download a full-sized, printable map at ecojustice.ca/greenbelt

absence of breeding amphibian studies). A lack of guidance in the Master Plan/EA report on various proposed mitigation measures was also noted, including failure to meet a policy requirement (under the Class EA process) to list specific mitigation measures for features such as wetlands. Lastly, no breeding bird studies were conducted, so potential impacts on breeding birds were not assessed. The Consultant's rating for policy effectiveness was "Medium" for all applicable policies.[98]

98 See Table 8, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 42–43.

PHOTO COURTESY GREENBELT.CA

3. Mount Albert Community Water Supply Class EA (in the Oak Ridges Moraine Conservation Plan area and the Greenbelt Protected Countryside)

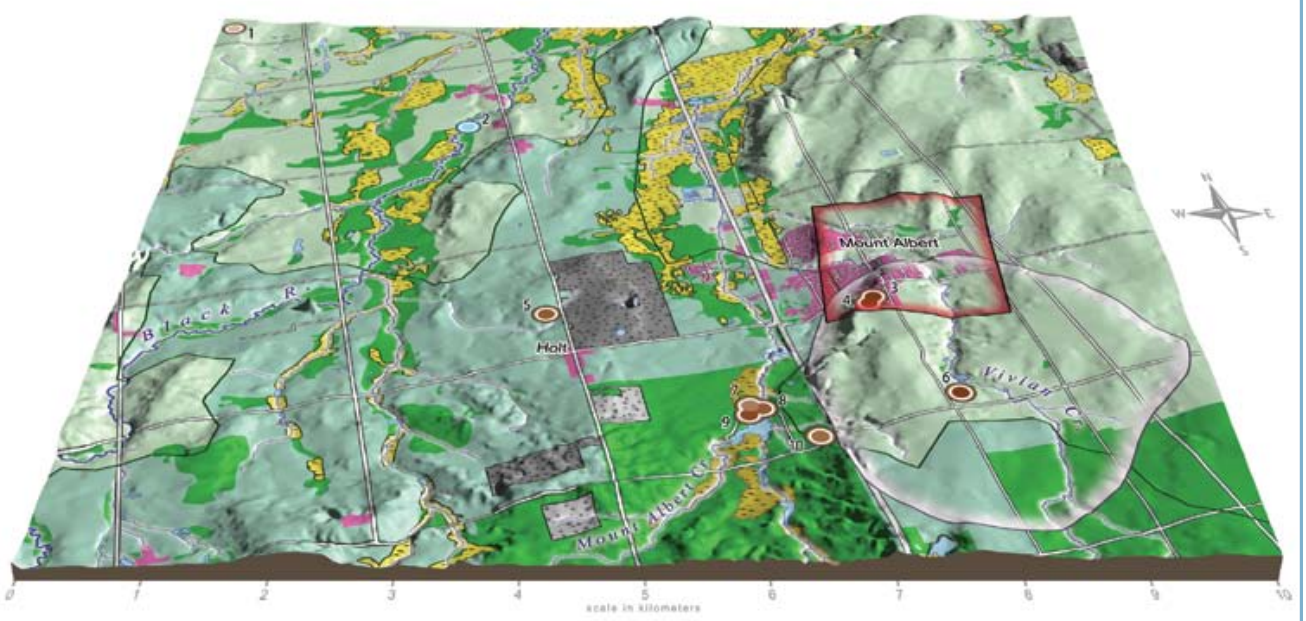
This case study assesses the effectiveness of policies to conserve wetlands in the vicinity of a planned water supply expansion (to accommodate future urban growth) in Mount Albert, in the Town of East Gwillimbury.

WETLAND IMPACT ASSESSMENT: Because the location of the preferred alternative for the water supply was distant from all wetlands in the area, there were no apparent positive or negative impacts to those wetlands. "Minor effects" on local creek elevations and/or base flows were predicted.

POLICY EFFECTIVENESS ASSESSMENT: The preferred alternative that was selected via the Class EA recommended that an additional well and related works (i.e., well house and water main) remain outside the Oak Ridges Moraine Conservation Plan area and out of Key Natural Heritage Features and Key Hydrological Features in the Greenbelt Natural Heritage System. In this respect, there was a clear recognition and satisfaction of *Environmental Assessment Act*/Class EA, Oak Ridges Moraine Conservation Plan and Greenbelt Plan requirements, which resulted in a positive outcome for wetlands (i.e., avoidance of wetland impacts). Furthermore, the Class EA for this project requires continuous monitoring for potential impacts on surface water features. The Consultant's rating for policy effectiveness was "High" for all applicable policies.[99]

99 See Table 9, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 54–55.

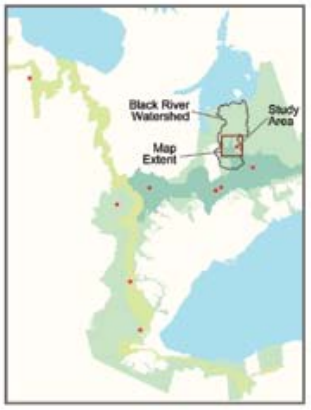
MAP 5: MOUNT ALBERT COMMUNITY WATER SUPPLY CLASS EA



Study Area
Zone of Influence

GREENBELT
- Niagara Escarpment
- Oak Ridges Moraine
- Protected Countryside

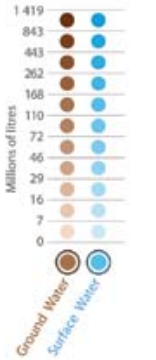
WETLANDS
- Provincially Significant Wetland
- Wetland



PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	16 353 000	Agricultural	Field and Pasture Crops
2	33 129 000	Agricultural	Field and Pasture Crops
3	1 194 688 800	Water Supply	Municipal
4	1 194 688 800	Water Supply	Municipal
5	442 029 600	Agricultural	Field and Pasture Crops
6	1 194 688 800	Water Supply	Municipal
7	143 362 510	Commercial	Aquaculture
8	286 725 385	Commercial	Aquaculture
9	453 981 890	Commercial	Aquaculture
10	215 044 130	Commercial	Aquaculture

Permits to Take Water



AGGREGATE SITES
- Active
- Surrendered

- Environmentally Important Areas*
- Built Up Area 2006

* Includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Map design by As the Crow Flies cARTography
2011

Download a full-sized, printable map at ecojustice.ca/greenbelt

PHOTO COURTESY STEVE BYLAND

5.2.2 Private land development case studies

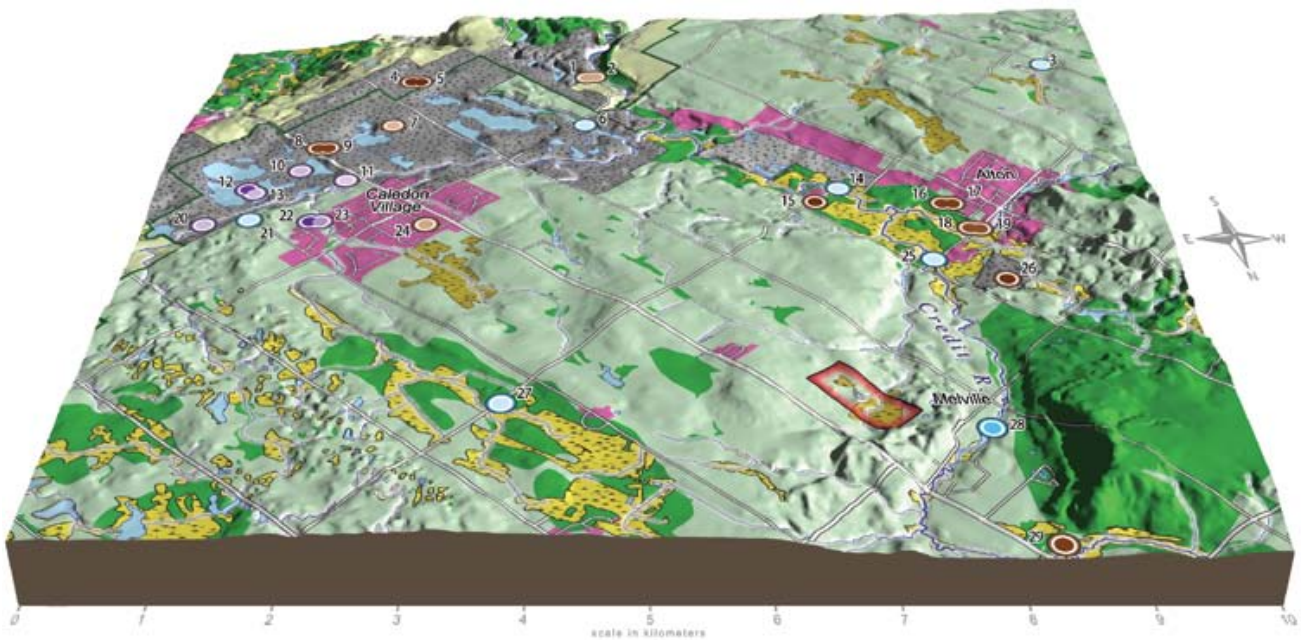
4. Pinnacle Heights Golf Course Expansion (in the Greenbelt Plan Protected Countryside)

This case study assesses the effectiveness of policies to conserve wetlands in the case of a golf course expansion (addition of nine holes) in the Town of Caledon.

WETLAND IMPACT ASSESSMENT: The overall net effect on the subject wetlands and their ecological functions will most likely be negative to some extent . The outcome of the *Planning Act* approval process was to direct all development away from the wetland units, and to generally provide a 30-metre buffer with two exceptions: (1) a sightline for Hole #11 travels directly over a marsh area, meaning that golfers may impact the wetland buffer as they look for lost golf balls, and (2) a cart path crossing for Hole #21 through another wetland area. Other potential negative impacts include water quality degradation from fertilizer use and impacts on the wetlands water supply caused by pumping groundwater for an irrigation well.

POLICY EFFECTIVENESS ASSESSMENT: There is some permissiveness in the Greenbelt Plan policies for recreational uses, such as golf courses (e.g., allowance for "small scale structures"). In this case study, the Environmental Implementation Report did not explicitly address the specific Key Natural Heritage Features and Key Hydrological Features found on site, nor did it contain adequate analyses of the potential hydrological impacts to the wetland from the irrigation well or water quality impacts from nutrients. Authors of the Environmental Implementation Report also make the argument that the golf course is exempt from the policies to establish a Vegetation Protection Zone (i.e., Section 3.2.4.5 of the Greenbelt Plan) because it is a recreational development. The basis for this interpretation is not clear. Nonetheless, most of the wetland features have the required 30-metre Vegetation Protection Zone. In addition, the Consultant reported a failure to provide a vegetation enhancement plan and conservation plan (as a mitigation requirement), as per Section 4.1.2 of the Greenbelt Plan. The Consultant also determined that "the conclusion that there will be no impacts to the ... hydrologic

MAP 6: PINNACLE HEIGHTS GOLF COURSE EXPANSION

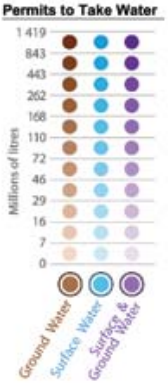


PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	42 048 000	Remediation	Groundwater
2	42 048 000	Remediation	Groundwater
3	2 500 000	Construction	Other - Construction
4	916 440 000	Industrial	Other - Industrial
5	916 440 000	Industrial	Other - Industrial
6	2 500 000	Construction	Other - Construction
7	9 948 075	Water Supply	Other - Water Supply
8	716 918 400	Water Supply	Municipal
9	477 770 400	Water Supply	Municipal
10	22 093 560	Industrial	Aggregate Washing
11	15 768 000	Industrial	Aggregate Washing
12	760 320 000	Industrial	Aggregate Washing
13	19 612 800	Industrial	Aggregate Washing
14	2 500 000	Construction	Other - Construction
15	1 194 668 800	Water Supply	Municipal
16	477 770 400	Water Supply	Municipal
17	477 770 400	Water Supply	Municipal
18	382 300 270	Water Supply	Municipal
19	382 300 270	Water Supply	Municipal
20	19 612 800	Industrial	Aggregate Washing
21	25 00 000	Construction	Other - Construction
22	1 846 800 000	Industrial	Aggregate Washing
23	53 994 600	Industrial	Aggregate Washing
24	44 676 000	Water Supply	Municipal
25	2 500 000	Construction	Other - Construction
26	1 385 000 000	Industrial	Aggregate Washing
27	2 500 000	Construction	Other - Construction
28	126 037 440	Commercial	Golf Course Irrigation
29	530 330 400	Water Supply	Municipal

Study Area

Permits to Take Water



WETLANDS
Provincially Significant Wetland
Wetland

AGGREGATE SITES
Active
Surrendered

GREENBELT
Niagara Escarpment
Oak Ridges Moraine
Protected Countryside

Environmentally Important Areas*
Built Up Area 2006
* includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Road and hydrographic data provided by Geobase®. Greenbelt boundary © Queen's Printer for Ontario, 2005. Reproduced with permission. All other data provided by Ontario Ministry of Natural Resources. © Queens Printer 2009.

Map design by As the Crow Flies cARTography 2011

Download a full-sized, printable map at ecojustice.ca/greenbelt

features and functions of the wetland has not been well supported in the [proponent's] study...."[100] The Consultant's rating for policy effectiveness was "High" for the *Planning Act*, "Medium" for the Greenbelt Plan and "High" for the Town of Caledon Official Plan.[101]

100 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 67.

101 See Table 10, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 66.

PHOTO COURTESY PETER FERGUSON

5. North Waterdown Secondary Plan (in Greenbelt Plan Protected Countryside)

The North Waterdown Secondary Plan case study assesses the effectiveness of policies to conserve wetlands in and around a 133 hectare block of largely undeveloped land designated for mixed-use development, within the City of Hamilton.

WETLAND IMPACT ASSESSMENT: The extent of expected wetland impact is difficult to determine at this stage until site-level planning is completed, development proceeds, and protection and mitigation measures are identified, implemented and monitored. Nevertheless, the Consultant did identify two impacts. One positive impact was noted, resulting from the placement of new storm water management facilities outside the natural area that will reduce the inputs of chlorides, sediments and other contaminants to the wetlands and creeks. There was also a potential negative impact identified due to inadequate buffers around the creek and wetlands that "may not ensure habitat sustainability in an urban context."[102] In the Consultant's opinion, "[t]hese landscape-level effects may not be mitigated at the site level."[103]

POLICY EFFECTIVENESS ASSESSMENT: Because this site is within a "settlement area", the Greenbelt Plan policies for Key Natural Heritage Features and Key Hydrological Features do not apply. Instead, municipal official plans continue to govern land uses within the existing settlement boundaries. Notwithstanding, the Consultant found that "the Secondary Plan does seek to protect the Borer Creek corridor ... through an Open Space designation ... and provide[s] some adjacent lands buffers to the wetlands and the creek itself."[104] It was also noted that Greenbelt Plan policies were successful

102 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 72.

103 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 72.

104 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 74.

MAP 7: NORTH WATERDOWN SECONDARY PLAN

Study Area

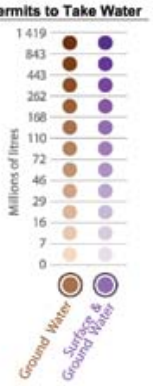
GREENBELT
- Niagara Escarpment
- Oak Ridges Moraine
- Protected Countryside

WETLANDS
- Provincially Significant Wetland
- Wetland

PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	50 406 048	Dewatering	Pits and Quarries
2	252 030 240	Commercial	Golf Course Irrigation
3	252 030 240	Commercial	Golf Course Irrigation
4	274 909 110	Agricultural	Market Gardens / Flowers
5	286 363 560	Agricultural	Market Gardens / Flowers
6	286 363 560	Agricultural	Market Gardens / Flowers
7	165 000 000	Agricultural	Other - Agricultural
8	198 000 000	Agricultural	Other - Agricultural
9	24 192 000	Agricultural	Market Gardens / Flowers
10	22 118 400	Dewatering	Construction

Permits to Take Water



AGGREGATE SITES
- Active
- Surrendered

- Environmentally Important Areas*
- Built Up Area 2006

* Includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Map design by As the Crow Flies cARTography 2011

Download a full-sized, printable map at ecojustice.ca/greenbelt

in preventing further urban expansion into ecologically sensitive lands within the Greenbelt Natural Heritage System north of the Secondary Plan area. The Consultant's rating for policy effectiveness was "High" for the Greenbelt Plan, "High" for the *Environmental Assessment Act*, and "High" for the *Planning Act* — Official Plans.[105]

105 See Table 11, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 76–77.

PHOTO COURTESY J. REAUME

6. Sunshine Estates Development (in the Oak Ridges Moraine Conservation Plan area)

This case study assesses the effectiveness of policies to conserve wetlands in and around a proposed subdivision of 58 new residential lots and access roads in the community of Palgrave, within the Town of Caledon.

WETLAND IMPACT ASSESSMENT: There were no direct negative wetland impacts anticipated for this case study, which centred on an application for a Draft Plan of Subdivision. It is not clear, however, whether the wetland hydrology can be maintained following the development of Phases I and II. The protection of the wetlands and their Minimum Vegetation Protection Zone (30 metres in width and greater in some areas) in Environmental Protection blocks suggests that the hydrological function may be maintained, but this has not been demonstrated through appropriate assessment. Similarly, wetland connectivity with other natural areas has not been assessed, and the subdivision may ultimately reduce connectivity and limit the wetland's ecological function. The Consultant did not identify any positive impact on the ecological function of wetlands.

POLICY EFFECTIVENESS ASSESSMENT: The Consultant summarized the effectiveness of the Oak Ridges Moraine Conservation Plan policies as follows: "In this case, the [Oak Ridges Moraine Plan] policies have largely been effective, although there are some shortcomings of the (natural heritage and hydrological evaluation) study in terms of demonstrating that there will be no impacts to the hydrological functions of wetlands.... The deficiency in the study also suggests a lack of thorough review by the municipality and agencies during the approval process."[106] The study reviewed by the Consultant also failed to clearly demonstrate conformity with requirements of the Oak Ridges Moraine Conservation Plan (including a lack of analysis regarding maintaining connectivity—Oak

106 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 86–87.

MAP 8: SUNSHINE ESTATES DEVELOPMENT

Study Area

GREENBELT
- Niagara Escarpment
- Oak Ridges Moraine
- Protected Countryside

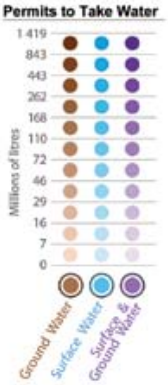
WETLANDS
- Provincially Significant Wetland
- Wetland

PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	272 160 000	Commercial	Golf Course Irrigation
2	57 229 200	Commercial	Golf Course Irrigation
3	12 263 400	Commercial	Golf Course Irrigation
4	24 526 800	Commercial	Golf Course Irrigation
5	12 263 400	Commercial	Golf Course Irrigation
6	204 390 000	Commercial	Golf Course Irrigation
7	16 351 200	Commercial	Golf Course Irrigation
8	94 620 960	Commercial	Golf Course Irrigation
9	94 620 960	Commercial	Golf Course Irrigation
10	477 875 520	Water Supply	Municipal
11	955 751 040	Water Supply	Municipal
12	955 751 040	Water Supply	Municipal
13	5 891 616	Water Supply	Municipal

Map design by As the Crow Flies cARTography 2011

Permits to Take Water



AGGREGATE SITES
- Active
- Surrendered

- Environmentally Important Areas*
- Built Up Area 2006

* Includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Road and hydrographic data provided by Geobase®. Greenbelt boundary © Queen's Printer for Ontario, 2005. Reproduced with permission. All other data provided by Ontario Ministry of Natural Resources. © Queens Printer 2008.

Download a full-sized, printable map at ecojustice.ca/greenbelt

Ridges Moraine Conservation Plan policies concerning natural heritage [Sections 20–26] do apply in this case). There was an analysis of conformity to the Town of Caledon's Official Plan, but not for Region of Peel Official Plan policies. The Consultant's rating for policy effectiveness was "Medium" for the Oak Ridges Moraine Conservation Plan, "High" for the *Planning Act* and "High" for the Town of Caledon's Official Plan.[107]

107 See Table 12, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 85–86.

PHOTO COURTSEY JOE SEBEK

5.2.3 Aggregate extraction project case studies

7. Goodwood Pit Expansion (in the Oak Ridges Moraine Conservation Plan area)

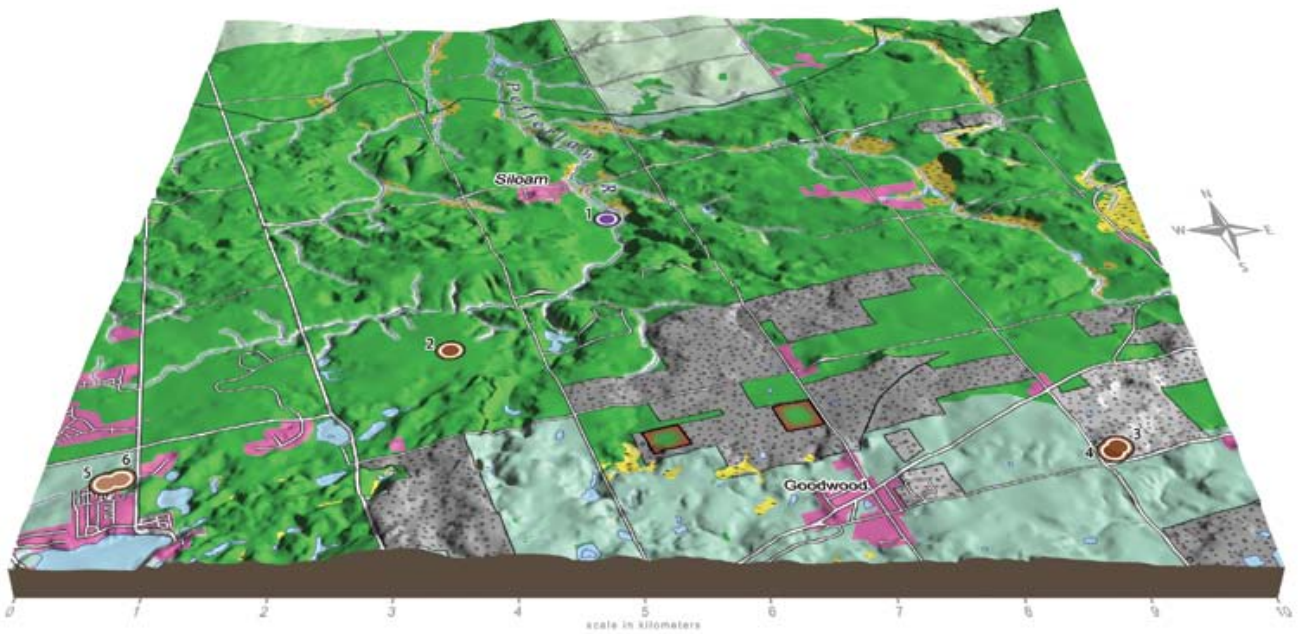
This case study assesses the effectiveness of policies to conserve wetlands in the case of a proposed sand and gravel pit expansion (above the water table) in the Township of Uxbridge.

WETLAND IMPACT ASSESSMENT: Based on the documents reviewed, the Consultant did not find evidence of either positive or negative impact on the provincially significant wetland complex located adjacent to the proposed (and later approved) Phase 1 extraction area. The Ministry of Natural resources did not approve extraction from Phase 2 lands, pending further groundwater studies to determine the setback distance required to protect the provincially significant Wetland.

POLICY EFFECTIVENESS ASSESSMENT: The Consultant summarized the effectiveness of the applicable policies by stating that the *Aggregate Resources Act* and Oak Ridges Moraine Conservation Plan were effective in protecting the provincially significant wetland from any impacts associated with the Phase 1 expansion. In relation to the Phase 2 expansion, however, the Ministry of Natural Resources identified the need for further groundwater studies beyond 120 metres from the provincially significant wetland, even though there is no policy requirement for this. According to the Consultant, this suggests that in some cases policies "may need to consider wetlands beyond the 120 m adjacent lands limit to fully assess potential impacts to wetlands."[108] If additional studies determine that there

108 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 97.

MAP 9: GOODWOOD PIT EXPANSION



Study Area

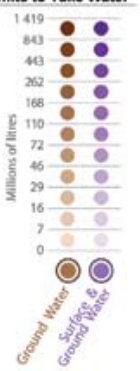
GREENBELT
- Niagara Escarpment
- Oak Ridges Moraine
- Protected Countryside

WETLANDS
- Provincially Significant Wetland
- Wetland

PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	392 688 000	Commercial	Golf Course Irrigation
2	265 161 600	Commercial	Golf Course Irrigation
3	356 159 700	Commercial	Golf Course Irrigation
4	707 040 000	Commercial	Golf Course Irrigation
5	79 575 840	Water Supply	Communal
6	79 575 840	Water Supply	Communal

Permits to Take Water



AGGREGATE SITES
- Active
- Surrendered

- Environmentally Important Areas*
- Built Up Area 2006

* includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

Map design by As the Crow Flies cARTography 2011

Road and hydrographic data provided by Geobase®. Greenbelt boundary © Queen's Printer for Ontario, 2005. Reproduced with permission. All other data provided by Ontario Ministry of Natural Resources, © Queens Printer 2009.

Download a full-sized, printable map at ecojustice.ca/greenbelt

will be hydrological impacts to the wetland which can't be mitigated from the Phase 2 expansion, the policy effectiveness in protecting wetlands will be lower. The Consultant's rating for policy effectiveness was "High" with respect to both the *Aggregate Resources Act* and the Oak Ridges Moraine Conservation Plan.[109]

109 See Table 13, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 96.

PHOTO COURTESY JOHN URQHART

8. Milton Quarry Expansion (in the Niagara Escarpment Plan area)

This case study assesses the effectiveness of policies to conserve wetlands in the vicinity of a proposed expansion area for aggregate removal below the water table in the Towns of Halton Hills and Milton.

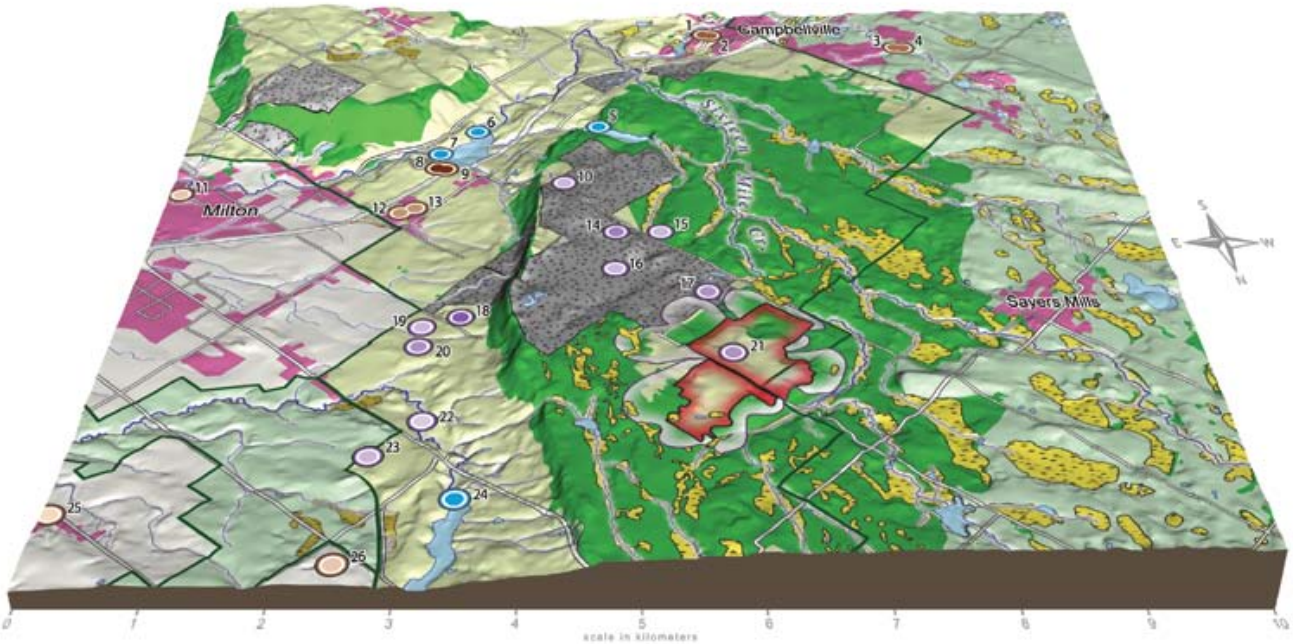
WETLAND IMPACT ASSESSMENT: There are some 55 provincially significant wetland units and one non-provincially significant wetland unit in the study area, primarily located within adjacent lands, with a few in the proposed extraction area. No positive impacts were apparent but negative impacts (confirmed and potential) were identified. The Consultant reported that: "It appears that there may be indirect impacts to the two [provincially significant wetland] units (W7 and W8) and the non-[provincially significant wetland] unit (V2) within the East Extension (extraction area) through changes to their surface and groundwater sources."[110] The Consultant further stated that "avoiding potential hydrological impacts to wetlands is heavily dependent on the mitigation measures that will artificially maintain the groundwater levels through a complex series of infiltration wells and monitoring wells. This is presumably not self-sustaining over the long term as it will require continued monitoring." According to the consultant, "The study's assessment and conclusions assume that the wetland function was protected through maintaining wetland hydrology, as anticipated in the approved plans. However, this cannot be confirmed as an assessment of the protection of wetland hydrology was not reviewed (and presumably has not yet been completed as extraction has not yet extended into the area where this mitigation would be needed)."[111]

POLICY EFFECTIVENESS ASSESSMENT: In terms of assessing policy effectiveness, the final approval for the project is not necessarily representative of policy implementation through the Greenbelt Plan since it was based on a Ministerial Order, which takes precedence over and does not necessarily conform to applicable policies. Regardless, there are a number of observations that shed light on approval of aggregate extraction across the Greenbelt, notably "The *Adjacent Lands*, as determined

110 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 104.

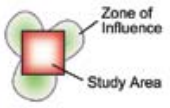
111 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 111.

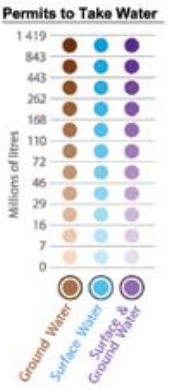
MAP 10: MILTON QUARRY EXPANSION

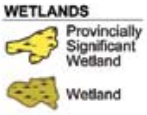


PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	191 161 450	Water Supply	Municipal
2	191 161 450	Water Supply	Municipal
3	117 832 500	Water Supply	Communal
4	117 832 500	Water Supply	Communal
5	1 418 500 000	Miscellaneous	Dams and Reservoirs
6	850 356 000	Miscellaneous	Dams and Reservoirs
7	986 765 000	Miscellaneous	Dams and Reservoirs
8	955 570 000	Water Supply	Municipal
9	1 075 290 000	Water Supply	Municipal
10	20 711 520	Dewatering	Pits and Quarries
11	12 000 000	Dewatering	Construction
12	48 253 000	Water Supply	Campgrounds
13	48 253 000	Water Supply	Campgrounds
14	103 680 000	Dewatering	Pits and Quarries
15	17 280 000	Dewatering	Pits and Quarries
16	17 280 000	Dewatering	Pits and Quarries
17	51 840 000	Dewatering	Pits and Quarries
18	180 688 000	Commercial	Golf Course Irrigation
19	23 652 000	Commercial	Golf Course Irrigation
20	60 131 200	Commercial	Golf Course Irrigation
21	64 800 000	Dewatering	Pits and Quarries
22	8 553 600	Water Supply	Other - Water Supply
23	27 375 000	Water Supply	Other - Water Supply
24	1 110 134 000	Miscellaneous	Dams and Reservoirs
25	1 960 800	Agricultural	Fruit Orchards
26	9 000 000	Agricultural	Fruit Orchards







Road and hydrographic data provided by Geobase®. Greenbelt boundary © Queen's Printer for Ontario, 2005. Reproduced with permission. All other data provided by Ontario Ministry of Natural Resources. © Queens Printer 2009.

Map design by As the Crow Flies cARTography 2011

Download a full-sized, printable map at ecojustice.ca/greenbelt

and established for the overall study area, were greater than the 120 m required by the [*Aggregate Resources Act*] and PPS."[112]

There were 15-metre setbacks between the two provincially significant wetland units and the extraction limit, while the non-provincially significant wetland was given a 25-metre setback. The rationale for these setbacks was not provided in the planning documents.

112 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 104.

PHOTO COURTESY JOE CROWLEY

Non-provincially significant wetlands are not explicitly protected by the *Aggregate Resources Act*, the PPS or the Niagara Escarpment Plan, which is a deficiency in the effectiveness of the associated policies in protecting all wetlands.

The Consultant's rating for policy effectiveness was "Medium" with respect to the Niagara Escarpment Plan, the *Aggregate Resources Act*, the *Planning Act* and the municipal official plan.[113]

5.2.4 Addition of lands to the Greenbelt

9. Addition of Lands to Niagara Escarpment Plan in Grey County

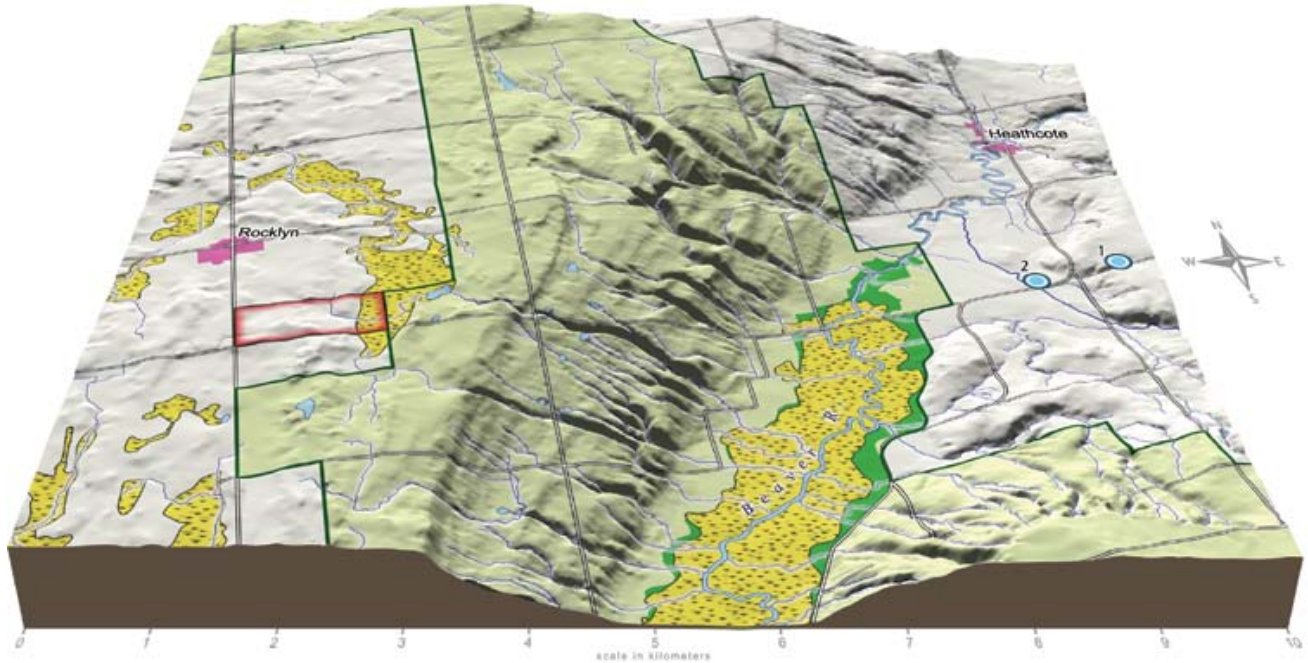
This case study examines the change in wetland protection resulting from expanding the geographic extent of the Niagara Escarpment Plan Area, in the Township of Grey Highlands.

The three provincial land use plans in effect across the Greenbelt support wetland protection by allowing for, and facilitating, the addition of wetlands and other areas determined to be suitable to the Greenbelt. This was illustrated in the final case study where 80 hectares of private land, including 10 hectares of wetlands and associated forest and agricultural lands, were added to the Niagara Escarpment Plan Area. This was one of five additions made to the Niagara Escarpment Plan Area in June, 2010, totaling 750 hectares.

According to the Consultant, no impacts on wetlands are expected as a result of this land addition. Two positive outcomes were noted: first, the wetlands on the subject property will be afforded a higher level of protection once the lands are formally added and designated under the Niagara Escarpment

113 See Table 14, Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* pp. 110–11.

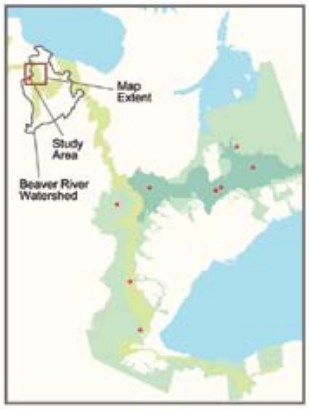
MAP 11: ADDITION OF LANDS TO NIAGARA ESCARPMENT PLAN IN GREY COUNTY



PERMITS TO TAKE WATER (PTTWs)

	Max Litres/Year	Major Category	Specific Purpose
1	52 369 920	Agricultural	Fruit Orchards
2	52 369 920	Agricultural	Fruit Orchards

PTTW (Surface Water)



GREENBELT
- Niagara Escarpment
- Oak Ridges Moraine
- Protected Countryside

WETLANDS
- Provincially Significant Wetland
- Wetland

Study Area

- Environmentally Important Areas*
- Built Up Area 2006

* includes Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas, & Significant Ecological Areas

AGGREGATE SITES
- Active
- Surrendered

Map design by As the Crow Flies cARTography 2011

Road and hydrographic data provided by Geobase®. Greenbelt boundary © Queen's Printer for Ontario, 2005. Reproduced with permission. All other data provided by Ontario Ministry of Natural Resources, © Queen's Printer 2009.

Download a full-sized, printable map at ecojustice.ca/greenbelt

Plan; second, this addition (combined with the other four) demonstrates that the enabling policies which allow lands to be added to the Niagara Escarpment Plan Area (and therefore the Greenbelt) are working effectively.

5.3 What was learned

Based on the case study assessments, the Consultant identified a number of broad, overarching findings as well as five more specific findings and issues. For each of the five specific findings, the Consultant also identified opportunities for improving policy effectiveness.

5.3.1 Overall findings

The Consultant's primary, overall finding was that policies and regulations applied across the Greenbelt are generally protecting wetlands either by ensuring avoidance of wetland features or by mitigating impacts to wetlands.

The Consultant's primary, overall finding was that policies and regulations applied across the Greenbelt are generally protecting wetlands either by ensuring avoidance of wetland features or by mitigating impacts to wetlands. While reporting that the case studies showed that "wetlands are not generally being lost across the Greenbelt as a result of residential/commercial, or aggregate development,"[114] the Consultant also concluded that the effective protection of wetland functions is less certain.

The Consultant went on to state that wetland protection resulted from one of three policy scenarios, as follows:

1. clear direction on restrictions or requirements within a single policy (e.g., the Greenbelt Plan, which prohibits land development in wetlands); or
2. the cumulative weight of protection provided through multiple policies (e.g., the *Aggregate Resources Act,* which is subject to the policies of the Greenbelt Plan, Oak Ridges Moraine Conservation Plan and Niagara Escarpment Plan); or
3. general mitigation (including compensation) requirements as part of a broader process (e.g., the environmental assessment process).[115]

The overall finding of strong policy effectiveness was qualified by the Consultant with the observation that some policies and legislation do allow for wetlands to be lost or negatively impacted across the Greenbelt, notably the *Environmental Assessment Act*. The Consultant further noted that: "[t]he generally positive findings of this case study review should not be extrapolated to suggest that there is no net loss of wetlands across the Greenbelt on the ground, as this information can only be obtained by a broader review of pre- and post-construction conditions as well as related monitoring data."[116]

5.3.2 Opportunities for improvement

5.3.2.1 Ensuring policy conformity

Demonstration by the proponent (and verification by the "regulator") of conformity of a proposal to all applicable policies is central to effective implementation of land-use and related policies. However, the Consultant found that typically "conformity of the study proposal with the applicable wetland

114 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 116.

115 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 116.

116 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 117.

policy was not explicitly demonstrated ... Only one case study (i.e., Leslie Street Class EA) included a specific section on 'policy conformity' where it was shown how specific clauses were addressed through the study."[117]

The Consultant added that:

> *it has been our finding that generally the link between the findings and conclusions of the technical reports is not consistently discussed in the context of the specific applicable policies (in this case wetland policy) in a manner that demonstrates effective implementation and conformity. In other words, the environmental reports typically do not include a review of policy conformity that is linked to the conclusions and recommendations of the study.*[118]

5.3.2.2 Definition of a wetland

How a wetland is defined and the clarity and consistency in that definition is another key element in an effective policy framework for wetland conservation, particularly in Ontario where there are so many pieces of legislation and policy that influence wetlands (see Section 3.1). For this reason, the Consultant identified the lack of consistency in the definition of a wetland in several important pieces of legislation as a policy deficiency.

How a wetland is defined and the clarity and consistency in that definition is another key element in an effective policy framework for wetland conservation.

As the Consultant noted:

> *there are slightly different definitions of "wetlands" that can apply within the Greenbelt because the [Oak Ridges Moraine Conservation Plan] and [Greenbelt Plan] definitions are not identical to the [Niagara Escarpment Plan] definition, which are also different from the Conservation Authorit[ies] Act (2006) definition. A key concern identified is that the [Oak Ridges Moraine Conservation Plan]/[Greenbelt Plan] definition could be interpreted to mean that only wetlands that have been evaluated under [Ontario Wetland Evaluation System] would qualify as wetlands.... Based on the Consulting Team's experience, most municipalities across the Greenbelt adopt a broader interpretation, and tend to screen for both evaluated and non-evaluated wetlands, as illustrated in the case studies. Nonetheless, having a consistent definition of "wetland" across all provincial policy documents would help support more consistent protection of these features and pre-empt any potential misinterpretation.*[119]

5.3.2.3 Municipal infrastructure

The primary legislation that determines the approval and outcome of municipal infrastructure projects is the *Environmental Assessment Act* and the associated Municipal Class EA process (see Section 3.3.2 regarding Class EAs). Unlike most legislation in effect across the Greenbelt, the *Environmental Assessment Act* can and does allow for loss of wetland area and function. However, Municipal Class EA provisions also support mitigation (including avoidance and minimization of impacts). Indeed, the Consultant reported that, in their experience, mitigation and/or compensation is typically applied when Class EAs result in negative impacts to wetlands. To help address this issue, the Consultant

117 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 117.

118 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 117.

119 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 118.

identified this opportunity for improvement: "In order for greater consistency with the direction of other provincial policy documents in the Greenbelt, particularly with respect to wetlands, a provision for recognition and mitigation of impacts (in the *Environmental Assessment Act*) to natural features, such as wetlands, would be warranted."[120]

The three infrastructure case studies indicate that overall outcomes for wetlands were most likely neutral or potentially favourable.

The three infrastructure case studies indicate that overall outcomes for wetlands were most likely neutral or potentially favourable. The Consultant reported there were, in theory, "net gains" for wetlands in two of the three cases (Leslie Street and East Lake Wilcox), assuming that planned mitigation measures are effective in offsetting the removal of some wetlands and addressing other impacts. However, the likelihood that mitigation measures will succeed cannot be determined based on the information in the documents reviewed by the Consultant. In the case of the Mount Albert Community Water Supply Class EA, the outcome for wetlands was much easier to assess: avoidance of all nearby wetlands and other natural features through appropriate siting of the preferred alternative was a positive outcome.

5.3.2.4 Private land development

Based on the three case studies, wetlands appear to be adequately protected from the direct impacts of residential land development (i.e., occurring within the actual wetland). However, there is a reasonable likelihood of negative impact on wetland functions in all three cases due to adjacent land development (e.g., resulting from decreased water supply). There is also some permissiveness and ambiguity in the Greenbelt Plan policies related to major recreational activities, such as golf courses and how Greenbelt Plan policies for Key Natural Heritage Features and Key Hydrological Features are to be applied (as noted for Pinnacle Heights Golf Course Expansion case study).

As the Consultant noted, "The main gap related to land development policies and wetlands in the Greenbelt appears to be related to the need for regularly and consistently documented, site-specific monitoring to ensure that wetlands protected on paper are in fact being protected on the ground after changes in surrounding land uses have occurred, particularly for medium to large-scale studies."[121]

An additional policy shortfall was noted regarding the lack of clarity concerning which activities or projects were intended by the Province to trigger the need for Environmental Impact Studies or Natural Heritage Evaluations (as required in the Greenbelt Plan). The Consultant described the issue as follows:

"In the Provincial Policy Statement (2005) and the [Oak Ridges Moraine Conservation Plan], policies related to land development within and adjacent to wetlands speak to "*development* and *site alteration*" as being the triggers for activity prohibition, or a requirement for an [Environmental Heritage Evaluation] or [Environmental Impact Study] .... The Niagara Escarpment Plan does not even use the term "site alteration" in their land-use policies and refers exclusively to "development." The use of the word "or" in the Greenbelt Plan could be interpreted to imply that a site alteration application that is not part of a development would be treated in the same manner, from a policy perspective, as a development. We are uncertain why this ambiguity has developed, but in the Consulting Team's experience, this can create uncertainty about the definition of a "project." Therefore, the Greenbelt

120 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 119.

121 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 119.

Plan text should be amended to be consistent with the Provincial Policy Statement (2005) and the [Oak Ridges Moraine Conservation Plan] in this regard."[122]

5.3.2.5 Aggregate resource extraction

The fact that there were only two aggregate case studies, one of which was approved in an atypical manner (Milton Quarry Expansion), makes it difficult to extrapolate the case study findings across the Greenbelt. The Consultant identified two issues arising from the aggregate case study assessments; one that is (or will be) favourable to wetland protection and one that enables approvals that may not be favourable to wetlands.

The Consultant described these issues as follows:

> *The first issue is the determination of the study limit adjacent to the proposed extraction, which according to Provincial Standards under the Aggregate Resources Act (1990) is 120 m from the subject lands. In both the Goodwood Pit and Milton Quarry case studies the 120 m limit was considered insufficient by the [Ministry of Natural Resources] for a full hydro-geological assessment of potential effects to wetlands within the actual zone of influence of the proposed extraction. While the Consulting Team felt that the extension of the study area limit for aggregate extraction licences beyond the required 120 m in these cases was an example of proponents meeting the "spirit" of the Greenbelt Plan, going forward it may be more appropriate to allow for the actual study to determine the zone of influence (when it needs to go beyond the 120 m threshold) as a matter of policy... The second issue relates to the balance between the protection of natural heritage features and the access to important natural resources. The [Ministry of Natural Resources] is responsible for the identification of [provincially significant wetlands], as well as administering applications for aggregate resource extraction. However, there are often conflicting interests in terms of provincially significant potential mineral extraction areas and [provincially significant wetlands], which may occur at the same location. The Provincial Policy Statement provides some direction on striking a balance in these potentially conflicting interests by requiring the document to be considered in its entirety when implementing related policies. In practice, this means that while the protection of a [provincially significant wetland] can override the access to a provincially significant mineral resource, the reverse is also true and a [provincially significant wetland] can be impacted or removed in order to access a significant mineral resource.*[123]

Notwithstanding this second issue and the unusual nature of approval for the Milton Quarry Expansion case study (i.e., via a Ministerial Zoning Order), the Consultant concluded that wetlands are being effectively protected from further aggregate extraction based on "the scarcity of new aggregate applications in the Greenbelt, and [the Ministry of Natural Resources'] informal observations that the more onerous and restrictive policies under the Greenbelt seem to be causing a shift in aggregate activities outside this policy area."[124]

Application of the PPS where a provincially significant mineral resource area occur in the same location can result in protection of the wetland, but can also result in its loss or degradation.

122 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 119–20.

123 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 120–21.

124 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 121.

5.3.2.6 Project monitoring requirements

Although all three land-use plans in effect across the Greenbelt recognize the importance of environmental monitoring (to varying degrees), this has not translated into effective and consistent project-level monitoring to track actual outcomes (for instance the extent to which measures designed to avoid, minimize and compensate for wetland impacts were successful). This monitoring deficiency places significant constraints on all attempts to measure the effectiveness of policies aimed at conserving wetlands and other natural areas.

The Consultant further described the problem as follows:

> *While approved plans may support avoidance of wetlands, or approve measures to minimize and/or compensate for anticipated impacts (both direct and indirect), the actual effectiveness of approved plans, designs and approaches on the ground cannot be assessed without review of monitoring and/or site inspection results....*
>
> *However, environmental monitoring continues to be largely uncoordinated, undertaken sporadically, at varying levels of detail, and poorly understood, despite the general support for it in theory. In many cases, there is no clear direction about the objectives and type of monitoring required or desired, or clear lines of responsibility for ensuring rigorous data collection and assessment.*[125]

The Consultant concluded with this call for action: "In order to obtain 'on-the-ground' information about policy effectiveness, and ensure plans approved on paper are actually implemented, all provincial plans with the Greenbelt should have specific requirements for monitoring natural feature protection, mitigation, and restoration at the site-specific level following the approval and implementation of medium to large scale projects."[126]

PHOTO COURTESY JOE CROWLEY

125 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 126.

126 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project,* p. 131.

PART 6

CUMULATIVE IMPACT OF WATER TAKINGS ON GREENBELT WETLANDS

This section of *Protecting Greenbelt Wetlands* examines the cumulative impact of water takings on Greenbelt wetlands, including the impact of existing water takings and of potential new ones. It builds on the findings of *Ontario's Water Hazard: The Cumulative Impact of Golf Courses on Our Water Resources,* a 2008 report by Earthroots and Ecojustice examining the water takings of nine golf courses within a high-use watershed in the Aurora/Newmarket area of the Oak Ridges Moraine.[127] The earlier report found that, under the Ministry of the Environment's Permit to Take Water (PTTW) system, proponents were not required to examine cumulative impacts when applying for a new PTTW.

This section of the report focuses on the extent to which water takings, authorized under the *Ontario Water Resources Act*, pose a threat to wetlands on the Greenbelt, as well as the effectiveness of policy to address potential impacts.

This section of the report considers the impacts of water takings through a different lens, focusing on the extent to which water takings, authorized under the *Ontario Water Resources Act* (Section 3.3 of this report), pose a threat to wetlands on the Greenbelt, as well as the effectiveness of policy to address potential impacts.

The case studies described in Section 5 yielded a subset of four case studies that involved water takings: the Mount Albert Community Water Supply Class EA (Section 5.2.1), the Milton Quarry Expansion (Section 5.2.3), the North Waterdown Secondary Plan (Section 5.2.2) and the Pinnacle Heights Golf Course Expansion (Section 5.2.2). Our objectives in evaluating these four case studies were:

- To critically examine the PTTW system as a tool for regulating water takings and protecting surrounding hydrologic features from the impacts of water takings;
- To determine to what extent the potential for cumulative impacts associated with surrounding water takings were considered as part of the approval process for the PTTW, with specific regard to wetlands that could be impacted by the new land use.

At the time of writing, project proponents in two of the four PTTW case studies had obtained their PTTWs: Mount Albert Community Water Supply Class EA and Milton Quarry Extension. For

127 Earthroots & Ecojustice. (2008). *Ontario's water hazard: The cumulative impact of golf courses on our water resources*. Retrieved from www.ecojustice.ca/publications/reports/ontarios-water-hazard/attachment

these two case Earthroots worked with hydrogeologist Paul Hubley to review available Environmental Assessment reports, Environmental Impact reports or studies, and other relevant documentation, including available PTTW documents and Conservation Authority watershed studies. Earthroots then met with the Ministry of the Environment to discuss the PTTW system and, through correspondence with Ministry staff, further clarified the PTTW approvals process with respect to the case studies. The case study maps (included in Section 5) served to highlight surrounding land uses and to identify nearby PTTWs, shedding light on the potential for cumulative impacts.

The two remaining PTTW case studies, Pinnacle Heights Golf Course Expansion and North Waterdown Secondary Plan, could not be examined with the same level of scrutiny. Since the PTTWs had not been obtained, Earthroots was not able to evaluate the effectiveness of the PTTW approval process. Nevertheless, examination of the area surrounding the projects and of the potential for the water takings to impact wetlands was still pursued.

6.1 Water takings case studies

6.1.1 Mount Albert Community Water Supply Class EA

The Mount Albert Study area is situated in the Lake Simcoe watershed, within the Black River subwatershed.

Background

In December 2006, the *Class Environmental Assessment and Water Resources Exploration for Water Supply in the Community of Mount Albert* was completed, identifying a preferred approach to deliver water to a growing population in the community of Mount Albert. The Class EA recommended adding an additional well to the existing two-well system. The addition of this third well required construction of a new pumphouse and treatment building, along with a new water main to connect the third well to the existing two-well system.[128] Based on the results of the Class EA, the Ministry of the Environment issued a PTTW in support of the new water supply project on June 9, 2008.

Hydrogeology and Water-Taking Impact Assessment

The Mount Albert Study area is situated in the Lake Simcoe watershed, within the Black River subwatershed. Several Environmentally Significant Areas are present, including three provincially significant wetlands/wetland complexes and three tributaries of the Black River.[129]

The majority of the study area is just outside the boundaries of the Oak Ridges Moraine Conservation Plan, though the moraine's Thorncliffe aquifer extends well into the Mount Albert area. The degree of connectivity between the aquifer and the surface water features appears to be limited, however, so that pumping at Mount Albert is anticipated to have no negative impacts on these features, including wetlands.

Nearby land uses within the subwatershed are limited; a potato farm and trout farm are the only operations with water takings near the Mount Albert Community Water Supply wells. While the actual PTTWs for these operations were unavailable, Ministry of the Environment staff confirmed that

128 Marshall, Macklin, Monaghan (MMM) Group Ltd. (2006). *Class environmental assessment and water resource exploration for water supply to the community of Mount Albert,* section 5.

129 Marshall, Macklin, Monaghan (MMM) Group Ltd. (2006). *Class environmental assessment and water resource exploration for water supply to the community of Mount Albert*, section 3.

these wells are screened in the Thorncliffe aquifer,[130] which is generally the only aquifer in the area capable of sustaining the levels and rates of takings associated with most PTTWs. While there is some limited potential for cumulative impacts between the water takings of the two nearby farms and the Mount Albert's takings, these are not a major concern. Quantities and rates of pumping associated with Mount Albert appear sustainable, with no likelihood of significant impacts on nearby wetlands or other surface water features. The Class EA did not indicate that increased takings or the inclusion of the new well would negatively impact any hydrological features (beyond expected draw down in groundwater levels directly surrounding the wells, which would be associated with any water taking).

The Mount Albert EA case study illustrates how the legislative framework can effectively address potential for environmental impacts associated with water takings. The Class EA provided a detailed justification for the new water supply, and included stakeholder consultations, a comprehensive examination of the study area, an exploration of groundwater resources and a consideration of alternative water supply options. The Ministry of the Environment reviewed surrounding well data before approving the amended PTTW to determine any impacts from existing levels of takings from the two original wells.[131] The EA also measured potential impacts associated with water takings through a pump test.

Close consideration of cumulative impacts is not standard practice and is not required of proponents.[132] Given the limited number of water takings in the surrounding area, there would be little justification to engage in any further consideration of impacts, cumulative or otherwise.

6.1.2 Milton Quarry Expansion

The Milton Quarry is located on the Niagara Escarpment in the region of Halton, and has been operating for many years under existing approvals for a "main quarry" and "north quarry." This case study looks at the extension of aggregate extraction northward to two areas the proponent refers to as the west extension and east extension. In combination, the two areas cover a 70.4- hectare area. The proposal to extract aggregate from below the existing water table requires dewatering, a PTTW and an extensive mitigation plan to protect nearby wetland complexes from the impacts of dewatering.

The Milton Quarry has been operating for many years under existing approvals for a "main quarry" and "north quarry." In combination, the two areas cover a 70.4-hectare area.

Hydrogeology and Water-Taking Impact Assessment

The Milton Quarry is situated within the Sixteen Mile Creek watershed. Groundwater is found within an unconfined aquifer several metres below the surface of the ground. Locally, this aquifer provides recharge to two separate tributary systems and their associated wetland complexes. The area of the quarry is a topographic high point, as well as a high point in the water table; both groundwater and overland water flow radially outward from the site. To the east lies a wetland complex, associated with the Speyside tributary system, which feeds into the Middle Sixteen Mile Creek. To the west lies another wetland complex, associated with the Sixth Line Tributary system, which feeds into the Sixteen Mile Creek.

The eastern wetlands associated with the Speyside tributary receive inflow from overland flow and precipitation. The east and west quarry expansions fall on the northwest side of a flow divide,

130 Ministry of the Environment, Central Division. (2011, February 15). Meeting between K. Baker, R. Hodgins, P. Hubley, & J. Kohler. Toronto, ON.

131 Ministry of the Environment, Central Division. (2011, February 15). Meeting between K. Baker, R.Hodgins, P. Hubley, & J. Kohler. Toronto, ON.

132 Ministry of the Environment, Central Division. (2011, January 21). Meeting between MOE PTTW staff, Ecojustice, Earthroots, & DUC. Toronto, ON.

so it appears that excavation activities will not disrupt southeast flows toward the Speyside tributary system and eastern wetlands, leaving these areas mainly unaffected.

In contrast, the western wetlands associated with the Sixth Line Tributary receive significant groundwater recharge in addition to precipitation. Due to the position of the quarry extension on the northwest side of a groundwater flow divide, quarry activities will significantly reduce groundwater flows toward the western wetlands and Sixth Line Tributary. For this reason, the proponents expect that excavation and dewatering will have significant impacts on wetlands, requiring extensive mitigation measures to minimize them.

There are no nearby land uses requiring a PTTW within the planned zone of influence associated with the quarry's dewatering activities. Although there are a number of private domestic supply wells within the quarry's zone of influence, domestic water takings are at a miniscule scale compared to the quarry's dewatering activities. The proponents must ensure that their dewatering does not result in unacceptable impacts to these wells, however, cumulative impacts are not a concern.

Permit to Take Water Approval and Mitigation Plan

The proponent was granted a 10-year PTTW expiring November 30, 2020, regulating the scope of the full quarry operations for the main, north, and east and west extensions. Maximum allowable takings under the permit are 2584 litres per minute, approximately equivalent to the volume of an average above-ground swimming pool every 10 minutes. Over a year, the maximum allowable takings are 1.359 billion litres, roughly the equivalent volume of an area the size of a football field and two-thirds the height of the CN Tower.[133]

Maximum allowable takings under the permit are 2584 litres per minute, approximately equivalent to the volume of an average above-ground swimming pool every 10 minutes.

Prior to granting a PTTW, the Ministry of the Environment reviewed the PTTW application to ensure that the proponent had met requirements to protect existing water uses and surface water features. The Ministry expressed concern about the impact of water taking on local well water supplies and on groundwater-dependent surface water features, in particular the Sixth Line Tributary and its associated wetlands. The proponent was required to determine baseline conditions, predict and monitor effects on nearby hydrologic features, and prevent and/or plan to mitigate undesirable effects.

According to the Ministry, the primary method for prevention of undesirable effects will be the maintenance of groundwater levels between the quarry and the Sixth Line Tributary and its associated wetlands. The proponent will install and operate recharge wells between the quarry and these features, and ensure the levels are acceptable through ongoing monitoring and adjustment of water levels so that ecological functions are maintained.[134]

The mitigation plan appears to satisfy legislative requirements, and is comprehensive by industry standards. It consists of a system of 27 sentinel wells in close proximity to the quarry and an estimated 27 trigger wells in closer proximity to the wetlands that trigger mitigation measures if water levels drop. The plan also involves 127 recharge wells supplied with water from a large nearby reservoir created by the proponent. These wells allow the proponent to inject water into the water table to maintain flows toward the wetlands and tributary systems.[135]

Long-term plans for mitigation involve allowing the excavated areas to fill with water from precipitation and seepage from the surrounding groundwater table, forming new lakes. Seepage from the surrounding area will cause a continued lowering in the groundwater table, requiring ongoing

133 Hubley, P. (2011). *Milton Quarry extension: Hydrogeology overview.* Hubley Geosciences Ltd.

134 K. Baker, pers. comm., (April 12, 2011).

135 Hubley, P. (2011). *Milton Quarry extension: Hydrogeology overview.* Hubley Geosciences Ltd.

mitigation to protect groundwater-dependent surface water features until the lakes are filled and a new equilibrium is reached within the water table. The proponent estimates that the process will take approximately 50 years.[136]

In the short term, it seems the mitigation plan will be able to maintain water flows to nearby wetlands and tributaries through its extensive system of monitoring wells and recharge wells. A key uncertainty, however, given the difficulty of manipulating a hydrologic system over a period of at least 50 years, is whether groundwater flow divides will remain constant before, during and after excavation and dewatering activities. This is highly unlikely, as excavation and dewatering will almost surely cause significant changes and shifts in groundwater flow divides. If groundwater flow directions change over time, mitigation will be based upon inaccurate modelling. The input of water into the hydrologic system and evaporation rates are subject to significant variation from year to year, depending on weather (e.g., average temperatures). It is thus unclear how much water will be necessary to maintain flows to nearby wetlands and tributaries. For the Sixth Line Tributary in particular, if water levels in the western extension lake are even slightly lower than the planned final water level, the tributary and associated wetlands will not receive groundwater flows, and ongoing mitigation will be required until the western extension lake reaches the required elevation.

Ultimately, the quarry's excavation and dewatering activities will result in permanent alteration of the local landscape and hydrogeology. Despite PTTW requirements and the diligence of the proponent in developing a strong mitigation plan, it is not evident that a new equilibrium will be reached that will maintain wetlands in their original condition.

6.1.3 North Waterdown Secondary Plan

The North Waterdown Secondary Plan involves 133 hectares of land in the Spencer Creek watershed, located within a "Settlement Area" of the Greenbelt in the City of Hamilton. The site in question will be developed into a large residential area, supported by a small commercial and institutional area. The Secondary Plan took effect in January 2009, but planning for servicing and wastewater for the area were not complete at the time of writing. This project was identified as requiring a future PTTW based on the work completed in Phase 4 of the *Class EA Secondary Plan and Water and Wastewater Study*, which identified a preferred solution for water servicing.[137]

The North Waterdown Secondary Plan involves 133 hectares of land in the Spencer Creek watershed, located within a "Settlement Area" of the Greenbelt in the City of Hamilton.

While a number of significant hydrologic features including wetlands have been identified on or near the case study site, impacts associated with water takings have not yet been evaluated. This evaluation won't occur until the next phase of the Class EA, underlining a key weakness of the approval process: water takings and associated impacts are considered late in the Class EA process, and the PTTW approval is considered even later, long after the project is approved and is moving forward under the *Planning Act*.

Given that the full EA results regarding water takings were not available for consideration at the time of writing, a discussion of impacts associated with this project's water takings would be premature.[138] It can be noted, however, that the area surrounding the site does not include any existing PTTWs (see Map 7), so there is no potential for cumulative impacts associated with the combined influence of new and existing water takings.

136 Hubley, P. (2011). *Milton Quarry extension: Hydrogeology overview.* Hubley Geosciences Ltd.

137 KMK Consultants Ltd., (2007, February 26). *Waterdown water and wastewater servicing class environmental assessment,* section 10.

138 KMK Consultants Ltd., (2007, February 26). *Waterdown water and wastewater servicing class environmental assessment,* section 10.

6.1.4 Pinnacle Heights Golf Course Expansion

In 2001, Caledon Grove Developments conducted a feasibility study for a new 18-hole golf course adjacent to Highway 10 in Caledon. Technical reports, including a 2003 Environmental Implementation Report, were submitted, and in April 2005 the Ontario Municipal Board approved the zoning application. The initial proposal for an 18-hole course predated the Greenbelt Plan, so was not subject to its policies; however, in 2005 the proponent purchased an additional 74 hectares directly west of the original site with the intention of creating an additional nine holes. The expansion of the golf course is subject to Greenbelt policies, and thus a new scoped Environmental Implementation Report was completed in August 2007. This case study focuses on the anticipated future water taking associated with this expansion.

Hydrogeology and Water-Taking Impact Assessment

The Pinnacle Golf Course case study is located within the Credit Valley watershed, in the Credit Valley "Melville to Forks of the Credit" subwatershed, with approximately 5 percent of the case study area extending into the northern Orangeville subwatershed.[139] The area contains several wetland features and two tributaries that eventually connect with the Credit River south of the case study sites. The proponent's Environmental Implementation Report identified five distinct wetland areas, including a willow organic thicket swamp at the northern edge of the property, a second willow organic swamp north of the northern tributary, a mineral meadow marsh in the central portion of the site, a mineral mixed swamp connected to the largest wetland unit on the east lands, and a linear area of mixed mineral meadow marsh within the floodplain of the north tributary.[140]

The area contains several wetland features and two tributaries that eventually connect with the Credit River south of the case study sites.

Two regional aquifer systems are present in the area: one is in coarse sand sediments in a buried bedrock valley and another is in a layer of Amabel dolostone. The sand sediments aquifer is the main water supply for wells north of the Pinnacle site, whereas the Amabel dolostone aquifer supplies most of the wells south and east of the study site.[141]

The Environmental Implementation Report does not explicitly discuss how the groundwater regime connects to surface water features, including the five wetland areas and north and south tributaries of the Credit River. However, in the discussion of pump tests that were completed as part of the report, it is noted that for the potable water well supplying the clubhouse "continuous operation at up to 3L/s will cause drawdown in a nearby wetland (in the southeast corner of the Core Greenland)."[142] This indicates that there is significant connectivity between surface water features and the local bedrock valley aquifer that supplies the potable water supply well.

Similarly, correspondence between the Credit Valley Conservation Authority and the proponent from March 27, 2009 to May 8, 2009, discusses the potential for water takings from one of the irrigation wells (also accessing the deep bedrock valley aquifer) to impact surface water features.[143]

---

139 Stantec Consulting Ltd. (2007). *Scoped environmental implementation report for Pinnacle Heights Golf Course final*, section B.

140 Beacon Environmental. (2011). Greenbelt wetlands protection assessment: Investigation of wetland case studies project, pp. 57–58.

141 Stantec Consulting Ltd. (2007). *Scoped environmental implementation report for Pinnacle Heights Golf Course final*, section B.

142 Stantec Consulting Ltd. (2007). *Scoped environmental implementation report for Pinnacle Heights Golf Course final*, p. B29.

143 Credit Valley Conservation. (2009, March 27). CVC Additional Ecology Comments – Pinnacle Heights Golf and Country Club Expansion. *Appendix B to Issues List.*

The proponent notes that water levels in the core area of the property, surrounding the wetland in question, did drop during the course of a 72-hour pump test, and that a further ecological assessment of the wetland's sensitivity to water-level fluctuations would be conducted at a later time.[144] Again, the irrigation and potable water supply wells indicate significant connectivity between surface water features and the bedrock aquifer.

The Environmental Implementation Report includes brief recommendations to reduce impacts to wetlands, such as limiting operation of wells and recirculating water to maintain water levels in wetlands.[145] However, the work done to date does not clearly address or quantify the connection between surface and groundwater. As noted by Beacon Environmental:

> *There does not appear to have been any monitoring of the wetlands (e.g., through installation of mini-piezometers to monitor any potential changes in the surface and ground water elevations in the wetlands) during the pump test. This information would be critical for establishing a potential hydrological connection to the wetland and measure any potential effects.*[146]

By its very nature, the Permit To Take Water (PTTW) system is reactive; consideration of cumulative impacts happens only once something has gone wrong, such as declining groundwater levels.

Further, the Conservation Authority raised questions about the validity of the results of the pump test that was done, noting that the discharge of water during the pump test might have skewed results and that the pumping rate in the test was less than one-third of the long-term proposed pumping rate. The Conservation Authority suggested that an additional pump test be completed prior to the granting of a PTTW.[147] The Conservation Authority also requested clarification on the details of the long-term monitoring program. In response, the proponent indicated that long-term monitoring would be determined at the PTTW stage.[148]

The potential for cumulative impacts associated with Pinnacle's water takings is difficult to assess. The Environmental Implementation Report does not include a discussion of the zone of influence associated with Pinnacle's water takings. It should be noted, however, that there are other nearby PTTWs and there does appear to be some potential for cumulative impacts among a nearby cluster of PTTWs (see Map 6). Information regarding *actual* water takings (as opposed to *permitted* water takings) and associated zones of influence is not available without a Freedom of Information Request.

In the end, the proponent met the requirements of Ontario's legislative framework, as indicated by Beacon Environmental's assessment, which rated policy effectiveness of the *Greenbelt Act, 2005* and Plan as "Medium" and the *Planning Act* as "High." The Class EA process, which was the overriding policy, was effective in ensuring the project avoided sensitive features.[149]

The project received approval under the *Planning Act* even though the impacts of water takings on wetlands and surrounding water systems were not fully considered. As with the North Waterdown Secondary Plan, the approval of the project prior to the issuance of a PTTW points to a weakness in the approval process: the option of refusing to issue a PTTW is by and large foreclosed, and will likely result in mitigation of water-taking impacts on wetlands, as opposed to the avoidance of impacts altogether.

---

144 Stantec Consulting Ltd. (2009, May 7). To Josh Campbell, MES, MCIP, RPP, Credit Valley Conservation Authority, Attachment 3 Proposed Water Taking Program.

145 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, pp. 59–60.

146 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 60.

147 Credit Valley Conservation. (2009, March 27). CVC Additional Ecology Comments – Pinnacle Heights Golf and Country Club Expansion. *Appendix B to Issues List.*

148 Credit Valley Conservation. (2009, March 27). CVC Additional Ecology Comments – Pinnacle Heights Golf and Country Club Expansion. *Appendix B to Issues List.*

149 Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland case studies project*, p. 66.

6.2. What was learned

6.2.1 Mitigation versus avoidance

Mitigation is currently the primary tool for addressing the impacts of water takings on wetlands, under the PTTW approval processes. While mitigation measures may address immediate concerns by protecting wetlands in the short term — as seems to be the case with the Milton Quarry — success will depend on ongoing monitoring and effective mitigation in response to issues that arise (e.g., variations in water levels). Whether mitigation is enough, even in the short term, is an open question.

In his 2006/2007 annual report, *Reconciling our Priorities*, the Environmental Commissioner of Ontario noted that of the 121 aggregate operations on the Oak Ridges Moraine, 100 were found to be in non-compliance with the *Aggregate Resources Act*, indicating that long-term issues with compliance are extremely common.[150] The fundamental question, with respect to projects like the Milton Quarry, which is operating on a 50-plus-year time frame, is whether proponents will be monitoring and mitigating impacts for as long as needed. Many aggregate operations permanently alter a landscape and hydrogeologic functions. At the Milton Quarry, for example, the modelling for mitigation measures did not address inevitable long-term changes in hydrogeology or climate (e.g., precipitation and evaporation).

How long can mitigation measures reasonably be expected to continue? If an aggregate company ceases to operate or simply decides to not honour long-term plans for mitigation and reclamation, wetlands will be left at risk.

Many aggregate operations permanently alter a landscape and hydrogeologic functions. At the Milton Quarry, for example, the modelling for mitigation measures did not address inevitable long-term changes in hydrogeology or climate (e.g., precipitation and evaporation).

While the existing legislative framework is able to prevent serious impacts to wetlands from water takings in the short term by requiring mitigation measures, a higher standard — avoidance of impacts — would offer greater certainty and a more permanent solution to the loss of wetlands and wetland function.

6.2.2 Opportunities for improvement

6.2.2.1 Order of approvals

The current legislative framework puts the cart before the horse by approving new land uses prior to considering the impacts of water takings. This approval process can be problematic, as illustrated by three of our case studies (Pinnacle Heights Golf Course, Milton Quarry Expansion and North Waterdown Secondary Plan) where concerns about surface and groundwater connections and potential negative impacts were not addressed prior to project approval.

The water needs associated with a new development have the ability to profoundly impact the environment, including wetlands, and should be given meaningful consideration prior to, not after, a project's approval. Considering these matters after a project has been approved exposes wetlands to the potential for impacts that cannot be fully or adequately addressed through mitigation measures. The Ministry of the Environment, which issues PTTWs, does not currently play an active role in the

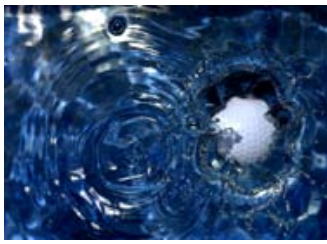
150 Environmental Commissioner of Ontario. (2007). Preserving natural areas or extracting aggregates wherever they lay. *Reconciling our priorities.* Retrieved from www.ecoissues.ca/index.php/Preserving_natural_areas,_OR_Extracting_aggregates_wherever_they_lay%3F

initial approval of a new land use (under the *Planning Act* or *Aggregate Resources Act*).[151] It is extremely difficult for the Ministry to deny a PTTW after project approval—especially since, at this stage, proponents have engaged in extensive and extremely costly planning, consultation and environmental studies to obtain their approvals. This situation illuminates the need to better integrate PTTW and land-use approval processes in order to effectively and proactively address concerns associated with water takings.

6.2.2.2 Cumulative impacts

Consideration of cumulative impacts at the watershed or aquifer scale prior to granting a new PTTW is not required of a proponent and is not typically given by the Ministry of the Environment. Rather, under the *Ontario Water Resources Act*, specific conditions, such as declining water levels or a high density of PTTW holders in a given area, trigger consideration of cumulative impacts. By its very nature, the PTTW system is reactive; consideration of cumulative impacts happens only once something has gone wrong, such as declining groundwater levels.

That being said, the cumulative impact of water takings did not seem to be a concern in our case studies, and may not pose a large threat to wetlands on the Greenbelt. In our case studies, any nearby water takings appeared to be outside the anticipated zone of influence associated with proposed new water takings, with the possible exception of the Pinnacle Golf Course, where there was not enough information available to determine the potential for cumulative impacts. Another factor noted in the Mount Albert case study was that it is common for wells on the Oak Ridges Moraine to take water from deeper, confined aquifers. In these situations, there is limited connectivity between groundwater sources being accessed and surface water features like wetlands. As a result, impacts from water takings, cumulative or otherwise, did not appear to pose a significant risk to nearby wetlands.



The one case study that raised some concern was the Pinnacle Heights Golf Course Expansion, where a cluster of PTTWs in the area surrounding the golf course suggests that there may be cumulative impacts.

The one case study that raised some concern was the Pinnacle Heights Golf Course Expansion, where a cluster of PTTWs in the area surrounding the golf course suggests that there may be cumulative impacts. While it is possible that Pinnacle's new water takings may be outside of the zone of influence of these nearby water takings, the issue was not addressed in the Environmental Impact Report and could not be confirmed using available information.

In situations where there is the potential for cumulative impacts from new water takings, the Ministry of the Environment should take a more proactive approach by making information regarding the sustainable capacity of existing water resources readily available to proponents, and by outlining requirements for proponents to address potential cumulative impacts as part of PTTW applications (and any related EAs where they are triggered).

6.2.2.3. Transparency regarding the use of public water resources

Information regarding PTTWs, actual water takings and their respective zones of influence is not readily available to the public. Access to such information typically requires the use of Freedom of Information requests, which can be costly and result in long wait times to access information. Indeed, despite the fact that water is a public, shared resource, it is quite difficult to access information

151 Ministry of the Environment, Central Division. (2011, January 21). Meeting between MOE PTTW staff, Ecojustice, Earthroots and DUC, Toronto, ON.

about its regulated use under the *Ontario Water Resources Act*. While some PTTWs are posted on the Environmental Registry, which can be accessed by the public, others are not required to be posted.[152]

For the purpose of this study, Earthroots obtained PTTW information using a membership with the Ontario Geospatial Data Exchange/Land Information Ontario to access GIS data. Most members of the public, however, do not have access to this system or GIS capacity. Status as charitable organizations and a budget to pay a professional cartographer allowed access to information that would not be readily available to the public. Even with these tools, information regarding actual water takings (as opposed to permitted takings) and/or the zone of influence associated with water takings was still not available, limiting the identification and quantification of cumulative impacts.

To increase transparency regarding the regulated use of public water resources, the Ministry of the Environment should make PTTW information easily available online, including all information regarding the location of PTTWs, respective PTTW holders, associated land uses, permitted takings, actual takings, respective water resources drawn upon, the sustainable capacity of those resources, information about required monitoring, and permit applications.

152 Under the *Environmental Bill of Rights, 1993*, S.O. 1993, c.28, "instruments" are subject to public consultation prior to approval. For the Permit to Take Water program, the Ministry of the Environment determined that only those permits that are more than one year in length (and do not involve irrigation for agricultural crops) are to be considered instruments (O.Reg. 681/94, section 3).

FINDINGS AND RECOMMENDATIONS

Ontario's Greenbelt was created to protect sensitive environmental lands and farmlands from urban sprawl. It embodies a bold vision that includes a natural heritage system where the first priority is to protect, restore and reconnect natural features and their associated functions.

Protection and restoration of wetlands across the Greenbelt are crucial to achieving this vision. Nearly three-quarters of southern Ontario's original wetlands have been lost since European settlement. In some areas, such as metropolitan Toronto, less than 15 percent of the area's wetlands remain. The loss of wetlands is a loss not only to the many species of plants and animals that depend upon them for habitat, but to all of us who benefit from the many services they provide, including their role in climate regulation (carbon storage and uptake), flood control, water filtration, erosion control, sediment retention, waste treatment and enhanced landscape resilience in the face of climate change. Permanent, legal protection for wetlands across the Greenbelt from many forms of development is a welcome signal of the government's commitment to address wetland decline.

With this study we set out to determine the extent to which new legislation, policy and stronger legal standards were helping to realize the Greenbelt vision with respect to wetlands. Specifically, we aimed to assess whether wetland protection objectives were being achieved, and whether and how wetland protection across the Greenbelt could be improved. Below we bring together the key findings from the four components of the study and present 12 recommendations for actions needed to build upon the government's efforts to date to advance wetland conservation across the Greenbelt.

With this study we set out to determine the extent to which new legislation, policy and stronger legal standards were helping to realize the Greenbelt vision with respect to wetlands.

Finding A: The three provincial land-use plans in effect across the Greenbelt (Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan, Greenbelt Plan) provide effective protection for virtually all wetlands from activities requiring Planning Act approval.

Unlike provincial policy for the rest of Southern Ontario, which requires that municipal-planning decisions be "consistent with" the PPS and which affords protection only to provincially significant wetlands, the legal and policy framework for Greenbelt wetlands protects almost all wetlands from "development" and "site alteration" (as defined in the three provincial land-use plans). It also enhances

BRIAN LASENBY PHOTO

protection for wetlands through the legal standard that requires municipal decisions to "conform with" the three provincial plans. This framework has enabled planners to remove almost all wetlands from development consideration (with some exceptions). As indicated by our case studies, however, there is less certainty about the effectiveness of policy to protect wetland ecological functions from impacts such as decreased water inflows and reduced water quality.

RECOMMENDATION 1: Maintain current legal and policy protections for wetlands across the Greenbelt.

Finding B: Infrastructure development, aggregate extraction, some existing land uses and peat extraction pose ongoing threats to wetlands across the Greenbelt.

Legislation governing infrastructure and aggregate extraction addresses mitigation to some degree, but is not as protective as requirements to *avoid* development in wetlands under the *Planning Act* and the three provincial land-use plans. Decisions affecting planning matters that are made under other laws and policies should be subject to similar protective measures, stipulating avoidance of development in wetlands. Further, given that there may be instances where avoiding development in wetlands is not possible or where a competing use is deemed to be a higher priority, policies should clearly sequence avoidance of development in wetlands as the top priority, minimization of impacts as the second priority and compensation for loss only as a last resort. Finally, municipalities should take advantage of existing options to address the impacts of peat extraction including (a) providing clear direction and support for Conservation Authorities to regulate peat extraction through existing regulations made under Section 28 of the *Conservation Authorities Act*, and (b) passing a site alteration bylaw under the *Municipal Act, 2001*.

RECOMMENDATION 2: Amend the *Environmental Assessment Act, Aggregate Resources Act,* and *Ontario Water Resources Act* approvals mechanisms to include a mitigation sequence that clearly ranks avoidance of wetland impacts as the top priority, minimization of impacts as the second priority and compensation as a last resort, where avoidance and minimization are not feasible or adequate.

Finding C: The overall legal and policy framework does not effectively support or require an increase in wetland extent or function.

The current legal and policy framework does little to facilitate wetland restoration in order to address historic losses. The goals of the Greenbelt Plan speak to the "enhancement of natural heritage features" and the "restoration of the hydrological integrity of watersheds." However, the plan neither supports nor requires an increase in the extent or health/function of wetlands.

RECOMMENDATION 3: Amend the legal and policy framework to provide an overarching objective to protect and restore wetlands to achieve a net gain in wetland extent and function.

Finding D: Where municipalities are adequately resourced, they are able to plan for natural heritage systems, ensuring more comprehensive protection of water features generally and wetlands specifically.

System-based planning better enables municipalities to protect wetlands. Some municipalities, however, do not have the resources to conduct system-based planning. Further, a lack of capacity within the Ministry of Natural Resources to support wetland delineation and mapping has made it difficult for many municipalities to implement policy.

RECOMMENDATION 4: Provide additional guidance to municipalities and Conservation Authorities. The Ministries of Municipal Affairs and Housing and Natural Resources should coordinate their efforts to (1) finalize the draft technical guidelines for existing natural features and (2) provide additional guidance on natural heritage systems planning.

RECOMMENDATION 5: Enhance education and outreach to municipalities and Conservation Authorities. The Ministry of Municipal Affairs and Housing should showcase best practices in municipal policy and enable improved communication and information sharing across Greenbelt municipalities.

RECOMMENDATION 6: Adequately fund the Ministry of Natural Resources to provide guidance and mapping support to municipalities.

Finding E: Lack of on-the-ground monitoring for compliance and effectiveness impedes assessment of policy effectiveness.

It is difficult to assess the outcomes of wetland protection policies due to the lack of monitoring. Our case studies highlighted insufficient post-construction monitoring of both compliance with and effectiveness of mitigation requirements. Follow-up reporting on approvals under the *Environmental Assessment Act*, *Planning Act*, *Aggregate Resources Act* and *Ontario Water Resources Act* were lacking.

RECOMMENDATION 7: Amend the *Environmental Assessment Act*, *Planning Act*, *Aggregate Resources Act*, *Ontario Water Resources Act* approvals mechanisms and other relevant laws and policies to require rigorous post-construction monitoring and reporting for compliance and mitigation effectiveness. The monitoring framework should include a protocol for cases where mitigation measures are shown to be inadequate and where additional measures are needed (with enforcement and oversight provided by the approval agency). It should be based on an adaptive management approach that requires continuous improvement in information collection and disclosure.

Finding F: The sequence of project approvals needs reordering. When Permit to Take Water approvals are the last (or one of the last) to be processed, the impacts of water takings are not adequately considered.

Approvals for new land uses under the *Planning Act* and *Aggregate Resources Act* do not consider water takings until after initial approval is granted. Once a project has already been approved as being viable, it then moves into a more detailed design phase where water takings and their impacts on surrounding features are considered, first during the final stages of an Environmental Assessment, and then through the Permit to Take Water approval process. This sequencing limits the ability of the Ministry of the Environment to regulate water takings and prevent impacts. The Ministry addresses problematic Permit to Take Water applications by requiring proponents to engage in mitigation to control and minimize impacts. If water takings were considered as part of the initial approval for new projects, better outcomes could be achieved by identifying issues earlier and avoiding impacts altogether.

RECOMMENDATION 8: Amend the three provincial land-use plans and the *Ontario Water Resources Act* approvals mechanisms to require that the impacts of water takings, under the Permit to Take Water process, be considered concurrently with land-use planning approvals.

Finding G: Inconsistencies and ambiguities among laws and policies are leading to confusion among planning authorities and other agencies.

There are a number of instances where clarity is needed to ensure that policy will be interpreted and implemented consistently across the Greenbelt. For example:

- There is no specific requirement for proponents in their *Planning Act* application to demonstrate conformity with the specific, relevant land-use policies.
- Wetlands definitions in laws and policies governing land use in the Greenbelt are not consistent. In Part C of the Greenbelt Plan definition, "has been further identified by" creates ambiguity and should be removed.
- There is inconsistency in thresholds for triggering natural heritage protection and environmental studies (i.e., policy regarding "development *or* site alteration" in the Greenbelt Plan rather than "development *and* site alteration" as in the other provincial land-use plans).
- Recreational-use policies in the Greenbelt Plan (e.g., concerning golf courses) are not clear regarding setbacks (i.e., Vegetative Protection Zones).

RECOMMENDATION 9: Amend provincial land-use plans to require the proponent to demonstrate conformity with all applicable policies as part of the applications' supporting materials.

RECOMMENDATION 10: Amend provincial land-use plans and related legislation to use one consistent definition of "wetlands."

RECOMMENDATION 11: Amend the Greenbelt Plan to clarify policies for recreational uses adjacent to wetlands. For consistency, amend provincial land-use plans to include thresholds for triggering natural heritage protection and environmental studies.

Finding H: Outreach, education and stewardship strategies are needed to build greater landowner appreciation and support for wetland conservation across the Greenbelt.

The vast majority of wetlands across the Greenbelt are situated on private land and managed by landowners. In addition to strengthening law and policy, provincial and municipal governments should reach out to private landowners with information on wetland values and assistance with stewardship strategies. Better outreach and stewardship programs to assist private landowners will also reduce impacts of existing land uses, resulting in better adoption of sustainable land-management practices.

RECOMMENDATION 12: Provide stronger support and incentives to landowners (e.g., outreach and stewardship programs) to increase adoption of sustainable wetland management practices and allocate appropriate public resources for these supports.

REFERENCES

Reports and Published Sources

Beacon Environmental. (2011). *Greenbelt wetlands protection assessment: Investigation of wetland.* www.ecojustice.ca/greenbelt

Binstock, M., & Carter-Whitney, M. (2011). *Aggregate extraction in Ontario: A strategy for the future*. Toronto: Canadian Institute for Environmental Law and Policy. Retrieved from http://cielap.org/pdf/AggregatesStrategyOntario.pdf

Ducks Unlimited Canada. (2010). *Southern Ontario wetland conversion analysis*. Retrieved from www.ducks.ca/aboutduc/news/archives/prov2010/pdf/duc_ontariowca.pdf

Ducks Unlimited Canada. (2011). A business case for wetland conservation, The Black River watershed. Retrieved from www.ducks.ca/blackriver2011

David Suzuki Foundation. (2008). *Ontario's wealth, Canada's future: Appreciating the value of the Greenbelt's eco-services*. Vancouver. Retrieved from www.davidsuzuki.org/publications/downloads/2008/DSF-Greenbelt-web.pdf

Earthroots & Ecojustice. (2008). *Ontario's water hazard: The cumulative impact of golf courses on our water resources*. Retrieved from www.ecojustice.ca/publications/reports/ontarios-water-hazard/attachment

Environmental Commissioner of Ontario. (2007). *Reconciling our Priorities, ECO Annual Report, 2006-07.* Toronto: Environmental Commissioner of Ontario. Retrieved from www.ecoissues.ca/index.php/Preserving_natural_areas,_OR_Extracting_aggregates_wherever_they_lay%3F

Fishera, B., Turnera, R. K., & Morling, P. (2009). Defining and classifying ecosystem services for decision making. *Ecological Economics*, *68*, 643.

Hubley, P. (2011). *Milton Quarry extension: Hydrogeology overview.* Hubley Geosciences Ltd.

KMK Consultants Ltd., (2007, February 26). *Waterdown water and wastewater servicing class environmental assessment,* section 10.

Marbek Resource Consultants. (2011). *Assessing the economic value of protecting the Great Lakes ecosystems*. Commissioned study for Ministry of the Environment (with support from the Toronto and Region Conservation Authority, and the Great Lakes and St. Lawrence Cities Initiative).

Marshall Macklin Monaghan (MMM) Group Ltd. (2006). *Class environmental assessment and water resource exploration for water supply to the community of Mount Albert,* section 5.

O'Connor, The Honourable Dennis R. (2002). *Part two report of the Walkerton Commission of Inquiry: A strategy for safe drinking water*. Toronto: The Queen's Printer for Ontario.

Price, J.S., Branfireun, B.A., Waddington, J.M., & Devito, K. J. (2005). Advances in Canadian wetland hydrology, 1999–2003. *Hydrological Processes, 19*, 201.

Stantec Consulting Ltd. (2007). *Scoped environmental implementation report for Pinnacle Heights Golf Course final*, section B.

Swanson, G.A., Euliss, N. H.J., Hanson, B.A., & Mushet, D.M. (2003). Dynamics of a prairie pothole wetland complex: implication for wetland management. In Winter, T.C. (Ed.) *Hydrological, chemical, biological characteristics of a prairie pothole wetland complex under highly variable climate conditions: The Cottonwood Lake Area, east-central North Dakota.* US Geological Survey Professional Paper 1675: 55 – 94.

Warren, F., Waddington, J.M., Bourboniere, R.A., & Day, S. M. (2001). Effect of drought on hydrology and sulphate dynamics in a temperate swamp. *Hydrological Processes, 15*, 3133.

Winter, T.C. (1999). Relation of streams, lakes, and wetlands to groundwater flow systems. *Hydrogeology Journal, 7*, 28.

Woo, M-K., & Young, K. L. (2003). Hydrogeomorphology of patchy wetlands in the high Arctic, polar desert environment. *Wetlands, 23*, 291.

Legislation and Policy

Aggregate Resources Act, R.S.O. 1990, c. A. 8

Clean Water Act, 2006, S.O. 2006, c. 22

Conservation Authorities Act, R.S.O. 1990 c. C.27

Drainage Act, R.S.O. 1990, c. D. 17

Endangered Species Act, 2007, S.O. 2007, c. 6

Environmental Assessment Act, R.S.O. 1990, c. E. 18

Green Energy Act, 2009, S.O. 2009 c. 19

Ministry of Municipal Affairs and Housing. (2001). Oak Ridges Moraine Conservation Plan. O.Reg 140/02. Toronto: The Queen's Printer for Ontario. Retrieved from www.mah.gov.on.ca/AssetFactory.aspx?did=1779

Ministry of Municipal Affairs and Housing. (2005). *Provincial policy statement*. Toronto: The Queen's Printer for Ontario. Retrieved from www.mah.gov.on.ca/Asset1421.aspx

Ministry of Municipal Affairs and Housing. (2005). Greenbelt Plan. Toronto: Queen's Printer for Ontario. Retrieved July 5, 2011, Retrieved from www.mah.gov.on.ca/Page189.aspx#greenbelt

Ministry of the Environment. (2011, January 11). Information Notice: Proposed amendments to the Municipal Engineers Association's municipal class environmental assessment, *Environmental Bill of Rights* Registry, Number 011–1391.

Ministry of Public Infrastructure Renewal. (2006). Growth plan for the Greater Golden Horseshoe, p. 12. Toronto: Queen's Printer for Ontario. Retrieved from www.moi.gov.on.ca/pdf/en/GrowthPlan_GGH.pdf

Niagara Escarpment Commission. (2001). Niagara Escarpment Plan. Toronto: The Queen's Printer for Ontario. Retrieved from www.escarpment.org/_files/file.php?fileid=fileqoQkPglXij&filename=file_NEP_updated_April_2011.pdf

Niagara Escarpment Planning and Development Act, R.S.O. 1990, c. N.2

Nutrient Management Act, 2002, S.O. 2002, c.4

Oak Ridges Moraine Conservation Act, 2001, S.O. 2001, c. 31

Ontario Water Resources Act, R.S.O. 1990, c. O. 40

Places to Grow Act, 2005, S.O. 2005, c. 13

Planning Act, R.S.O. 1990, c. P13

Other

Baker, K. (April 12, 2011). Ministry of the Environment. pers. comm.

Bakker, J. (August – September, 2010). Ministry of Natural Resources. pers. comm.

Credit Valley Conservation. (2009, March 27). *CVC Additional Ecology Comments-Pinnacle Heights Golf and Country Club Expansion. Appendix B to Issues List.*

Gerretsen, Hon. John. "Orders of the Day, Greenbelt Act, 2005, Third Reading." In Ontario, Legislative Assembly. *Legislative Debates (Hansard)*. 38th Parl. 1st Sess. (February 23, 2005). Retrieved from www.ontla.on.ca/house-proceedings/transcripts/files_html/2004-06-23_L067A.htm#PARA565

Ministry of the Environment, Central Division. (February 15, 2011). Meeting between K. Baker, R. Hodgins, P. Hubley, & J. Kohler. Toronto, ON.

Ministry of the Environment, Central Division. (January 21, 2011). Meeting between Ministry PTTW staff, Ecojustice, Earthroots, & Ducks Unlimited Canda. Toronto, ON.

Stantec Consulting Ltd. (May 7, 2009). To Josh Campbell, MES, MCIP, RPP, Credit Valley Conservation Authority, Attachment 3 Proposed Water Taking Program.

Ducks Unlimited Canada is the leader in wetland conservation. A national, private, registered charity, DUC conserves, manages and restores wetlands and associated habitats to benefit waterfowl, other wildlife and people. Guided by sound science and research, DUC delivers on-the-ground habitat projects, education programs and public policy work to stop wetland loss across the country.

In Ontario, DUC has been implementing its habitat conservation program since 1974. Since then, DUC has conserved more than 940,000 acres of wetlands and associated habitat across the province.

Earthroots is a grassroots conservation organization dedicated to the preservation of wilderness, wildlife and watersheds in Canada, with a focus on Ontario. Earthroots is a strong advocate and agitator for wilderness preservation in Ontario, combining grassroots campaign strategies with effective research and educational programs. Since 1986, Earthroots has used its grassroots expertise to organize, educate and mobilize the public, conduct successful media events, carry out wilderness research projects and ensure proper forest management planning.

Ecojustice is Canada's leading non-profit organization of lawyers and scientists devoted to protecting the environment. Since 1990, we have helped hundreds of groups, coalitions and communities expose law-breakers, hold governments accountable and establish powerful legal precedents in defence of our air, water, wildlife and natural spaces.

Ontario Nature protects wild species and wild spaces through conservation, education and public engagement. Ontario Nature is a charitable organization representing more than 30,000 members and supporters and 140 member groups across Ontario.