Chapter 1

Protecting Southern Ontario's Wetlands

Abstract

Southern Ontario has lost over 72% of its wetlands, and wetland loss continues today. Despite the wide array of essential ecosystem services that wetlands provide, the government continues to fail to protect the few wetlands we have left. Existing wetland conservation efforts need to be enhanced, not just maintained. There are several fundamental actions the government needs to take to halt wetland loss. First, the wetland evaluation system needs to be improved. All unevaluated wetlands should be presumed significant until proven otherwise to prevent further wetland loss while completing lengthy evaluation and designation procedures. Next, wetland policies and programs need to be strengthened to tackle all the main drivers of wetland loss, including agricultural and development activities. Most importantly, the province must empower conservation authorities to effectively protect wetlands from all serious threats. Finally, strong regulations for wetland offsetting need to be developed to ensure that key ecological functions are successfully replaced in the select circumstances that wetland loss is truly unavoidable.

Wetlands provide critical habitat and flood control. Government is letting them be destroyed.

Contents

1.1 Introduction

The world is estimated to have lost at least 64% of its original wetland area in the 20th century as natural landscapes were degraded and destroyed to make way for homes, roads, farms and industry.[1] Ontario holds about 6% of the remaining wetlands in the world, and 25% of Canada's total. However, these valuable assets are dwindling. Southern Ontario has lost nearly three quarters of its original wetland cover, and wetlands are still being destroyed to this day (see Figure 1).

> Southern Ontario has lost nearly three-quarters of its original wetland cover.

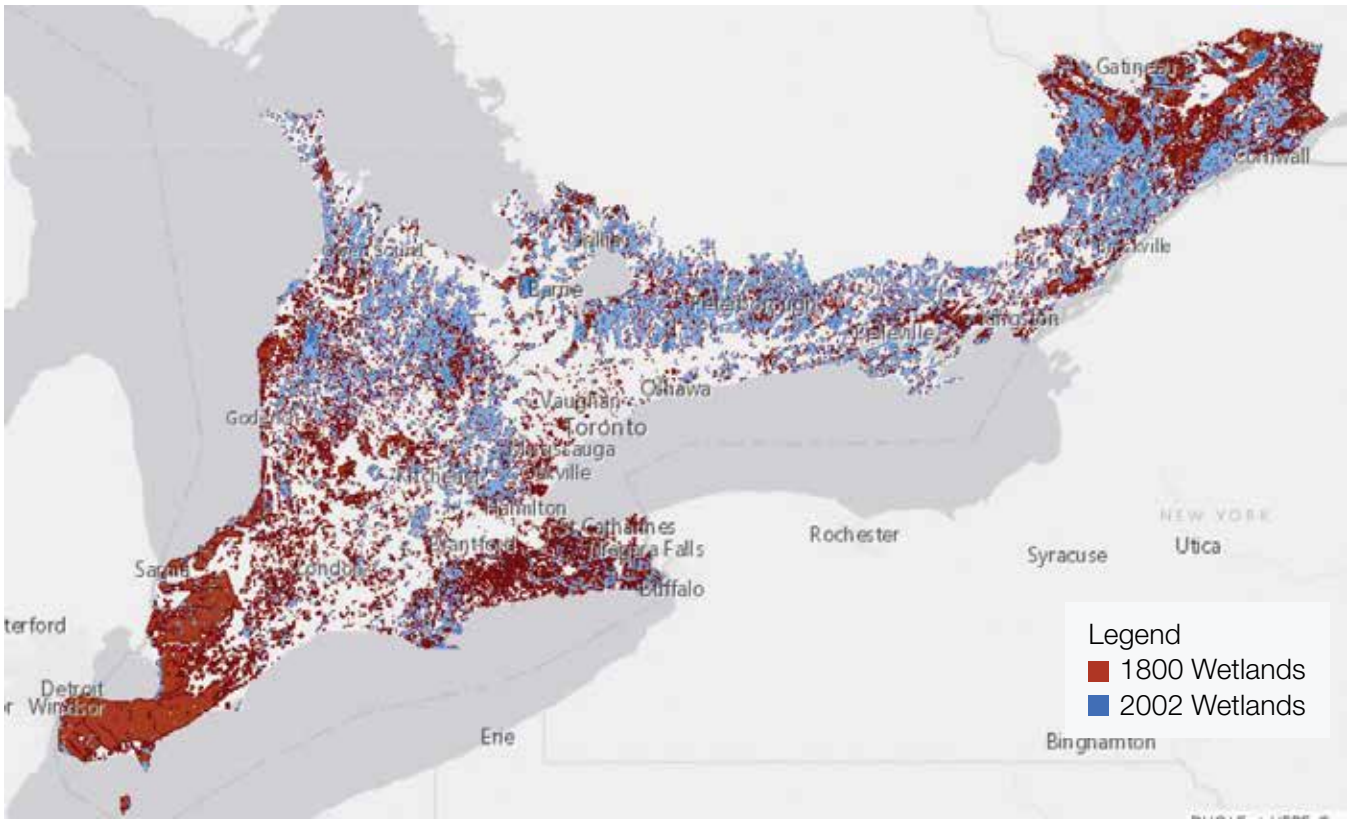

Figure 1. Map of wetland loss in southern Ontario. This map compares wetland cover in 1800 (brown and blue) to remaining wetland cover in 2002 (just blue) in southern Ontario, also referred to as the Mixedwood Plains ecozone. The brown areas therefore represent wetland area loss.

Source: Duck's Unlimited Canada, 2015. Generated using datasets from Ducks Unlimited Canada's (DUC) Southern Ontario Wetland Conversion Analysis (2010).

In recent decades, our understanding and appreciation of wetland services has grown and the government has taken steps to protect certain wetlands. Many wetlands across southern Ontario have been recognized as significant for their ecological, social, cultural and economic values. Eight of Ontario's wetlands are designated as internationally important under the Ramsar Convention, an international wetlands treaty. Ontario's Great Lakes coastal wetlands provide migratory bird habitat of continental significance, with many species flying each year from Central and South America all the way to Ontario. The peatlands in Ontario's Far North are among the most biologically productive subarctic wetlands in the world, and represent a globally significant carbon store.

Unfortunately, simply recognizing the significance of these wetlands has not resulted in sufficient protections. Despite the essential ecosystem services these wetlands provide, they are often regarded as obstacles to competing land uses. The province has long failed to confront the leading causes of wetland loss, leaving even our most significant wetland habitats vulnerable to destruction.

The Ontario government has recently released its Wetland Conservation Strategy for Ontario, 2017-2030, which commits to halting net wetland loss by 2025. However, in the absence of meaningful policy action, the strategy's timelines still allow wetland loss to continue for at least the next seven years. This chapter examines how the Ontario government can address the key barriers to wetland conservation to prevent further wetland loss in southern Ontario and ultimately achieve net gain of both area and function.

1.1.1 What is a wetland?

Wetlands are lands that are seasonally or permanently covered in shallow water, or lands where the water table is close to the surface of the soil. In both instances, the presence of water creates conditions that favour the growth of water-tolerant or water-loving plants and the development of hydric (waterlogged) soils.

Wetlands are often transitional habitats, connecting aquatic and terrestrial ecosystems. They can exist in isolation or can be functionally connected to other wetlands, forming large wetland complexes. Wetlands vary in size and type, and their distribution across the province depends on various ecological and geographical factors. More recently, humans have become significant drivers of change in wetland distribution.

There are four main types of wetlands: swamps, marshes, bogs and fens.

Swamp in Keddy Nature Sanctuary.

Photo Credit: Awakebutterfly, (CC BY-SA 4.0).

Marsh in Point Pelee National Park.

Photo Credit: Ken Lund, (CC BY-SA 2.0).

Sphagnum Bog in Mer Bleue Conservation Area.

Photo Credit: P199, (CC BY 2.5).

Fen in Torrance Barrens Conservation Reserve.

Photo Credit: Larissa Sage. Used with permission.

Swamps are largely dominated by trees and shrubs, and are often flooded for part of the year. Swamps vary widely in vegetation, age, and ecological setting, and they are generally the most biologically diverse and productive wetland type.

Marshes often have open areas of water with floating plants and non-woody emergent plants, such as cattails, reeds and grasses.

Bogs and fens are peat-filled areas that are common in northern Ontario. They are typically covered in sphagnum moss. Bogs receive water only from rainfall and surface runoff, and are strongly acidic and nutrient poor. Unlike bogs, fens are fed by groundwater. They are less acidic and more nutrient-rich than bogs, and have a higher diversity of plant life.

1.1.2 The value of wetlands

Wetlands provide Ontario with an amazing number of benefits (see Figure 2). Wetlands can store water, acting like a sponge during wet periods and gradually recharging groundwater, which in turn replenishes soils and streams across the larger landscape. Wetlands provide critical reservoirs during storms and heavy rains, protecting us from the worst impacts of floods. Wetlands can stabilize shorelines and control erosion, protecting both the land and water quality. They purify water by filtering out nutrients, sediments and pollutants from groundwater and surface runoff before discharging it to other water bodies. Wetlands also provide habitat for many species of plants and animals, including an estimated 20% of Ontario's species at risk.[2] For all of these reasons, both the federal and provincial governments have recognized that conserving and enhancing wetland habitat is vital for supporting Canada's actions to sustain biodiversity.

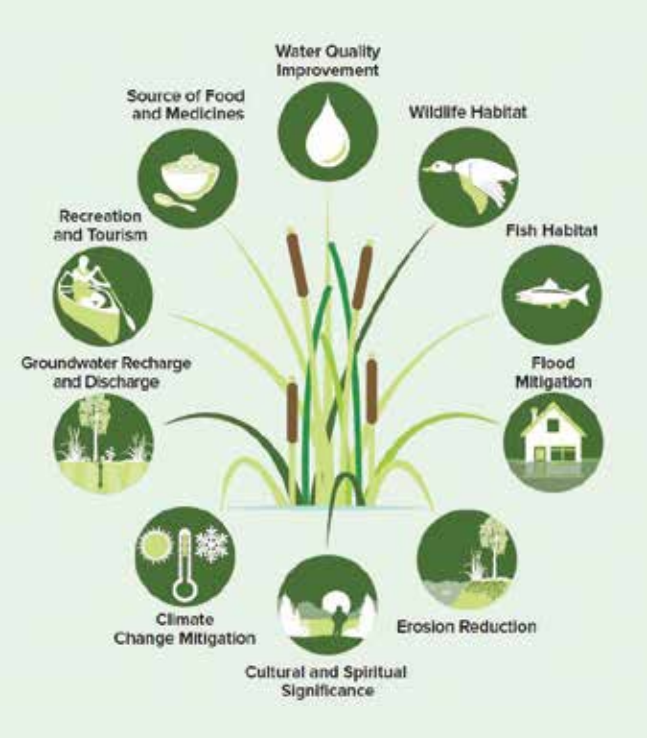

Figure 2. The many services that wetlands provide.

Source: MNRF.

Wetland services are becoming even more essential as our climate changes. Intact wetlands help to maintain water flow patterns and reduce some of the impacts of extreme weather events. Even a wetland as small as 2 hectares can retain water runoff from an area 70 times its size, buffering against flooding.[3] Wetland conservation can also contribute to climate change mitigation, as undisturbed wetlands can store large quantities of carbon.

Even small wetlands, such as the one shown above beside the Credit River, help to absorb water from the surrounding landscape and can reduce flooding impacts.

Photo Credit: (CC0 1.0).

Southern Ontario wetlands often act as green infrastructure, a service that provides at least $14 billion in annual economic benefits.[4] For example, one recent study found that leaving wetlands intact rather than draining them for agriculture reduced the costs of flood damage from severe storms by up to 38%.[5] However, as numerous Indigenous groups, environmental organizations, and members of the public have argued, we should not rationalize wetland conservation solely around economic benefits. Wetlands are valuable in and of themselves, irrespective of present or future human uses. Many people strongly believe that the intrinsic value of natural features is reason enough to ensure their long-term conservation.

1.2 The sad state of wetlands in southern Ontario

The failure to recognize the value of wetlands across southern Ontario has had staggering impacts. Prior to European settlement, roughly 25% of southern Ontario was covered in wetlands. As of 2002, wetland cover had shrunk to just 6.8%.[6] As noted above, this represents a loss of over 72% of wetland cover. A study by Ducks Unlimited Canada determined that 3.5% of this total loss (equivalent to about 350 large lost wetlands each year) occurred in the not-so-distant past, between 1982 and 2002.

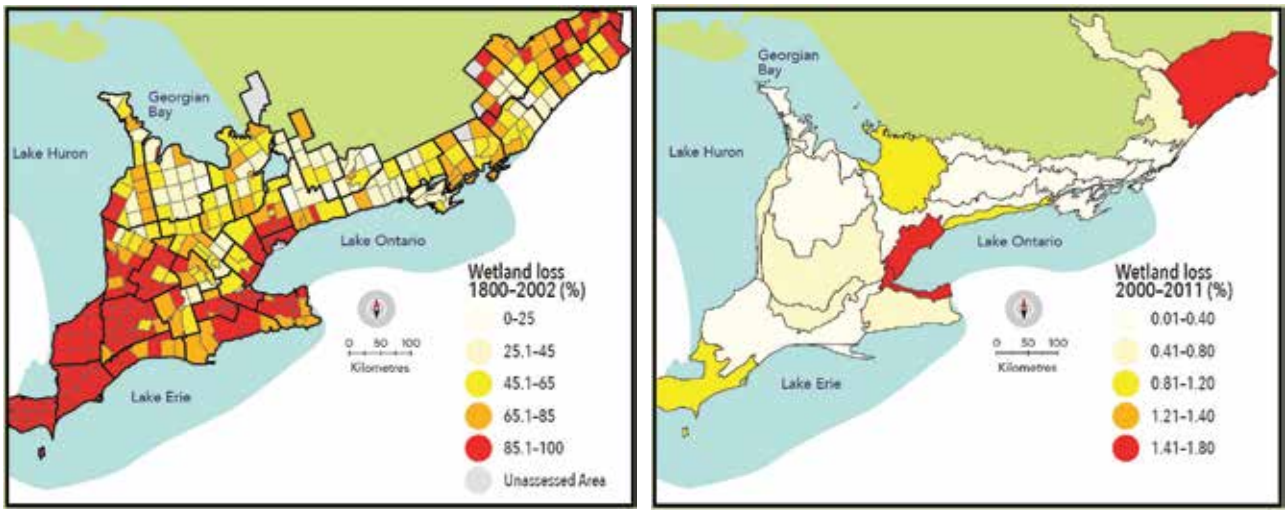

Figure 3. Wetland loss in southern Ontario's Mixedwood Plains ecozone from 1800-2002, and more recently, from 2000-2011.

Source: Ducks Unlimited Canada, Southern Ontario Wetland Conversion Analysis, (2010) (left), Ontario Biodiversity Council, (2015) (right).

Despite these profound historic losses, southern Ontario's remaining wetlands are still being destroyed (see Figure 3). Between 2000 and 2010, (the most recent period for which we have complete data) southern Ontario lost an additional 0.6% of the remaining wetland area (see Figure 4).[7] This represents a loss of 61.5 km^2 of wetlands, an area roughly the size of the entire City of Waterloo. This suggests that the rate of loss from 2000 to 2010 may be less than that of the previous two decades, but it is still continuing on a downward trend.[8] Rates of loss have lessened for a number of reasons, including enhanced protection and restoration efforts. There are also simply fewer wetlands remaining on the landscape to conflict with human activities.

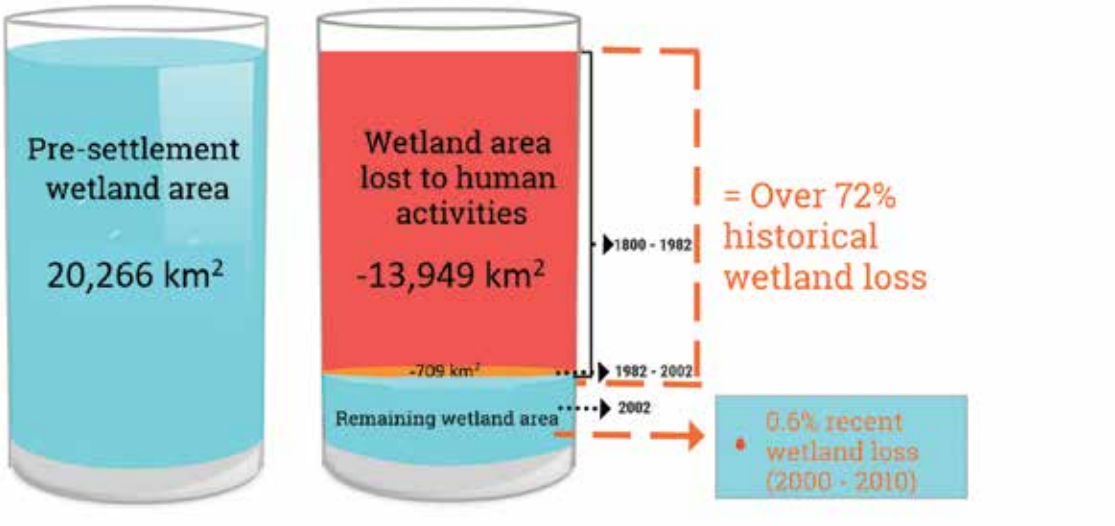

Figure 4. Recent wetland loss as a proportion of remaining wetlands. Southern Ontario lost over 72% of its original pre-settlement wetland area by 2002. The recent 0.6% loss is a proportion of the *remaining* 27.7% of wetlands in southern Ontario in 2002.

Source: Created by the Environmental Commissioner of Ontario.

Wetland loss has been most pronounced in southwestern Ontario, and some regions of eastern Ontario. For example, Essex County had the highest concentration of pre-settlement wetland area (83%), and as of 2002, only 1.6% of this original area remained.[9] St. Clair Region Conservation Authority reported in its 2013 Watershed Report Card that wetlands cover only 0.9% of the watershed, compared to the minimum of 10% cover Environment Canada recommends for healthy watersheds.[10] As of 2018, wetland cover has shrunk to just 0.1% of this watershed.

Unfortunately, these are all conservative estimates of wetland loss. Although better mapping technology now captures some smaller wetlands, wetlands that are less than 0.5 hectares (roughly the size of a football field) are still not accounted for in recent estimates of wetland loss.[11] Small wetlands and vernal pools (temporary pools of water) provide essential breeding ground and habitat for many species, and smaller wetlands are actually better at filtering out pollutants than larger wetlands.[12] Despite their value, small wetlands are more likely to be the first to be removed to accommodate development projects and agricultural activities.

A vernal pool in Backus Woods. Small ephemeral wetlands and vernal pools provide unique habitats for wood frogs, Jefferson salamanders and fairy shrimp with little to no threat from the fish predators found in larger freshwater environments.

Photo Credit: John Oyston, North American Native Plant Society. Used with permission.

With fewer wetlands, both rural and urban regions across the province are increasingly vulnerable to flooding, droughts, algal blooms, soil erosion, loss of species habitat and numerous other environmental consequences. Many of these threats are increasing in both frequency and severity as climate change progresses, and without healthy and abundant wetlands, we lose our ability to adapt.

1.2.1 Why are southern Ontario's wetlands disappearing?

Wetland cover in southern Ontario has been steadily shrinking due to a number of human activities that harm or destroy wetlands (Table 1). The key continuing causes of wetland loss in southern Ontario are briefly discussed below. Like most environmental pressures, the cumulative impacts of all of these activities, through repeated and multiple disturbances, have lead to greater wetland loss or degradation than any threat on its own. The fate of individual wetlands is often determined on a case-by-case basis, and overall wetland cover is declining due to a slow death by a thousand cuts.

Table 1. Primary causes of wetland loss in southern Ontario from 2000 – 2010. Land cover categories represent the activities that replaced former wetland area.[13]

Source: MNRF data.

Activities responsible for wetland loss[a]	Area of loss (km^2)	Percent of total loss
Agriculture (cultivated fields, orchards, nurseries, vineyards, hay and pasture land and agricultural buildings)	**26.8**	**43**
Development and infrastructure	**15.0**	**24**
Built-up area (impervious surfaces)	12.5	20
Built-up area (pervious surfaces)	1.4	2
Transportation infrastructure	1.1	2
Undifferentiated[b] (includes variety of additional agricultural and development and infrastructure activities)	**11.5**	**19**
Peat and topsoil extraction	**4.6**	**7**
Aggregate extraction	**3.6**	**6**
Stormwater management, clearing vegetation for swimming, and soil removal	**0.2**	**<1**

Agriculture

Agricultural activities have historically been, and continue to be, the greatest cause of wetland loss in most of southern Ontario. An analysis by Ducks Unlimited indicates that approximately 85% of wetland loss across southern Ontario (outside of the Golden Horseshoe) between pre-settlement and 2002 was due to conversion to agricultural uses.[14] From 1967 to 2002 alone, wetland cover in southwestern Ontario shrunk by half, primarily due to intensive agriculture activities.[15] According to the government, agricultural activities are still the greatest contributor to wetland losses across southern Ontario, responsible for 43% of recent wetland losses (i.e., between 2000 and 2010) (see Table 1).

Farmers often use drainage systems, such as open or enclosed ditches or tile drains, to divert water from the land. Watercourses can flow through open ditches or enclosed pipes to remove surface water from fields. Tile drainage removes water from the soil through networks of underground pipes to lower the water table. Drainage systems can be effective and even necessary tools for managing water and increasing agricultural production. However, agricultural drainage can reduce or destroy both wetland area and function if environmental impacts are not properly assessed and avoided. Even relatively small changes to natural water levels can impair wetland functions.

Despite the fact that agricultural activities are responsible for the majority of recent wetland loss, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) does not monitor the impacts of drainage works on wetlands, and was unable to provide the ECO with data on how many hectares of wetlands have been lost or disturbed due to drainage activities. However, according to the OMAFRA, at least 1,561 km^2 of land

a. The activities listed above represent the class descriptions used in the Southern Ontario Land Resource Information System (SOLRIS) Version 2.1, a natural resource inventory and monitoring system. Please refer to this document for complete class descriptions.

b. The undifferentiated class includes idle agricultural land, urban brown fields, hydro right-of-ways, the edges of transportation corridors, upland thickets and clearings within forests. Agricultural activities are typically included in the undifferentiated class, but were analyzed separately by MNRF staff using SOLRIS the Agricultural and Agri-Food Canada Annual Crop Inventory dataset.

was drained by tile drainage contractors from 2006 to 2016 alone. Some portion of this tiling is bordering or directly overlapping with wetland areas (see Figure 5). The additional area drained from privately installed tiles (i.e., not through a contractor) is unknown, and the OMAFRA is not tracking the impacts of tiling (either by contractors or private landowners) on wetlands. The lack of publically accessible information on the impacts of agricultural drainage on wetlands in southern Ontario is especially troubling as drainage enclosures and tiling are now making up the majority of new agricultural drainage systems.

Development and infrastructure

New development and infrastructure projects often result in the "filling" of wetlands. From 2006 to 2016, 83% of population growth in Toronto was in the suburban edges of the region, a trend that is mirrored throughout Southern Ontario.[16] Urban centres are sprawling into farmland and natural areas, and replacing them with an ever-increasing amount of pavement. Such impervious surfaces often obliterate natural features such as wetlands from the landscape, which can make the entire watershed much more vulnerable to flooding. Projects that manage to avoid complete destruction can still degrade wetland function when construction encroaches on the edges of wetland habitat or alters hydrological patterns.

The expansion of impervious surfaces in urban areas increases flooding risks during severe rainfall events. The damage of this extreme flooding along the Ottawa River could have been reduced if wetlands and other vegetation bordered the river, as opposed to impervious surfaces, like this parking lot.

Photo credit: Ross Dunn, (CC BY-SA 2.0).

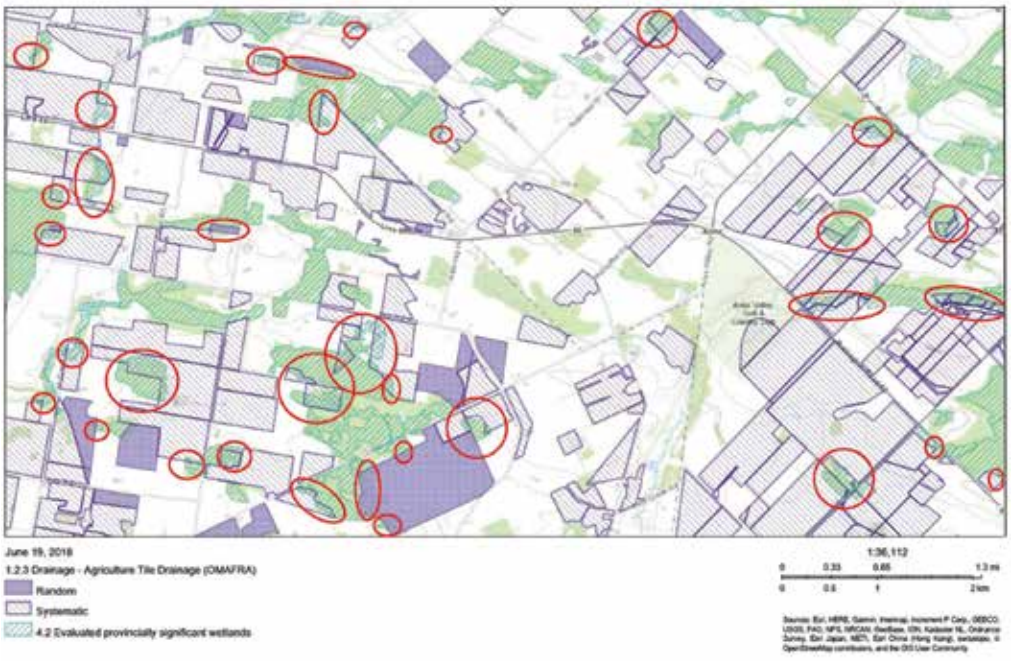

Figure 5. Map of agricultural tile drainage in southern Ontario. This map shows a section of southern Ontario where evaluated provincially significant wetlands are often bordered by tile drainage systems, and in several cases (red circles) tile drains may have been installed directly within provincially significant wetlands.

Source: OMAFRA, Agricultural System Portal.

According to recent data from the MNRF, the development of built-up areas, ranging from small rural hamlets to large cities, is responsible for 22% of recent wetland loss. Of these wetland areas lost to development, 20% were converted to impervious surfaces (Table 1). This estimate would be even higher if it included wetlands lost to other forms of development and infrastructure, grouped loosely into the "undifferentiated" class. The Toronto and Region Conservation Authority has recently reported that over half of the land cover within its jurisdiction is urban development, and in several watersheds, urban cover is six to nine times more extensive than natural cover from forests, wetlands and meadows.[17]

Peat and topsoil extraction

Peat and topsoil extraction account for 7% of recent wetland loss, but very little is known about where the extraction operations are taking place and why activities are not stopped before wetland loss occurs. Peat and topsoil are generally used for horticultural purposes and for gardening, however, the province does not actually track the end uses of either resource. While some municipalities and conservation authorities may regulate extraction to some extent, there is no policy that explicitly prohibits these activities in or around wetlands.[18] What is clear is that a market has been created for the rich organic soils in wetlands, and rather than focusing on building soil organic matter (i.e., through composting) both at home and in the horticultural industry, wetlands are being destroyed to supply healthy soils.

Aggregate extraction

Aggregate operations account for 6% of recent wetland loss (Table 1). Land use planning policy dictates that aggregate pits and quarries must be located as close as possible to markets,[19] which often means they are located just outside of urban centres in order to support expanding development needs. Unfortunately, the regions targeted for aggregate extraction frequently overlap with wetlands that have avoided urban expansion, only to then be impacted by aggregate operations. There are currently over 6,000 active licences and permits for aggregate pits and quarries across the province. The majority of these are located in southern Ontario, and industries are advocating for reduced protections for smaller wetlands and the edges of significant wetlands to enable further expansion of aggregate operations.

Rehabilitation of aggregate pits and quarries is mandatory in Ontario, and successful projects can even result in the creation of significant wetland habitat. However, aggregate operations can last for decades, and the enforcement of rehabilitation standards is often inadequate (see Chapter 5 of the ECO's 2016/2017 Environmental Protection Report).

Pollution and degradation

Even if wetlands are not fully destroyed by human encroachment, they are frequently degraded or altered from their natural states. Wetlands are often polluted from toxic runoff, road salt, sewage, pesticides and fertilizers. Wetlands near farms or urban areas are particularly vulnerable to degradation from polluted runoff.[20] Wetlands naturally filter out pollutants, acting as buffers before runoff enters other waterways. However, excessive nutrient runoff and pollution can overload wetlands, which can trigger algal blooms downstream (see Chapter 4 of the ECO's 2016/2017 Environmental Protection Report). Pesticides and fertilizers are also having a severe impact on wildlife downstream from intensive agricultural areas. For example, high levels of nutrient runoff in the Holland Marsh has contributed to reduced reproductive success for amphibians such as the American toad, green frog and northern leopard frogs, resulting in declines in both population and species diversity.[21]

Northern leopard frog.

Photo Credit: Douglas Wilhelm Harder, (CC-BY SA-3.0).

Development, infrastructure and other site-alteration projects can also have indirect impacts on wetland hydrology. For example, a parking lot built beside a wetland can affect the amount of surface water and/or groundwater flowing in and out of wetlands. That in turn can impact the extent of saturation and water levels in flooded wetlands, both of which can have significant impact on the function and value of that wetland.

Climate change and invasive species

Climate change has become a significant threat to wetlands across the province. The direct and indirect impacts of climate change can shrink or completely dry wetlands, alter the types of plant or animal life found within a wetland, or shift wetland type, potentially resulting in loss of biodiversity.

Invasive species are also a growing threat to southern Ontario's wetlands. Once established, they often outcompete native plants, and can cause irreversible ecological damage. Phragmites, a common European wetland reed, has been called Canada's worst invasive plant and is recognized by the MNRF as a significant threat to biodiversity in coastal marshes. It is now rapidly spreading across southern Ontario, and threatening species at risk that depend on healthy wetlands. The wetlands of Rondeau Provincial Park, which are recognized globally for their significant bird habitat, are in danger of permanently losing key ecological functions due to the exponential growth of phragmites.

Phragmites.

Photo Credit: Conrad Kuiper, (CC BY-NC-SA 2.0).

Northern Ontario wetlands: value and vulnerability

One-third of the province is covered in wetlands, the vast majority of which are located in northern Ontario (see Figure 6). In fact, the wetlands of Ontario's Far North are among the most extensive on earth. The region is dominated by peatlands and permafrost ecosystems, which are characterized by the accumulation of deep layers of saturated peat. These northern peatlands annually sequester an amount of carbon equal to about one-third of Ontario's total carbon emissions.[22] The Hudson Bay Lowlands Ecozone, which covers roughly 50% of the Far North, contains the second largest peatland complex in the world and represents a globally significant carbon sink.

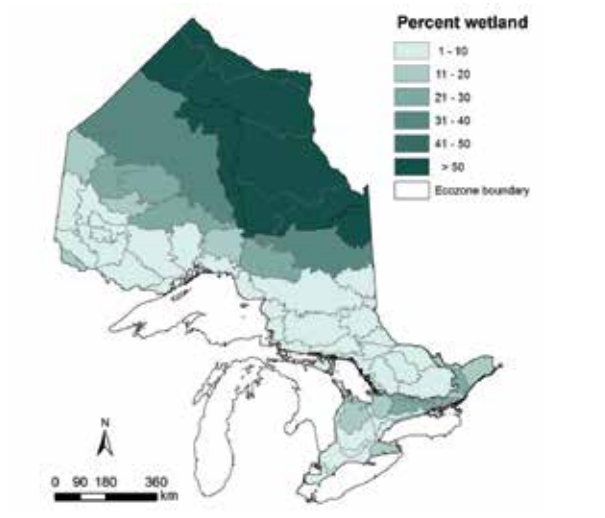

Figure 6. Distribution of wetlands across Ontario based on 2011 land cover.

Source: Ontario Biodiversity Council. 2015. State of Ontario's Biodiversity [web application].

Northern peatlands annually sequester an amount of carbon equal to about one-third of Ontario's total carbon emissions.

The wetlands and peatlands in the Far North are largely intact and relatively free from human disturbance. However, both direct and indirect threats are gradually altering northern ecosystems and the wildlife they support. Some of these threats, such as encroaching settlements and energy and transportation infrastructure, are similar to those in southern Ontario, while other, such as mining and forestry activities are relatively unique to this northern region of the province.

Peatlands, Hudson Bay Lowlands.

Photo credit: Gord McKenna, (CC BY-NC-ND 2.0).

In addition to the cumulative impacts of the various human disturbances, Ontario's northern peatlands are facing a potentially much greater threat: climate change. Peatlands depend on high water levels, low oxygen levels and low temperatures. Depending on local hydrology and geographic location, climate change may cause peatlands to thaw, shrink, or disappear entirely. These changes can, in turn, further exacerbate climate change – thawing permafrost can increase methane emissions from peat, while climate-induced drying can increase carbon dioxide emissions. Natural disturbances such as fires and insect outbreaks are also projected to increase, which can further impact carbon storage and result in cascading ecological effects. As northern peatland ecosystems, and the vast quantities of carbon they store, become increasingly vulnerable to climate change, Ontario will need to develop conservation plans to address the unique challenges this region faces. The province should work with First Nations communities to help protect northern wetlands and peatlands and the vital services they provide.

1.3 Ontario's wetland conservation strategy: a product of collaboration

Many people across Ontario are working hard to reverse the loss of wetlands. Federal, provincial and municipal governments and conservation authorities are contributing to wetland conservation and restoration efforts. Industries, non-governmental organizations, universities and local community groups are also making important contributions to wetland research and conservation.

Led by the Ministry of Natural Resources and Forestry (MNRF), the Ontario government released a Wetland Conservation Strategy 2017-2030 in July 2017. It's a much-needed step forward.

The strategy contains two very important targets:

- By 2025, halt the net loss of wetland area and function where wetland loss has been greatest; and
- By 2030, achieve a net gain of wetland area and function where wetland loss has been greatest.

Progress will be measured against a baseline year of 2010 and reports will be published every five years, beginning in 2020. The strategy sets out 67 promised actions, grouped into awareness, knowledge, partnership, and conservation. Three actions are prioritized to reverse the net loss of wetlands:

1. Improve Ontario's wetland inventory and mapping,
2. Create a no net loss policy for Ontario's wetlands, and
3. Improve the evaluation of significant wetlands.

The ECO is pleased that the province created a strategy to address wetland loss, a concern that Ontarians have been voicing for decades. The Wetland Conservation Strategy is the result of collaboration among farm organizations, forestry and aggregate industries, environmental organizations, conservation authorities, municipalities, as well as First Nations and Métis people. There is broad consensus that the province needs to take action to conserve wetland habitat, and that there are numerous opportunities for partnership across sectors to achieve wetland conservation goals.

The strategy calls for the MNRF to collaborate with other provincial ministries to develop an implementation plan for the various proposed actions. These ministries all have a shared responsibility to take action to improve wetland conservation.

Public comments on the Environmental Registry improve wetland targets

The public submitted 654 comments on the draft wetland strategy when it was open for consultation on the Environmental Registry. There was strong support for its overall direction, and many people expressed relief that the Ontario government was finally making a commitment to halt wetland loss.

However, commenters were very concerned with the original proposed targets, which were: (1) to identify and conserve Ontario's significant wetlands by 2025; and, (2) to halt the net loss of wetlands in Ontario in areas where wetland loss has been greatest by 2030.

Many comments from conservation authorities, environmental organizations, land use planners, and universities stated that the proposed targets were not aggressive enough, and that the proposed strategy tolerated the continued loss of wetlands for far too long. Many of these people also argued that the focus should be on achieving a net gain of wetlands, as opposed to just halting the net loss.

In response to these comments and other public consultation, the MNRF developed more aggressive timelines, bringing the no net loss goal forward by five years, and creating a new target for net gain by 2030. The final strategy also provides some interim timelines for meeting mapping and inventory goals. Many of the public's comments also raised concerns about the impacts of an offsetting policy, and the ministry clarified in the final strategy that the development of a wetland offsetting policy will be a distinct process with consultation opportunities and open discussion with Indigenous people, communities and organizations, and all relevant sectors.

The substantial revisions to the draft strategy highlight the critical role of the Environmental Registry and the power of public consultation. The MNRF clearly took the public feedback on this proposal into consideration and, ultimately, it resulted in a stronger strategy for wetland conservation.

Although the final Wetland Conservation Strategy substantially improved the timelines, there is still potential for ongoing loss of wetlands for the next seven years. Ontario is going to need to substantially improve wetland protections to meet the target of halting the continuing loss of wetlands in southern Ontario.

In addition, in order to achieve the second target of "net gain," wetlands will have to be restored or created. Wetland restoration efforts will need to be scaled-up considerably, and while there is expertise and motivation among NGOs and conservation authorities, more resources from the provincial government are needed to fund restoration programs.

The strategy is largely focused on achieving net gain through wetland offsetting – restoring or constructing new wetlands to compensate for the loss of wetland area and function. Details of a potential offsetting policy are not included in the Wetland Conservation Strategy, and although the MNRF has stated that this is only an "option" for halting net loss, the second target suggests that it might be a necessity. In short, it seems that the MNRF is already relying on an approach that is inherently risky, and may not be an effective approach to conservation (see section 1.4.3).

Marsh in Parry Sound.

Photo Credit: Suzanne Schroeter, (CC BY-SA 2.0).

1.4 Moving wetland conservation forward

The existing system for wetland protection is not working. The fact that we continue to lose wetlands across the province is evidence that the policies and practices behind wetland conservation are not adequate. Even though the rate of loss appears to have declined, it is still unacceptably high, given the small fraction of wetlands remaining in southern Ontario.

> The existing system for wetland protection is not working.

The ECO has identified five core steps that the province needs to take to reverse the net loss of wetlands:

1. overhaul the process for evaluating and identifying provincially significant wetlands (section 1.4.1),
2. strengthen baseline wetland protections in the Provincial Policy Statement (section 1.4.2),
3. provide conservation authorities with clear authority to regulate all activities that interfere with wetlands, including agricultural activities (section 1.4.3),
4. encourage landowner conservation through incentives (section 1.4.4), and
5. ensure that wetland offsetting is always secondary to protection efforts and develop strict criteria for offsetting projects (see section 1.4.5).

1.4.1 Clearing the first hurdle: identifying significant wetlands

The government's basic premise of wetland protection in southern Ontario is fundamentally flawed. In principle, every single wetland in southern Ontario is "significant" and should be protected, particularly given the extent of historical wetland loss.

> The key legal protection provided to wetlands applies only to wetlands that have been identified as "significant."

In reality, the key legal protection provided to wetlands – under the Planning Act and Provincial Policy Statement, 2014 (PPS) – applies only to wetlands that have been identified as "significant."[23] The PPS prohibits "development" and "site alteration" in provincially significant wetlands (PSWs) in southern and parts of central Ontario, as well as in significant coastal wetlands across the Great Lakes basin. It's under this legal framework that municipalities map out land use designations in their official plans, including identified PSWs, which then guide municipal decisions to approve (or deny) applications for development, such as a new subdivision. Similarly, some conservation authorities choose to rely heavily on the identification of a wetland's significance when carrying out their duties. Some municipalities and conservation authorities do go further and include protections for other wetlands, but generally, they are unlikely – and to some extent unable – to use their tools to protect a wetland unless it has been identified as a PSW.

In short, a wetland must first be evaluated and identified as significant before the land use planning system grants official provincial protections. However, the evaluation process for wetlands is very lengthy and, in the interim, unevaluated wetlands are left unprotected.

> Unevaluated wetlands are left unprotected.

Waiting for evaluations puts wetlands at risk

Currently, wetlands are evaluated based on the Ontario Wetlands Evaluation System (OWES), a ranking system that assesses the environmental, economic and social values of wetlands. The MNRF developed the OWES Southern Manual to evaluate the significance of wetlands within Ontario's "Mixedwood Plains Ecozone."[c] The MNRF is responsible for identifying wetlands, as well as reviewing and confirming completed evaluations, but the evaluations can be carried out by other trained individuals using the MNRF's manuals.

The OWES analyzes and scores over 50 variables, which are divided into four components – biological, social, hydrological and special features. Wetlands are deemed provincially significant if they score at least 600 points overall, or at least 200 points in either the biological or special features component. Therefore, a wetland that provides a critical function on a very local scale can still be provincially significant if, for example, it has high levels of biodiversity or provides breeding habitat for an endangered species. In this sense, the evaluation system can capture the significance of large wetlands and wetland complexes (groups of functionally-related wetlands), as well as the significance of small, isolated or even degraded wetlands.

Great blue heron.

Photo Credit: Jean Hilscher. Used with permission.

c. The Mixedwood Plains Ecozone includes the region of Ontario south of the Canadian Shield. It is bounded by Lake Ontario, Lake Erie and Lake Huron and extends along the St. Lawrence River shoreline to Quebec City.

Wetland boundaries are delineated through a combination of aerial photography, mapping analysis and field work. One key gap in the OWES is that wetlands less than 0.5 hectares are typically not mapped. In addition, while the OWES manual recognizes the importance of vernal pools, evaluators are only encouraged to collect information on vernal pools they encounter.[24]

One of the core issues for wetland protection is that OWES evaluations are labour intensive, time-consuming and often expensive, and the MNRF has been very slow to complete wetland evaluations with its available resources.[25] To date, only about half (51%) of wetland area in the Mixedwood Plains Ecozone has been evaluated. The total evaluated wetland area increased by a mere 0.2% in the past year. At the current rate, it would take roughly 260 years to evaluate the remaining wetlands just in southern Ontario, let alone to carry out the evaluations in central and northern Ontario, where there are far more wetlands and far fewer evaluations have been completed.

At the current rate, it would take roughly 260 years to evaluate the remaining wetlands just in southern Ontario.

Nevertheless, the Ontario government is committed to evaluating the remaining wetlands, nearly 5,000 km^2 of wetlands in the Mixedwood Plains Ecozone alone (see Figure 7). Adding to this challenge, wetlands that were evaluated many years ago may need to be re-evaluated due to changes in wetland boundaries and features (natural or otherwise), advances in mapping technology, or changes in perceived values.

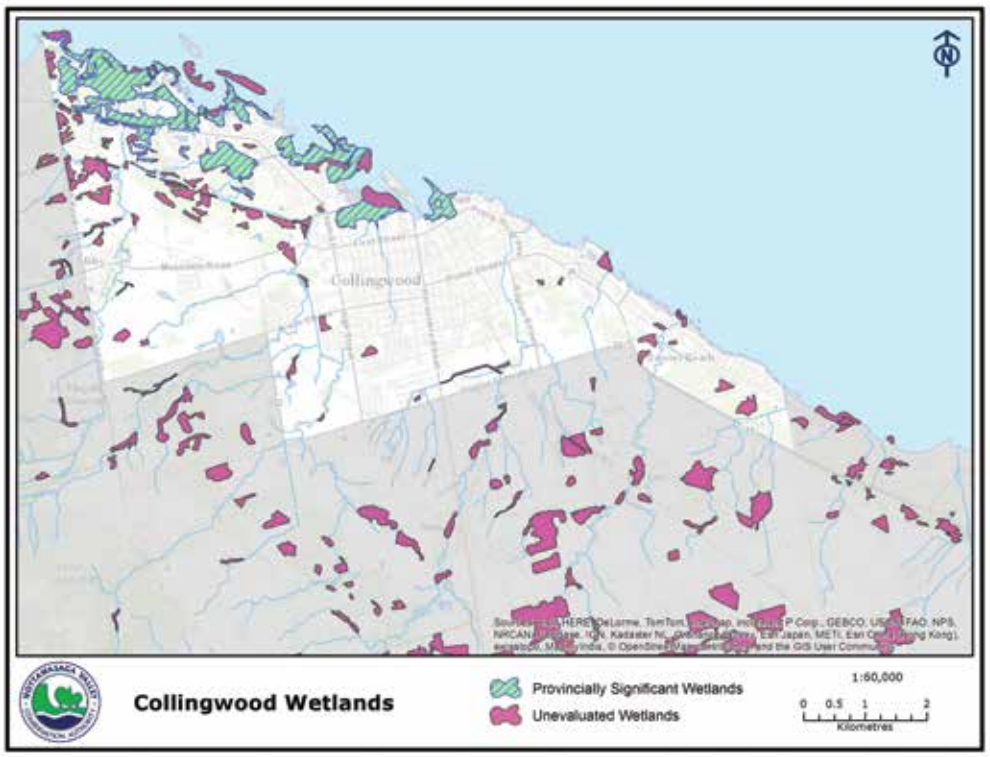

Figure 7. Map of unevaluated wetlands and provincially significant wetlands in and around Collingwood. This map provides an example of the vulnerability of unevaluated wetlands. Many of the unevaluated wetlands are near PSWs and are in areas that are currently zoned for development. The Town of Collingwood and the Nottawasaga Valley Conservation Authority have attempted to address the presence of these unevaluated wetlands, but until these wetlands are officially evaluated and designated in Collingwood's Official Plan, they will receive a lower level of protection.

Source: Nottawasaga Valley Conservation Authority, 2018.

The MNRF is currently conducting an initial evaluation of the OWES, and it is possible that improvements to the evaluation process could help reduce the cost and time required for some evaluations. However, unevaluated wetlands are being lost every year, and it is unlikely that changes would be substantial enough for evaluations to be completed within a reasonable timeframe, let alone before the first provincial target in 2025. Technological advances in remote sensing and aerial photography can speed up some aspects of the process, but eventually on-the-ground field work is needed for rigorous and accurate evaluations. There are also some things that technology cannot solve, such as waiting for landowner permission to evaluate privately owned wetlands. Wetland evaluators may have to wait weeks or even months before they even make contact with landowners, and landowners may decide for a variety of reasons to refuse access, particularly if they are concerned that a newly identified PSW might create restrictions on how they use their land.

Reverse the onus: identify wetlands as significant until proven otherwise

The current policy framework is premised on proving a natural feature is "significant" enough to be protected. Instead, given the enormity of wetland loss, continuing to this very day, the burden of proof should be shifted. Various stakeholders have suggested taking such a precautionary approach: treat all wetlands in southern Ontario as provincially significant until proven otherwise.

In this approach, the burden would be on the company or person who wants to interfere with a wetland; they would need to obtain an official evaluation and demonstrate that the particular wetland does not meet the criteria of being provincially significant. Not only would this reduce wetland loss, it would create more certainty for developers and other landowners by integrating wetland evaluations into the early stages of project approvals. Evaluations would still be conducted by individuals trained in the MNRF-approved wetland evaluation course, and would be based on the OWES guidelines.

Importantly, to avoid the risk of wet areas or muddy fields being incorrectly labelled as PSWs, the definition of wetlands should remain consistent with the OWES manual.[26] Under this definition, wetlands constructed and currently used for purposes other than wetland conservation (e.g., storm water management ponds or livestock watering ponds), as well as areas that no longer retain key wetland characteristics (e.g., fields that have been planted or tilled for agricultural use) are not considered wetlands and, therefore, would not be considered PSWs.

> 61% of wetland evaluations conducted have resulted in PSW status, which is equivalent to 90% of the total evaluated wetland area.

To date, 61% of wetland evaluations conducted have resulted in PSW status, which is equivalent to 90% of the total evaluated wetland area. It is possible that the proportion of PSWs might decline with time, as large wetlands and wetlands that are known to be valuable or sensitive are often a higher priority to evaluate. However, it is also true that we have fewer and fewer wetlands left, so their relative significance increases with time. A dramatic change from the status quo will be needed if Ontario is to halt the loss of wetlands, especially considering that the natural features in much of southern Ontario are still under serious pressure.

Given that the majority of evaluated wetlands are PSWs, and that there are relatively few wetlands remaining in southern Ontario, **the ECO recommends that the government formally identify all wetlands in southern Ontario as PSWs until proven otherwise.** Protecting wetlands pre-emptively is a first step the province can take to demonstrate its commitment to halting net loss of wetland area and function.

Luther Marsh Wildlife Management Area.

Photo Credit: Janet Baine, (CC BY-NC-ND 2.0).

1.4.2 Enhancing protections: addressing gaps in land use rules

Even if all wetlands in southern Ontario were instantly declared provincially significant (as recommended above), wetland loss would still not be halted. The PPS provides the overarching direction for municipal land use planning decisions in southern Ontario, and includes some baseline protections for natural features. However, the PPS's protections for wetlands are limited. Even PSWs, which are afforded the highest level of protection, are vulnerable to destruction due to *de facto* exemptions, caveats and discretionary wording. Therefore, a second important step to halt wetland loss is to increase the level of protection for wetlands provided in the PPS and Ontario's other land use planning laws and policies.

The Provincial Policy Statement provides limited wetland protection

The PPS prohibits "development" and "site alteration" in PSWs, but the definitions of these terms do not include other destructive land uses such as infrastructure projects and drainage works.[27] The PPS' natural heritage provisions also state that nothing in the policy is intended to "limit the ability of agricultural uses to continue," which essentially serves as a *de facto* exemption for ongoing agricultural operations, despite

the fact that it continues to be the single greatest cause of wetland loss across southern Ontario. The ambiguity of this exemption with regard to existing versus new agricultural uses is part of the problem. While some conservation authorities and land use planners interpret this provision to apply only to existing agricultural land, others can rely on the unclear wording to argue that draining or clearing a wetland to expand agricultural land is a necessary part of continuing agricultural use. More importantly, agricultural practices can change over time in such a way that destroys or degrades wetlands, even if a landowner is not actually expanding their fields.

> The PPS only directly addresses one of the major causes of wetland loss: development.

Similarly, while the PPS does not provide an explicit exemption for aggregate extraction, it prioritizes aggregates over other land uses by enabling aggregate sites to be located in or near PSWs. In these cases, the PPS merely suggests minimizing environmental impacts and requires site rehabilitation after the aggregate extraction is complete to "mitigate negative impacts to the extent possible."[28] This more lenient policy likely stems from the fact that aggregate operations are considered to be an "interim land use," even though rehabilitation requirements do not necessarily entail restoring the property to its former use. There is also no specific language regarding peat and topsoil extraction in the PPS.

In other words, the PPS only directly addresses one of the major causes of wetland loss: development (see Table 1 above), leaving a massive hole in this ostensible wetland protection. On top of this, the already-narrow definition of development does not account for infrastructure projects approved under the Environmental Assessment Act, which can also contribute to wetland destruction. In addition, development approvals that might be decades old are "grandfathered in," despite the fact that they no longer conform with current natural heritage policies and can have devastating environmental impacts.

Another glaring omission is that the key protections in the PPS only apply to PSWs and significant coastal wetlands. Wetlands that are either unevaluated, awaiting official designation, or fail to reach the standard of provincial significance (such as locally significant wetlands), are vulnerable to destruction. Although most conservation authorities do require permits for activities that might impact other wetlands, there is currently no consistent approach, and the PPS does not recognize any "middle ground" in terms of significance.[29] For example, a wetland that scores very low under the OWES would receive the same level of protection as a wetland that almost reaches the threshold for significance.

The PPS also allows development and site alteration on lands adjacent to PSWs as long as it has been demonstrated that there will be "no negative impacts" on the wetland's ecological functions.[30] This caveat allows activities to be approved on lands bordering PSWs, despite the fact that it is very difficult to prove that there will be no negative impacts, especially in the long-term. The province provides recommendations on how municipalities can determine what constitutes a reasonable distance for proposed adjacent activities,[31] but even if these guidelines were strictly followed, they would still not necessarily be sufficient for preventing pollution, shoreline erosion, or disruptions to local hydrology. For example, a subdivision that is built adjacent to a wetland may not cause immediate negative impacts, but eventually, the cumulative impacts from this expansion, such as road salting, fertilizer runoff, leaking fuels, wildlife predation from domestic cats and recreation overuse (e.g., from off road vehicles and mountain bikes), can severely degrade wetland functions.

A new housing development adjacent to a wetland.

Photo Credit: Andrew McLachlan, Ducks Unlimited Canada. Used with permission.

Coastal wetlands and PSWs in the Canadian Shield (central Ontario) are protected to some degree in the PPS, but again, development and site alteration are permitted in most of this region if "no negative impacts" are demonstrated.[32]

Should protecting a wetland from development be seen as a landmark decision?

Provincially significant wetlands are supposed to be protected from development. The reality is that battles are typically fought on a site-by-site basis, and wetlands often lose in planning decisions. But a rare success story for wetland protection shows the power of public participation in planning decisions.

Recently, a local citizen group and Curve Lake First Nation succeeded in stopping a development project along the shores of Stoney Lake, near Kawartha. The proposed 58-unit condominium project was to be constructed adjacent to two provincially significant wetlands, one of which is a large wetland complex. The development project would have destroyed habitat for numerous wildlife species, including species at risk like the Blanding's turtle, and had the potential to degrade the entire aquifer.

The opponents of the proposal provided evidence at an Ontario Municipal Board hearing. The Board rejected the developer's proposal, concluding that the proponent had failed to demonstrate that the development would have "no negative impacts" on the two PSWs.[33] The decision also recognized the importance of wetland complexes and the various ecological interactions at play.

The Fraser Wetland site is believed to contain over 450 different species, including the Blanding's turtle and the butternut tree.

Photo credit: Scott Wootton. Used with permission.

However, in a certain light, it is troubling that some people have called this case a "landmark decision" for the protection of wetlands. The Fraser wetlands were only protected because concerned citizens voluntarily put in the time, effort and resources to appeal a planning decision, and provided persuasive testimonies on the risks of the proposed development. The existing protection measures in place are clearly not adequate – even for provincially significant wetlands. Until wetland protections are strengthened in our land use planning system, the protection of many of them will continue to rely on passionate local citizens taking action at their own expense.

The PPS' overarching provision to protect natural heritage features also contains discretionary wording that further enables other land uses to be prioritized above wetland protection. The fact that the PPS only encourages the protection of long-term ecological function and biodiversity of natural heritage systems suggests that there is still a failure to understand that conserving natural heritage features is not sufficient if their functions are lost or degraded.[34] Moreover, the PPS does not contain requirements to consider cumulative impacts of repeatedly encroaching on land surrounding PSWs. These impacts are especially serious for species that rely on wetlands for at least part of their life cycle.

There is still a failure to understand that conserving natural heritage features is not sufficient if their functions are lost or degraded.

Raise the bar for wetland protection across all provincial land use planning tools

In addition to the PPS, Ontario has a patchwork of land use laws and policies across southern Ontario (see Figure 8), which provide varying levels of protection to wetlands depending on the geographic region. Several of these area-specific land use plans have stronger wetland protections than the PPS. For example, the Oak Ridge Moraine Conservation Plan contains clear prohibitions on new development and site alteration activities (with the exception of some infrastructure projects) that would negatively impact *any* wetland within the region (not just PSWs).[35] Several regional plans also provide stronger provisions to protect wetlands from new and expanding aggregate operations.

The Ministry of Municipal Affairs and Housing has recently released the Growth Plan for the Greater Golden Horseshoe, 2017. The updated growth plan mirrors the natural heritage policies discussed in that all wetlands in the Natural Heritage System are afforded some level of protection as opposed to just PSWs, but there are still several exceptions. Notably, new or expanded aggregate operations are allowed in non-significant wetlands if certain replacement or rehabilitation requirements are met, and the "full range of existing and new agricultural uses" are permitted within the entire Natural Heritage System.[36]

Clearly, none of these plans offer full protection for PSWs,[37] and since they only apply to specific areas, there are gaps and inconsistencies in wetland protection across southern Ontario.

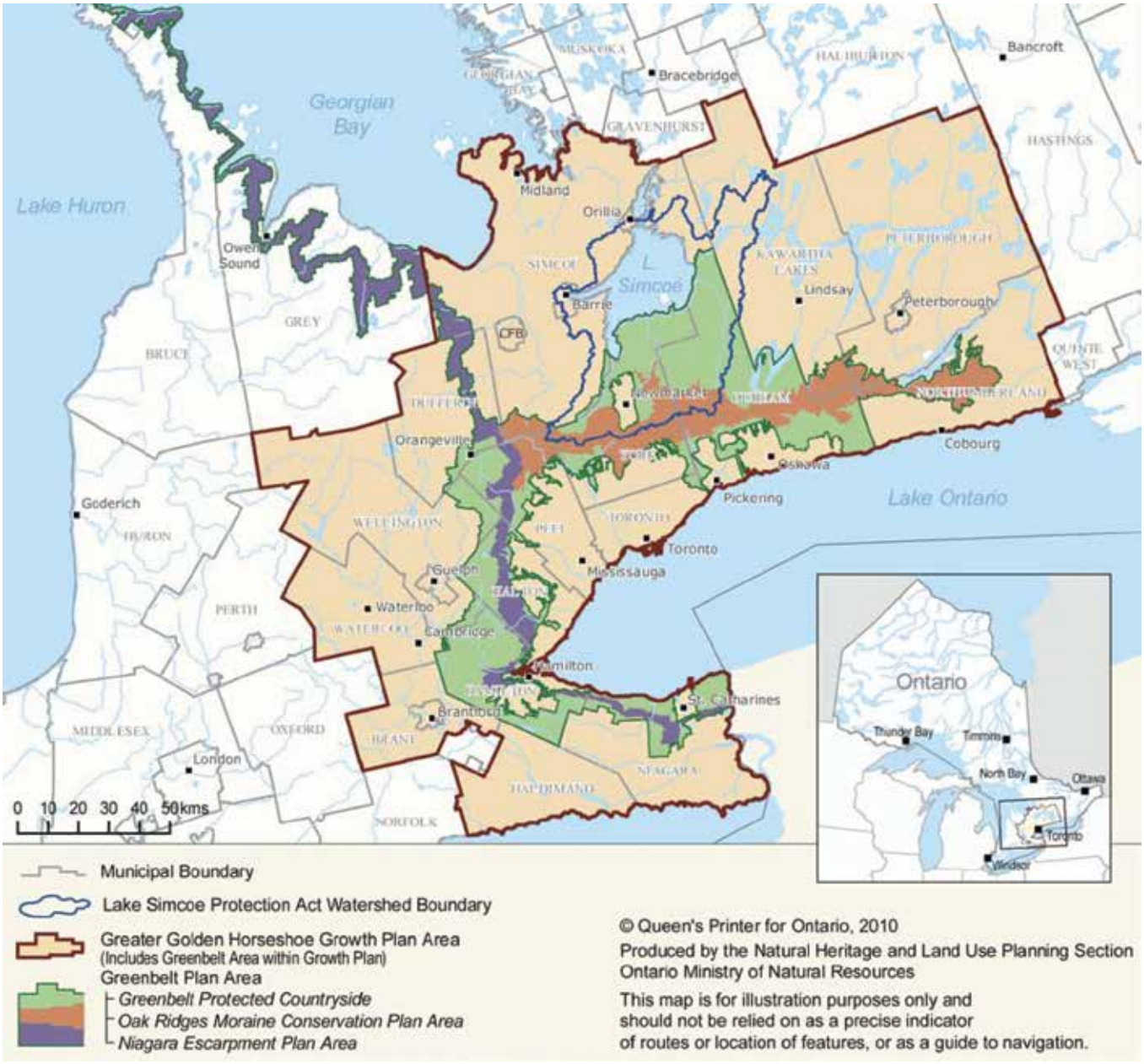

Figure 8. Area-specific land use plans in Southern Ontario. The Lake Simcoe Protection Plan, Greenbelt Plan, Oak Ridge Moraine Conservation Plan, Niagara Escarpment Plan and the Growth Plan for the Greater Golden Horseshoe each include additional protections for natural features, including wetlands, in the respective area. The Greater Golden Horseshoe Growth Plan is an overarching plan to manage growth throughout the region.

Source: MNRF, 2010.

To provide stronger and consistent protection for wetlands throughout all of southern Ontario, the ECO and others have urged government many times before to strengthen the PPS to prevent the loss of wetlands. The PPS's discretionary wording and narrow definitions of development and site alteration create exemptions for too many activities, leaving Ontario's most valuable wetlands vulnerable.

The ECO recommends that the Ministry of Municipal Affairs and Housing revise the Provincial Policy Statement to strengthen protection for southern Ontario's remaining wetlands. Specifically, the PPS should clarify that the provisions in the natural heritage policies regarding agriculture only apply to *existing* agricultural uses, and that any expansion of agricultural lands that interferes with provincially significant wetlands is prohibited. The province should also ensure that municipalities have a clear understanding of their role in enhancing wetland protection and provide them with guidance to effectively implement the PPS.

1.4.3 Strengthening conservation authorities' ability to protect wetlands

Ontario's 36 conservation authorities play an important role in protecting wetlands. The Conservation Authorities Act gives each conservation authority the power to create its own regulation, subject to approval by the MNRF, to prohibit or regulate activities that are capable of "changing or interfering in any way with a wetland."[38]

However, which specific activities each conservation authority regulates, and how they exercise their powers within their respective watersheds, varies considerably. Some conservation authorities do not impose any restrictions on certain activities that can impact wetlands. This might be in part because it is a complicated process to refuse an application, but also due to pressure to accommodate other interests, such as development. Similarly, some conservation authorities choose to only regulate PSWs designated in official plans, while others regulate unevaluated and locally significant wetlands too.

To protect wetlands in southern Ontario from continuing loss, the third – and potentially most important – measure is for the province to strengthen the ability of conservation authorities to regulate wetland threats. This includes empowering every conservation authority to regulate all threats to wetlands within their respective watersheds.

Vague language, resource constraints and conflicting priorities limit the power of conservation authorities

Many conservation authorities struggle due to a lack of provincial direction with regard to definitions, policies and technical guidance, which is compounded by inadequate provincial funding for programs and staff. These shortfalls predispose conservation authorities to narrow the scope of their activities and, thus, the extent to which they regulate impacts on wetlands. A key consequence is that conservation authorities vary greatly in how they regulate wetlands.

Many conservation authorities struggle due to a lack of provincial direction with regard to definitions, policies and technical guidance, which is compounded by inadequate provincial funding for programs and staff.

The fact that the Conservation Authorities Act contains language that is open to wide interpretation also discourages conservation authorities from enforcing wetland protections. For example, the absence of clear definitions in the Conservation Authorities Act for key terms – such as what constitutes "interfering" with a wetland – is one of the fundamental obstacles for wetland protection.[39]

Conservation authorities struggle to determine the extent to which they can or should regulate certain activities, partially because the lack of a clear definition

> Conservation authorities vary greatly in how they regulate wetlands.

makes it challenging to prove that a wetland has in fact been interfered with. Despite many conservation authorities requesting clarification from the government for years, there is still no definition or explicit list of activities that are known to "interfere" with wetlands. Even the definition of "wetland" can be an obstacle, due to a qualifier that wetlands be connected to surface watercourses.[40]

This lack of clear language and direction in the Conservation Authorities Act creates uncertainty for conservation authorities both in terms of:

- their ability to regulate *all threats* to wetlands, including from agriculture drainage and peat extraction, and
- their ability to regulate threats to *all wetlands*, including wetlands that have not yet been evaluated or formally designated in a municipal official plan as a PSW, as well as those wetlands that do not meet the criteria of a PSW.

How weak definitions can undermine protections: St. Luke's Marsh

St. Luke's Marsh is a PSW on Lake St. Clair that is currently completely vulnerable to agricultural drainage. It is directly adjacent to the St. Clair National Wildlife Area, an internationally significant wetland designated under the Ramsar Convention. According to the Lower Thames Valley Conservation Authority, the landowner has made it clear that St. Luke's Marsh could be converted to farmland at any time.

Across the road from St. Luke's Marsh lies the former Triangle Marsh, a 49 hectare PSW that was drained for agriculture in 2008 (see Figure 9). Unfortunately, the conservation authority and environmental organizations didn't realize what was going on until it was too late.

Now that St. Luke's Marsh is at risk, the Lower Thames Valley Conservation Authority has looked into how it might intervene. In this instance, its hands are tied because of the Conservation Authorities Act's definition of a wetland. St. Luke's Marsh is a coastal marsh that is controlled by pumps that move water between the lake and the wetland. Because it is not connected to a surface watercourse (i.e., rivers, streams and creeks), it does not meet the law's definition of a wetland, which limits the powers of the Conservation Authority to intervene. As of now, there is no plan in place to protect this PSW.

Figure 9. Aerial photographs of Triangle Marsh. The 2006 aerial image shows channels that were constructed for restoration work directed by the province in 1985 to address wetland loss in the Chatham Kent region. The marsh was drained for agricultural previously in the 1800s and was drained again in 2008.

Source: Lower Thames Valley Conservation Authority. Used with permission.

Although conservation authorities have the power to take violators to court, they are often reluctant to exercise this power to protect wetlands because of the potentially very high cost of defending their enforcement actions, and – due to the vague language of the law – uncertainty that the court will uphold their right to prosecute the case. For smaller conservation authorities, the choice to prosecute a landowner may even mean cuts to other conservation programs and activities. In some cases, prosecutions can also damage a conservation authority's relationships within the larger community, which can make it more challenging to effectively regulate activities within their jurisdiction.

On top of all of these constraints, conservation authorities often struggle to balance the conflicting priorities of conserving wetlands and securing funding from municipalities, who are often seeking to grow development.[41] The financial and political pressure to accommodate the interests of municipalities, developers or farmers can interfere with the ability of a conservation authority to carry out some of its responsibilities. For all of the above reasons, some conservation authorities have narrowly interpreted their responsibility to focus more on natural hazard prevention (i.e., flooding and erosion issues), choosing – willingly or otherwise – to give less attention to protecting wetlands.

Uncertainty about role in protecting wetlands from agriculture and other serious threats

One of the fundamental obstacles to wetland protection in southern Ontario is the province's continuing lack of action to address the primary threat of wetland destruction: drainage for agriculture. Unfortunately, the government has given no indication that this trend will change, and has proposed no specific measures in its Wetland Conservation Strategy to address this major threat. The Strategy contains only a short section on wetland threats in which agriculture, development, and resource extraction are all lumped together as "land conversion," which is identified as the primary cause of wetland loss. Seeing as the agricultural sector is essentially treated as exempt from the provisions under the PPS to protect natural heritage features, conservation authorities hold one of the very few potential tools to protect wetlands from agricultural drainage. However, the province will need to clarify and strengthen this tool to confront wetland loss in a meaningful way.

Conservation authorities can help fill gaps in wetland protection from agriculture drainage

The OMAFRA facilitates agricultural drainage by providing grants for municipal drainage works, and loans for individual tile drainage projects. The OMAFRA's only restriction is that it no longer provides grants for new municipal drainage systems that run directly through or from identified PSWs, unless it has been demonstrated that the project will not interfere with the wetland function in a negative way.[42] Beyond this, the OMAFRA imposes no restrictions for municipal or tile drainage projects that may impact a wetland.[43] In other words, outside of the conservation authorities' limited powers, municipalities and landowners are not restricted by any provincial law or policy to construct a drainage project for agricultural purposes that reduces wetland function or area, regardless of the wetland's significance.

While the Conservation Authorities Act is fairly clear that conservation authorities can regulate development (and that they may not regulate aggregate activities),[44] it is much less clear whether, and to what extent, conservation authorities can regulate drainage and other agricultural activities. As a result, some conservation authorities do not impose any restrictions on agricultural tile drainage, despite the threat it poses to wetlands.

Although the definition of development under the Conservation Authorities Act includes "the temporary

> Some conservation authorities do not impose any restrictions on agricultural tile drainage.

or permanent placing, dumping, or removal of any material," there is still some uncertainty around regulating peat and topsoil extraction, which is likely exacerbated by insufficient resources. Some conservation authorities, such as the Grand River Conservation Authority, have chosen to regulate peat extraction; however, they have been limited in their ability to actually enforce regulations. Conservation authorities have the ability to grant permits for extraction, but if the conditions are violated, they can only request that the work is stopped or take violators to court.

A precedent for regulating agricultural interference with wetlands

Despite the many obstacles, some conservation authorities are exercising their power to regulate agricultural activities that interfere with wetlands. The Lower Thames Conservation Authority recently convicted a landowner and a drainage contractor for clearing wetland areas to create additional agricultural land, and installing tiles drains adjacent to the wetland. When the landowner was denied a permit by the conservation authority, he illegally interfered with the wetland in an attempt to claim additional agricultural land. Although it would have been easy to turn a blind eye, the Lower Thames Conservation Authority recognized that this wetland destruction violated the Conservation Authorities Act, and that it had the power and responsibility to act. The landowner was fined $15,000 for three charges, and ordered to remove the tiles he installed and rehabilitate the wetland area he destroyed.

Uncertainty about role in protecting all wetlands, not just designated PSWs

The PPS only applies prohibitions and restrictions on development and site alteration in PSWs and coastal wetlands. Conservation authorities are required to act in a manner that is consistent with the PPS, in terms of how and what they regulate.[45] As a result, conservation authorities are sometimes hesitant to regulate wetlands that haven't yet been identified and designated as PSWs, as well as wetlands that don't meet the criteria to be a PSW. This is despite the fact that the Conservation Authorities Act itself provides no such qualifications around the term "wetland."

As noted above, it can take years before a wetland is evaluated. But even after a wetland has been evaluated, some conservation authorities still do not apply their protections until the wetland has been formally designated as a PSW in the local municipal official plan. Unfortunately, official plan designation often takes years, during which time wetlands can be lost through legal loopholes. For example, official plans are now on 10-year review cycles and it is possible for a wetland that has been evaluated and identified as a provincially significant wetland to take another decade to be designated in an official plan. In the interim, wetlands can be destroyed.

Municipal delays in designating PSWs in their official plans due to landowner disputes can leave wetlands unprotected for even longer. In some cases, farmers may attempt to smooth the way for development projects by removing wetland features on their properties to pre-empt a PSW designation. This risk becomes more plausible when agricultural land is already held by developers or speculators, and landowners can take the opportunity to drain and clear wetlands under the guise of "normal farm practices" (see pages 57-58 in the ECO's 2010/2011 Environmental Protection Report).

Designation delayed, protection denied

The case of the Goulborn Wetland Complex near Ottawa provides a cautionary tale. In 2006, the boundaries of this PSW were re-evaluated by the MNRF and expanded to include 20 additional wetland areas. However, the City of Ottawa has delayed designating several identified PSWs in its official plan for 12 years due to disputes with landowners over the validity of the ministry's re-evaluation of the wetlands.

The Rideau Valley Conservation Authority and concerned local residents agree that there is evidence of filling and newly installed drainage works within the Goulbourn Wetland Complex, indicating that wetlands are being destroyed while they await designation.

Despite evidence of wetland loss, the board of the conservation authority determined in 2009 that until the wetlands are officially designated it is unable to enforce the wetland protection provisions in its regulation.[46] Landowners are able to dispute the re-evaluated wetland boundaries until the end of 2018, at which time the City of Ottawa intends to amend its official plan (see Figure 10). This is the opposite of a precautionary approach. The result is wetlands are left vulnerable despite having been proven (time and again) to be significant.

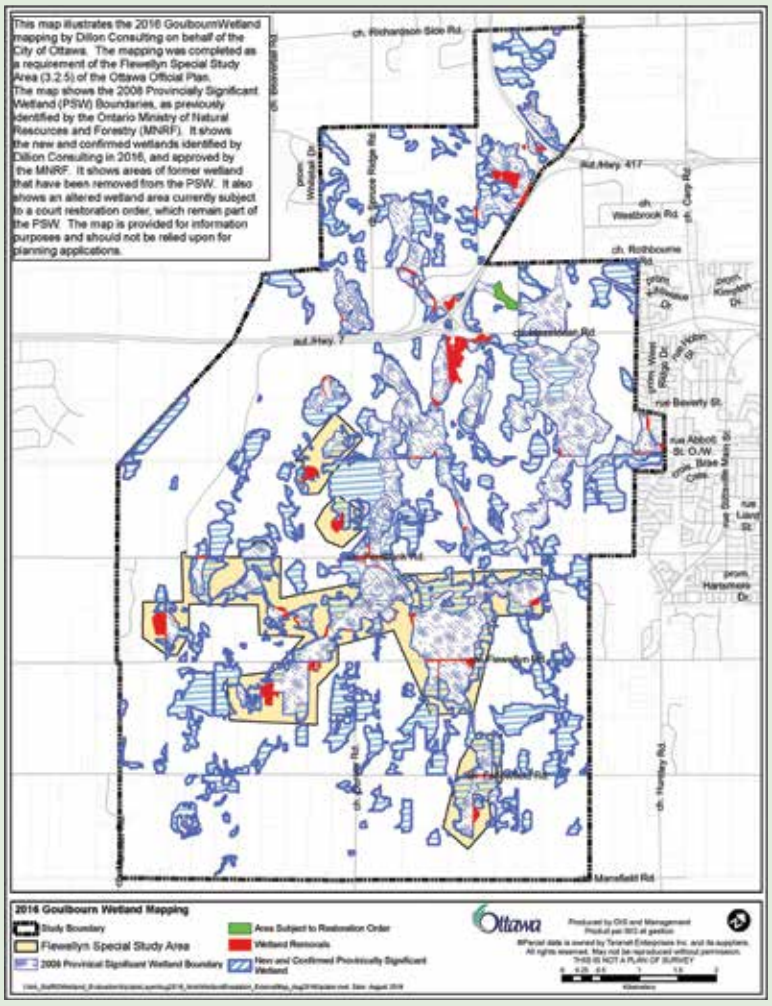

Figure 10. Map of revised boundaries of the Goulbourn Wetland Complex. The map shows the 2008 PSW boundaries as well as the areas where wetland boundaries expanded (blue horizontal lines). It also shows areas of wetland removals (red), due to residential development, quarries and agricultural drainage. Areas that were altered and are not subject to court restoration orders are shown in green.

Source: City of Ottawa, 2016. Used with permission.

Protect wetlands by creating stronger conservation authorities

Conservation authorities can and should be key players in the province's efforts to reverse net wetland loss. However, conservation authorities currently lack the necessary power and resources to allow them to effectively and consistently carry out this responsibility across southern Ontario.

In 2017, the government amended the Conservation Authorities Act to increase consistency and clarify the responsibilities of conservation authorities. Notably, the government transferred the authority to make regulations for each specific watershed from the individual conservation authority to the MNRF to help alleviate inconsistencies among conservation authorities.[47] The amendments also enable conservation authorities to issue stop work orders, as well as increased fines for offences.[48] Prior to this, conservation authorities could only send violators to court, a time-consuming process that left wetlands vulnerable throughout the negotiations.

However, these amendments may not actually come into force for several years, as they depend in part on the completion of a four-year work plan for the Conservation Authorities Act review.[49] The previous amendments to enable conservation authorities to protect wetlands took eight years to come into force.

Clear regulations under the Conservation Authorities Act for both agricultural and development activities are necessary for conservation authorities to protect wetlands in their jurisdictions. Avoiding unnecessary delays is critical if the province is to successfully reverse the net loss of wetlands by 2025. But even if these changes to the Conservation Authorities Act happen quickly, there is no guarantee that there will be further restrictions on activities that interfere with wetlands.

To enhance overall wetland protection, the province must take a stronger stance as to what activities should be expressly prohibited or regulated in wetlands. **The ECO recommends that the Ontario government give conservation authorities clear direction to regulate *all* activities that interfere with *all* wetlands, regardless of significance.** This could potentially be achieved by defining the term "interference" and/or explicitly listing all activities known to impact wetland function, including agricultural activities and peat extraction.

While recent amendments to the Conservation Authorities Act may eventually help to strengthen enforcement powers, ultimately conservation authorities need more funding from the province to carry out their responsibilities. This is especially true given that the province will need the support of conservation authorities to meet the new wetland conservation targets. **The ECO recommends that the Ontario government allocate sufficient funding to conservation authorities to effectively enforce regulations for all activities that interfere with wetlands.**

> Ultimately conservation authorities need more funding from the province to carry out their responsibilities.

Getting early input from conservation authorities

Giving conservation authorities the power and tools to regulate wetland threats is imperative, but it will not be nearly as effective if they are not involved in the early stages of land use planning. Currently, conservation authorities are often only engaged in the final hour of land use planning and the issuance of other approvals under the Environmental Assessment Act and the Drainage Act. If a development proposal interferes with wetland function, conservation authorities are in the positon of trying to minimize the damage to wetlands by issuing a permit with restrictive conditions. Conservation authorities might be challenging a project that is on the cusp of getting final approval (or has already been approved), and possibly already has millions of dollars and years of work invested in it.

To avoid this kind of a reactionary approach to wetland regulation, the ECO urges the province to require developers and planners work with conservation authorities in the early stages of planning decisions that impact wetlands. Requiring wetland impacts to be considered pre-emptively would reduce wetland loss and create a more efficient approval process for developers and other landowners.

A Blanding's turtle resting on a log in Frontenac Provincial Park.

Photo credit: Bob Hilscher. Used with permission.

1.4.4 Encouraging wetland stewardship on private land

As discussed in the sections above, government needs to take serious measures to stem the loss of wetlands. But wetland protection in southern Ontario requires more than just government action. Wetland conservation efforts will not succeed unless private landowners keep the wetlands on their properties.

Wetland conservation efforts will not succeed unless private landowners keep the wetlands on their properties.

The Conservation Land Tax Incentive Program (CLTIP) is a voluntary program that encourages stewardship by offering 100% property tax exemption on eligible portions of a property to landowners who protect identified natural heritage features.[50] Evaluated PSWs that are at least 0.2 hectares in size are eligible for this tax exemption. CLTIP has been operating since 1998, but landowner participation has hovered at around 40% of eligible properties. Unfortunately, the number of eligible properties has also declined since 2014.[51] Low enrollment is likely driven by several factors:

- lack of awareness or understanding of program details
- reluctance to file onerous paperwork that must be re-submitted annually
- size criteria are too strict
- concerns that enrollment may result in a loss of future income (e.g., lower resale value or restrictions on developing or cultivating the land in the future), and/or
- general mistrust of a government program that restricts activities on private land.

Perhaps the biggest reason for low enrollment is that the financial incentive is not strong enough for farmland owners. Agricultural lands already receive a 75% tax reduction relative to the residential rate, and the additional 25% is often seen as a marginal increase that simply isn't worth the hassle. For example, farmers may decide that it is more lucrative to drain wetland features to increase the land they have under production.

Simplify and re-frame the program to attract more landowners

To increase enrollment, the MNRF should simplify the administrative process for this program and widen the eligibility criteria. The MNRF should also develop new strategies to attract additional landowners and consider re-framing the program to help promote awareness and interest.

Going one step further, **the ECO recommends that the Ontario government make all wetlands on agricultural land eligible for a rebate through the Conservation Land Tax Incentive Program, regardless of size or significance.** This would mean that a wetland on a farmer's land would still be eligible even if it was evaluated as a non-PSW. Instead of offering a tax exemption, the province should provide a tax

rebate. A rebate will still reward participating landowners, but will do so without penalizing municipalities.[52]

Re-framing CLTIP to attract landowners and recognize and reward their participation would likely go a long way to ensuring wetlands are protected on private land. While this might mean creating more significant financial incentives, it could also be achieved by making the program's objectives more understandable. A first step could be changing the program's somewhat complicated name to something that actually sounds interesting and exciting. Giving landowners signs for their lawns would be a simple way to recognize them for what they're doing, and also to advertise to other local people that could participate. Both of these actions could remind people that they are contributing to environmental protection simply by letting natural features like wetlands to continue to *exist* on their property.

Wetlands help protect valuable assets by reducing damage from temperature extremes, flooding, and droughts, all of which are projected to increase in southern Ontario with climate change. They also provide direct services for farmers by creating essential pollinator habitat and improving water quality. Farmers who conserve and restore wetlands on their properties are not only reducing their own susceptibility to these environmental risks, they are helping to protect other landowners that are nearby or potentially even far downstream. Organizations such as Alternative Land Use Services (ALUS) work with farmers to restore wetlands and create sustainable drainage systems. Although ALUS provides the programs and resources for ecological stewardship, the organization is driven by farmers who recognize the benefits that wetlands and other natural features bring to their proprieties.

Recognizing the value of wetlands as a public good is both a necessary and challenging transition, and will require the participation of many sectors. The agricultural community must be meaningfully involved in the effort, particularly since farmers have been relatively unrestricted with regard to wetland interference, compared to other main drivers of wetland loss. The province also has a responsibility to address concerns farmers might have related to loss of future income and the reluctance to have restrictions imposed on their land. The province should engage in an ongoing and open discussion as to how the government can work with farmers to conserve or restore wetlands on their farm properties.

A provincially significant wetland situated between agricultural fields and a small woodland, near Caledon, Ontario. The majority of the PSW is privately owned and protected under CLTIP.

Photo credit: Larissa Sage. Used with permission.

1.4.5 Wetland offsetting: a last resort

Ontario's Wetland Conservation Strategy has proposed using a wetland offsetting policy to halt the net loss of wetlands, and eventually achieve net gain in areas where loss has been greatest.

Offsetting is a way to compensate for wetland losses in situations when the developers and regulators have concluded that a project should proceed (such as an important site-specific infrastructure project), but where the project cannot practically avoid destroying or degrading a wetland. Losses are offset by restoring or creating new wetlands, ideally in a way that replicates the characteristics of the wetland lost (i.e., type, location, size, biodiversity and function). An offsetting requirement can help to reflect the true social and environmental costs of development in natural heritage areas. However, it is not easy to put a "price" on any natural feature.

> It is extremely challenging to successfully re-create all of the functions of a natural wetland.

It is extremely challenging to successfully re-create all of the functions of a natural wetland, particularly when high levels of biodiversity and complex ecological functions are involved. For example, some wetland properties, like flood attenuation, may be easier to replicate, while other features, such as the habitat of a threatened frog species, may not be. This is partially because there is still a relatively poor understanding of how to replicate certain wetland functions, especially those of smaller wetlands. But even if functions were better understood, some features, such as a wetland's deep organic soils, can take thousands of years to accumulate. The reality is, in many circumstances, wetlands are simply not replaceable.

Wetland offsetting has been used in jurisdictions around the world, and six other Canadian provinces have developed policies or protocols to guide offsetting practices.[53] While some jurisdictions have succeeded with particular aspects of their offsetting policies, there is no example of a resounding success story to date.

Despite the risks associated with offsetting, the fact remains that there is a real urgency to reverse the trend of wetland loss in southern Ontario, particularly in light of wetland contributions to climate change adaptation. If done effectively, newly created and restored wetlands can help achieve the province's conservation goals. Furthermore, wetland offsetting may legitimately be the only realistic option in some situations. For example, a linear infrastructure project (such as a 400-series highway), may not be able to avoid all wetlands if it is to be affordable and safe.

Perhaps one of the strongest reasons to develop a wetland offsetting policy is that offsetting projects are already happening across the province. They are currently unregulated, and there is no consistent set of criteria that offset projects must satisfy.

Wetland restorations represent an ideal opportunity for potential offset projects. The photos above show an abandoned agricultural field (top) that was restored to a healthy wetland (bottom) by the Toronto and Region Conservation Authority by removing three agricultural tile drains.

Photo credit: Toronto and Region Conservation Authority. Used with permission.

The real challenge will be to ensure that, in practice, proponents and regulators do not quickly pass over the preceding steps and over-rely on the offsetting option.

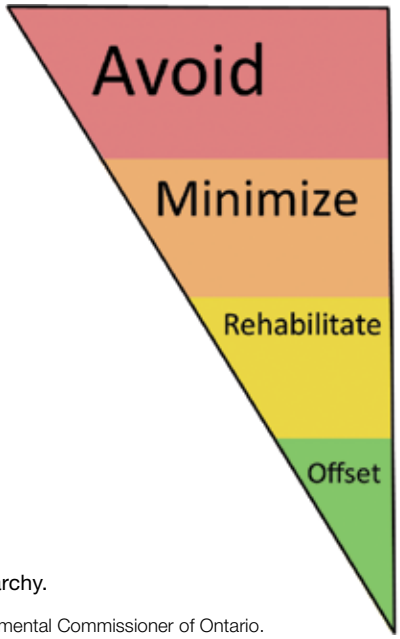

Figure 11. Mitigation hierarchy.

Source: Created by the Environmental Commissioner of Ontario.

Ensure the offsetting option is not abused

Developing an offsetting policy that requires offset projects to follow a mitigation hierarchy, as well as strict criteria with a transparent approval process, will help ensure that the various risks of offsetting are minimized. The government is considering the mitigation hierarchy as a way to ensure that offsetting will only be used as a last resort (see Figure 11). Before a potential offset is considered, project proponents should strive to: (1) avoid any negative impacts (e.g., locate project at a different site away from wetland); (2) minimize unavoidable impacts; and (3) rehabilitate wetlands that have been impacted when possible. The real challenge will be to ensure that, in practice, proponents and regulators do not quickly pass over the preceding steps and over-rely on the offsetting option.

Various versions of this hierarchy have been used in other jurisdictions, and experience has shown that it is difficult to demonstrate that avoidance and minimization measures are carefully considered before the offsetting option is accepted. This is partially due to a lack of agreement on what constitutes avoidance and minimization. Lessons from Alberta and the United States suggest that these steps are often skipped because developers aren't inclined to consider alternative locations once an application has been submitted, which is in part a consequence of narrowly defined project proposals.[54] **The ECO recommends that the offsetting policy clearly define the thresholds for avoidance and minimization of adverse impacts.** Applications for development and site alteration should document measures taken to meet the thresholds, and where efforts have been insufficient, regulators should deny applications.[55]

Recommended criteria for wetland offset projects

Ensuring that offsets are additional, permanent, and representative of original wetland function is highly complex, and the province must carefully consider the successes and shortcomings of offsetting policies in other jurisdictions in developing a wetland offsetting policy. **The ECO recommends that the province's wetland offsetting policy reaffirm that offsetting will be treated as a last resort and require eligible projects to adhere to strict standards based on a net gain of both wetland area and function.**

> Only wetlands that have been officially evaluated and are not significant or irreplaceable should be eligible for offsetting.

Eligibility for offsetting

The ECO suggests that, except in the rarest of exceptions (such as essential infrastructure that cannot be located elsewhere), only wetlands that have been officially evaluated and are not significant or irreplaceable should be eligible for offsetting. In other words, the following should be strictly off limits:

- unevaluated wetlands
- all provincially significant wetlands and coastal wetlands, and
- wetlands that are irreplaceable, such as bogs and fens

The government should also create clear limits on offsetting in areas of greatest historic loss. By 2002, over a quarter of southern Ontario counties had lost at least 85% of their original wetland cover.[56] Some environmental organizations have proposed that in areas (municipality or watershed) where wetland loss has exceeded 85%, remaining wetlands should be ineligible for offsetting. The criteria for offsetting should also recognize the vulnerability of wetlands that are relatively isolated. To ensure that Ontario's existing natural wetlands are protected, it has also been suggested that offsetting only be allowed for non-significant, highly degraded wetlands.

Offsets should attempt to replicate key aspects of the wetland lost

If a wetland is eligible for offsetting, the offset project should replicate the original wetland in terms of type, function and location. A marsh should not be offset by a swamp, and if that marsh happens to be habitat for an endangered salamander species it should not be offset by a marsh that fails to replicate these habitat conditions but instead provides habitat for waterfowl. Offset locations must also be as close as possible to the original wetland. In Alberta, offset projects are to be located, to the extent possible, within the same municipality, watershed, or region as the wetland lost, or if necessary, in any area with high historic loss in the province. This language is not nearly strong enough. Proponents should be required to demonstrate that they have carefully assessed location options and the proposed location of the new wetland will help compensate the people, wildlife and local ecosystem that will be affected by the loss.

Jefferson salamanders are an endangered species in Ontario.

Photo Credit: Andrew Hoffman, (CC BY-NC-ND 2.0).

Replacement Ratios

Replacement ratios are used to calculate the amount of wetland area that needs to be created or restored. Ratios can vary to reflect the value of the wetland lost, expected time lags or the uncertainty associated with an offset project. For example, a higher ratio should be required to re-create a wetland that provides important ecosystem services. Lower ratios might be acceptable for a wetland restoration project that has a higher probability of success, but all ratios should be sufficiently high to deter proponents from skipping straight to offsetting without careful consideration of avoidance and minimization steps of the mitigation hierarchy.

> A series of small wetlands cannot be replaced with one large wetland.

All offset projects should be required to reproduce the key wetland functions that are lost to the extent possible – ratios should be treated as an additional measure to increase overall wetland area. A series of small wetlands cannot be replaced with one large wetland, especially given that smaller wetlands are better at filtering pollutants and can provide unique habitat for species at risk. Similarly, some systems for offsetting ratios should be unacceptable, such as that of Alberta, which allows for 1 ha of an "A" value wetland (the highest level of significance) to be replaced with 8 ha of a "D" grade wetland (the lowest level of significance).[57] Not only does this system allow for the destruction of the most valuable wetlands (Alberta's equivalent to Ontario's PSWs), it perpetuates the misguided assumption that larger areas can be used to compensate for the loss of valuable and rare ecological functions. In addition to prohibiting offsetting for PSWs, the Ontario government should require higher replacement ratios for the province's eligible wetlands, in order to reflect their value as well as the time lags and inherent uncertainty of offsetting.

Timing and duration of offset project

Before a project is carried out, an offset project proposal should be approved and paid for. Timelines for completion should be reasonable, and the offset ratio should reflect the fact that there will invariably be time lags in establishing a successful project. Because not all offset projects will be successful and the province's goal to achieve net gain of both area and function, wetland offset projects should be designed to last in perpetuity. All offsetting projects should be subject to long term monitoring and maintenance to ensure they continue to meet project requirements over time.

The government's Wetland Conservation Strategy focuses heavily on offsetting as a means to halt the net loss of wetlands, rather than making clear commitments to enhance wetland protections.[58] This emphasis on offsetting suggests that the government's intention is to allow ongoing loss, provided that these losses can be compensated for.

Wetland offsetting is inherently risky both in terms of effectiveness and the dangers of creating an option that essentially justifies the destruction of an existing wetland. Concerns have been raised across sectors about the risk that an offsetting policy will undermine existing wetland protections, which are not adequate in the first place. Offsetting should be viewed as a small component of a much broader plan to protect our remaining wetlands, not as the solution to halt the net loss of wetlands.

> Offsetting should be viewed as a small component of a much broader plan to protect our remaining wetlands, not as the solution to halt the net loss of wetlands.

Wetland adjacent to a subdivision restored by the TRCA.

Phote Credit: Toronto and Region Conservation Authority, 2009.

1.5 Conclusion

The Ontario government's approach to wetland conservation must reflect the urgency of the situation. The scattered wetlands remaining in southern Ontario are still being destroyed, and cannot afford further delay of meaningful change to wetland protections. This is especially true in light of the number of threatened and endangered species that depend on these unique habitats and the increasingly important role wetlands are playing in buffering changes to our climate.

The baseline protections for wetlands in southern Ontario provided under the Provincial Policy Statement, 2014 are inadequate for stopping wetland loss, primarily because the definitions of development and site alteration exclude agricultural activities, infrastructure projects and other destructive activities. Although conservation authorities are expected to regulate activities that interfere with wetlands in any way, their regulatory capacity is limited by insufficient resources, unclear definitions and a lack of provincial direction. Strengthening the PPS and the Conservation Authorities Act will help to close the gaps in wetland protection and support the province's new wetland conservation targets. Increased protections need to occur in conjunction with a concerted effort to increase wetland restoration activity, so that our remaining wetlands are healthy and capable of supporting rich biodiversity and the numerous ecosystem services we depend on.

The government's Wetland Conservation Strategy sets targets to reverse wetland loss and identifies opportunities for improvement, but it does not commit to any concrete steps to achieve those targets. The ECO is also concerned that the province is already relying far too heavily on a wetland offsetting policy to reverse the net loss of wetlands. Although offsetting will likely be necessary to some extent, successfully replicating complex wetland functions is challenging, if not impossible, and it creates an alternative to wetland protection that can be easily abused.

Enhancing protections for the remaining wetlands in southern Ontario is the safest and most effective way of preventing the loss of area and function. **The ECO strongly recommends that the province reprioritize its approach to wetland conservation and ensure that protections are strengthened for the remaining wetlands in southern Ontario.** The goal should be to raise the bar for wetland protections by prohibiting degradation and destruction of PSWs and unevaluated wetlands, giving conservation authorities clear direction to protect and regulate all wetlands, and enforcing strict offsetting requirements when wetland loss or degradation does occur (see Figure 12).

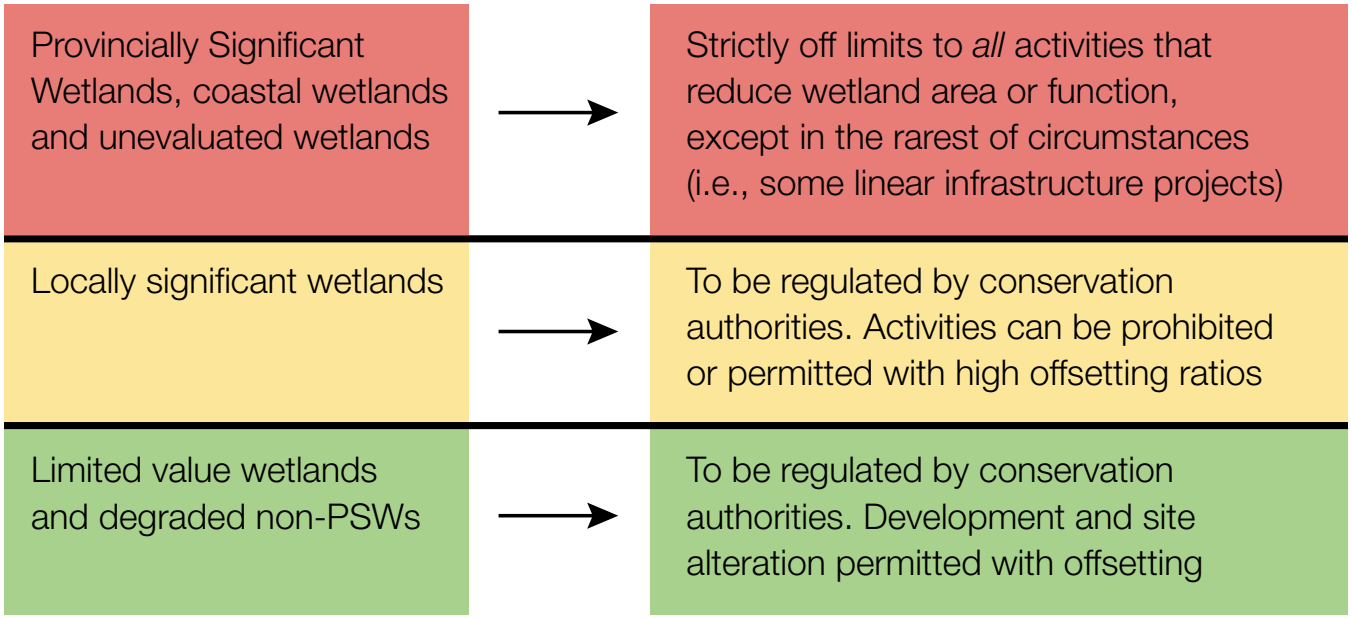

Figure 12. Proposed system to strengthen wetland protections and increase certainty for developers and landowners. Currently, PSWs receive some protections, but there is no "middle ground" for protections in Ontario's land use planning policy, leaving locally significant and unevaluated wetlands vulnerable to destruction.

Source: Created by the Environmental Commissioner of Ontario.

The ECO recommends that the government formally identify all wetlands in southern Ontario as PSWs until proven otherwise.

The ECO recommends that the Ministry of Municipal Affairs and Housing revise the Provincial Policy Statement to strengthen protection for southern Ontario's remaining wetlands.

The ECO recommends that the Ontario government give conservation authorities clear direction to regulate all activities that interfere with all wetlands, regardless of significance.

The ECO recommends that the Ontario government allocate sufficient funding to conservation authorities to effectively enforce regulations for all activities that interfere with wetlands.

The ECO recommends that the Ontario government make all wetlands on agricultural land eligible for a rebate through the Conservation Land Tax Incentive Program, regardless of size or significance.

The ECO recommends that the offsetting policy clearly define the thresholds for avoidance and minimization of adverse impacts.

The ECO recommends that the province's wetland offsetting policy reaffirm that offsetting will be treated as a last resort and require eligible projects to adhere to strict standards based on a net gain of both wetland area and function.

The ECO strongly recommends that the province reprioritize its approach to wetland conservation and ensure that protections are strengthened for the remaining wetlands in southern Ontario.

Provincially significant marsh along the Bruce Peninsula's Lake Heron shoreline.

Photo credit: Larissa Sage. Used with permission.

Endnotes

1. Nick C Davidson, "How much wetland has the world lost? Long-term and recent trends in global wetland area" (2014) 65 Mar Freshwater Res at 934.
2. Ontario Nature conducted a species-by-species review of habitat and threats using the Ontario Species at Risk List to determine the percentage of species at risk dependent on wetland habitat.
3. David Godschalk et al, Natural Hazard Mitigation: Recasting Disaster Policy and Planning (Washington, DC: Island Press, 1999).
4. Ontario Ministry of Natural Resources and Forestry, Estimation of Ecosystem Service Values for Southern Ontario by Austin Troy and Ken Bagstad (Pleasanton, CA: Spatial Informatics Group, 2013).
5. Intact Centre on Climate Adaptation, When the Big Storms Hit: The Role of Wetlands to Limit Urban and Rural Flood Damage, Prepared for the Ontario Ministry of Natural Resources and Forestry, by Natalia Moudrak, Anne-Marie Hutter and Blair Feltmate, (Waterloo, Ont: Intact Centre on Climate Adaptation, University of Waterloo, 2017).
6. Ducks Unlimited Canada, "Southern Ontario Wetland Conversion Analysis, Final Report" (March 2010), at 21, online: Ducks.ca www.ducks.ca/assets/2010/10/duc_ontariowca_optimized.pdf
7. Ontario Biodiversity Council, "Extent of Wetland Cover and Wetland Loss" (Peterborough, Ont: Ontario Biodiversity Council, 2015), online: State of Ontario's Biodiversity <sobr.ca/_biosite/wp-content/uploads/Indicator-Extent-of-Wetland-Cover-and-Wetland-Loss.pdf>.

   Note that the Ontario Biodiversity Council uses the dates "2000-2002 to 2011" whereas the MNRF data provided to the ECO is for 2000 -2010. This is because each version of SOLRIS is made up of multiple years of imagery to get the seamless cloud-free coverage of all of southern Ontario. SOLRIS Version 1.0 was made up of imagery captured from 1999-2002 (the "2000" date) and Version 2.0 is made up of imagery captured between 2009-2011 (the "2010" date).
8. The recent estimate for 2000 to 2010 wetland loss cannot be directly compared to Ducks Unlimited Canada's historical analysis due to differing methodologies and different wetland size classes that were assessed. The State of Ontario's Biodiversity Report (2015) discusses the differences between the two assessments in more detail.
9. Ducks Unlimited Canada, "Southern Ontario Wetland Conversion Analysis, Final Report" (March 2010), at 7, online: Ducks.ca www.ducks.ca/assets/2010/10/duc_ontariowca_optimized.pdf
10. Environment Canada, How much Habitat is Enough? 3rd ed, (Toronto: Environment Canada, 2013).
11. The historical analysis by Ducks Unlimited Canada excluded wetlands less than 10 ha. If smaller wetlands were included in the study, the percentage lost would be even higher. In more recent estimates, SOLRIS coverage includes wetlands as small as 0.5 ha within all of the ecodistricts in the Mixedwood Plains Ecozone with the exception of Manitoulin Island. Cumulatively, these small losses could be substantial.
12. Frederick Y Cheng & Nandita B Basu, "Biogeochemical hotspots: Role of small water bodies in landscape nutrient processing" (2017) 53:6 Water Resour Res 5038.
13. Ministry of Natural Resources and Forestry, information provided to the ECO (March 5 2018, May 8 2018).
14. Ducks Unlimited Canada, "Southern Ontario Wetland Conversion Analysis, Final Report" (March 2010), at 16, online: Ducks.ca www.ducks.ca/assets/2010/10/duc_ontariowca_optimized.pdf.
15. In 1967 Essex, Kent, Elgin, Lambton, Middlesex and Oxford counties had 47, 372 ha of wetland cover combined, and by 2002, there were only 23,388 ha (ibid at 7-8).
16. David L A Gordon, Still Suburban? Growth in Canadian Suburbs, 2006-2016 (Working Paper #2), (Council for Canadian Urbanism and Queen's University: August 2018) at 2.
17. Toronto and Region Conservation Authority (TRCA), "Toronto and Region Watersheds Report Card 2018", online: <reportcard.trca.ca>.
18. While there is no explicit policy, the Natural Heritage Reference Manual recommends that where there is a planning application, the activities associated with extraction of peat constitute site alteration, and as such are not permitted in significant wetlands. Where no planning application is made, planning authorities can use the powers under the Municipal Act to pass a site alteration by-law to prohibit the removal of topsoil or peat.
19. Ontario Ministry of Municipal Affairs and Housing, Provincial Policy Statement, 2014, (Toronto: MMAH, 2014) Policy 2.5.2.1.
20. Jeff E Houlahan and C Scott Findlay, "The effects of adjacent land use on wetland amphibian species richness and community composition" (2002) 60 Can J Fish Aquat Sci 1078; Natalie Gottschall et al, "The role of plants in the removal of nutrients at a constructed wetland treating agricultural (dairy) wastewater, Ontario, Canada" (2007) 29 Ecol Eng 154.
21. Christine A Bishop et al, "Anuran Development, Density and Diversity in Relation to Agricultural Activity in the Holland River Watershed, Ontario, Canada (1990–1992)" (1999) 57 Environ Monit Assess 21.
22. Science for a Changing Far North: The Report of the Far North Science Advisory Panel (Final Report), a report submitted to the Ontario Ministry of Natural Resources. (Toronto: Queen's Printer for Ontario, 2010); Ontario Ministry of Natural Resources and Forestry, "Measuring Carbon Exchange in the Hudson Bay Lowlands" (Presentation to the ECO, March 8, 2017).
23. In the Provincial Policy Statement, 2014, the term "significant," (with regard to wetlands) is defined as: "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."
24. Whether or not a vernal pool is mapped depends on the extent of vegetation cover and if it is surrounded by wetland vegetation. However, even if conditions are right for an evaluator to map a vernal pool, they are not required to collect information on its characteristics (e.g., species utilizing the pool).
25. From 2016 to 2017, the MNRF completed seven wetland evaluations in the Mixedwood Plains ecozone, which corresponds to 0.1% of the remaining unevaluated wetland hectares. From 2017 to 2018, only five evaluations were completed.
26. The Ontario Wetland Evaluation System (southern manual) states that "if an area no longer meets the definition of a wetland, in terms of water, soil/substrate, and vegetation characteristics, then it should not be considered to be a wetland. Conversely, land which is under agricultural use, but has retained the characteristics and function of a wetland, is still considered to be one."
27. The Provincial Policy Statement does not restrict development for infrastructure projects approved under the Environmental Assessment Act or drainage projects approved under the Drainage Act or the Tile Drainage Act. The definition of "development" in the Provincial Policy Statement, 2014 also does not apply to "underground or surface mining of minerals or advanced exploration on mining lands in significant areas of mineral potential in Ecoregion 5E, where advanced exploration has the same meaning as under the Mining Act."

28. Ontario Ministry of Municipal Affairs and Housing, Provincial Policy Statement, 2014, (Toronto: MMAH, 2014) Policy 2.5.2.2, 2.5.3.1.

29. The new Wetland Conservation Strategy does note that the conservation of all wetlands and their functions is important, including "locally and regionally important wetlands," but does not provide any details as to how this might occur.

30. Ontario Ministry of Municipal Affairs and Housing, Provincial Policy Statement, 2014, (Toronto: MMAH, 2014) Policy 2.1.8.

31. Ontario Ministry of Natural Resources, Natural Heritage Reference Manual, for Natural Heritage Policies of the Provincial Policy Statement, 2005, 2nd ed (Toronto: Queen's Printer for Ontario, 2010) at 62.

32. The Provincial Policy Statement affords the same level of protection to PSWs in ecodistrict 5E (which is on the shield) as those in ecodistricts 6e and 7e (the south), but PSWs north of 5E and coastal wetlands are afforded a lower level of protection if no negative impacts have been demonstrated.

33. Burleigh Bay Corporation v North Kawartha (Township), 2017 CanLII 66321 (ON LPAT) at 138.

34. Ontario Ministry of Municipal Affairs and Housing, Provincial Policy Statement, 2014, (Toronto: MMAH, 2014) Policy 2.1.2.

35. Oak Ridges Moraine Conservation Plan, O Reg 140/02, s 22.

36. Ontario Ministry of Municipal Affairs and Housing, Growth Plan for the Greater Golden Horseshoe, 2017, (Toronto: Queen's printer for Ontario, 2008 – 2018) policies 4.2.8, 4.2.3.1 (d) and 4.2.2.3 (b).

    The Growth Plan does contain restrictions on expansions or alterations to existing agricultural building and structures in the Natural Heritage System. Expansions and alterations within key features (i.e. wetlands) are to be limited if there are no alternatives, and must have a minimum of 30 metre "vegetation protection zone" from key features. It must be demonstrated that impacts on the feature and its functions are minimized and mitigated to the extent possible.

37. Ducks Unlimited Canada, Earthroots, Ecojustice and Ontario Nature, "Protecting Greenbelt Wetlands: How Effective is Policy?" (2012), online: <www.greenbelt.ca/protecting_greenbelt_wetlands_how_effective_is_policy>.

38. Conservation Authorities Act, RSO 1990 c C-27, s 28(1)(b).

39. In addition to not defining "interference," the Conservation Authorities Act gives conservation authorities the power to prohibit or regulate activities that might affect the "conservation of land," but does not define or explain this term.

40. The Conservation Authorities Act states that "wetland" means land that "directly contributes to the hydrological function of a watershed through connection with a surface watercourse." This definition of wetland differs from that of Provincial Policy Statement, which creates unnecessary complications in implementing both policies. Specifically, this qualifier limits the ability of conservation authorities to regulate wetlands that are isolated, fed by pumps or are adjacent to lakes.

41. There is also pressure to accommodate municipal interests because conservation authorities typically have elected or appointed municipal officials on their boards, and municipalities are their primary source of funding. The typical breakdown of funding sources for conservation authorities is as follows: municipal levies (54%), self-generated revenue (34%), provincial grants & Special Projects (9%), and federal grants or contracts (3%). See: Conservation Ontario, "Conservation Authorities", (Conservation Ontario, 2018), online: <conservationontario.ca/conservation-authorities/about-conservation-authorities/>

42. Ontario Ministry of Agriculture, Food and Rural Affairs, Agricultural Drainage Infrastructure Program: Administrative Policies, (Toronto: Queen's Printer for Ontario, 2016) at Policy 2.3(d).

43. Neither the Drainage Act nor the Tile Drainage Installation Act contain specific prohibitions for wetland interference. In fact, wetlands are not even mentioned in either act.

44. Conservation Authorities Act, RSO 1990 c C-27, s 28(11).

45. Gilmor v. Nottawasaga Valley Conservation Authority, 2018 CanLII 3410 (SCC) at para 51.

46. As of Jan. 25 2018, the Rideau Valley Conservation Authority no longer considers these wetlands exempt from the conservation authority's regulation pertaining to wetland interference (O Reg 174/06).

47. Conservation Authorities Act, RSO 1990 c C-27, s 40(3)(e). Note this section is not yet in effect.

48. Conservation Authorities Act, RSO 1990 c C-27, s 30.4 (1) and 30.5(2). Note these sections are not yet in effect.

49. Ontario Ministry of Natural Resources and Forestry, Conserving Our Future: A Modernized Conservation Authorities Act, (Toronto: Queen's Press for Ontario, 2017).

50. Ontario Ministry of Natural Resources and Forestry, Conservation Land Tax Incentive Program, (Toronto: Queen's Printer for Ontario, 2012-2018), online: <www.ontario.ca/page/conservation-land-tax-incentive-program>.

51. Ontario Biodiversity Council, "Participation in Provincial Tax Incentive Programs" (Peterborough, Ont: Ontario Biodiversity Council, 2015), online: <sobr.ca/indicator/participation-provincial-tax-incentive-programs/>.

52. The ECO recommends the CLTIP program offer a tax rebate, rather than a tax exemption. This will enable the province to reward and incent landowners but avoid penalizing municipalities by reducing their property tax revenue. Since the realignment of service responsibility between municipalities and the Province in 1998, municipalities have born the burden of the Farm Land Tax Incentive Program, the Managed Forest Tax Incentive Program and the CLTIP, meaning the more properties enrolled in these programs, the less tax revenue the municipality collects.

53. Ontario Nature, Navigating the Swamp: Lessons on Wetland Offsetting for Ontario, by David W Poulton and Anne Bell (Toronto: Ontario Nature, 2017).

54. Shari Clare et al, "Where is the avoidance in the Implementation of Wetland Law and Policy?" (2011) 19 Wetlands Ecol Manage 165 at 168.

55. For further discussion, see: Ontario Nature, Navigating the Swamp: Lessons on Wetland Offsetting for Ontario, by David W Poulton and Anne Bell (Toronto: Ontario Nature, 2017) at 44.

56. Ducks Unlimited Canada, "Southern Ontario Wetland Conversion Analysis, Final Report" (March 2010), at 12-13, online: Ducks.ca <www.ducks.ca/assets/2010/10/duc_ontariowca_optimized.pdf> ; Eleven of forty counties in southern Ontario had lost at least 85% of original wetland area by 2002. Please see the report for details on the assessed study area as some counties were only partially covered in the analysis.

57. Government of Alberta, Alberta Wetland Mitigation Directive, (Edmonton: Water Policy Branch, Alberta Environment and Parks, 2017) at 8.

58. The Wetland Conservation Strategy has promised that any wetland offsetting policy will "not reduce protection for those wetlands already protected by existing law and policy."