

A Wetland Conservation Strategy for Ontario 2017–2030



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Message from the Minister

Whether you're an angler or birder who loves marshes and swamps, or a person who would never step foot in a bog, wetlands matter to you. They're vital to the health of our province, giving us clean and abundant water, protecting us from flooding, and reducing the effects of climate change.

However, wetlands are sensitive ecosystems – and they're under pressure from land conversion, invasive species, pollution and climate change. Without action, our wetlands will be severely impacted, with many likely to disappear in the face of these significant threats.

The conservation of wetlands and the biodiversity they support are an important part of the Ministry of Natural Resources and Forestry's mandate. That's why Ontario is adopting this new strategy with ambitious conservation targets to help stop the loss of wetlands and restore wetlands in areas where significant losses have occurred.

This Strategy builds on our government's strong commitment to wetland conservation and our existing efforts, actions and programs. It sets out the steps government will take to support wetland conservation.

This document has been shaped by many voices, and I want to thank all who contributed their valuable perspectives. Our ongoing collaboration and our important partnerships will be central to the Strategy's success.

I encourage you to read the Strategy and consider how we can all work together to conserve, protect, and restore our precious wetlands and Ontario's rich biodiversity.

Hon. Kathryn McGarry

Minister of Natural Resources and Forestry





Executive Summary

Wetlands are among the most productive and diverse habitats on Earth and form an important part of Ontario's landscape. From the swamps and marshes in the southern part of the province to the vast peatlands in the north, wetlands play a vital role in supporting Ontario's rich biodiversity and providing essential ecosystem services on which Ontarians depend for health and well-being.

Building on over 30 years of positive achievements in conserving Ontario's wetlands, A Wetland Conservation Strategy for Ontario is a framework to guide the future of wetland conservation across the province. The intent of the Strategy is to establish a common focus to protect wetlands, so that Ontario can achieve greater success in a more efficient and effective manner.

The Strategy itself includes two sections. The first section covers what wetlands are, the state of wetlands in Ontario, and the variety of legislation, regulations, policies, guidelines, programs and partnerships that support wetland conservation across the province. The second section describes the new Wetland Conservation Strategy, including a clear vision, goals and desired outcomes, and a series of actions the Ontario government will undertake.

This Strategy is supported by objectives that are aligned with four strategic directions that reflect critical components required to conserve Ontario's wetlands. These include **awareness, knowledge, partnership** and **conservation**.

A comprehensive suite of actions that the Ontario government is taking, or will take, is a critical part of the Strategy. These actions include improving Ontario's wetland inventory and mapping as a cornerstone of our strategy. Other key actions include developing policies and tools to prevent the net loss of Ontario's wetlands, and improving evaluation of the significance of Ontario's wetlands.

Finally, the success of the Strategy will be measured through two overarching targets concerning wetland area and functions. These targets will use 2010 as a baseline:

1. By 2025, the net loss of wetland area and function is halted where wetland loss has been the greatest.
2. By 2030, a net gain in wetland area and function is achieved where wetland loss has been the greatest.

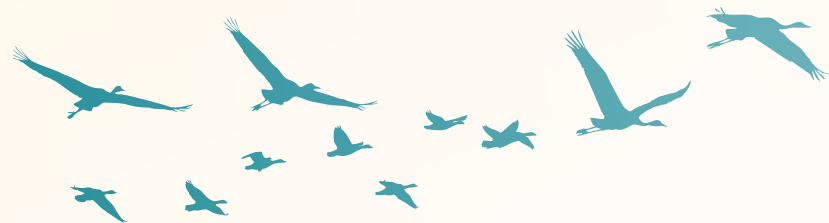
The Ontario government commits to developing performance measures and reporting to the public on progress in implementing the actions as well as progress towards achieving the targets. Progress will be monitored and assessed on a five-year time frame beginning in 2020 to encourage completion of action that will ultimately lead to halting loss and restoring wetlands across the province.

Our Vision

Ontario's wetlands and their functions are valued, conserved and restored to sustain biodiversity and to provide ecosystem services for present and future generations.

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Introduction

Forming the connection between land and water, wetlands are among the most productive and diverse habitats on Earth. Ontario's wetlands are biodiversity hotspots, serving as an important habitat to an array of plants, birds, insects, amphibians, fish and other animals, including many species at risk. Wetlands also provide Ontarians with a variety of valuable ecosystem services that create economic benefits and contribute to a high quality of life for people in this province. These include providing clean and abundant water, flood and erosion mitigation, climate moderation, recreational opportunities and other important social, cultural and spiritual benefits.

Building on over 30 years of progressive wetland policy and partnerships, A Wetland Conservation Strategy for Ontario provides a coordinating framework to guide wetland conservation across the province. The intent is to provide both the government and people of Ontario with a common focus to conserve wetlands and a path forward so that we can achieve greater success in a more efficient and effective manner. The Strategy will serve as a launching point for new, innovative conservation commitments and actions that can protect Ontario's wetlands.

This Strategy includes strategic directions, goals and desired outcomes, and actions the government will undertake by 2030 to improve wetlands in Ontario. This includes increasing knowledge and understanding of wetland ecosystems and raising awareness about the importance of wetlands. It also includes building strong and effective wetland policies, encouraging cooperation at all levels of government and supporting strategic partnerships in a shared responsibility for conserving wetlands. Taken together, these actions will help Ontario first stop the loss of wetlands and then restore wetlands where they have been lost.

HOW WE GOT HERE

In 2014, the Ministry of Natural Resources and Forestry (MNRF) was given a mandate to work with other ministries, municipalities and partners in the review of Ontario's broad wetland conservation framework and the identification of opportunities to strengthen policies and stop the net loss of wetlands. This mandate was renewed in 2016, when MNRF was asked to create a strategy for Ontario's wetlands by 2017, with the goal of stopping the net loss of wetlands. To achieve this mandate, the MNRF has developed A Wetland Conservation Strategy for Ontario that will help to improve wetland conservation and achieve a net gain in wetland area and function where wetland loss has been the greatest.

The development of this Strategy mirrors the preparation of similar policy documents across Ontario, Canada and the world, where there has been a realization that investing in wetland conservation is essential to ensuring quality of life for people and resilient habitats for wildlife – now and in the future.

Through a series of engagement opportunities, people across Ontario expressed their concern about wetland loss in the province and loss of the important ecosystem services they provide. Ontarians also discussed the different issues and opportunities for wetland conservation in the different parts of the province, highlighting that there is no one-size-fits-all solution to wetland conservation. Finally, Ontarians expressed strong support for the development of this Strategy as well as the strategic directions identified.



ONTARIO'S WETLANDS

Ontario is fortunate to be home to more than 350,000 square kilometres of wetlands. In fact, Ontario currently accounts for about 25 per cent of all the wetlands in Canada and 6 per cent of all the wetlands in the world. This places Ontario in a unique position and creates a responsibility to protect these wetlands for current and future generations.

Wetlands are lands that are seasonally or permanently covered by shallow water as well as lands where the water table is close to or at the surface. In either case, the presence of abundant water has caused the formation of hydric (waterlogged) soils and has favoured the dominance of either hydrophytic (water-loving) or water-tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens. They are often transitional habitats, forming a connection between aquatic and terrestrial ecosystems.

Wetlands can range in size from very small, only a few square metres, to exceptionally large, covering hundreds of square kilometres. Wetlands may be isolated, occur along the edges of lakes and rivers, or exist in conjunction with other natural areas such as woodlands, shrublands and native grasslands. In some cases, closely spaced wetlands related in a functional way can also form what is known as a wetland complex.

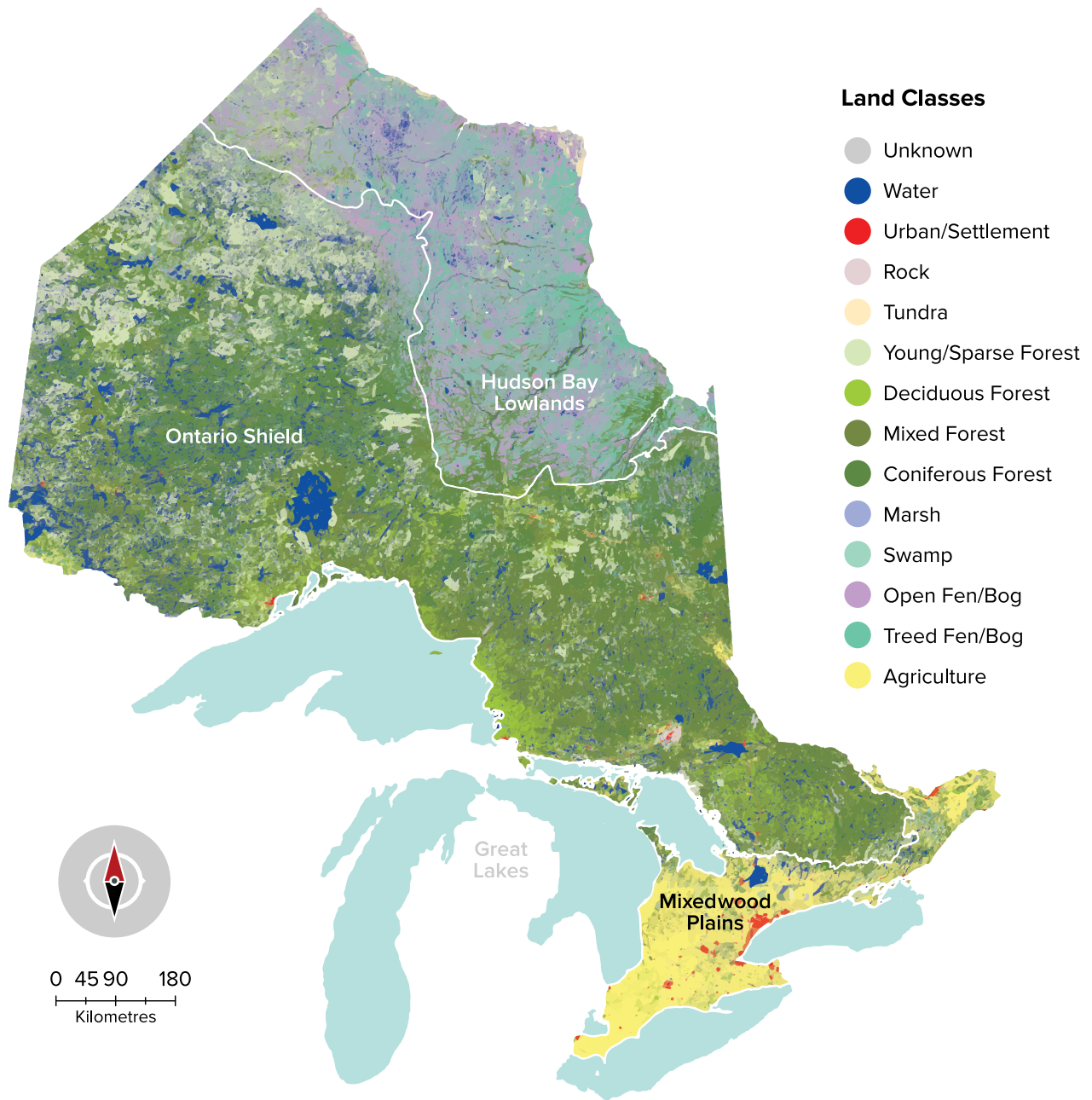


Photo: Peatlands in the Hudson Bay Lowlands, Peter Uhlig

Climate, geology and ecosystems differ throughout the province, as do the number, size, type and distribution of wetlands (Figure 1). In Ontario, the majority of wetlands are found in northern Ontario, with the Hudson Bay Lowlands Ecozone accounting for 20,000,000 hectares or about 57 per cent of Ontario's wetlands (Ontario Biodiversity Council 2015). An estimated 10,000 square kilometers or 1,000,000 hectares of wetlands exist in southern Ontario, with an average size of 25 hectares

Ontario currently accounts for about 25 per cent of all the wetlands in Canada and 6 per cent of all the wetlands in the world..

FIGURE 1: Ontario's ecozones and associated land cover. To make a custom map of wetlands in your area visit <https://www.ontario.ca/page/make-natural-heritage-area-map>.



The Four Main Types of Wetlands

Swamps are the most common and diverse type of wetland found in southern Ontario. Largely dominated by trees and shrubs, some swamps take many years to develop. Swamps are found throughout a variety of ecological settings and support a large diversity of vegetation and wildlife.

Photo: Sam Brinker



Marshes are the most recognized yet least common type of wetland in Ontario. Marshes often have open areas of water with floating plants, such as water-lilies, and emergent plants (standing above the water), such as cattails. They provide a critical habitat for migratory waterfowl, breeding amphibians, and a wide variety of other animal and plant species.

Photo: Rebecca Zeran



Bogs are very old wetlands — thousands of years old in many cases. Bogs are extremely rare in southern Ontario, but much more common in the north. They are peat-covered areas or peat-filled depressions with a surface carpet of Sphagnum moss that receive water only from rainfall or surface runoff. Bogs are typically low in nutrients and strongly acidic.

Photo: Sam Brinker



Fens, like bogs, are rare in southern Ontario and more common in the north. They are less acidic and more nutrient-rich than bogs. This allows for a higher diversity of plant life, including a variety of sedges, grasses and reeds.

Photo: Sam Brinker



Wetlands characterized by accumulations of peat greater than 40 centimetres are also known as **peatlands**. Peat is formed where dead plant material is conserved over thousands of years due to a combination of permanent water saturation, low oxygen levels and low temperatures. High water levels in peatlands limit peat oxidation, thereby minimizing the release of carbon dioxide into the atmosphere — an important service in mitigating the effects of climate change. In fact, it is estimated that peatlands in the Far North of Ontario annually sequester an amount of carbon equal to about one third of Ontario's total carbon emissions (The Far North Science Advisory Panel 2010). Changes in water levels from the effects of climate change may alter the ability of Ontario's peatlands to store and sequester carbon and provide important ecosystem services.

The **wetlands of the Hudson Bay Lowlands** in the Far North of Ontario are among the most productive subarctic wetland habitats in the world. They support a significant global migratory flyway for waterfowl and shorebirds in addition to being the densest carbon storage and water-retention ecosystems in Ontario.

Ontario is also home to a unique kind of wetland known as a Great Lakes coastal wetland. **Great Lakes coastal wetlands** are located in close proximity to the Great Lakes coastline and are connected by surface water to a Great Lakes system lake or channel. These wetlands are among the region's most ecologically valuable and productive habitats, providing a number of essential ecosystem services to Ontarians. This includes improving Great Lakes water quality by filtering pollutants and sediment; storing and cycling nutrients and organic material from land into the aquatic food web; and reducing flooding and erosion during periods of high water. These wetlands provide an important habitat for wildlife, including a migratory habitat for waterfowl, and breeding/spawning and nursery habitats for many Great Lakes species.



Photo: Kayakers in a wetland, Ontario Tourism Marketing Partnership Corporation (OTMPC)

It is estimated that peatlands in the Far North of Ontario annually sequester an amount of carbon equal to about one third of Ontario's total carbon emissions.

What Do Wetlands Do?

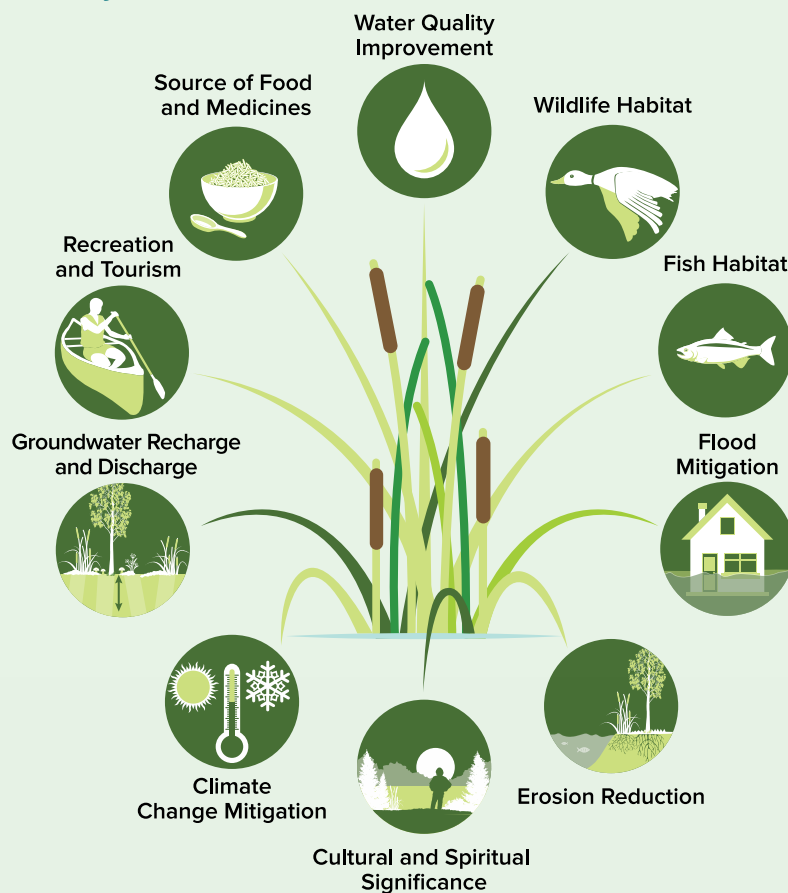
Ecological functions are the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions. Wetlands play an important role in protecting biodiversity and providing ecological services. Some of the roles that wetlands play in the functioning of natural ecological processes include providing a habitat for a variety of species and maintaining natural cycles (including carbon, nutrients, and water cycles) and climate systems. These functions occur within the wetland itself but may also extend to adjacent areas as well as downstream.

Healthy, biologically diverse wetlands also provide multiple ecosystem services to Ontarians (Figure 2). Ecosystem services are defined as the benefits

people obtain either directly or indirectly from nature. Some of the ecosystem services provided by wetlands include water filtration, flood mitigation, erosion reduction, nutrient cycling, groundwater recharge/dischage, carbon sequestration and recreational, social, cultural and spiritual opportunities.

Protecting Ontario’s valuable wetlands means Ontarians can benefit from these ecosystem services for years in the future. For example, wetlands intercept rainfall and filter pollutants from the water, making Ontarians less dependent on stormwater and water treatment infrastructure (Ducks Unlimited Canada 2011). Wetlands also play an important role in soil stabilization and flood mitigation, providing benefits to the surrounding landscape and the people who inhabit it. In particular, wetlands can provide much-needed flood attenuation services helping Ontarians adapt to more frequent extreme weather events resulting from climate change. When wetlands are protected, so are these important ecosystem services that they provide.

FIGURE 2: Wetland ecosystem services



Economic Value of Wetlands

In southern Ontario, wetlands act as natural infrastructure — producing at least \$14 billion in economic benefits each year for Ontarians (Troy and Bagstad 2013). Wetlands provide natural functions that are not often priced by markets or considered in decisions. These are critical public assets and both the public and decision-makers can benefit from considering the value of the services wetlands provide. By providing important ecosystem services, such as flood mitigation, wetlands will also become increasingly important as communities adapt to a changing climate.

The economic valuation of wetlands offers us a way to communicate and understand the benefits derived from wetlands. A study of the economic value of

protecting and restoring great lakes ecosystems (Marbek 2010) found that benefits that people received (e.g. including recreational value, clean water filtration and biodiversity conservation) were 13 to 35 times greater than the costs of the protection or restoration projects depending on the location. Further, a recent study that examined the financial cost of a major flood event in urban and rural areas, found that leaving wetlands intact on the landscape can reduce the financial costs of floods by up to 38 per cent (Moudrak, Hutter and Feltmate 2017).

Investment in wetland conservation may be considered prudent as it could keep costs on various services such as water filtration, flood mitigation, and soil retention, lower than if man-made infrastructure were used for these services.



Photo: Open water marsh, Simon Dodsworth

CURRENT STATUS AND THREATS

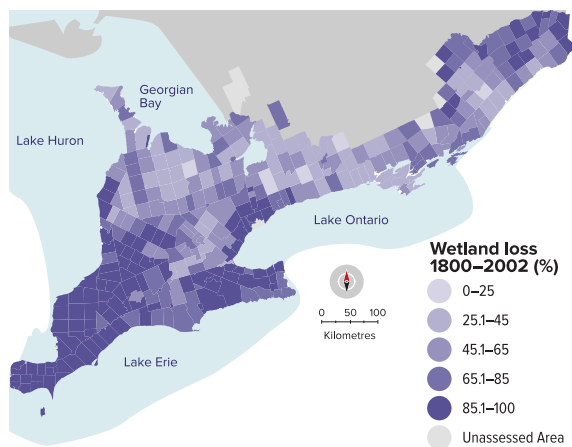
The province of Ontario was once characterized as a vast sea of contiguous forest, lakes, rivers and wetlands with scattered islands of open spaces, grasslands, and prairies. However, since the time of European settlement, the landscape has undergone repeated change in response to various economic and resource-use opportunities. In the southern portion of the province (Mixedwood Plains Ecozone), a thriving economy and fast-growing human population has resulted in many wetlands being drained or filled to accommodate infrastructure and agricultural, industrial and residential land uses. Estimates suggest that 68 per cent of the wetlands originally present in southern Ontario were lost by the early 1980s (OBC 2010). An additional 4 per cent has been lost since this time (OBC 2015) (Figure 3); however, a recent assessment has shown that the rate of loss appears to be decreasing (OBC 2015). While land conversion is the primary cause of wetland loss in southern Ontario, pollution, invasive species, alteration to natural water levels and climate change also pose serious threats.

Ontario’s Great Lakes coastal wetlands have experienced similar historical losses and degradation over the past 200 years. It is estimated that by 1984, 35 per cent of wetlands along the Canadian shores

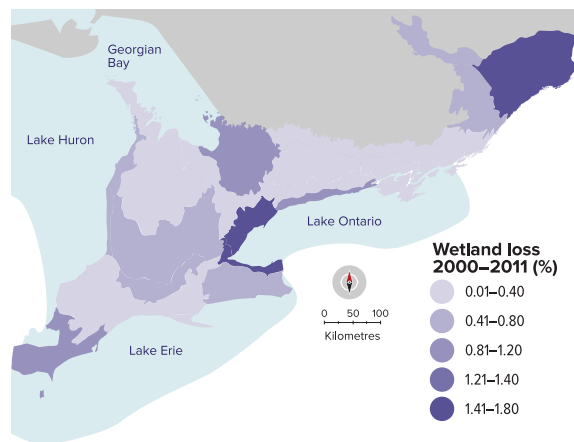
of Lakes Erie, Ontario, and St. Clair had been lost, with the greatest losses occurring between Toronto and the Niagara River. Loss and degradation continue today, largely resulting from shoreline alteration, water level control, nutrient and sediment loading, invasive species, dredging, and development. Upstream land use practices also have an impact, particularly through runoff from urban and industrial development, agricultural lands and impervious surfaces.

Despite some localized loss and degradation, wetlands in the northern part of Ontario (Hudson Bay Lowlands and Ontario Shield ecozones) remain largely intact. Threats to northern Ontario wetlands are quite different from those in southern Ontario. Although urban development and drainage for agriculture are a concern in the more settled regions of northern Ontario, pressures from activities such as mining, hydro-electric and alternative energy development, and transportation infrastructure are more common. Longer-term, climate change is expected to have a significant impact on wetlands in northern Ontario, particularly on peatlands in the Far North. Increases or decreases in water levels as a consequence of climate change may result in changes in the extent and composition of current wetlands and alter the ability of these ecosystems to store and sequester carbon.

FIGURE 3: Wetland loss in the Mixedwood Plains Ecozone



State of Ontario’s Biodiversity Report 2010: Loss of original wetland area by township, from 1800 to 2002 (1.4 million ha)



State of Ontario’s Biodiversity Report 2015: Loss of wetlands by ecodistrict, between 2000 and 2011 (6,152 ha)

It is important to recognize that wetlands are often exposed to multiple threats at the same time, and in many cases, these threats are closely linked. These combined effects from multiple threats have a far greater negative outcome and lead to greater wetland loss or degradation than any single threat on its own

could. For example, the combined impact of climate change on stream flows, coupled with increased water usage to support population growth, or increased habitat fragmentation in urban areas, will have a greater impact than any of these pressures on their own.



Photo: Urban wetland, David Hintz

Wetlands and Climate Change

Wetlands are among the ecosystems most vulnerable to climate change. A future with a warmer and drier climate may reduce many wetlands in size, convert some wetlands to dry land or shift one wetland type to another. In particular, bogs and fens, which depend on precipitation and surface runoff rather than groundwater, are especially sensitive to drying. Peatlands are also likely to become dry due to increased evapotranspiration. Drying will increase the rate of peat decomposition and over the longer term, carbon loss.

Water-level fluctuations also have a strong influence on the structure and function of wetlands. Increased runoff during severe rain events may alter wetland ecosystems, including changes to the resident plant and animal species and their relationships. Alternatively, reduced water levels may eliminate wetlands or affect their ability to maintain shoreline integrity, reduce erosion, filter contaminants, and provide fish and wildlife habitat (Chu 2015).

While climate change poses a serious threat to wetlands in Ontario, the conservation of

wetlands can play an important role in mitigating climate change by reducing greenhouse gas concentrations and adapting to the impacts of climate change. Wetlands regulate temperature, reduce the heat-island effect (the added heat that builds up in urban areas compared to nearby rural areas), slow the impacts of droughts and reduce flood and erosion risks and negative impacts on water quality. Forested wetlands and peatlands are especially important because they can store significant amounts of carbon.

A recent study examined carbon sequestration in both drained and restored wetlands at 3 sites across southern Ontario. The results of the study demonstrated that restored wetlands increase the amount of carbon stored in the landscape (Enanga et al. 2014). Continued research will help to further examine the benefits of restored wetlands in mitigating climate change.

The conservation and restoration of wetlands can be an effective tool to help protect communities and help Ontarians mitigate and adapt to climate change. Ontario's Climate Change Action Plan, 2016-2020 outlines the range of actions Ontario is taking to meet its targets and establishes the framework necessary to achieve its transformative goals.

Wetlands and Invasive Species

Invasive species are having a profound impact on Ontario's most fragile and threatened natural ecosystems; wetlands, in particular, are vulnerable. The large number of lakes and interconnected waterways and our network of roads and railways have allowed the continued spread and establishment of numerous aquatic and terrestrial invasive species across the province. Climate change is also influencing the spread of invasive species.

To address this issue, on November 3, 2015, the Ontario government passed the Invasive Species Act, 2015. The Act establishes a regulatory framework that allows Ontario to better prevent, detect, control and eradicate invasive species across the province. For example, applying regulations and prohibiting certain activities (e.g., buying, selling, transporting, or propagating the species) helps prevent the further spread of an invasive species. These actions, combined with other programs to prevent, detect and eradicate invasive species, will help to reduce the threat posed by invasive species to Ontario's wetlands.

In particular, Phragmites (also known as the Common Reed) is having a negative impact on coastal wetlands in Ontario. This species spreads rapidly and creates dense

thick clusters, disrupting Ontario's sensitive wetland ecosystems and impacting at least 25 per cent of Ontario's species at risk. Without effective detection, monitoring and control, Ontario's coastal wetlands will continue to deteriorate as a result of Phragmites expansion.

Ontario has taken action to combat the ecological and economic threats that Phragmites poses to the natural environment. In 2016, the Ontario government regulated Phragmites as a restricted species under the Invasive Species Act, enabling new tools for the management of this invasive plant. Further, through initiatives such as the Ministry of Natural Resources and Forestry's Land Stewardship and Habitat Restoration Program and the Ministry of the Environment and Climate Change's Great Lakes Guardian Community Fund, the Ontario government is assisting municipalities and community groups by funding the control of invasive plants, such as Phragmites.

In 2016, the Ministry of Natural Resources and Forestry (MNRF), along with other conservation groups, started a pilot project at Long Point and Rondeau Bay to test the application of a herbicide in wetland areas to combat phragmites. With positive results, this project is helping to demonstrate the effectiveness of controlling Phragmites in wetlands with the use of herbicides.



Photo: Invasive Phragmites, Wasyl Bakowsky

ONTARIO'S CURRENT WETLAND POLICIES

Ontario's first public discussions regarding the development of a wetland policy occurred more than 30 years ago, when the government released a discussion paper titled *Towards a Wetland Policy for Ontario*. The result of the effort was a wetland policy issued by the Ontario government in 1984 titled *Guidelines for Wetlands Management in Ontario* and later on, the 1992 Wetland Policy Statement — a precursor to what are now the wetland-related natural heritage policies under the Provincial Policy Statement.

Since this time, pressures on Ontario's wetlands have changed and evolved, with wetland policy following suit. Currently, wetlands are managed through a variety of policies that include over 20 different pieces of legislation administered and/or implemented by five provincial ministries, two federal departments, a provincial agency (Niagara Escarpment Commission), 36 conservation authorities and 444 municipalities. Some of these statutes enable aspects of natural resource or natural heritage conservation and management, which can include wetlands, while others explicitly restrict certain land uses or activities within them.

Table 1 outlines the major legislation and policy instruments currently in place that influence and guide wetland conservation in Ontario. In addition



Photo: Farm wetland, Ducks Unlimited Canada

to the legislation and policy described, several other provincial statutes require consideration of wetlands when making decisions (e.g., Aggregate Resources Act) or influence wetlands in some way (e.g., Drainage Act). Others recognize that wetlands are part of recharge and discharge areas, which are also important for protecting sources of drinking water in Ontario (e.g., wetlands mapped in source protection plans, including local assessment reports prepared under the Clean Water Act). Several federal policies and statutes also contribute to wetland conservation in Ontario (e.g., Fisheries Act, Federal Policy on Wetlands).

TABLE 1: Policy instruments that guide wetland conservation and management in Ontario

| Policy Instrument | Link to Wetland Conservation and Management |
|---|--|
| Provincial instruments that restrict certain activities in wetlands | |
| Planning Act, Provincial Policy Statement 2014 | Protects provincially significant wetlands and coastal wetlands from development and site alteration depending on where they are located within the province. Wetlands can also be identified within natural heritage systems, which are networks of core areas and linkages that support biodiversity, and can be identified as part of water resource systems or significant cultural landscapes. |
| Niagara Escarpment Planning and Development Act & Plan | Protects wetlands located within the Niagara Escarpment planning area from development. |
| Oak Ridges Moraine Conservation Act, 2001 & Plan | Protects wetlands located within the Oak Ridges Moraine planning area from development. |
| Greenbelt Act, 2005 & Plan | Protects wetlands in the area designated as Protected Countryside within the Greenbelt Plan in the Greater Golden Horseshoe. |
| Places to Grow Act, 2005 & Growth Plan for the Greater Golden Horseshoe | Protects wetlands located within the Growth Plan planning areas, outside of settlement areas, from development. |
| Lake Simcoe Protection Act, 2008 & Plan | Protects wetlands located in the Lake Simcoe watershed from development. |
| Conservation Authorities Act Regulations | Regulate development in and around wetlands for effects on the control of natural hazards (e.g., flooding) as well as activities that may interfere with a wetland. |
| Renewable Energy Approvals Regulation (under the Environmental Protection Act) | Prohibits most activities associated with renewable energy projects from locating directly within provincially significant wetlands in southern Ontario and significant coastal wetlands, while enabling a risk-based approach to minor encroachments from infrastructure. |
| Crown Forest Sustainability Act, 1994 & Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010) | Provides for the long-term health of Crown Forests and for forest sustainability. Forest management guides used during the planning and implementation of operations and construction of roads contain mandatory direction and best management practices designed to protect the integrity of aquatic habitats that include permanent and seasonal wetlands (inclusive of those recognized as provincially significant). |
| Public Lands Act and enabling processes | Guides the administration and disposition of Crown land resources in Ontario and Crown land use planning south of the Far North. Dispositions (sale and issuance of land use occupational authority) and issuing of permits (e.g., work permits for aquatic vegetation removal) are subject to screening under the Class Environmental Assessment for MNR Resource Stewardship and Facility Development Projects. Crown land use planning applies land use designations and develops area-specific land use direction that incorporate key social, economic, cultural and ecological values, including consideration and protection of wetlands. |



| Policy Instrument | Link to Wetland Conservation and Management |
|---|---|
| Lakes and Rivers Improvement Act | Requires approval for the construction, alteration and operation of water control structures, some of which may be used to restore or enhance wetland habitat. Potential impacts and associated mitigation measures may be considered as part of the approvals process. |
| Ontario Water Resources Act | Prohibits discharge of polluting material that may impair the quality of water, which encompasses impacts on aquatic life, including those within wetlands. |
| Provincial instruments that facilitate wetland conservation | |
| Great Lakes Protection Act, 2015 | Enables establishment of wetland targets and supporting plans to prevent net loss of wetlands, as well as regulatory tools and initiatives to support shoreline and coastal protection and restoration. |
| Far North Act, 2010 | Establishes objectives for community based land use planning, including the protection of 225,000 square kilometres of land in the Far North of Ontario, and the maintenance of biological diversity, ecological processes and functions, such as the storage and sequestration of carbon. |
| Endangered Species Act, 2007 | Prohibits the damage and destruction of the habitat of endangered and threatened species, some of which carry out life processes in wetlands. |
| Provincial Parks and Conservation Reserves Act, 2006 | Permanently protects a system of provincial parks and conservation reserves that includes ecosystems representative of all of Ontario's natural regions and provincially significant elements of Ontario's natural and cultural heritage, including wetlands. |
| Municipal Act, 2001 | Enables a municipality to pass by-laws to restrict tree cutting (e.g., in swamps), placing or dumping of fill, and removing topsoil (e.g., defined to include peat). |
| Assessment Act | Sets out eligibility criteria for lands that can receive property tax exemptions under the Conservation Land Tax Incentive Program and the Managed Forest Tax Incentive Program — many of these lands contain wetlands. |
| Conservation Land Act | Enables the protection of natural areas, including wetlands, by establishing conservation easements on private land. |
| Environmental Assessment Act | Requires an assessment of any major public sector and some private sector undertakings that may have a significant environmental impact. The process requires public bodies, such as the Ontario Ministry of Transportation, and some private agencies to make design decisions to avoid impacts and to mitigate where avoidance is not possible. |
| Invasive Species Act, 2015 | Establishes an enabling regulatory framework to prevent, detect, control and eradicate invasive species across the province. |



Photo: Great Blue Heron, Rebecca Zeran

Wetlands and Land Use Planning in Ontario

Wetland conservation in Ontario is largely implemented through land use planning. Whether through development of municipal official plans and municipal decisions on land use plans, community based land use plans or resource management planning for Ontario's Crown land, conserving Ontario's wetlands is an important consideration. Wetland conservation should also be integrated into watershed planning, water management and climate change mitigation and adaptation strategies.

Planning Act: The Provincial Policy Statement

The Provincial Policy Statement 2014 (PPS) provides policy direction on matters of provincial interest related to land use planning and development on private lands (OMMAH 2014). The PPS is issued under section 3 of

the Planning Act and all decisions affecting land use planning matters "shall be consistent with" the PPS. The PPS applies province-wide, with municipalities relying on the PPS to develop their official plans and to guide and inform decisions on other planning matters.

The PPS prohibits development and site alteration in all provincially significant wetlands (PSWs) throughout much of southern and central Ontario, and provincially significant Great Lakes coastal wetlands anywhere in the province. Development and site alteration is prohibited on lands adjacent to PSWs, in PSWs in northern Ontario, and in non-PSW coastal wetlands in central and southern Ontario, unless it has been demonstrated that there will be no negative impacts on the wetlands or their ecological functions. Wetlands can also be identified within natural heritage systems, which are networks of core areas and linkages that support biodiversity, and as part of water resource systems or significant cultural heritage landscapes.

Ontario's 36 conservation authorities support municipalities in ensuring that official plans and other planning decisions are consistent with the policy direction contained within the PPS. All conservation authorities review municipal planning policy and applications for consistency with the natural hazard policies of the PPS, and many municipalities rely on conservation authorities to review natural heritage evaluations undertaken in support of Planning Act applications.

In addition to the PPS, there are a number of provincial land use plans that contain protections for wetlands, including the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan, the Greenbelt Plan and Growth Plan for the Greater Golden Horseshoe, some of which go above and beyond the protections afforded under the PPS. For example, the Growth Plan requires the protection of natural heritage features and areas, including wetlands, as part of natural heritage systems and water resource systems. Further, the province is in the process of developing a Natural Heritage System (NHS) for the Greater Golden Horseshoe (GGH) under the Growth Plan, which will include many

wetlands. As well, there are enhanced requirements for municipal official plans to identify water resource systems and undertake watershed planning to inform decisions. This will provide for the long-term protection of water quality and quantity.

In addition to land use approvals under the Planning Act, an environmental assessment process may be applied to new infrastructure and modifications to existing infrastructure under applicable legislation. The process requires public bodies and some private agencies to make design decisions to avoid impacts to the environment and to mitigate where avoidance is not possible.

Far North Act: Community based land use planning

In 2008, the Ontario government announced that it would work with First Nations to protect more than half of the Far North Boreal region. Under the Far North Land Use Planning Initiative, Ontario is working with local First Nations to prepare land use plans that clarify where development can occur and where land is dedicated to protection.

The Far North Act, 2010 puts a requirement for First Nations approval of land use plans on public lands into law for the first time in Ontario's history. The Act sets out a land use planning process in which joint First Nations-Ontario planning teams prepare and approve land use plans to identify lands in the Far North that will be designated as lands that are protected, those that are open for sustainable economic development, and how such land and water will be managed into the future. The Far North Act also provides for a Far North Land Use Strategy which would assist in the preparation of land use plans and guide the integration of matters beyond the scale of individual plans.

As of 2016, five First Nation communities had completed community based land use plans (Pikangikum, Cat Lake, Slate Falls, Pauingassi and Little Grand Rapids) and all but a few of the remaining First Nation communities are engaged with the MNR in the various stages of preparing a land use plan.

Public Lands Act: Crown land use planning

The MNR has the lead role for the care and management of Ontario's Crown land and water covering about 87 per cent of the province. Many of the province's significant wetlands are located on provincial Crown lands.

South of the Far North, the MNR's Crown land use planning system is enabled under the Public Lands Act. Through a variety of planning processes undertaken over the past 40 years, land use policy has been developed for Crown lands south of the Far North that provides broad land use direction for resource and management planning as well as establishment of a protected areas system.

Land use planning processes are open and transparent, providing the public, First Nation and Métis Peoples, and stakeholders with the opportunity to participate in and influence land use decisions. Cultural, social, spiritual, economic and ecological values, including provincially significant wetlands, are considered during Crown land use planning activities.

Provincial Parks and Conservation Reserves Act: Planning and management of provincial parks and conservation reserves

The MNR is responsible for the planning and management of provincial parks and conservation reserves, which comprise about 9 per cent of Ontario. These protected areas are identified to protect important natural and cultural features and are planned and managed to maintain their ecological integrity. They also provide opportunities for the public to experience and learn about the values of wetlands, and places for research to improve our knowledge of these critical ecosystems.

Many wetlands have been protected within Ontario's system of provincial parks and conservation reserves. For example, 6.4 per cent of Great Lakes coastal wetlands in the province are within the boundaries of provincial parks and conservation reserves.

INTERNATIONAL COOPERATION FOR WETLAND CONSERVATION

Wetlands are recognized globally as a resource of great ecological, economic, social, cultural heritage and recreational value. Numerous conventions, agreements and collaborative partnerships have been developed to help ensure that wetlands and the important functions they provide are conserved and sustained for future generations. These initiatives operate at various scales, involve both government and non-government organizations, and often seek to coordinate conservation action across provincial, national and continental boundaries.

Ramsar Convention: In 1971, a multi-national global treaty, called the Ramsar Convention, was adopted in the Iranian city of Ramsar to provide a framework for national action and international cooperation for the conservation and wise use of

wetlands and their resources. The treaty was negotiated in the 1960s by countries and non-governmental organizations concerned about increasing loss and degradation of wetland habitats for migratory birds. The Ramsar Convention has long recognized the importance of the cultural significance of wetlands in achieving their conservation and sustainable use. A key commitment of the Ramsar Convention is to identify globally important wetlands on the List of Wetlands of International Importance. There are eight Ramsar Wetlands of International Importance designated in Ontario, including Long Point National Wildlife Area, St. Clair National Wildlife Area, Southern James Bay, Polar Bear Provincial Park, Point Pelee National Park, Mer Bleue Conservation Area, Matchedash Bay Provincial Wildlife Area and Minesing Swamp. Together, these important wetlands cover an area of 56,419 hectares.



Photo: Polar Bear Provincial Park, Edward Morris

Convention on Biological Diversity:

Established in 1992, this convention provides a broad framework for the conservation and sustainable use of biodiversity. Nationally, the Convention on Biological Diversity is supported by the Canadian Biodiversity Strategy and the recently established Canadian 2020 Biodiversity Goals and Targets.

On a provincial level, **Ontario's Biodiversity Strategy 2011** and **Biodiversity: It's in Our Nature — Ontario Government Plan to Conserve Biodiversity 2012-2020** contribute to Canada's actions to conserve biodiversity and both include actions to improve wetland conservation.

United Nations Framework Convention on Climate Change:

Established in 1992, The Climate Change Convention aims to address problems resulting from the increasing concentrations of carbon dioxide and methane in the atmosphere. Wetlands are likely to be affected by the expected changes in hydrology associated with climate change. For Canada and Ontario, major responses to obligations under the Climate Change Convention are addressed through **Canada's Way Forward on Climate Change** and **Ontario's Climate Change Strategy and Action Plan**. Wetland conservation is identified as a key action in mitigating carbon emissions and the impacts of changing climatic conditions.

Eastern Habitat Joint Venture (EHJV):

This joint venture is a collaborative partnership of government and non-government organizations working together across eastern Canada to conserve continentally significant wetlands and other habitats that are important to migratory birds. Since 1986, the EHJV has helped to implement habitat conservation



Photo: Researcher in Polar Bear Provincial Park, Rod Brook

programs — such as wetland securement, restoration, stewardship and management — that support continental waterfowl objectives identified under the North American Waterfowl Management Plan (NAWMP). The EHJV, one of more than 20 joint ventures in North America, spans the six easternmost Canadian provinces. Each province has established its own provincial partnership to implement activities that support the joint ventures as a whole. In Ontario, this partnership is known as the Ontario EHJV. Ontario EHJV partners include the Government of Canada, the Government of Ontario, Ducks Unlimited Canada, the Nature Conservancy of Canada, and Bird Studies Canada.

There are eight Ramsar Wetlands of International Importance designated in Ontario, covering an area of 56,419 ha.

CONSERVING WETLANDS IN THE GREAT LAKES BASIN

It has long been recognized that wetlands play an important role in maintaining the water quality and ecosystem integrity of the Great Lakes basin. Several initiatives have been developed over the last 40 years that recognize the important role of wetlands in the Great Lakes, identify the threats that wetlands face in this region, and seek to implement actions to protect and restore wetlands across the basin. Many of these initiatives involve close inter-jurisdictional cooperation and a commitment to work together. These initiatives include:

Canada-U.S. Great Lakes Water Quality Agreement (GLWQA): This bi-national agreement has a vision to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes. The amended agreement (2012) includes an objective to support healthy and productive wetlands and other habitats to sustain resilient populations of native species.

Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014 (COA): This agreement outlines how the governments of Canada and Ontario will work together to restore, protect and conserve Great Lakes water quality and ecosystem health. The 2014 COA includes a priority focusing on restoring, protecting and conserving wetlands, beaches and other coastal areas of the Great Lakes.

Lakewide Action and Management Plans (LAMPs): Bi-national action plans created to help restore and protect each Great Lake, LAMPs are used to assess the status of each Great Lake. These action plans also outline how federal, provincial and state agencies are working together to implement management actions that address lake-wide environmental issues, including wetland conservation.

Ontario's Great Lakes Strategy, 2012:

This Strategy provides a roadmap for how Ontario ministries are taking action to protect the Great Lakes – St. Lawrence River basin. Now enshrined as a living document under the Great Lakes Protection Act, 2015, it is designed to focus provincial actions across ministries, and to enhance collaboration and engagement with the broader Great Lakes community. One of the six goals of the Strategy is to improve wetlands, beaches, shorelines and coastal areas.

Great Lakes Wetland Conservation Action Plan (GLWCAP):

Prepared by government and non-government organizations in 1994, this action plan outlines a framework for wetland conservation in the Great Lakes basin through eight implementation strategies. The plan is coordinated by a team of federal, provincial and non-governmental organizations, and actions are updated regularly.

Great Lakes Water Level Management:

Established under the Boundary Waters Treaty in 1909, the International Joint Commission (IJC) is an advisor to the governments of Canada and the U.S. on implementation of the GLWQA and helps to manage Great Lakes waters by regulating boundary water uses, investigating trans-boundary issues and recommending solutions. The Ontario government participates in the IJC's initiatives, including investigating the impacts of water level regulation on Great Lakes coastal wetlands.

International Joint Commission Plan 2014

Following extensive binational study and public engagement, the International Joint Commission approved Plan 2014 in December 2016 to improve the regulation of Lake Ontario and St. Lawrence River water levels and flows. Past practices of water level regulation have resulted in a change in coastal wetland areas and loss of the diversity of plants, fish and wildlife that depend on these habitats. Plan 2014 has been designed to help reverse this trend by taking a step toward more natural water level variations and expanding meadow marsh areas over time. This represents an important binational effort to restore wetland health across shorelines. To ensure that the new plan functions as intended, its on-going performance will be tracked through assessments of hydroclimate and environmental-economic indicators coordinated by the Commission's Great Lakes-St. Lawrence River Adaptive Management Committee.



Photo: St. Lawrence River, Rebecca Zeran

Canada-Ontario Action Plan for Lake Erie

Canada and Ontario are working with the Great Lakes community to develop the Canada-Ontario Action Plan for Lake Erie under COA to meet Ontario's phosphorus load reduction commitments for Lake Erie. Aligning with federal commitments under the GLWQA, Ontario is adopting a target of 40 per cent phosphorus load reduction (from 2008 levels) in the Ontario portion of the western and central basins by 2025. An aspirational goal of a 20 per cent reduction by 2020 has also been adopted under the Great Lakes Protection Act, 2015. The Plan includes actions to improve and restore wetlands and other natural heritage features in the Lake Erie basin. Investing in these features provides several important ecosystem services including mitigation of phosphorus losses from the landscape.



Photo: Toxic algae bloom in Lake Erie, NASA

PARTNERS IN WETLAND CONSERVATION

Wetland conservation efforts can be significantly strengthened through the support of citizens and organizations that can help monitor, maintain and enhance wetlands across the province. Such efforts are an important contribution to the continual, on-the-ground work of wetland conservation and building awareness and appreciation for these sites among the broader community.

First Nation and Métis Peoples and communities are important partners in wetland management. The Ontario government recognizes that First Nation and Métis communities are involved in managing and using wetlands sustainably, and that local and traditional ecological knowledge can substantially contribute to effective wetland management practices. The livelihoods, food security, cultural and spiritual heritage of First Nation and Métis Peoples are often connected to wetlands. This unique relationship with the land and its resources pre-dates the existence of the province and continues to be of central importance in First Nation and Métis communities across Ontario today.

Private landowners are important partners in the conservation of wetlands, particularly in southern Ontario, where the majority of wetlands are privately owned. Private landowners can conduct stewardship projects in conjunction with provincial and federal government agencies, municipalities, conservation authorities and environmental organizations.

Municipal governments recognize the importance of wetlands, particularly for the ecosystem services these lands provide to their communities. Municipalities play an important role in wetland conservation, particularly through the development of municipal official plans and bylaws that can protect wetland environments within their jurisdiction.

The agricultural community are significant land owners in Ontario and work to balance the need for sustainable food production with maintaining ecosystem services provided by natural heritage and farmed land. Many farmers are actively engaged in conserving wetlands on their lands.

Conservation authorities (CAs) have a long legacy of wetland conservation and restoration throughout their watersheds. CAs are collectively one of the largest landowners in Ontario providing protection to many wetland areas. CAs also administer regulations related to development in their jurisdiction. This includes regulating development within natural hazard areas such as floodplains, shorelines and wetlands as well as regulating any alterations to a watercourse or interference with a wetland.

Environmental organizations such as Ducks Unlimited Canada, the Nature Conservancy of Canada, and local land trusts (among others) are actively involved in wetland securement and restoration efforts through land acquisition projects, monitoring programs, public outreach, research, education, and more.

Cultural heritage organizations, such as historical societies, community heritage groups, and other non-profit or volunteer groups whose purposes include the identification and protection of cultural heritage resources may play an important role in interpreting and celebrating the cultural heritage value of wetlands.

The Ontario government administers several grant and incentive programs to encourage conservation and stewardship of wetlands and other important habitats. Examples of these programs are found in Appendix 1.



Photo: Kettle and Stony Point First Nation Phragmites control, Janice Gilbert

Kettle and Stony Point First Nation Phragmites control program

Wetland conservation in Ontario requires a coordinated approach that includes meaningful involvement of First Nation and Métis Peoples and communities. Many First Nations are leading wetland conservation projects in their communities. For example, the Chippewas of Kettle and Stony Point First Nation in southern Ontario have implemented a successful invasive Phragmites control program to protect a coastal meadow marsh in their community.

Phragmites (also known as the Common Reed) is an invasive plant that grows and spreads easily, quickly out-competing native species for water and nutrients. Phragmites is well established in parts of Ontario and was found to be present within the coastal meadow marsh and interior wetlands on Kettle and Stony Point.

In the fall of 2011, the First Nation selected an approximately 1.8-hectare section of coastal meadow marsh overtaken with Phragmites as a demonstration site to show the local community the restoration benefits of using a combination of herbicide and mechanical control methods. The positive response of native vegetation and wildlife during the following summer helped gain community support for a Phragmites control program in the area.

As a result, a five-year community Phragmites Management Plan was developed to help guide effective, efficient and environmentally responsible control efforts. The First Nation was also successful in obtaining funds through the Canada/Ontario Resource Development Agency in 2012 and 2013 to support the development and implementation of the control program.

The community's efforts resulted in a noticeable decline in Phragmites in the project area. Prior to control efforts, coverage of Phragmites ranged from 20 to 100 per cent. Post-control, the average coverage declined to approximately 1.5 per cent. An increase in the diversity of native vegetation and wildlife in the area was also observed.

Landscape level planning for wetlands

Many jurisdictions, including Ontario, agree that biodiversity conservation, sustainable resource management, and reconciling potentially conflicting resource uses or objectives are best accomplished using ecosystem or landscape-based management. Taking an ecosystem or broader landscape approach to natural resource management and planning means implementing management actions in an integrated way, over larger areas of land and water, and over appropriate — often longer — time periods.

In the context of wetland conservation, this will mean identifying ecologically and hydrologically meaningful scales of management by taking into consideration

the importance of habitat connectivity, watershed conditions, adjacent lands and land uses, natural heritage and water resource systems, maintaining water quality and quantity, protected area networks, climate change adaptation and mitigation, sources of drinking water, the life histories of native aquatic and terrestrial species, and areas of resource development needed to sustain quality of life of Ontarians.

For example, the Ecological Land Classification system characterizes the landscape at various scales, from large ecozones to finer scale ecoregions and ecodistricts. This framework can be used for wetland conservation planning and monitoring across Ontario.



Photo: Wetlands in the landscape, Jason Mortlock

COMPLEMENTARY INITIATIVES

Wetland conservation is an efficient, cost effective solution to several challenges facing Ontario, including a number of provincial priorities. Key provincial priorities that can be addressed through a commitment to wetland conservation include protecting the province's biodiversity, protecting water quality and water supplies and the Great Lakes, mitigating the impacts of flooding and erosion, addressing growing infrastructure needs, mitigating climate change and helping communities address and build resiliency to climate change. Likewise, a number of initiatives designed to improve natural heritage and biodiversity conservation simultaneously support the goals of A Wetland Strategy for Ontario. These initiatives include:

Biodiversity: Ontario's Biodiversity Strategy is the guiding framework for coordinating the conservation of the province's rich variety of life and ecosystems. Biodiversity: It's in Our Nature (the government implementation plan for the Strategy) provides a broad framework to improve conservation in Ontario through actions that engage people, reduce threats to biodiversity, enhance ecosystem resilience and improve knowledge. Many of the actions and activities outlined in these plans will have both direct and indirect benefits to wetlands.

Climate change: Ontario has made a strong commitment to climate change mitigation and adaptation. Ontario's Climate Change Strategy, 2015 sets out the transformative change required to reduce greenhouse gas emissions below 1990 levels by 37 per cent by 2030 and by 80 per cent by 2050. The Climate Change Action Plan, 2016–2020 lays out the range of actions Ontario is taking over the next five years to meet its 2020 targets and establishes the framework necessary to achieve the transformative goals of the Strategy. The province is also updating climate change adaptation planning that will build on Climate Ready: Ontario's Adaptation Strategy and Action Plan, 2011-2014 which includes several actions to maintain and restore ecosystem resiliency and wetlands, as well as the proposed Naturally Resilient: MNR's Natural Resource Climate Adaptation Strategy. The Pan-Canadian Framework on

Clean Growth and Climate Change is Canada's plan to grow our economy while reducing emissions and building resilience to adapt to a changing climate. One of the priority actions which relates to wetlands is the commitment to invest in traditional and natural infrastructure.

Invasive Species: Ontario's Invasive Species Strategic Plan (OISSP) aims to reduce the impact of invasive species, prevent new invaders from arriving and surviving and to halt the spread of existing invasive species. The Invasive Species Act, 2015 establishes an enabling regulatory framework that will allow Ontario to better prevent, detect, control and eradicate invasive species across the province. Invasive species represent one of the key threats to wetland ecosystems, and together, the OISSP and the Act will help to prevent, detect, manage and respond to their impacts.

Pollinator Health Action Plan: Ontario's Pollinator Health Action Plan is designed to improve the health of Ontario's pollinator populations, to contribute to a sustainable food supply and to support resilient ecosystems and a strong economy. Pollinators play an important role in the maintenance of healthy ecosystems, including wetlands. There are several actions in the Plan aimed at restoring, enhancing and protecting pollinator habitat, which will also benefit wetland conservation in the province.

Green infrastructure: Green infrastructure means natural and human-made elements that provide ecological and hydrological functions and processes (e.g., natural heritage features and systems, vegetation and landscaping, street trees and other urban forest elements, green roofs, etc.). The province of Ontario encourages the use of green infrastructure solutions as a means to better manage stormwater, decrease energy use and increase carbon storage in vegetation. Green infrastructure also plays a role in improving air and water quality, preserving biodiversity and the health of pollinators and reducing flood impacts. Conservation and creation of wetlands are alternatives to traditional infrastructure that will help to build resilience to the effects of climate change and improve wetland functions and ecosystem services on the landscape.

Ontario's Wetland Conservation Strategy

The Ontario government has long understood the importance of wetlands and continues to provide strong leadership to conserve these vital ecosystems. From enacting progressive legislation and policy designed to protect and enhance wetlands, to working with partners in the delivery of innovative programs to encourage stewardship and landscape restoration, the Ontario government is committed to conserving wetlands.

A Wetland Conservation Strategy for Ontario represents a framework to improve the conservation of wetlands across the province. The Strategy provides a vision, goals and outcomes for conserving Ontario's wetlands as well as a list of actions the Ontario government will undertake to ensure progress. The Strategy operates as an integrated part of the existing legislative, policy and strategic framework for natural resource and biodiversity conservation in the province and seeks opportunities for improvement. It also supports provincial, regional, continental and international objectives for wetland conservation that have been established through a variety of mechanisms (e.g., North American Waterfowl Management Plan, Ontario Eastern Habitat Joint Venture, Ontario's Great Lakes Strategy, etc.). The intent is to provide both the Ontario government and Ontarians with a common focus and a path forward, so that greater success in wetland conservation can be achieved in a more efficient and effective manner.

Wetland conservation, akin to the management of other natural resources, requires an integrated approach. A shared commitment among all sectors, including the provincial government, is essential to conserving Ontario's wetlands. As such, A Wetland Conservation Strategy for Ontario has been shaped through engagement with a variety of industry, academic and non-governmental organizations, stakeholders, First Nation and Métis Peoples and communities, individual Ontarians and federal,



Photo: Wye Marsh, OTMPC

provincial and municipal government staff. Of critical importance is the need for all people to support this Strategy as a mechanism to achieve more integrated and collaborative approaches to the protection of wetlands in Ontario.

The successful implementation of A Wetland Conservation Strategy for Ontario will also require the support, involvement, knowledge, innovations and practices of First Nation and Métis Peoples and communities. The Strategy is consistent with the constitutional protection provided for existing Aboriginal and treaty rights and supports the involvement of Indigenous Peoples in wetland conservation in Ontario.

While there are already many important policies and programs in place to protect Ontario's wetlands, without future action these areas will face increasingly serious threats. The Ontario government and its partners must continue to reach higher and further to ensure that wetlands remain an enduring part of Ontario's landscape. This Strategy provides that roadmap.

VISION

Ontario's wetlands and their functions are valued, conserved and restored to sustain biodiversity and to provide ecosystem services for present and future generations.

OUR GUIDING PRINCIPLES

This Strategy is underpinned by seven core principles that establish important concepts, values and approaches that form the basis of effective wetland conservation. These principles are as follows:

1. Wetlands are integral components of their watersheds, natural heritage and hydrologic systems, and part of the larger landscape. Wetlands are also important to the global climate system.
2. Wetlands and their functions provide important benefits that are vital to the health and well-being of all life in Ontario and improve the province's resilience to climate change.
3. Wetlands should be conserved based on three hierarchical priorities:
 - **Protect** – retain area and functions of existing wetlands,
 - **Mitigate** – minimize any further damage to wetlands, and
 - **Restore** – improve and re-establish wetland area and function on the landscape.
4. Wetlands should be conserved based on a precautionary approach and using the best available science, information and traditional ecological knowledge.
5. Conservation of all wetlands and their functions is important, including provincially significant, coastal wetlands and other locally and regionally important wetlands.
6. Wetlands should be conserved in a manner that recognizes and is informed by the Aboriginal and treaty rights, as well as the interests of First Nation and Métis communities.
7. Wetlands should be conserved in strong partnership with other levels of government, First Nation and Métis communities, local public sector agencies, private landowners, the agricultural community, industry, non-government organizations and others involved in wetland conservation.



Photo: Wye Marsh Wildlife Centre, OTMPC

GOALS AND OUTCOMES

A Wetland Conservation Strategy for Ontario is based on four strategic directions that reflect the critical components required to conserve Ontario's wetlands. These include **awareness, knowledge, partnership and conservation**. Each strategic direction is supported by a long-term goal and desired outcome to focus efforts, provide aspirations for achievement and establish a flexible framework through which to plan and implement actions to benefit the conservation of wetlands and their functions. The four strategic directions, with their goals and outcomes are outlined in Figure 4.

ACTIONS

A Wetland Conservation Strategy for Ontario includes a comprehensive suite of actions that the Ontario government is taking or will take, to conserve Ontario's wetlands. Each action is related to one or more of the goals and desired outcomes and contributes to achieving the Strategy's overarching vision and targets. Many

actions also support or align with other government priorities, such as biodiversity conservation, climate change mitigation and adaptation, and Great Lakes water quality. Although the Province has committed to implementing the Strategy, many actions will involve collaboration with municipalities, First Nation and Métis communities, conservation authorities, the agricultural community, industry, environmental organizations, and others. Public engagement and the consideration of existing policy and land use planning frameworks in the province will also be important considerations.

It is important to note that as our knowledge and understanding of wetlands and their conservation improves, new issues will emerge and further actions may be considered. Some actions may also be completed more quickly, while others may take longer. As such, the identified actions do not represent an exhaustive list or preclude the identification of new Ontario government initiatives to support wetland conservation in the future.

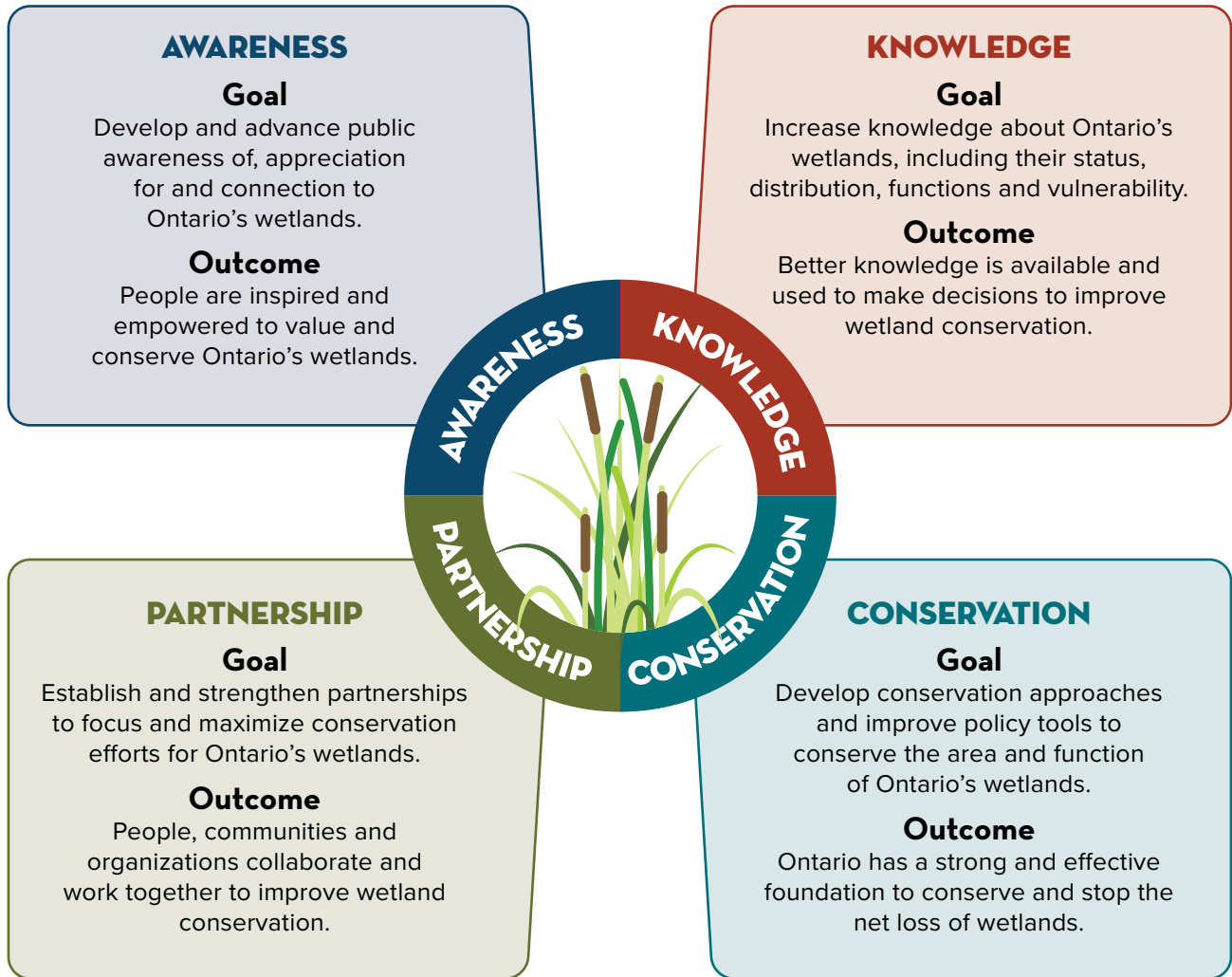


Photo: Wetland stewardship project, Ministry of Natural Resources and Forestry

FIGURE 4: A Wetland Conservation Strategy for Ontario 2017–2030 Framework

VISION

Ontario’s wetlands and their functions are valued, conserved and restored to sustain biodiversity and to provide ecosystem services for present and future generations.



TARGETS

By **2025**, the net loss of wetland area and function is halted where wetland loss has been the greatest. By **2030**, a net gain in wetland area and function is achieved where wetland loss has been the greatest.



Strategic Direction – Awareness

At the most fundamental level, the greatest challenge to wetland conservation in Ontario is the limited value that society, as a whole, places on the functions that wetlands perform and the services and benefits they provide. This is largely due to limited awareness and understanding about the critical roles wetlands play in our province. Additionally, the fact that many wetland functions are ‘public goods’ whose benefits accrue to the wider community rather than individual landowners also poses a challenge.

The Ontario government recognizes the need for better education, communication and awareness about the importance of wetlands and the essential role they play in maintaining a healthy environment and supporting our quality of life. There is also a need to encourage and support private stewardship of wetlands, so they can continue to supply benefits to the wider community.

Actions under this strategic direction include those related to improving wetland education, better communicating the value of wetlands to the public and encouraging active participation in wetland conservation through volunteerism and stewardship.

Goal: Develop and advance public awareness of, appreciation for and connection to Ontario’s wetlands.

Outcome: People are inspired and empowered to value and conserve Ontario’s wetlands.



Photo: Child hiking in a wetland, OTMPC

Actions:

- Evaluate existing communication materials and outreach initiatives about wetlands to assess gaps.
- Improve understanding of the motivations, values, attitudes and practices of landowners who conserve or do not conserve wetlands, as a guide for promoting stewardship.
- Develop and employ innovative strategies to effectively communicate the value of wetlands and their connections to the landscape and natural systems to the public.
- Develop, implement and promote initiatives that communicate the socio-economic value of wetlands and the ecosystem services they provide.
- Promote existing education programs (e.g., Project Wild, Envirothon, Adopt-a-Pond) and develop new programs to teach the importance of wetlands to youth.
- Continue to support international partnerships that raise awareness of the importance of Ontario's wetlands in the broader landscape (e.g., Ramsar Convention, North American Waterfowl Management Plan, Eastern Habitat Joint Venture, etc.).
- Work with First Nation and Métis communities and organizations to develop targeted initiatives and materials and to include First Nation and Métis perspectives in wetland awareness initiatives.
- Improve information management and public access to open data, including wetlands inventory and mapping data and results of research on functions, threats, status and trends.
- Continue to support, encourage and promote stewardship of wetlands on private lands (e.g., Canada-Ontario Environmental Farm Plan, Conservation Land Tax Incentive Program, and Species at Risk Stewardship Fund).
- Explore the development of stewardship programs that support First Nation and Métis community studies, restoration and monitoring.
- Analyze and describe practical opportunities for public and private sectors to undertake wetland conservation projects, including development and communication of best management practices.
- Explore the development of multi-ecosystem (e.g., wetland, woodland, grassland) stewardship plans.

Strategic Direction – Knowledge

Decades of scientific inquiry have expanded our knowledge of wetlands, their important role on the landscape, and the ecosystem services they provide, but there is still much to learn. For example, there is a need to better understand the relationship between wetlands and uplands and implications for habitat connectivity, as well as the relationship between wetlands and ground and surface waters, which are important for source water protection. Further, there is a need to better understand what mitigation and restoration techniques are most effective, how traditional knowledge can improve understanding of wetlands, and the role wetlands play in ecosystem services related to climate change, such as carbon sequestration and flood attenuation.

Successful wetland management depends on ongoing monitoring and assessment to ensure that conservation activities are tailored to the dynamic nature of the landscape. Implementing robust monitoring and assessment of the condition and functions of Ontario’s wetlands is crucial to ensuring that Ontario’s efforts are making a difference. Actions under this strategic direction include support for ongoing research as well as improvements to monitoring and assessment of the area and quality of Ontario’s wetlands.

Goal: Increase knowledge about Ontario’s wetlands including their status, distribution, functions, and vulnerability.

Outcome: Better knowledge is available and used to make decisions to improve wetland conservation.



Photo: Open graminoid bog, Sam Brinker

Actions:

- Develop criteria and a framework to prioritize areas for improving wetland inventory and knowledge.
- Assess and improve the capability of existing tools and resources for mapping, describing and documenting change in the area, functions and condition of wetlands over time at various scales.
- Update and refine provincial wetland mapping to align with evaluation of policy and planning actions and targets.
- Establish a framework for determining priority areas and focusing efforts for conservation and restoration that considers the broader landscape context and provincial commitments (e.g., wetland loss, habitat connectivity, natural heritage systems, mitigation and adaptation to climate change).
- Support mapping and assessment of ecologically significant groundwater recharge areas and discharge to wetlands to provide information on water balances and sustainability.
- Continue to investigate current and emerging threats to wetlands and develop effective strategies to mitigate impacts on wetland functions.
- Support research into the development of effective prevention, detection, monitoring and control (mechanical, biological and chemical control) of invasive species in wetlands.
- Support research into understanding and quantifying how wetlands are responding to climate change (e.g. changes to their hydrologic functions, changes in their role to act as carbon sinks or sources and in their role to support aquatic and terrestrial habitats).
- Support research into the role of wetlands in adaptation strategies and climate resiliency (e.g. ecosystem services such as flood attenuation).
- Expand programs that assess risk and vulnerability of wetland species and ecosystems to climate change (e.g. Far North permafrost, peatland drying, changes in fire regime, etc.) to inform mitigation and adaptation efforts.
- Explore the feasibility of a carbon offsetting protocol for wetlands.
- Support research into developing methods and approaches for cumulative effects assessment on wetlands.
- Support research into the role that wetlands (existing, restored and constructed) can play in improving water quality (including phosphorus reduction capabilities) and managing water quantity for supply and natural hazard management.
- Enhance understanding of the reciprocal relationship between wetlands, ground and surface water features, and hydrologic functions (e.g. quantifying the role of groundwater in maintaining wetland function.)
- Support First Nation and Métis communities in collecting, storing and managing local and traditional ecological knowledge related to wetlands.
- Identify and better understand the functions and ecosystem services provided by wetlands as well as their economic value.
- Improve and develop new tools to assess and monitor wetland function within watersheds.
- Develop site-specific tools for assessing wetland function, condition and restoration success.
- Support research into the efficacy of terrestrial and riparian buffers in maintaining wetland conditions and functions.
- Enhance expertise and guidance for restoring wetlands (including constructed wetlands and green infrastructure) and thereby the success in restoring wetland functions and benefits.
- Increase capacity, support research and provide advice on the design of monitoring programs to track changes in wetlands and evaluate the outcomes of conservation and mitigation activities.
- Develop and implement a broad-scale monitoring program to assess trends in the quality and function of wetlands.

Strategic Direction – Partnership

Across Ontario, many public and private agencies, organizations and institutions are involved in the conservation of wetlands (e.g., governments, First Nation and Métis peoples and communities, conservation authorities, non-government organizations, local community interest groups, etc.). While the overall goals of these groups are often similar, their work is not always coordinated. The conservation of Ontario’s wetlands requires an integrated approach, and encouraging cooperation and supporting partnerships is essential to successful wetland conservation. Actions under this strategic direction include efforts to clarify roles and responsibilities, encourage improved communication, cooperation and coordination and work collaboratively with partners involved in wetland conservation.

Goal: Establish and strengthen partnerships to focus and maximize conservation efforts for Ontario’s wetlands.

Outcome: People, communities and organizations collaborate and work together to improve wetland conservation.



Photo: Dunlin feeding, Simon Dodsworth

Actions:

- Clarify roles and responsibilities of various agencies involved in wetland conservation to ensure wetland protection.
- Improve inter-agency cooperation and coordination to ensure that wetland programs and policies do not have conflicting objectives.
- Work collaboratively with partners to enhance coordination, leadership, outreach and learning about the importance of wetlands and wetland conservation actions.
- Enhance coordination within government to prioritize wetland conservation projects supported through funding initiatives.
- Support the efforts of land securement agencies in all sectors to protect and enhance wetlands.
- Continue to participate in partnerships such as the Ontario Eastern Habitat Joint Venture and other initiatives that work to promote and conserve Ontario's wetlands and that are important in a broader landscape context.
- Further develop conservation partnerships between the Ontario government, municipalities, First Nation and Métis communities, conservation authorities, the agricultural community, private landowners, environmental organizations and industry to share information, promote the value of wetlands, encourage conservation, implement best management practices, monitor change in wetland area and function and identify restoration opportunities.
- Continue to work with partners to address threats to wetlands (e.g., detection, monitoring, removal and control of invasive species, pollution control, etc.).
- Continue to work with partners to restore wetlands and their functions to support healthy, resilient ecosystems and communities.
- Build partnerships with the academic community to research effective techniques for wetland restoration and creation, and monitoring.
- Work with partners (e.g., academia, federal government) to monitor and assess carbon emissions and sequestration in wetlands (e.g., through current provincial efforts to develop an Ontario land use carbon inventory), as well as climate change adaptation functions of wetlands.
- Work with local governments, local public sector agencies, stakeholders, First Nation and Métis communities and interest groups to develop and implement regional and landscape level wetland conservation strategies to guide wetland conservation.

Strategic Direction – Conservation

Ontario has a broad range of policies and legislation to support wetland conservation. The integration and implementation of these tools remains a priority; however, improvements to Ontario’s current wetland conservation policies and implementation are also required. Improvements will result from reviewing the effectiveness of the provincial laws, regulations and policies to ensure the conservation of wetlands, identifying gaps and proposing improvements as soon as possible. Exploring the development and implementation of new policies to better conserve Ontario’s wetlands will also be important. Actions under this strategic direction include seeking opportunities to improve wetland policy and enhancing guidance for wetland conservation.

Goal: Develop conservation approaches and improve policy tools to conserve the area and function of Ontario’s wetlands.

Outcome: Ontario has a strong and effective foundation to conserve and stop the net loss of wetlands.



Photo: Working in a wetland, Joel Mostoway

Actions:

- Review provincial laws, regulations and policies, with the goal of strengthening Ontario's wetland policies.
- Integrate a clear and consistent definition of wetlands across policy.
- Support the development of policy tools to improve the conservation of all wetlands, including the protection of provincially significant, coastal wetlands and other locally and regionally important wetlands.
- Develop conservation approaches and policy tools to prevent the net loss of wetlands in Ontario, focusing on areas where wetland loss has been the greatest.
- Review and improve the method by which provincially significant wetlands are identified and continue wetland evaluations across the province.
- Promote and expand opportunities to enhance wetland conservation and restoration through the Drainage Act.
- Strengthen provincial level guidance for integrating wetland values in Environmental Impact Statements.
- Enhance policy and guidance for wetland conservation on Crown land, including resource management, land administration, environmental assessment and the role that can be played by land use planning.
- Develop and ensure that adequate policy guidance is available on incorporating wetland protection strategies in local planning (e.g., natural heritage system planning, consideration of wetlands in the development of land use policies addressing climate change mitigation and adaptation and planning for natural hazard management).
- Ensure that wetland conservation strategies and tools integrate climate change adaptation and mitigation considerations.
- Develop and implement policies and strategies to support climate change mitigation by sequestering and storing carbon in wetlands, consistent with actions in Ontario's Climate Change Action Plan.
- Continue and enhance protection of wetlands through the provincial Protected Areas System and other effective area-based conservation measures.
- Continue to support and strengthen Great Lakes policies, initiatives and other efforts for wetland conservation aligning with commitments made in domestic and binational agreements (e.g. Great Lakes Protection Act, Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health) and strategies (e.g., Ontario's Great Lakes Strategy).
- Develop best management practices for activities in proximity to wetlands (e.g., establish limits for surface and groundwater withdrawals, draining or infilling in or near vulnerable wetlands, in order to enhance the resiliency of these wetlands to change) and for wetland creation as part of green infrastructure or alternatives to traditional infrastructure to help build resilience and improve other ecosystem services.
- Support the identification of additional candidate wetlands for international recognition under the Ramsar Convention and/or other national/international programs (e.g., UNESCO Biospheres, Important Bird Areas, Western Hemisphere Shorebird Reserve Network, etc.).
- Integrate wetland restoration and planning efforts with other watershed planning efforts.
- Work with First Nation and Métis Peoples and communities to include local and traditional ecological knowledge in wetland conservation strategies and best management practices.
- Explore improvements to policies and approaches to encourage wetland conservation on private land (e.g., tax incentive programs).
- Integrate the economic value and the value of the ecosystem services provided by wetlands into decision-making (e.g., promoting green infrastructure alternatives to traditional infrastructure).
- Develop performance measures and publicly report on progress toward targets and implementing actions.
- Develop an implementation plan to prioritize actions and facilitate a coordinated approach to meeting targets.



Photo: Improving wetland mapping techniques, Regina Varrin

Wetlands defined in Ontario’s municipal land use planning policy

One of the action items in this Strategy is to integrate a clear and consistent definition of ‘wetlands’ across provincial policy.

The definition of wetlands that is used in the Provincial Policy Statement, 2014 (PPS) (OMMAH 2014) was originally developed for the Ontario Wetland Evaluation System (OMNR 2014). Both define wetlands in the following way:

“Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to or at the surface; in either case, the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water-tolerant plants. The four major types of wetlands are swamps, marshes, bogs, and fens.

Periodically soaked or wet lands being used for agricultural purposes, which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.”

The key points in this definition are that the land is sufficiently wet for long enough that the soils become waterlogged, resulting in the growth of water-dependent or water-tolerant plants.

The Ontario Wetland Evaluation System was created to meet the need for a standardized approach to map wetlands, assess their functions and determine their level of significance for purposes of municipal land use planning. Design of the system was overseen by a committee with representation from the provincial and federal government, with input from conservation authorities, academia, consultants and others. Development of the system began with a review of scientific literature and evaluation methods being used in other jurisdictions at the time, and involved extensive field-testing, consultation with experts, and statistical analysis. The resulting Ontario Wetland Evaluation System has been in use in ecoregions 6E and 7E since 1983, and was expanded in 1994 to include a northern manual for use north of 6E, up to and including ecoregions 2E and 2W. The



Photo: Moose in Algonquin Provincial Park, OTMPC

manuals have been updated over time, most recently in 2014 to include administrative updates and technical clarifications.

The Ontario Wetland Evaluation System is the only means to evaluate whether particular wetlands are provincially significant or not and to determine the boundaries of a PSW. The Ontario Wetland Evaluation System contains a set of rules for delineating boundaries based on the presence of wetland plants. The boundary between the wetland and upland areas is drawn where the relative vegetation cover is 50 per cent wetland. There are also rules for drawing the boundary between the wetland and open water in areas bordering lakes and rivers.

In some parts of the province, protection of wetlands goes beyond provincially significant wetlands. In 2014, the PPS was updated to include protection for all non PSW (Great Lakes) coastal wetlands in 5E, 6E, and 7E, unless no negative impacts can be demonstrated. The Ontario Wetland Evaluation System (OMNR 2014) and PPS (OMMAH 2014) define a coastal wetland as:

“Any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Marys, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or

any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected.”

Landscape-level plans, including the Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan, Greenbelt Plan and the Lake Simcoe Protection Plan, also provide protection for unevaluated wetlands, as well as wetlands that have been evaluated but did not meet the threshold for provincial significance. Wetlands in these plans are also defined by the presence of hydric soils and wetland plants, and in some cases, the definitions include wording to ensure that unevaluated wetlands can also be protected. Tools other than the Ontario Wetland Evaluation System may be used to map unevaluated wetlands.



Photo: Wetland restoration on a farm, Dave Jewell

Restoring Wetlands Using the Drainage Act

Historically, drainage for agriculture resulted in the loss of many wetlands across Ontario, North America and many parts of the world. Today Ontario's Drainage Act can be used creatively to restore wetlands and wetland functions.

The Drainage Act provides a municipally-focused regulatory process to engage landowners in a collective solution. Across southwestern Ontario, more than 40 projects under the Wetland Drain Restoration Project have allowed restoration of wetland functions to numerous provincially significant wetlands. This

process allows drainage superintendents, biologists, conservationists and landowners the ability to work together to improve wetlands and their associated benefits, while still maintaining legal outlet.

One example of how the Act helps restore wetlands is the Dry Creek Drain Wetland Restoration Project in Norfolk County. Under the guidance of an engineer's report, two environmentally friendly water control structures were installed, resulting in improved wetland function and water quality and quantity benefits to downstream landowners. The expansion of this work to other parts of Ontario provides an opportunity to enhance wetland restoration throughout the province.

Monitoring Our Success

To monitor the success of this Strategy, two overarching targets have been established:

1. By 2025, the net loss of wetland area and function is halted where wetland loss has been the greatest.
2. By 2030, a net gain in wetland area and function is achieved where wetland loss has been the greatest.

The areas where the targets are intended to apply generally include Southern Ontario where wetland loss has been the greatest, as well as other areas where considerable wetland loss may occur in the future. These areas may be refined as wetland inventory and knowledge is improved.

Baseline data for these targets has been established from the 2010 Southern Ontario Land Resource Information System (SOLRIS) data. The process of determining the area of wetlands in the province involves the analysis of time-series satellite imagery. It takes 5 years to acquire cloud-free imagery for the benchmark year, compile provincial data, and analyze and validate all wetland change events. By 2025 it will be possible to report on the area of wetlands south and east of the Ontario Shield in 2020. Likewise, in 2030, Ontario will be reporting on the area of wetlands in 2025.

Given these broad benchmarks, monitoring and assessment must provide information on the total area, function and condition of wetlands in the province. Tracking this information over time will provide evidence to determine whether or not the Strategy is having the desired effect and indicate if changes are required to the actions, the way they are implemented, or both.

To measure and report on these targets will initially be challenging, particularly in areas where Ontario's wetland inventory is incomplete or in need of updating. To date, there has not been a rigorous, systematic and standardized approach taken to assessing wetland condition or functions. Despite these obstacles, there are several actions outlined in the Strategy which allow for advancement in these areas in the near future. Together, these actions will lay the groundwork for measuring the success of the Strategy.

As part of monitoring the success of this Strategy, the Ontario government also commits to developing a performance measurement framework and reporting to the public on progress in implementing the actions in this Strategy as well as progress towards achieving the targets. Progress reports will be published every five years, beginning in 2020.



Photo: Restoring wetlands, Stephen May

Where We Go From Here



Photo: Surveying by canoe, Jason Mortlock

Ontario's commitment to wetland conservation is embedded in the actions described in this Strategy. These have been developed over time, in response to the growing pressures facing wetlands, and through an extensive engagement process. Some actions will be simple and straightforward to complete, while others will involve sequential steps, engage a number of partners and take time. Many actions support or align with other government priorities, such as biodiversity conservation and climate change mitigation. Further, as many wetlands are located on provincial Crown lands, the Ontario government has an opportunity to play a leadership role in the conservation of wetlands.

Resulting from shared legislative responsibility, several ministries have a responsibility for, or interest in, wetland management (e.g., Ministry of the Environment and Climate Change, Ministry of Agriculture, Food and Rural Affairs, Ministry of Municipal Affairs, Ministry of Northern Development and Mines, Ministry of Transportation). An implementation plan will be developed to prioritize actions, and coordinate an approach to meeting targets.

The areas where the targets are intended to apply generally include Southern Ontario (south of and east of the Shield) where historical loss has been the greatest. However, action will not be limited to areas where targets apply.

Implementation planning will include prioritizing where to improve wetland knowledge and mapping, and what types of action will take place in different parts of the province. Maintaining connectivity and functions will be the focus of work in some parts of the province, but restoration of wetlands and re-establishment of functions will be required where there are few wetlands remaining. Reporting on a 5 year cycle will allow us to adapt implementation planning on a regular basis and refine prioritization through improved wetland inventory mapping of area and function.

Many actions will also involve collaboration with municipalities, First Nation and Métis communities, conservation authorities, the agricultural community, industry, environmental organizations, and others. Continued public engagement, First Nation and Métis involvement, and the consideration of existing policy and land use planning frameworks in the province will also be important.

Following consultation and engagement with a variety of industry, academics, non-governmental organizations, stakeholders, First Nation and Métis Peoples and communities, and individual Ontarians, three actions in this Strategy have been prioritized above all others. Work to advance these actions will begin with the release of the Strategy. These actions represent clear needs for wetland conservation and will help Ontario achieve the goals outlined in the Strategy.

Action 1: Improving Ontario's Wetland Inventory and Mapping

Ontario's changing landscape and associated land use practices require updated information about the area, location and quality of existing wetland habitats. This information, coupled with wetland trend analysis and assessments, can help focus government actions and programs. Using updated wetland mapping information can assist in the development and implementation of land use policies and protocols and measure performance of those policies and protocols towards conservation objectives.

The Ontario government currently maintains a wetland inventory for the province that includes best available information about the location, area and significance of wetlands. This includes high-quality information collected through detailed field work as well as mapping based on air photo interpretation and satellite imagery. While this inventory is a good start, more current and detailed mapping and regular updating are required to better conserve wetlands.

Ontario's wetland inventory could be improved by implementing a series of activities that includes:

- Updating wetland mapping to align with policy and planning targets and enhancing mapping in areas in high growth zones and where wetland mapping is currently limited.
- Standardizing wetland mapping techniques to improve consistency.
- Implementing the latest technologies for improved mapping and remote sensing.
- Continuing to monitor wetland change and improving methods to detect and measure change over time.
- Incorporating climate change considerations.
- Evaluating how to include information collected by citizen scientists to enhance inventory and monitoring programs.



Photo: Wetland mapping, Jason Mortlock

Specific wetland inventory activities include:

- In 2018, prioritize areas under most pressure for refinement of mapping using remote mapping standards and/or wetland evaluations.
- In 2018, collaborate with partners and First Nation and Métis communities in the ongoing maintenance and improvement of wetland mapping and information.
- By 2020, conduct wetland evaluations and remote-mapping in identified priority areas.
- By 2020, complete mapping of all coastal wetlands.
- By 2020, complete updates of the Southern Ontario Land Resource Information System (SOLRIS) to allow reporting in changes on wetland area.
- By 2020, undertake development of a broad-scale monitoring framework for the assessment of trends in the quality and function of wetlands.

Improving Ontario's wetland inventory is a priority action in A Wetland Conservation Strategy for Ontario and will improve the availability and accessibility of wetlands data to lay the foundation for improved wetland conservation across the province.

Action 2: Creating No Net Loss Policy for Ontario's Wetlands

As Ontario's population grows and demands for resources increase, natural areas such as wetlands will continue to be threatened where human growth interests intersect with conservation interests. One option to prevent the net loss of wetlands in Ontario is the development of a wetland offsetting policy. As noted below, this will not reduce protection for those wetlands already protected by existing law and policy.

Wetland offsetting is an approach in which negative impacts on wetlands are offset by the intentional restoration or creation of new wetlands, which can provide positive environmental impacts of an equivalent or greater magnitude and kind. This approach is sometimes referred to as a 'net gain'. This type of policy is typically set within a mitigation hierarchy and involves the hierarchical progression of alternatives, including avoidance of impacts, minimization or mitigation of unavoidable impacts and offsetting of impacts that cannot be avoided. The Ontario government remains committed to offsetting only being used as a last resort.

The mitigation hierarchy is an expression of the value of leaving natural ecosystems intact and the risks and uncertainties inherent in human interventions aimed at minimizing disturbance and restoring, enhancing or constructing wetlands to create effective offsets.

Thoughtful work on the best way to conceive and implement a wetland offsetting policy is ongoing. Several jurisdictions in Canada and around the world have developed wetland offsetting policies, providing clear models and lessons learned that can provide information for the exploration of this type of conservation approach in Ontario.

Adopting a wetland offsetting policy in Ontario could provide a tool for better land use decisions and help to stop the net loss of wetlands in the province, particularly in areas where wetland loss has been greatest.



Photo: Duck banding in a wetland, Ministry of Natural Resources and Forestry

Key considerations in the development of the policy will be:

- Providing provincial oversight to improve conservation outcomes, while not reducing protection for those wetlands already protected by existing policy (e.g., provincially significant wetlands, coastal wetlands protected by the PPS, 2014).
- Understanding the types of land or resource use that would be subject to a wetland offsetting policy. This includes consideration of local and regional issues affecting wetlands, the variety of existing land use planning frameworks in the province, other permitting requirements and the need for compliance.
- Defining wetland functions, and identifying the types of wetlands and functions that can or cannot be offset. Some sites, features and habitats will be ineligible for offsetting based on their status (i.e., provincially significant wetlands, coastal wetlands protected by the PPS, 2014),

their vulnerability, or their irreplaceability (i.e., bogs and fens).

- Understanding and establishing equivalence or greater in offsetting, in particular, replacement of both area and function of the wetland.
- Determining/identifying the location of the wetland offset, including its proximity to the negative impact and its landscape context (e.g., within a subwatershed/watershed), and selecting a site where restoration success is optimized and will result in an improvement in ecosystem services.
- Confirming that wetland losses in the south should not be offset by gains in the north.
- Determining the duration of wetland offsets. This may be based on the duration of the negative impacts of the development project or require wetlands to be secured in perpetuity.
- Developing appropriate policy mechanisms for implementation.
- Identifying clear roles and responsibilities for implementation.
- Reviewing long-term results of wetland offsetting and restoration projects as well as the lessons learned from other jurisdictions.
- Establishing monitoring requirements to ensure that wetland functions are restored.

The Ontario government is committed to developing conservation approaches and policy tools to prevent the net loss of its wetlands and will seek input from municipalities, conservation authorities, conservation groups, private landowners, First Nation and Métis communities and stakeholders and partners in this process.

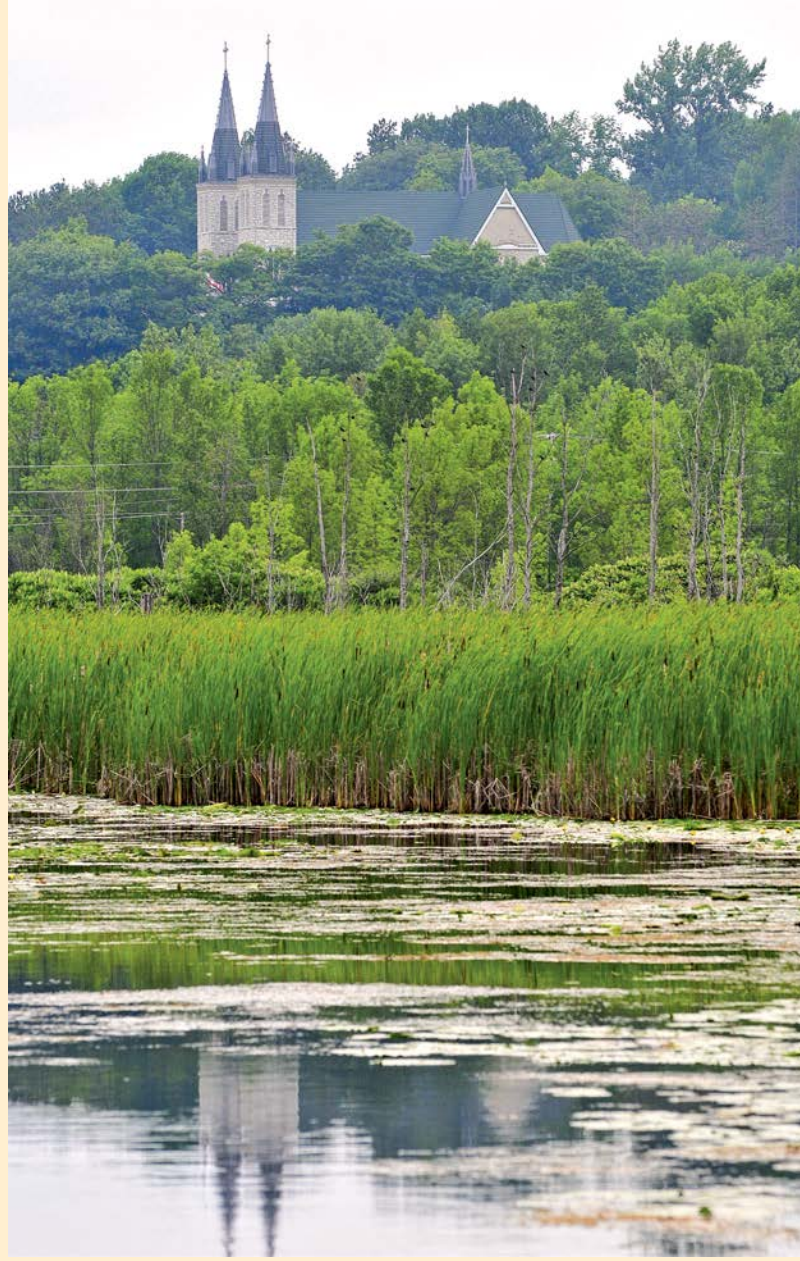


Photo: Urban wetland, OTMPC

Action 3: Improving Guidance for the Evaluation of Significant Wetlands

The Ontario Wetland Evaluation System (OWES) was originally created in the early 1980s to support Ontario's municipal land use planning process. The system was developed to standardize the evaluation of wetland values so that wetlands could be ranked relative to one another (OMNR 2014). The Ontario Wetland Evaluation System is recognized as the official provincial procedure to determine the wetlands that are provincially significant and to map their boundaries.

The Ontario Wetland Evaluation System provides a means of evaluating the relative importance of individual wetlands, based on perceived values in maintaining natural processes and providing benefits to society. It generates a numerical ranking of wetland values or functions that are grouped into four main categories:

- 1. Biological Component** recognizes that wetlands can differ in terms of productivity and habitat diversity.
- 2. Social Component** measures some of the direct human uses of wetlands, including economically valuable products (such as wild rice, commercial fish and furbearers), recreational activities and educational uses.
- 3. Hydrological Component** characterizes water-related values, such as natural storage capacity resulting in the reduction of flood peaks, protection against erosion, contributions to groundwater recharge and discharge and water quality improvements.
- 4. Special Features Component** addresses the geographic rarity of wetlands, the occurrence of rare species, ecosystem age, and habitat quality for wildlife, including fish.

The Ontario Wetland Evaluation System has now been in use for over 30 years. In that time, over half of the wetlands in southern Ontario and some high-value wetlands in northern Ontario have been evaluated.

The determination of wetland significance is now used to inform many more decisions. For example, wetland significance is considered during applications for renewable energy or aggregate extraction projects. Wetland significance, or other information collected during a wetland evaluation, can also be used by conservation authorities, during Crown land use planning, and when determining eligibility for programs such as the Conservation Land Tax Incentive Program.



Photo: Turtle tracking in wetland, Anna Sheppard

A review of the method for mapping and evaluating wetland significance will allow exploration of the following aspects:

- Developing more efficient, cost-effective methods of mapping and evaluation, without compromising the quality or accuracy of the OWES process.
- Incorporating recent advances in our knowledge about science and technology.
- Aligning classification of wetland type with other systems.
- Assessing whether some values that are not currently considered should be added, whether other values could be removed and whether some values should be re-assessed in light of new knowledge.
- Tailoring the process to the variety of land use planning frameworks in the province. For example, a unique approach will be required in the Far North, where First Nations and the Province work jointly to decide what lands will be designated as lands that are open for sustainable economic development.
- Improving the way in which local and traditional ecological knowledge and other First Nation and Métis values are incorporated and how to improve First Nation and Métis involvement in decision-making.
- Increasing clarity where current guidance is limited.



Photo: Bogbean Buckmoth, Regina Varrin

Much has been learned over the past 30 years of evaluating Ontario's wetlands. Information collected during past evaluations will be useful for investigating how evaluation guidance can be improved. Conservation of wetlands will be improved by making wetland evaluation results available to support informed decisions about land use and resource development.

Conclusion

Ontario is committed to wetland conservation and has established a variety of policies, programs and partnerships to conserve its wetlands; without continued action, however, these areas will face increasingly serious threats.

A Wetland Conservation Strategy for Ontario represents an important step forward in the conservation of Ontario's wetlands.

Focused around four key directions and associated goals, the Strategy offers a comprehensive suite of actions that the Ontario government is taking to conserve and restore wetlands across Ontario, and ensures that the ecosystem services they provide continue to benefit the people of Ontario for now, and for generations to come.

While the actions outlined will be undertaken by the Ontario government, all sectors are encouraged to work together to implement the Strategy so we can ensure that wetlands remain an enduring part of Ontario's landscape.



Photo: Sundew, Melinda Thompson

Glossary

Biodiversity: the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.

Carbon sequestration: the removal and storage of carbon from the atmosphere in carbon sinks (such as wetlands, oceans, forests or soils) through physical or biological processes, such as photosynthesis.

Climate change adaptation: an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects that moderates harm or exploits beneficial opportunities.

Climate change mitigation: an intervention intended to reduce adverse human influence on the climate system; it includes strategies to lower greenhouse gas emissions and to enhance greenhouse gas sinks.

Coastal wetland: any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Marys, St. Clair, Detroit, Niagara and St. Lawrence rivers); or any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected.

Conservation: actions that are intended to establish, improve or maintain good relations with nature. This can include protection, restoration, rehabilitation, management, stewardship and wise use.

Cumulative effects: changes to the environment over time as the result of combined effects from multiple activities and events.

Ecological processes or ecosystem function: the dynamic attributes of ecosystems, including interactions among organisms and interactions between organisms and their environment. Ecological processes are the basis for self-maintenance in an ecosystem.

Ecosystem: a dynamic complex of plant, animal and micro-organism communities and their physical environment functioning as an ecological unit.

Ecosystem resilience: the capacity of an ecosystem to adapt to changes and disturbances and still retain its basic functions and structures.

Ecosystem services: the services that humans derive from ecological functions, such as photosynthesis, oxygen production, water purification.

Ecoregion: a unique area of land and water nested within an ecozone that is defined by a characteristic range and pattern in climatic variables. A map of Ontario's ecoregions can be found at: <https://www.ontario.ca/document/ecosystems-ontario-part-1-ecozones-and-ecoregions>. Ecoregions are further divided into Ecodistricts.

Ecozones: geographic divisions of the landscape that separate coarse-scale enduring features. These features are based on key abiotic processes functioning at global and continental scales within which human and ecosystem functions are defined and constrained. There are three terrestrial ecozones in Ontario: Hudson Bay Lowlands, Ontario Shield, and Mixedwood Plains. The Great Lakes represent the only aquatic ecozone in Ontario.

Habitat: an area on which a species depends, directly or indirectly, to carry out its life processes, such as reproduction, rearing, hibernation, migration or feeding.

Hydrologic function: the functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment, including its relation to living things.

Hydrology: the science of water, its properties and laws and its distribution over the Earth's surface.

Invasive species: species that are not native to an area and whose introduction or spread threatens the environment, the economy or society, including human health.

Landscapes: complexes of ecosystems in geographically defined areas.

Landscape-level: a perspective that is above individual sites, stands or other local ecological units; usually refers to a scale that considers a mosaic of interconnected ecological units.

Natural heritage: natural features consisting of physical and biological formations or groups of such formations that are of outstanding value from the aesthetic or scientific point of view.

No net loss of wetlands: balancing wetland loss with mitigation and restoration efforts so that functions and services are maintained and the area remains constant or increases.

Peatlands: areas with peat soil more than 40 centimetres deep. Peat is formed where dead plant material is conserved for thousands of years due to a combination of permanent water saturation, low oxygen levels and low temperatures.

Precautionary approach: making decisions about the environment when risks are suspected but not known with certainty. The 1992 Declaration on Environment and Development states: “In order to protect the environment, the precautionary approach shall be widely applied by States [i.e., jurisdictions] according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

Protection: a commitment to protect individuals, a population or subpopulation or an ecosystem (or portions of one) from adverse impacts that may result in their loss.

Resilience: see Ecosystem Resilience.

Restoration: the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. Restoration can encompass a wide variety of actions, including removing a specific source of stress, restoring natural processes such as flooding and fire, removing invasive species or reintroducing extirpated native species. Restoration can also include elements of rehabilitation, reclamation and ecosystem creation (e.g., wetland creation).

Significant: in regard to *wetlands* and *coastal wetlands*, an area identified as provincially significant by the Ontario Ministry of Natural Resources and Forestry using evaluation procedures established by the Province, as amended from time to time.

Stewardship: an ethic that embodies cooperative planning and management of environmental resources in which individuals, organizations, communities and other groups actively engage in the prevention of habitat loss as well as the facilitation of resource restoration or rehabilitation, usually with a focus on long-term sustainability.

Watershed: the area of land that drains into a river, lake or other water body.

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

Wetland complex: a group of wetlands that are functionally linked to one another and no more than 750 metres apart.

Appendix 1: Ontario Government Grant and Incentive Programs to Encourage Conservation and Stewardship of Wetlands

Conservation Land Tax Incentive Program:

Administered by the Ministry of Natural Resources and Forestry, this program is designed to recognize, encourage and support the long-term private stewardship of Ontario's provincially important lands. It offers 100 per cent tax exemption to landowners who agree to protect provincially important natural heritage features on their property. Provincially significant wetlands are eligible under this program.

Land Stewardship and Habitat Restoration Program:

Administered by the Ministry of Natural Resources and Forestry, this program provides financial support up to \$20,000 for organizations and groups to undertake projects that support biodiversity conservation and fish and wildlife habitat restoration in Ontario, including wetland restoration.

Great Lakes Guardian Community Fund:

Administered by the Ministry of the Environment and Climate Change, this fund offers up to \$25,000 in grant funds for projects in the Great Lakes – St. Lawrence River basin that support at least one of three goals: (1) protect water quality for human and ecological health; (2) improve wetlands, beaches and coastal areas; (3) protect habitats and species.

The Canada-Ontario Environmental Farm Plan (EFP):

Administered by the Ontario Soil and Crop Improvement Association on behalf of the governments of Canada and Ontario, the Canada-Ontario Environmental Farm Plan provides education on wetlands and wildlife habitats and links to incentive funding as cost share assistance to Ontario farmers to implement beneficial management practices identified in their Environmental Farm Action Plan. Actions may include wetland restoration and management.

Growing Forward 2:

Administered by the Ontario Soil and Crop Improvement Association on behalf of the governments of Canada and Ontario, Growing Forward 2 provides cost-shared funding for a wide variety of projects, including “actions for biodiversity/habitat enhancements” such as wetland restoration.

Species at Risk Farm Incentive Program:

Administered by the Ontario Soil and Crop Improvement Association on behalf of the Ministry of Natural Resources and Forestry and Environment and Climate Change Canada, this program includes restoration and creation of wetlands as an eligible project type.

Species at Risk Stewardship Fund:

Created under the Endangered Species Act and administered by the Ministry of Natural Resources and Forestry, this program encourages people to become involved in protecting and recovering species at risk through stewardship activities. This can include restoration of habitats such as wetlands.

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