

Chapter 7

Ontario Wetland Policy Analysis



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7.1 Introduction

The ecological and economic benefits of wetlands have been well documented in academic literature; wetlands provide sediment and nutrient retention, water filtration, biochemical transformation, water storage during flooding events, carbon sequestration, and a habitat for many native species (Bradford 2016; Yang et al. 2016). An additional important aspect of wetlands is their ability to hold organic carbon stock, and in Southern Ontario, the levels of peat and organic carbon stock have been traditionally underestimated (Byun et al. 2018). Wetlands have been negatively impacted in Southern Ontario since the arrival of European settlers in the 1700s, and the primary stressors to wetlands in this region are urban development and agricultural expansion (Croft-White et al. 2017). Agricultural expansion which allows for wetland drainage is considered the leading driver of wetland loss in Ontario (Walters and Shrubsole 2003).

A central issue with the management of wetlands in Ontario is that existing policies, although apparently robust, have several gaps which pose challenges for effective wetland conservation. The Ontario provincial government outlines the policy instruments that have been implemented to restrict certain activities in wetlands (i.e., to foster wetland protection). These policy instruments include “provincial instruments that restrict certain activities in wetlands and provincial instruments that facilitate wetland conservation” (Government of Ontario 2020a, b). However, the Environmental Commissioner of Ontario has stated in the 2018 report that current approaches to wetland management are not working (Environmental Commissioner of Ontario 2018).

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There are several issues with the provincial management of wetlands including clarity regarding how provincial authorities should make decisions, lack of informed decision-making, enforcement, fragmented jurisdiction, communication between agencies, and determining the value of individual wetlands (i.e., only the most “valued” wetlands are afforded protection) (Schulte-Hostedde et al. 2007). Additionally, there are issues with lack of adherence and lack of enforcement by conservation authorities to the legislation outlined in the Drainage Act (Walters and Shrubsole 2003). The Ontario provincial government has also developed three major action items that begin to address some of the shortcomings mentioned above; however, there are some notable flaws to these major actions (Government of Ontario 2020a, b; Environmental Commissioner of Ontario 2018).

This paper argues that there are several shortcomings to the current policies used to facilitate wetland management, and improvement in these policies is needed to ensure effective wetland conservation. This paper will discuss the following: the context of this issue, a review of current wetland management approaches implemented by the Ontario provincial government, a critique of the current wetland management approaches, alternative approaches implemented in other North American regions and considerations for implementing these approaches in Ontario, and conclusions.

It is noted that this paper and the literature used to support this critique focus on wetland loss in Southern Ontario because (1) this is the most highly populated region in the province and (2) has experienced and continues to experience the most dramatic wetland loss compared to Northern Ontario (Byun et al. 2018).

Wetland management is complex and involves cooperation between the federal government, provincial government, municipal governments, conservation authorities, and landowners (Government of Ontario 2020a, b). This paper focuses on three central problems with the management of wetland conservation in Ontario: the general shortcomings of the provincial management, the limitations of the Drainage Act and its lack of enforcement by conservation authorities, and the flaws of the major actions to be implemented by the provincial government. Discussions included below will highlight limitations to the Drainage Act, the lack of adherence to the guidelines in the Drainage Act, and the lack of enforcement to these guidelines by conservation authorities. Additionally, to add to the discussion of the complexity of wetland management and conservation, this paper also discusses more generally the provincial wetland management and the shortcomings of existing policies. The more general shortcomings of existing policies are to varying degrees connected to the more pressing issue of wetland drainage.

7.2 Context

Wetlands are both economically and ecologically important, and they provide a habitat for many ecologically important species, prevent erosion, reduce the impacts of flooding events, maintain water tables, and facilitate water filtration (Greb et al. 2006). In the province of Ontario, the economic benefits that wetlands provide are

estimated to be at least \$14 billion, and they provide a reduction in costs associated with flooding events by approximately 38% (Troy and Bagstad 2013; Moudrak, et al. 2017). In Southern Ontario, wetland loss is estimated to be at 68% (since the arrival of European settlers) (Bradford 2016). There are several anthropogenic drivers of wetland loss including agricultural drainage, conversion for fish production and logging, construction (e.g., dams and canals), peat extraction, and urban and suburban development (van Asselen et al. 2013). However, wetland drainage for the purpose of agricultural expansion is the leading driver of wetland loss in the province and contributes to an estimated 81–85% of wetland loss (Walters and Shrubsole 2003).

Wetland drainage is an important aspect of agriculture, with the intention of improving the productivity of the land (Walters and Shrubsole 2005). Wetland drainage is done to increase crop production, and this is accomplished by creating an environment where agricultural vegetation is better able to increase nutrient uptake (Zucker and Brown 1998). However, wetland drainage for agricultural expansion has several direct and indirect environmental consequences including habitat loss, water quality reduction, hydrologic alteration, and increases in sediment, phosphorus, and nitrogen runoff (Blann et al. 2009).

7.3 Current Approaches to Wetland Management in Ontario

There are several policies in the province of Ontario that aid in wetland management including 20 pieces of legislation, which are implemented by a provincial agency, federal departments, and provincial ministries, 36 conservation authorities, and 444 different municipalities (Government of Ontario 2020a, b). This section outlines the existing provincial wetland conservation Acts and policy instruments, the role that conservation authorities play in wetland conservation under the Conservation Authority Act and the Drainage Act, and the wetland major actions to be implemented by the provincial government.

7.3.1 Provincial Wetland Conservation Acts and Policy Instruments

The policy instruments that currently aid in the protection of wetlands include the Planning Act, the Niagara Escarpment Planning and Development Act and Plan, the Oak Ridges Moraine Conservation Act, the Greenbelt Act, the Places to Grow Act, the Lake Simcoe Protection Act, the Conservation Authorities Act, the Environmental Protection Act, the Crown Forest Sustainability Act, the Public Lands Act, the Lakes and Rivers Improvement Act, and the Water Resources Act (Government of Ontario 2020a, b).

In addition to the Acts, mentioned above, that aid in the protection and conservation of wetlands is the Drainage Act, which regulates wetland drainage in the province of Ontario. Within this Act, “municipalities are legislated to maintain and

repair drains and to respond to petitions for new drainage systems [and] under Section 28 of the *CA Act*, conservation authorities (CAs) regulate development in or adjacent to watercourses, wetlands, the shoreline of the Great Lakes-St. Lawrence River System or inland lakes, river or stream valleys, hazardous lands and other areas” (Government of Ontario 2020a, b). This Act, coupled with various statutes, provides the provincial government statutory authority over private property (in regard to drainage) and authority over public lands and natural resources (Walters and Shrubsole 2005).

7.3.2 Ontario Conservation Authorities: The Conservation Authority Act and the Drainage Act

As mentioned previously, there are several Acts and policy instruments that have been implemented by the provincial government to aid in wetland conservation. Outlined in the Conservation Authority Act (and supported through the Drainage Act) is a set of regulations which give power to conservation authorities throughout the province to aid in wetland conservation. This Act was amended in 1998 to establish consistency between different conservation authorities throughout the province, and this amendment ensured that all conservation authorities were regulating all water bodies including wetlands. The role that conservation authorities play in wetland conservation is (1) ensuring that the policies under the Policy Act are upheld; (2) ensuring permission is granted to landowners before an area is developed if development may lead to erosion, pollution, dynamic beaches, or flooding; and (3) to regulate any changes, diversion, straightening, or interfering development that may take place on any water body including wetlands (Conservation Ontario 2020).

7.3.3 Wetland Conservation Major Actions

Included in the Ontario provincial government’s Wetland Conservation Strategy are three major actions aimed at preventing the further degradation of wetlands in the province, and they are outlined below.

1. Improving Ontario’s Wetland Inventory and Mapping: This action aims to pair wetland location area and quality data with trend analysis to provide a more accurate understanding of the location and extent of wetlands throughout the province. This information will be used to measure and improve land-use protocols and policies. The Ontario provincial government recognizes that there is room for improvement in their current wetland map inventory and notes that mapping techniques need to be updated and standardized and incorporate new information like climate change scenarios (Government of Ontario 2020a, b).

2. **Creating a No Net Loss Policy for Ontario's Wetlands:** The purpose of this action is to implement a wetland offsetting policy which will allow for the creation of new artificial wetlands to replace wetlands lost to development and drainage. This action recognizes that due to the sensitivity of many ecosystems, many wetlands will be ineligible for the offsetting policy. Additionally, important considerations of this policy include recognition that offset wetlands must replicate an equal than or greater area and function of the original wetland, provincial oversight must be provided, and only certain types of land use and resource extraction would qualify for wetland offsetting (Government of Ontario 2020a, b).
3. **Improving Guidance for the Evaluation of Significant Wetlands:** This action will continue to use the Ontario Wetland Evaluation System (OWES) created in the 1980s to identify provincially significant wetlands. This system uses a numerical ranking system to rank wetlands based on their natural processes and their societal value. The continued use of this system allows for the merging of new and existing information on wetlands in the province and for the province to use this information for informed decision-making (Government of Ontario 2020a, b).

7.4 Critique of Current Approaches

Although it appears that wetland management is given adequate attention and resources by the Ontario government, there are still several shortcomings of the provincial management of wetlands. This section provides a critique of the provincial management of wetlands, the Drainage Act and limitations faced by conservation authorities, and limitations to the major actions that the provincial government is currently working.

7.4.1 Critique of Provincial Management

As mentioned previously, based on the number of Acts and policy instruments implemented by the Ontario provincial government, it appears that there is sufficient action being taken by the province to ensure wetland conservation is adequately managed in Ontario. However, there are several shortcomings in the provincial management of wetlands including lack of informed decision-making, determining the value of individual wetlands (i.e., only the most "valued" wetlands are afforded protection), fragmented jurisdiction, clarity regarding how provincial authorities should make decisions, enforcement, and communication between agencies (Schulte-Hostedde et al. 2007).

The shortcomings outlined by Schulte-Hostedde et al. (2007) are echoed by the 2018 Environmental Commissioner of Ontario report. This report emphasizes that

despite current efforts from the provincial government, wetlands in Ontario continue to be destroyed (Environmental Commissioner of Ontario 2018).

Regarding lack of informed decision-making, a major shortcoming highlighted in the 2018 report is that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) fails to actually track the impacts of agricultural drainage on wetlands and cannot provide sufficient data on the extent and number of wetlands lost to agricultural drainage in the province. Additionally, the location and extent of peat and topsoil extraction (which represent about 7% of wetland loss) are also not tracked in the province, and there is actually no existing province-wide policy that prohibits peat and topsoil extraction (Environmental Commissioner of Ontario 2018).

Regarding the value of individual wetlands, the 2018 report highlights a flaw that is important to acknowledge: “legal protection to wetlands applied only to wetlands that have been identified as ‘significant’” (Environmental Commissioner of Ontario 2018). It is required that municipalities map all provincially significant wetlands (PSWs) and prohibit destruction of PSWs before applications for development or drainage are accepted. However, the central problem with this system is that this lengthy, labor-intensive, and expensive evaluation process leaves many wetlands unprotected. Additionally, wetlands are deemed either provincially significant or not provincially significant, meaning that wetlands that score just below the significance threshold are not afforded any greater protection than those which score well below the significance threshold (Environmental Commissioner of Ontario 2018). In Ontario, wetlands are evaluated through the Ontario Wetlands Evaluation System (OWES) which scores wetlands on over 50 variables to determine their functional significance and maps wetland extent through aerial photographs, as well as field and mapping analysis. This process, in addition to being lengthy, labor intensive, and expensive, often fails to account for small wetlands (less than 0.5 ha) because they are more challenging to map (Environmental Commissioner of Ontario 2018). The 2018 report discusses that a possible solution to this particular shortcoming is to flip this policy (or reverse the onus), meaning that all wetlands would be afforded the title of “significant” until proven otherwise (Environmental Commissioner of Ontario 2018).

Clarity regarding how provincial authorities should make decisions and jurisdictional fragmentation is another issue with wetland management that requires improvement. The 2018 report discusses issues with the Provincial Policy Statement (PPS) and highlights that it provides only limited protection and only addresses the issue of development on wetland loss. The lack of information in the PPS has led to a disparity in how conservation authorities and land-use planners interpret the PPS guidelines. It is noted that the PPS has unclear wording which has led to differentiation in how jurisdictions interpret existing versus new agricultural land, and what constitutes “development.” Additionally, the PPS guidelines only apply to PSWs, meaning that wetlands scoring below the significance threshold are not afforded any protection under the PPS (Environmental Commissioner of Ontario 2018). This problem is exacerbated by the lack of available information and challenges with the current system used to identify PSWs discussed previously (Environmental Commissioner of Ontario 2018).

The lack of enforcement and communication between different agencies is highly connected to limitations faced by conservation authorities throughout the province. Even though the Conservation Authorities Act was amended in 1998 to establish consistency between different conservation authorities throughout the province, inconsistencies and conflicting priorities remain (Conservation Ontario 2020; Environmental Commissioner of Ontario 2018). These problems, highlighted in the 2018 report, include lack of consistency with how conservation authorities exercise their powers, conflicting priorities between conservation authorities, inconsistent resource restraints, vague language used to guide conservation authorities, and an overall lack of guidance from the provincial government (Environmental Commissioner of Ontario 2018). The Conservation Authorities Act, used to guide how conservation authorities enforce wetland conservation, contains vague language that discourages the enforcement of wetland protection and creates challenges for conservation authorities in determining the extent to which wetland drainage and filling activities may be regulated or enforced. Additionally, the language used in the Conservation Authorities Act creates challenges in conservation authorities determining if any interference with a wetland has actually occurred. Requests from conservation authorities for the provincial government to provide an adequate list or definition of activities that interfere with wetlands, as well as an adequate definition of what constitutes a wetland, have not been granted (Environmental Commissioner of Ontario 2018). These challenges faced by conservation authorities mean that they are unable to “regulate threats to all wetlands and all threats to wetlands” (Environmental Commissioner of Ontario 2018).

Overall this report highlights that current approaches to wetland management are not working; agricultural drainage continues to be the leading cause of wetland depletion in the province; and there is a great deal of variance with how conservation authorities regulate wetlands, and a struggle faced by conservation authorities is the lack of provincial direction (Environmental Commissioner of Ontario 2018).

7.4.2 Critique of the Drainage Act: Limitations Faced by Conservation Authorities

As mentioned previously, wetland drainage is regulated by the Ontario provincial government under the Drainage Act. In order for landowners to acquire permission to drain water (e.g., a wetland) from their land, the Drainage Act requires that they follow the 38 steps outlined in the drainage legislation (including providing signed petitions, gaining approval from their local council, resolving all appeals, and gaining approval from the Ministry of Agriculture, Food and Rural Affairs) and continue to follow the maintenance, repair and improvement, and abandonment of a drain or part of drain requirements (Ministry of Agriculture, Food and Rural Affairs 2020).

However, a central shortcoming of the Drainage Act is there are no direct penalties or incentives in place that actually prevent agricultural wetland drainage

(Walters and Shrubsole 2003). This is a central problem with managing the impacts of agricultural drainage on wetland loss; there is an expectation that farmers obtain permission to drain water from their land; however, in practice this does not always happen (Cortus et al. 2009).

The current legislation outlined in the Drainage Act coupled with the shortcomings of the provincial government and limitations faced by conservation authorities throughout the province show that the current system for regulating wetland drainage is not working. Landowners are expected to adhere to the guidelines outlined in the Drainage Act; however, this does not always happen, and conservation authorities face many limitations (discussed previously) which add additional challenges to enforcing these regulations (Ministry of Agriculture, Food and Rural Affairs 2020; Cortus et al. 2009; Environmental Commissioner of Ontario 2018). Subsequently, the Environmental Commissioner of Ontario report argues that private landowners must be encouraged to implement wetland stewardship on their land (Environmental Commissioner of Ontario 2018).

7.4.3 Critique of Major Actions

Outlined previously were the major actions aimed at preventing the further degradation of wetlands in the province, which included improving Ontario's wetland inventory and mapping, creating no net loss policy for wetlands in Ontario, and improving guidance for the evaluation of significant wetlands. Although these actions may improve the management of wetlands in Ontario, there are some issues that are important to acknowledge (Government of Ontario 2020a, b).

First, regarding improvements to Ontario's wetland inventory and mapping, there is not any noteworthy criticism to be discussed. The limitations of mapping wetlands are highlighted in the Environmental Commissioner of Ontario's 2018 report, which discusses that mapping and creating an inventory of wetlands is a lengthy, labor-intensive, and expensive process which often fails to account for small wetlands (Environmental Commissioner of Ontario 2018). These limitations are acknowledged by Ontario's wetland inventory and mapping action item (Government of Ontario 2020a, b).

Second, regarding the creation of a no net loss policy for wetlands in Ontario, there are some limitations to this process that are important to acknowledge. The Nature Conservancy of Canada highlights problems with no net loss strategies and argues that these strategies rarely replicate the same features and functions that were initially in place. They often fail to fully replicate the complexity of the ecology or ecosystems lost, the time between wetland loss and new wetland formation has a lag time which often results in net biodiversity loss, and they often fail to prevent the loss of species at risk (Nature Conservancy of Canada 2020).

Third, regarding the improvement of guidance for the evaluation of significant wetlands, this major action outlined by the provincial government fails to account for the Environmental Commissioner of Ontario's report recommendation. As

stated previously, the 2018 report advises to “reverse the onus” or, in other words, allow all wetlands to be afforded the title of “significant” until proven otherwise (Environmental Commissioner of Ontario 2018). However, the improvement of guidance for the evaluation of significant wetlands’ major action calls for the continued use of the Ontario Wetland Evaluation System (OWES) (Government of Ontario 2020a, b). As mentioned previously, this business as usual use of the OWES will continue to jeopardize the conservation of many wetlands throughout the province (Environmental Commissioner of Ontario 2018).

7.5 Alternative Approaches

This paper has outlined several problems with the management of wetlands in Ontario including shortcomings of the provincial government (i.e., lack of informed decision-making, determining the value of individual wetlands, fragmented jurisdiction, clarity regarding how provincial authorities should make decisions, enforcement, and communication between agencies) (Schulte-Hostedde et al. 2007), shortcomings of the Drainage Act and limitations faced by conservation authorities (i.e., lack of adherence from landowners and lack of enforcement by conservation authorities) (Cortus et al. 2009; Environmental Commissioner of Ontario 2018), and shortcomings of major actions to be implemented by the provincial government (i.e., improving Ontario’s wetland inventory and mapping, creating no net loss policy for wetlands, and improving guidance for the evaluation of significant wetlands) (Government of Ontario 2020a, b).

When critiquing the shortcomings of provincial wetland management, it should be noted that balancing the management of wetland with economic, societal, and other environmental concerns is highly a complex undertaking. It is understandable that a perfect system for wetland management is not in place in Ontario and shortcomings of the provincial management of wetlands are expected. Rather than providing recommendations that aim to resolve all of the criticisms discussed, this section aims to discuss alternative approaches to wetland management that have been used in other regions that may be applied to the province of Ontario.

As discussed previously, a major shortcoming to the Drainage Act is the lack of adherence from landowners and the lack of enforcement to this legislation. A possible solution to this problem, which has been implemented in the United States, is the introduction of voluntary programs which give landowners incentives to restore or conserve wetlands. The Wetlands Reserve Program in particular has focused on optimizing wetland functions and values as well as wildlife habitat in every agricultural acreage enrolled in their program. Programs like this have been highly successful in restoring wetlands and increasing wildlife habitat (Benson et al. 2018). An additional successful strategy of wetland restoration and conservation exists in Connecticut in the United States. In this state, there is a bottom-up approach to the management of wetlands where the Connecticut Inland Wetlands and Watercourses Act provides regulatory guidance but has given jurisdiction of land-use activities

surrounding wetlands to local towns and municipalities. Within this system, impacts from agricultural activities on wetlands have actually been very small, and the natural resources have been managed in an environmentally sustainable manner (Owens and Zimmerman 2013). In regard to implementing voluntary programs such as these in Ontario, it would be important to provide landowners with enough information to understand the importance of wetland conservation. A study conducted by Nebel and others (2017) sought to better understand which factors contribute to environmental behavior changes in landowners in southwestern Ontario. When looking at landowners' likelihood of entering a wetland enhancement program to either restore or conserve wetlands on their property, this study found that motivation to enroll was enhanced when "access to more information on how the decline in wetlands area affects them personally [compared to] public recognition as the least motivating factor" (Nebel et al. 2017). Additionally, this study found that monetary incentives were less likely to motivate landowners to enter a wetland enhancement program and likelihood of enrollment was higher if the landowners relied on their land as their primary source of income (Nebel et al. 2017).

Another example of an area which has experienced historical massive wetland loss which for the past 30 years has adopted more environmentally conscious and sustainable wetland management is the Florida Everglades. Drainage of the Florida Everglades has taken place as early as the 1880s with the state providing drainage contracts to several investors to facilitate economic expansion (Glenn 1999). However, in response to the increase of several environmental issues (e.g., water quality degradation) exacerbated by the drainage and therefore loss of the Florida Everglades, the use of adaptive management and adaptive governance has improved the overall functionality and increased the extent to this extensive wetland area (Gunderson and Light 2005). Adaptive governance acknowledges the complexity of managing a system (like wetlands) and integrates decision-making, science, and policy. This form of governance prepares for changes in management strategies and allows for the flexibility to deal with challenges that would traditionally impede adaptive management. Adaptive management is a form of resource management that uses scientific approaches and experiments to test policies and accounts for the dynamic nature of systems like wetlands. Although the Florida Everglades are far from being restored to their original extent, the implementation of adaptive management and adaptive governance strategies has significantly improved their functionality and extent (Gunderson and Light 2005).

In addition to these approaches to wetland management that have already been implemented and enhanced wetland conservation and restoration in their respective regions, there is an additional study that aims to highlight strategies to wetland management that may be implemented to improve wetland conservation. This study was conducted by Clare and others (2011), and it discusses the importance of implementing watershed-based planning, comprehensive economic and social valuation of wetlands, and long-term citizen-based monitoring schemes (Clare et al. 2011). Watershed-based planning uses a broad landscape context for wetland management which allows for large-scale systematic conservation planning (SCP), a framework that facilitates regional decision-making and landscape planning. SCP can be highly

beneficial as it allows for a variety of perspectives to be included in the management process, and it allows for local and regional wetland management to work in tandem (Clare et al. 2011). Comprehensive economic and social valuation of wetlands allows for the true economic cost of wetland loss to be taken on by the proponent promoting the wetland loss, rather than the public. This process does so by “incorporating economic and social valuation processes into wetland permit approvals [that] may help link the desired ecosystem goods and services to benefit cost analyses of areas being considered for development” (Clare et al. 2011). Long-term citizen-based monitoring is a type of program that allows local citizens to aid in monitoring and managing local wetlands. This program would encourage citizen scientists to record and submit data on local wetlands and would provide a better understanding on the status and health of wetlands, and it also would also empower citizens to engage in local stewardship and put pressure on politicians to practice wetland conservation and restoration (Clare et al. 2011).

Strategies like implementing voluntary wetland conservation programs, adaptive management and adaptive governance, watershed-based planning, comprehensive economic and social valuation of wetlands, and long-term citizen-based monitoring schemes are all tools that could be used in Ontario to both improve the general provincial management of wetlands and address the issues of lack of adherence and lack of enforcement to the Drainage Act.

7.6 Conclusion

The economic and ecological importance of wetlands is well understood; however, development and agricultural expansion continue to facilitate wetland loss (Greb et al. 2006; Bradford 2016; van Asselen et al. 2013; Walters and Shrubsole 2003). Wetland drainage continues to be the leading driver of wetland loss in the province of Ontario, and there are several issues with approaches to wetland management that allow for this problem to continue (Walters and Shrubsole 2003; Environmental Commissioner of Ontario 2018; Cortus et al. 2009). This paper has argued that there are several shortcomings to the current policies used to facilitate wetland management, and improvement in these policies is needed to ensure effective wetland conservation.

The provincial management of wetlands includes several conservation Acts and policy instruments aimed at conserving and restoring wetlands, conservation authorities have been granted powers (through the Conservation Authority Act and the Drainage Act) to aid in wetland conservation, and the provincial government has proposed three major actions aimed at preventing further degradation of wetlands in the province (Government of Ontario 2020a, b; Conservation Ontario 2020). However, this paper has highlighted several shortcomings of the provincial management of wetlands, the limitations faced by conservation authorities, the lack of adherence of landowners to comply with the guidelines outlined in the Drainage

Act, and the flaws of the major actions to be implemented by the provincial government (Environmental Commissioner of Ontario 2018).

This paper has also discussed several strategies (implementing voluntary wetland conservation programs, adaptive management and adaptive governance, watershed-based planning, comprehensive economic and social valuation of wetlands, and long-term citizen-based monitoring schemes) that may aid in resolving some of the shortcomings discussed.

It is acknowledged that wetland management is highly complex and involves many actors. This paper has not aimed to provide solutions to all of the issues raised, but rather to highlight several strategies that either have been successfully implemented in other regions or in theory have the potential to be implemented in Ontario with the goal of improving wetland management in the province. The hope for this paper is that it provides a broad understanding of the central shortcomings of wetland management in Ontario. The economic and ecological significance of wetlands have historically been highly undervalued, and the current gaps in wetland management indicate that the importance of wetlands is still not fully appreciated.

Many of the issues discussed in this paper are not unique to Ontario, wetland loss is a global problem that has existed for over 100 years, and in more recent years, wetlands have experienced a greater loss (between 1950 and 2008) (Wójcicki and Woskowicz-Ślęzak 2015). Like in Ontario, the primary factors that contribute to wetland loss globally are agricultural expansion and urban development (Hu et al. 2017). Beyond highlighting the shortcomings that allow for continued wetland degradation in Ontario, additional goals of this paper are to (1) acknowledge that management issues seen in Ontario are likely seen in other governments around the world and (2) discuss strategies to aid in these issues that may also be applied to other governments around the world.

Wetlands are incredibly important at both local and global levels, and water purification, flood management, storm protection, and providing a habitat for many important species are just some of the functions that wetlands provide (Mao et al. 2018). Wetlands are considered multiple-value systems because of the multiple processes that they perform that are valued by humans (Mitsch and Gosselink 2000). It is highly important that the Ontario provincial government continues to implement policies that facilitate wetland conservation and restoration and also make improvements to existing management strategies that will allow for improvement in wetland conservation and ultimately allow for significantly fewer wetlands to be lost to anthropogenic activities.

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