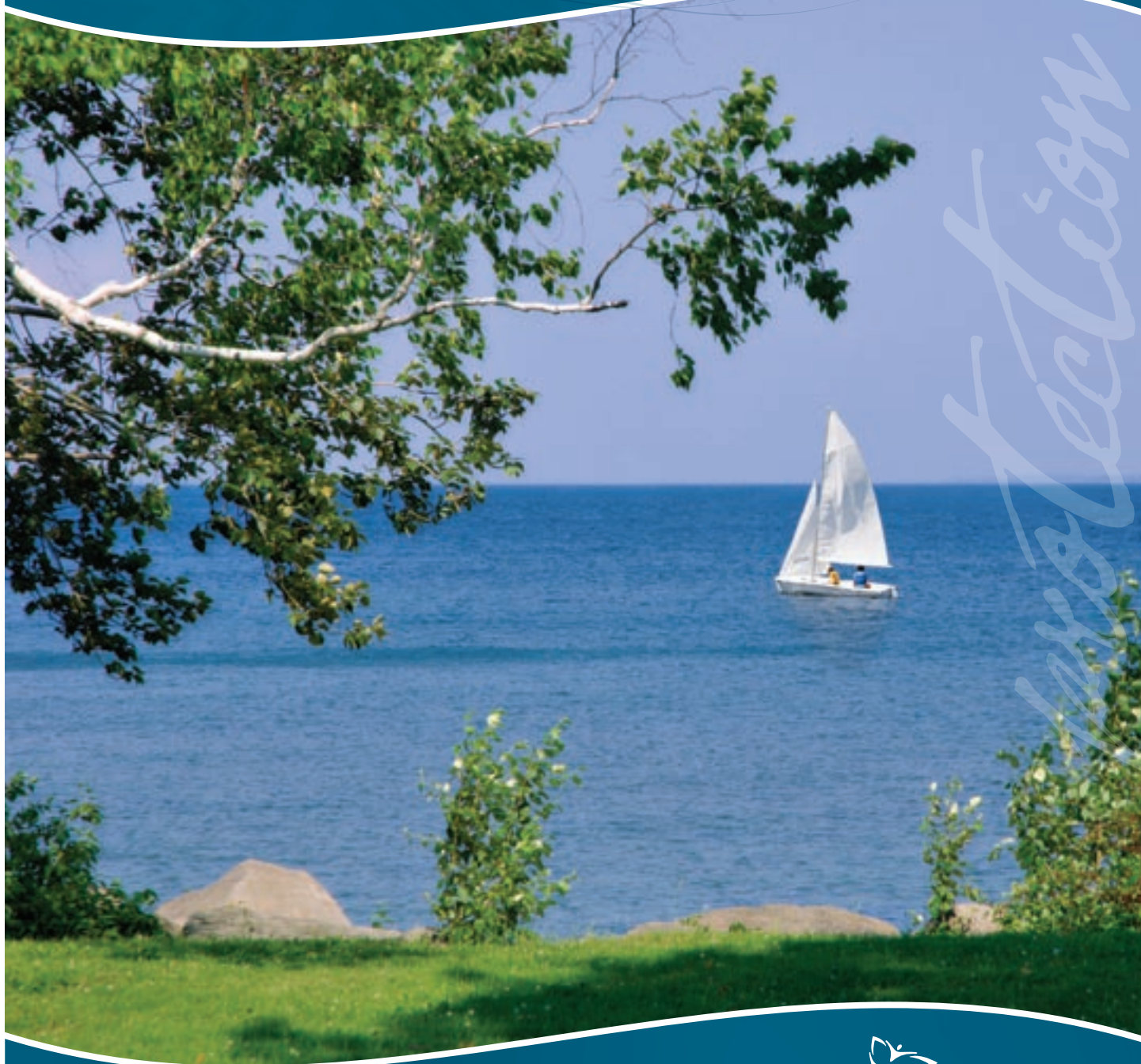


Lake Simcoe Protection Plan



Protecting our environment.



Ontario

July 2009

Lake Simcoe Protection Plan

A decorative graphic consisting of two overlapping, wavy, light gray lines that sweep from the left side of the page towards the right, positioned below the title.

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The Lake Simcoe Protection Plan was prepared and approved under the Lake Simcoe Protection Act, 2008, to take effect on June 2, 2009.

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vision

We believe ...

that the lake is life and the health of the lake determines the quality of life.

We see a *Lake Simcoe watershed* ...

where a healthy environment provides the foundation for healthy communities, healthy people and a healthy economy

where the well-being of diverse life forms – fish, wildlife, plants and human beings are enhanced

where we protect our natural environment for future generations

where natural shorelines are maintained and where *development* is well planned and ecologically sound

where citizens, governments, businesses and industries are stewards of the land, water and natural heritage

where there is greater cooperation, leadership and responsibility among all parties to protect the *Lake Simcoe watershed* for present and future generations

where our children can take their children to the beach and our grandchildren can take their grandchildren fishing and canoeing.



Chapter 1

Introduction

chapter one

ECOLOGICAL HEALTH OF LAKE SIMCOE AND ITS WATERSHED

The *Lake Simcoe watershed* contains significant natural, urban and agricultural systems including parts of the Oak Ridges Moraine and the Greenbelt. It also holds provincially-significant wetlands, woodlands, and prime agricultural areas, including specialty crop areas such as the Holland Marsh.

Ontarians have made clear their support for a comprehensive plan to protect and restore the ecological health of Lake Simcoe and its watershed. There are serious environmental problems that demand our attention and our collaboration to find solutions.

The *Lake Simcoe watershed* has experienced a wide range of interrelated pressures affecting the watershed – excessive nutrients, pollutants, *invasive species*, impacts of climate change, and increasing pressures from human activities.

The last four decades of research, monitoring, and scientific studies show how human-related activities, including urban and rural uses, recreation and agriculture, have impaired the health of the *Lake Simcoe watershed* ecosystem through direct and indirect changes. The threats include:

- degraded water quality due to excessive nutrients, such as phosphorus, contaminants, and pathogens, that directly or indirectly affect the health of the ecosystem and the suitability of the water for recreational uses;
- newly introduced species, such as zebra mussels that compromise the condition and equilibrium of the ecosystem and its resistance to other stresses;
- emerging threats, such as climate change, that also affect the condition, equilibrium, and resistance of the ecosystem;

Stresses from Human Activities

Human activities have influenced the *Lake Simcoe watershed* ecosystem for more than 200 years and *development* has changed the natural landscape, the composition and quality of vegetative cover and interfered with natural *ecological functions*. *Wetlands* and natural areas have been lost, fragmented and/or degraded. The loss of natural areas has reduced greenspace and the *biodiversity* of the watershed and has had negative impacts on the quality and quantity of water and quality of life.



Stresses from Phosphorus

Phosphorus is a key water quality concern in Lake Simcoe. While some phosphorus is required to support a healthy aquatic ecosystem, too much of this nutrient leads to excessive growth of plants. When these plants decay, oxygen that is required by fish and other aquatic species is depleted. There is little evidence in the past several decades of natural recruitment of lake trout or lake whitefish attributed primarily to low *dissolved oxygen* levels in the *hypolimnion* of the lake. The continued existence of these fish species in the lake is almost entirely due to a hatchery stocking program. Although reductions in phosphorus have led to improved oxygen conditions in the lake, the improvements are not yet sufficient for the fish to fully sustain themselves naturally.

- loss and fragmentation of sensitive natural areas and habitat, such as shorelines, *wetlands*, streamside areas, or forested lands, directly affecting the health of the watershed ecosystem;
- water quantity changes that alter ecosystem function, the quality and availability of aquatic habitats, as well as the amount of water available for human uses; and
- other human pressures, such as fishing and other resource uses, that may remove key resources from the ecosystem beyond its capacity to replenish itself.

Some of these challenges are not unique to this lake, but Lake Simcoe has particular characteristics that need a targeted plan to address its specific needs.

General Authority

As part of the government's overall strategy to protect and restore the ecological health of the *Lake Simcoe watershed*, the Lake Simcoe Protection Act, 2008 (Act) was passed by the Legislature and received Royal Assent in December 2008. This Act provides the authority for the establishment of and amendments to a Lake Simcoe Protection Plan.

This Plan generally applies to the *Lake Simcoe watershed*, which is defined in the Act as Lake Simcoe and the parts of Ontario, the water of which drains into Lake Simcoe. The *General Regulation* made under the Act provides a description of the boundaries of the watershed. The Act also allows policies in relation to research and monitoring to apply to areas outside of the watershed for the purpose of determining whether activities in those areas directly affect or indirectly affect the ecological health of the *Lake Simcoe watershed*. Future amendments to the Plan could apply certain policies of the Plan to areas outside of the watershed. Such amendments must be made in accordance with the requirements of the Act.

Invasive Species

Invasive species are one of the greatest threats to Ontario's waters, *wetlands* and *woodlands*. A variety of aquatic *invasive species* have been found in the *Lake Simcoe watershed*, several of which include the zebra mussel, round goby, spiny water flea, purple loosestrife and Eurasian watermilfoil. Many of the aquatic species found in Lake Simcoe have spread from the Great Lakes through activities such as boating, angling, and other pathways.

Terrestrial *invasive species* including giant hogweed, garlic mustard and others are introduced through ornamental gardening, or through the import of seeds in soil, or the treads of boots and tires.

Climate Change

In the winter of 2001-2002, Lake Simcoe did not completely freeze over. While not every winter will be mild, scientists say that we can expect more dramatic swings in weather patterns due to climate change.

Ontario is working on a comprehensive set of programs to reduce the province's greenhouse gas emissions that contribute to climate change. But the effects of climate change are already being observed, requiring adaptive measures to minimize impacts.

Objectives of the Plan

The objectives of the Plan as set out in the Lake Simcoe Protection Act, 2008 are to:

- protect, improve or restore the elements that contribute to the ecological health of the *Lake Simcoe watershed*, including, water quality, hydrology, key natural heritage features and their functions, and key hydrologic features and their functions;
- restore a self-sustaining coldwater fish community in Lake Simcoe;
- reduce loadings of phosphorus and other nutrients of concern to Lake Simcoe and its tributaries;
- reduce the discharge of pollutants to Lake Simcoe and its tributaries;

- respond to *adverse effects* related to *invasive species* and, where possible, to prevent *invasive species* from entering the *Lake Simcoe watershed*;
- improve the *Lake Simcoe watershed's* capacity to adapt to climate change;
- provide for ongoing scientific research and monitoring related to the ecological health of the *Lake Simcoe watershed*;
- improve conditions for *environmentally sustainable recreation* activities related to Lake Simcoe and to promote those activities;
- promote environmentally sustainable land and water uses, activities and *development* practices;
- build on the protections for the *Lake Simcoe watershed* that are provided by provincial plans that apply in all or part of the *Lake Simcoe watershed*, including the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan, and provincial legislation, including the Clean Water Act, 2006, the Conservation Authorities Act, the Ontario Water Resources Act, and the Planning Act; and
- pursue any other objectives set out in the Lake Simcoe Protection Plan.

Principles to Guide Our Efforts

The following principles will guide efforts – both individual and collective – to protect and restore the ecological health of the *Lake Simcoe watershed*.

Ecosystem Approach

An ecosystem approach will be used, one that treats Lake Simcoe and its watershed as an interconnected system. Individual components of the system, including humans and our activities, affect and are affected by other parts of the system. The ecosystem approach uses best available science, considers cumulative impacts, and promotes watershed and subwatershed approaches. It recognizes that a healthy environment provides the foundation for healthy communities and a healthy economy.

Subwatershed Approach

A multi-scale watershed approach will be used, where some policies and management actions may apply across an entire watershed, whereas others may be specific to the needs and priorities of a particular subwatershed. This approach can further focus effort in selected parts of a subwatershed and provide more detailed guidance for specific water resource issues such as the development of certain targets and actions at the subwatershed level.

Precautionary Approach

Caution will be exercised to protect the environment when there is uncertainty about environmental risks.

Adaptive Management Approach

Continuously improve and adapt our approaches, policies and management by incorporating new knowledge and innovative design, practices and technology from ongoing science and monitoring. This will allow the Plan to evolve and improve over time based on new science and implementation experience.

Sustainable Development Approach

Economies and communities in the *Lake Simcoe watershed* will need to continue to grow, but must do so in conformity with provincial plans including this Plan, the Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan and the Oak Ridges Moraine Conservation Plan, as well as in keeping with the Provincial Policy Statement, so that growth is managed in a manner that sustains a healthy ecosystem, healthy communities and healthy economies.

Shared Responsibility

Effective implementation of the Lake Simcoe Protection Plan will require collaboration amongst the Province, the First Nations and Métis communities, municipalities, the Lake Simcoe Region Conservation Authority, agricultural, commercial, and industrial sectors and small businesses, environmental groups, and the general public.

Cost-effectiveness

The Plan must be implemented in a cost-effective manner which delivers the maximum benefit to the watershed, while recognizing the fiscal realities of those who may share in the task of implementation.

Priorities of the Plan

While this Plan speaks in detail about the initial actions to be taken, it recognizes that protecting and restoring the ecological health of the *Lake Simcoe watershed* will be a long-term undertaking; initial strategies will evolve over time based on science and experience in implementing the plan.

In the near-term the Plan would focus on the issues most critical to the health of Lake Simcoe including:

- restoring the health of **aquatic life** within the Lake Simcoe watershed (*see Chapter 3*);
- improving **water quality**, including reducing loadings of phosphorus to the lake (*see Chapter 4*);
- maintaining **water quantity** (*see Chapter 5*);
- improving the health of the ecosystem by protecting and rehabilitating important areas, such as **shorelines and natural heritage** (*see Chapter 6*); and
- addressing impacts of **invasive species, climate change, and recreational activities** (*see Chapter 7*).

A **subwatershed approach** (*see Chapter 8*) will help determine priorities to focus on in different areas of the *Lake Simcoe watershed*, depending on environmental conditions and specific management considerations. This subwatershed approach will be critical to prioritizing initial actions and moving forward with an action plan into the future.

As the understanding of issues, such as conditions of subwatersheds, climate change, and impacts of atmospheric deposition, improves through research and monitoring, we will be better prepared to deal with future impacts. Ongoing monitoring and research will also help us detect changes in watershed conditions over time and measure the effectiveness of our management efforts.

How to Read this Plan

The Plan consists of targets, *indicators* and policies organized into chapters that address the following policy themes: aquatic life, water quality, water quantity, shorelines and natural heritage, other threats and activities (including *invasive species*, climate change and *recreational activities*), and implementation. Each Chapter provides background, context and explains the intent of the policies. Abbreviated terms are defined in the List of Acronyms. Terms in *italics* are defined in the Glossary.

This Plan should be read in conjunction with relevant provincial policies, plans and Acts, including the Provincial Policy Statement, 2005, the Greenbelt Plan, the Growth Plan for the Greater Golden Horseshoe, the Oak Ridges Moraine Conservation Plan, the Clean Water Act, 2006, the Ontario Water Resources Act, the Conservation Authorities Act, the Environmental Protection Act, the Public Lands Act, and the Planning Act. This Plan, in conjunction with the other plans and Acts mentioned above, express the Province's interest and direction with regard to protecting the ecological health and environmental sustainability of the *Lake Simcoe watershed*. As provided for in the Lake Simcoe Protection Act, 2008 subject to any policies in this Plan describing how to resolve conflicts between provincial policies or plans, if a conflict arises between a designated policy in this Plan and a provincial policy of another provincial plan the provision that gives the greatest protection to the ecological health of the *Lake Simcoe watershed* prevails.

Legal Effect of the Plan Under Lake Simcoe Protection Act, 2008

The policies in the Plan are grouped into four categories; the Act gives legal effect to the first three of these. The first category of policies is the "designated policies" in the Plan and they are coded as **DP**. The second category of policies is the "have regard to" policies; they are coded as **HR**. These first two categories of policies affect how decisions are made under specific statutes. The third category of policies relates to monitoring by public bodies; in the Plan they are coded as **M**. The fourth category of policies is not given legal effect by the Act. These policies set out strategic actions that public bodies should take in order to meet the Plan's objectives; in the Plan these policies are coded as **SA**.

Greenbelt Plan

The Greenbelt protects 1.8 million acres of environmentally sensitive and agricultural lands in the Greater Golden Horseshoe from urban development and sprawl.

The Greenbelt Plan encompasses the existing Niagara Escarpment Plan and Oak Ridges Moraine Conservation Plan as well as the new Protected Countryside. The Plan covers approximately 58% of the land area of the *Lake Simcoe watershed*.

The Greenbelt Plan works in conjunction with the Growth Plan for the Greater Golden Horseshoe, with the Growth Plan directing where future growth will occur.

Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe provides a 25-year vision and strategic direction for managing growth in the Greater Golden Horseshoe.

The Growth Plan encourages the development of more compact and complete communities. This type of development will make more efficient use of infrastructure and protect important natural spaces and agricultural lands from urban sprawl.

Municipalities are required to bring their official plans into conformity with the Growth Plan by June 2009. The Lake Simcoe Protection Plan will work in concert with and allow for completion of the Growth Plan conformity process.

Clean Water Act, 2006

The Clean Water Act, 2006 protects drinking water at the source, as part of an overall commitment to safeguard human health and the environment through a multi-barrier approach. The legislation sets prevention as its fundamental principle. A key focus of the legislation is the preparation of locally-developed terms of reference, science-based assessment reports and source protection plans. The intent is for communities to use a science-based approach to protect both the quality and quantity of drinking water supplies.

Designated Policies and Have Regard To Policies (Coded as “DP” and “HR”, Respectively)

The Act requires that decisions under the Planning Act or the Condominium Act, 1998 or decisions related to a “prescribed instrument” conform with the applicable designated policies in the Plan and have regard to the other applicable policies. Comments, submissions and advice of a public body must also conform with the applicable designated policies and have regard to the other policies that apply to such decisions. At the end of this Plan is a Schedule which sets out the “designated policies” and the “have regard to” policies in the Plan and the type of decision to which each policy applies.

(1). Designated Policies and Have Regard To Policies Affecting Decisions under the Planning Act and Condominium Act, 1998

The Act requires decisions under the Planning Act or the Condominium Act, 1998, to conform to the applicable designated policies in the Plan and have regard to other applicable policies. Comments, submissions and advice given by a public body in relation to such decisions must also conform to the applicable designated policies and have regard to any other applicable policies. The Act also requires that municipalities bring their official plans into conformity with the applicable “designated policies” at their five-year official plan review.

(2). Designated Policies and have Regard to Policies Affecting Decisions In Relation To Prescribed Instruments

The *General Regulation* under the Act lists the following instruments as “prescribed instruments”:

- A permission that is granted under the Conservation Authorities Act:
 - for *development* in or on the areas described in subsection 2 (1) of Ontario Regulation 179/06 (Lake Simcoe Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) made under that Act; or
 - to straighten, change, divert or interfere with the existing channel of a river, creek, stream or watercourse or to change or interfere with a *wetland*.
- A permit to take water that is issued under the Ontario Water Resources Act.
- An approval to establish, alter, extend or replace new or existing *sewage works* that is granted under the Ontario Water Resources Act.
- A work permit that is issued under the Public Lands Act.
- A licence within the meaning of subsection 1 (1) of the Fish and Wildlife Conservation Act, 1997 that is issued under that Act.
- An approval issued under the Lakes and Rivers Improvement Act for the location of a dam and its plans and specifications.

The Act requires that all decisions to create or amend a prescribed instrument conform with the applicable designated policies in the Plan, and have regard to other applicable policies. The Act also allows the Plan to require that a prescribed instrument be amended by a specified date to conform with the applicable designated policies in the Plan. Comments, submissions and advice given by a public body in relation to such decisions must also conform to the applicable designated policies and have regard to any other applicable policies. While policies that apply to prescribed instrument decisions affect how such decisions are made, the Act makes clear that such policies cannot alter the scope of the authority to issue, create or amend the instrument that is provided under the instrument’s enabling statute.

Even though permits to take water under the Ontario Water Resources Act and licences under the Fish and Wildlife Conservation Act are specified as prescribed instruments, in this version of the Plan there are no policies applicable to them. Therefore at this time the Plan does not affect decisions related to these instruments, but may do so in the future once certain strategic actions specified in the Plan are completed.

Policies governing Monitoring By Public Bodies (Coded as “M”)

If a public body is identified in the Plan as being responsible for the implementation of a policy governing monitoring, the Act requires the public body to comply with any obligations imposed on it by the monitoring policy. For this reason, monitoring policies are placed in a separate category from the other policies that commit public bodies to specified actions.

Policies In Relation to Strategic Actions (Coded as “SA”)

As envisioned by the Act, this Plan includes many other types of policies that are equally essential to achieving the Plan’s objectives but are not given legal effect by the Act, such as policies respecting stewardship programs, pilot programs, research, outreach and education, and, in several instances, policies that specify actions for public bodies. These policies are not designated policies. Under the Act, these policies are not legally enforceable, nor do they create legal duties. Rather, accountability for these policies is achieved through methods other than courts or tribunals, such as through the periodic progress reports on the Plan that are mandated under the Act. Chapter 8 contains more information on oversight in relation to the implementation of the policies in the Plan, including the SA policies.

Most of the SA policies have timeframes indicating when these actions are anticipated to be completed. Where an SA policy is silent on a timeframe, this may be an indication that the action specified is an ongoing action. It also may be an indication that a timeframe for completion is not predictable because the action is dependant on other actions or requires further analyses or discussions amongst the specified persons or bodies to develop an implementation strategy for the policy. Significant progress is anticipated on these actions within the period preceding Plan review, and this progress will be reported through the progress reports required under the Act. Further, some SA policies use the term in “collaboration” while others use the term in “partnership”. Partnership is used to convey a more structured relationship amongst the persons and bodies responsible for a policy; collaboration is used to convey a less structured relationship. For example, a more structured relationship may include a memorandum of understanding or a formal cost-sharing arrangement amongst the persons or bodies responsible for a SA policy.

In chapter 8 of the Plan, there are also policies governing the types of Plan amendments that the Minister is authorized to approve, pursuant to paragraph 10 of subsection 5 (2) of the Act. Where the Minister is not authorized to approve a Plan amendment, the Act requires that it be approved by the Lieutenant Governor in Council.

No matter is being specified in the Plan for the purpose of paragraph 5 of subsection 5 (2) of the Act. Therefore, there is nothing in this Plan that limits the ability of decision makers on planning applications to adopt policies more restrictive than the provisions in the Plan unless doing so would conflict with any of the policies or objectives of the Plan. Decision-makers who are considering applications in relation to prescribed instruments may also adopt policies more restrictive or protective than the provisions in the Plan.

Effective Date of the Plan

The effective date of the Lake Simcoe Protection Plan is June 2, 2009. As of this date the policies in this Plan have legal affect as provided by the Lake Simcoe Protection Act, 2008, subject to the transition rules described below.

Transition

Section 27 of the Lake Simcoe Protection Act, 2008 provides authority for a regulation addressing transitional matters. The *General Regulation* under the Act provides transition rules both in relation to applications, matters or proceedings that were commenced prior to the Plan coming into effect but were not disposed of as of the effective date of the Plan, and in relation to specific applications, matters or proceedings commenced after the effective date of the Plan. This regulation can be viewed at www.e-laws.gov.on.ca.

Watershed Boundary

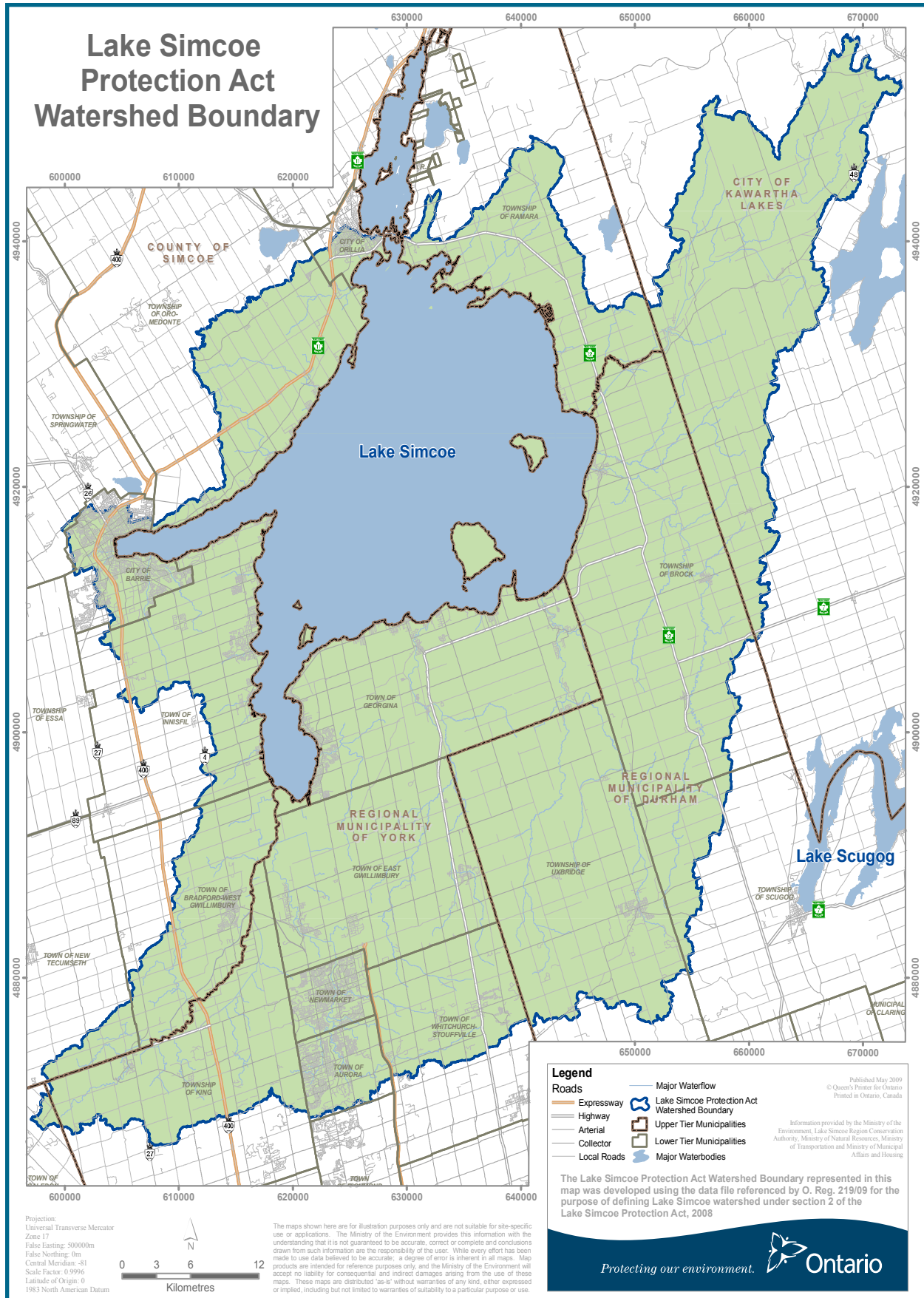
The policies of this Plan currently apply solely within the *Lake Simcoe watershed*. Authority is provided in the Lake Simcoe Protection Act, 2008 , to prescribe areas outside of the watershed boundary for the purpose of applying future policies to those areas. There are currently no areas prescribed as outside areas.

The *Lake Simcoe watershed* is defined in section 2 of the Act as Lake Simcoe and the part of Ontario, the water of which drains into Lake Simcoe or, if the boundaries are described more specifically in the regulations, the area within those boundaries. The *General Regulation* under the Act describes the area of the watershed and includes a reference to an electronic watershed boundary in the Land Information Ontario (LIO) warehouse, called "Lake Simcoe Protection Act Watershed Boundary". This watershed boundary may be accessed through the internet at both LIO and the MOE's Lake Simcoe website, www.ene.gov.on.ca.

The watershed boundary referenced by the *General Regulation* may be amended from time to time. The LIO warehouse will contain the current version of the boundary, as well as previous versions of the boundary after it has been amended.

- 1.1-DP** In relation to any matter affected by a policy in this Plan, the boundary of the *Lake Simcoe watershed* that applies to the matter is the boundary that was in effect at the time the matter is commenced. Whether a matter is considered commenced shall be determined in accordance with the rules specified in the *General Regulation* under the Lake Simcoe Protection Act, 2008 .

Lake Simcoe Protection Act Watershed Boundary



Note: For illustrative purposes only. Information provided by Ministry of the Environment, Lake Simcoe Region Conservation Authority, Ministry of Natural Resources, Ministry of Transportation and Ministry of Municipal Affairs and Housing.



Chapter 2

Building on Past Actions

chapter two

Cooperative efforts and actions by watershed partners already started to bring about improvements in the health of Lake Simcoe. For example, levels of *dissolved oxygen* in the bottom waters of the lake have increased and there is some evidence of natural reproduction in the coldwater fish community.

There have been longstanding partnership efforts to protect the health of Lake Simcoe; some of these are described below.



Field studies of aquatic life

Lake Simcoe Environmental Management Strategy (LSEMS)

The LSEMS program began in 1990 with the goal of restoring a self-sustaining coldwater fishery in Lake Simcoe by improving water quality. It was a multi-agency partnership involving the MOE, the MNR, the MAFRA, the MMAH, the MEI and the LSRCA. More recently watershed municipalities, the Chippewas of Georgina Island First Nation, Environment Canada and Fisheries and Oceans Canada had joined the partnership. The LSRCA chaired the partnership.

The LSEMS program focused mainly on controlling and reducing phosphorus inputs to Lake Simcoe in three major phases of the program:

- In Phase I (1990-1995), LSEMS was successful in reducing phosphorus levels entering the lake from more than 100 tonnes per year to an average of 67 tonnes per year.
- Phase II (1996-2001) included the completion of 55 water quality improvement projects, a 2.5 metric tonne reduction in the annual phosphorus loading to Lake Simcoe, completion of a hydrologic mass balance for the Lake and the completion of a Total Water Quality Study examining the benefits of phosphorus control measures.
- Phase III (2002-2008) was the final phase and it saw completion of a State of the Lake Simcoe Watershed (2003) report which provides an overview of existing conditions (e.g., geology, natural heritage, water and air quality, fisheries, etc.) and a Lake Simcoe Basin Wide Report (2008) that described actions being taken to protect and restore the basin and to identify emerging issues in the *Lake Simcoe watershed*.

Some of the research compiled through LSEMS was synthesized and adopted by the *Lake Simcoe Science Advisory Committee* and informs the Lake Simcoe Protection Plan.

Intergovernmental Action Plan (2006)

To address common interests in environmental protection, *development* certainty, and effective and sustainable governance, the Province partnered with the 19 municipalities in Simcoe County, including Barrie and Orillia, to produce the Intergovernmental Action Plan (IGAP).

Agricultural and Community Actions

Farmers in the *Lake Simcoe watershed* have made significant progress toward using improved agricultural practices and technologies. These include buffer strip creation along riparian areas, improved manure storage facilities and technologically advanced cropping systems. Some of this work has been accomplished by individual farmers on their own, and some has been done through formal stewardship programs such as the Environmental Farm Plan Program, the Lake Simcoe Water Quality Improvement Program, the Ontario Stewardship Program and a range of local, provincial, and federal-provincial cost-share programs.

In other areas of the watershed, rural landowners, community groups and individuals have participated in a variety of stewardship, education and outreach programs that have reduced stream-bank erosion, improved *fish habitat*, increased natural cover and encouraged sustainable actions throughout the watershed.

Assimilative Capacity Study for Lake Simcoe

One of the key initiatives of the IGAP was the Assimilative Capacity Study (ACS) for the *Lake Simcoe watershed*. The ACS was developed in collaboration with federal, provincial, municipalities, the Lake Simcoe Region Conservation Authority, the Nottawasaga Valley Conservation Authority, and other stakeholders.

The ACS produced a modelling tool to inform decision-makers of the potential impacts of existing and planned land use activities on water quality. The ACS also developed a process for establishing subwatershed loading targets.

Provincial support for agricultural and community initiatives

- The Province has provided financial and technical support to agricultural and community initiatives through the Environmental Farm Plan, the Lake Simcoe Farm Stewardship Initiative, the Community Fisheries and Wildlife Involvement Program, the Managed Forest and Conservation Land Tax Incentive Programs, the Ontario Stewardship Program and other conservation and green community programs.
- Through the Ontario Stewardship program, the Province provides support to county-based stewardship councils that represent the broad-base of landowner and community interests in their areas. The Province facilitates partnerships and leverages financial and in-kind resources for a wide variety of stewardship, education and outreach projects.

Municipalities

Municipalities have made significant investments that have had a positive impact on the lake. These include *sewage treatment plant* upgrades, storm-water management retrofits, aquatic habitat improvement and septic system decommissioning, investments in stewardship programs and supporting the Lake Simcoe Region Conservation Authority among others.

Municipal phosphorus reductions

Under the Lake Simcoe Water Quality Improvement Program, municipalities have reduced phosphorus inputs by:

- replacing inadequate private septic systems;
- retrofitting stormwater ponds;
- undertaking stream bank erosion control projects;
- inspecting sewage treatment facilities regularly and reporting effluent concentrations monthly;
- decommissioning 2,200 septic systems along the *Lake Simcoe shoreline*.

Lake Simcoe Region Conservation Authority (LSRCA)

Conservation Authorities are local, community-based environmental agencies. They represent a grouping of municipalities on a watershed basis and work in partnership with others to manage their respective watersheds. The Conservation Authorities Act provides the means by which the province and municipalities of Ontario could join together to form a Conservation Authority within a specific area.

The Lake Simcoe Protection Plan builds on the ongoing work of the LSRCA and the LSRCA will continue to be a key partner in the implementation of the Plan and protection of the watershed. The LSRCA's mission is to provide leadership in the restoration and protection of the environmental health and quality of Lake Simcoe and its watershed with community, municipal and other government partners.

Lake Simcoe Region Conservation Authority

The LSRCA has led improved stormwater management strategies for major municipalities around the lake. As a result, since 2000, all new developments around the lake have met or exceeded the highest provincial environmental design standards for stormwater management.

Federal Government

The federal government also has a presence in the watershed through its existing departments. Parks Canada is an example of how different levels of the federal government continue to protect and manage the lake's ecosystem. Lake Simcoe is part of the Trent-Severn Waterway.

The federal government established a Lake Simcoe Clean-Up Fund which supports reductions in the amount of phosphorus inputs, rehabilitating priority habitats, restoring the coldwater fishery, and improving scientific understanding for decision-making.

Lake Simcoe Advisory Committees

The *Lake Simcoe Science Advisory Committee* was appointed in February 2008 to advise the Province on how best to protect and improve the *Lake Simcoe watershed* ecosystem to guide the development of the Lake Simcoe Protection Plan. The committee provided valuable scientific advice on the state of the lake and its watershed, pressures on the system now and in the future, identification of ecosystem features that need protection and on appropriate management methods and a monitoring plan to support the protection strategy.

In May 2008, the Province appointed a *Lake Simcoe Stakeholder Advisory Committee* to gain input from the wide range of interests around Lake Simcoe. The committee included representatives from: LSRCA, First Nations, municipalities, farmers and the agricultural sector, tourism, fisheries, business, developers, residents, cottagers and environmentalists. The committee provided valuable input and advice to the government on the development of the Lake Simcoe Protection Plan.

These two advisory committees will be replaced by a Lake Simcoe Coordinating Committee and a Lake Simcoe Science Committee, described in *Chapter 8: Implementation*.



Chapter 3

Aquatic Life

chapter three

CONTEXT

Healthy ecosystems, including healthy aquatic communities, provide significant social and economic benefits, contributing to a high quality of life for the people of Ontario. Currently, aquatic communities and habitats in Lake Simcoe are stressed by degraded water quality, unsustainable land uses, and pressures from other human activities.

Improving and restoring the health of aquatic life within the *Lake Simcoe watershed* will depend on successfully implementing the policies of this chapter, as well as those related to water quality, water quantity, shorelines and natural heritage, *invasive species*, and climate change that are outlined in the other chapters of this Plan. This Plan will seek to improve habitats for aquatic life and help to protect and restore aquatic communities throughout the watershed by improving our overall management and stewardship of these resources.

The health of the coldwater fish community, specifically the lake trout, is a good indicator of environmental quality and the overall health of the aquatic ecosystem. The health of the warm-water and tributary fish communities and their *ecological functions* are also important in determining how well the aquatic ecosystem is functioning. Additional *indicators* of environmental quality include the *biodiversity* of aquatic life within the watershed and the presence of species that are rare, threatened, or endangered.

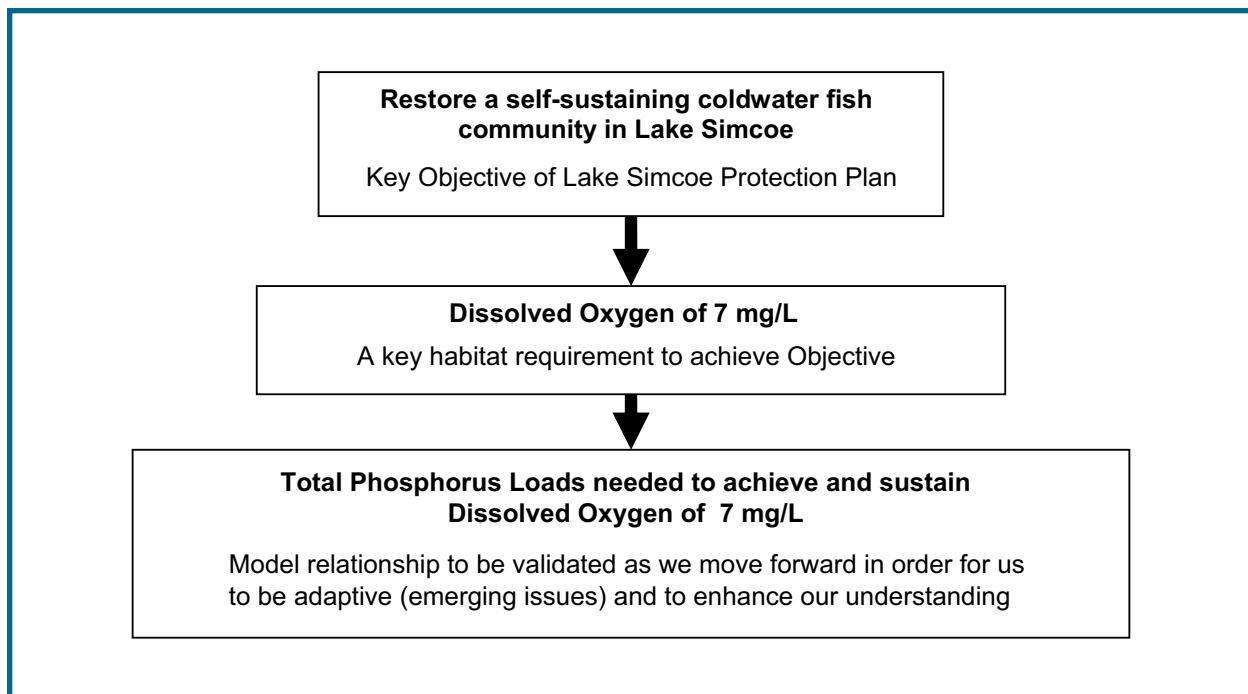
Excessive phosphorus loads to the lake from changes in watershed land use and associated activities is perhaps the most significant stressor. Excess phosphorus has led to the depletion of *dissolved oxygen* in deep waters of the lake that provide essential habitat for coldwater species such as lake trout and lake whitefish.



Large Mouth Bass



Collection of Whitefish Eggs



Key assumptions between the relationship of attaining the Plan objective of restoring a self-sustaining coldwater fish community in Lake Simcoe, dissolved oxygen habitat requirements and the total phosphorus loads needed to achieve the dissolved oxygen requirements.

Key Facts

- 35 rivers flow into Lake Simcoe, including the Holland River, Black River, Beaver River, Pefferlaw River and Uxbridge Brook, which in total comprise almost 4,000 kilometres of streams.
- Lake Simcoe supports a wide variety of aquatic animals including:
 - coldwater fish such as lake trout and lake whitefish;
 - warmwater fish such as bass and perch;
 - invertebrates including crayfish, insects, snails and clams;
 - amphibians and reptiles;
 - benthos and plankton.
- 65 species within the watershed ecosystem are rare and 33 of these are species at risk, including the Jefferson salamander and the spotted turtle.
- Current conditions do not fully support the natural production of lake trout and whitefish, therefore, a hatchery stocking program exists that annually releases approximately 100,000 yearling lake trout and 140,000 fall fingerling lake whitefish to support rehabilitation of these native species.
- Since 2001, there has been evidence that natural reproduction of lake trout and lake whitefish has increased, consistent with water quality improvements.
- Degraded water quality is believed to have been the primary cause of population failures of lake trout and other coldwater fish species.

Lake Simcoe supports a significant winter fishery for lake trout, lake whitefish, and perch with considerable socio-economic benefits. It is also a year-round destination fishery for perch, which attracts tourists from Canada and the United States and is also known for its world-class bass fishing. The fact that Lake Simcoe is the most intensively fished inland lake in Ontario may add significant stress to the aquatic communities of the lake. Properly managing these additional pressures will be key to restoring a self-sustaining coldwater fish community while maintaining a sustainable recreational fishery and its associated social benefits.

This Plan supports the development of fish community objectives specific to the *Lake Simcoe watershed* that will be used to inform land use and watershed planning and management activities. Monitoring and research will be conducted to further our understanding of the lake and its watershed, their aquatic communities, and the way they function, which in turn will improve our ability to manage its resources. The Plan will also support the review of Lake Simcoe's coldwater fish stocking program to ensure that stocking targets continue to assist in restoring a self-sustaining coldwater fish community. It will also support an evaluation of the ecological and socio-economic value of the aquatic life resources within the watershed.

Target:

- Mean Volume Weighted *Hypolimnetic Dissolved Oxygen* Concentration of 7 mg/L on September 15th

Indicators:

- Natural reproduction and survival of native aquatic communities
- Presence and abundance of key sensitive species (i.e. lake trout and brook trout)
- Shifts in cold, warm and tributary fish community composition

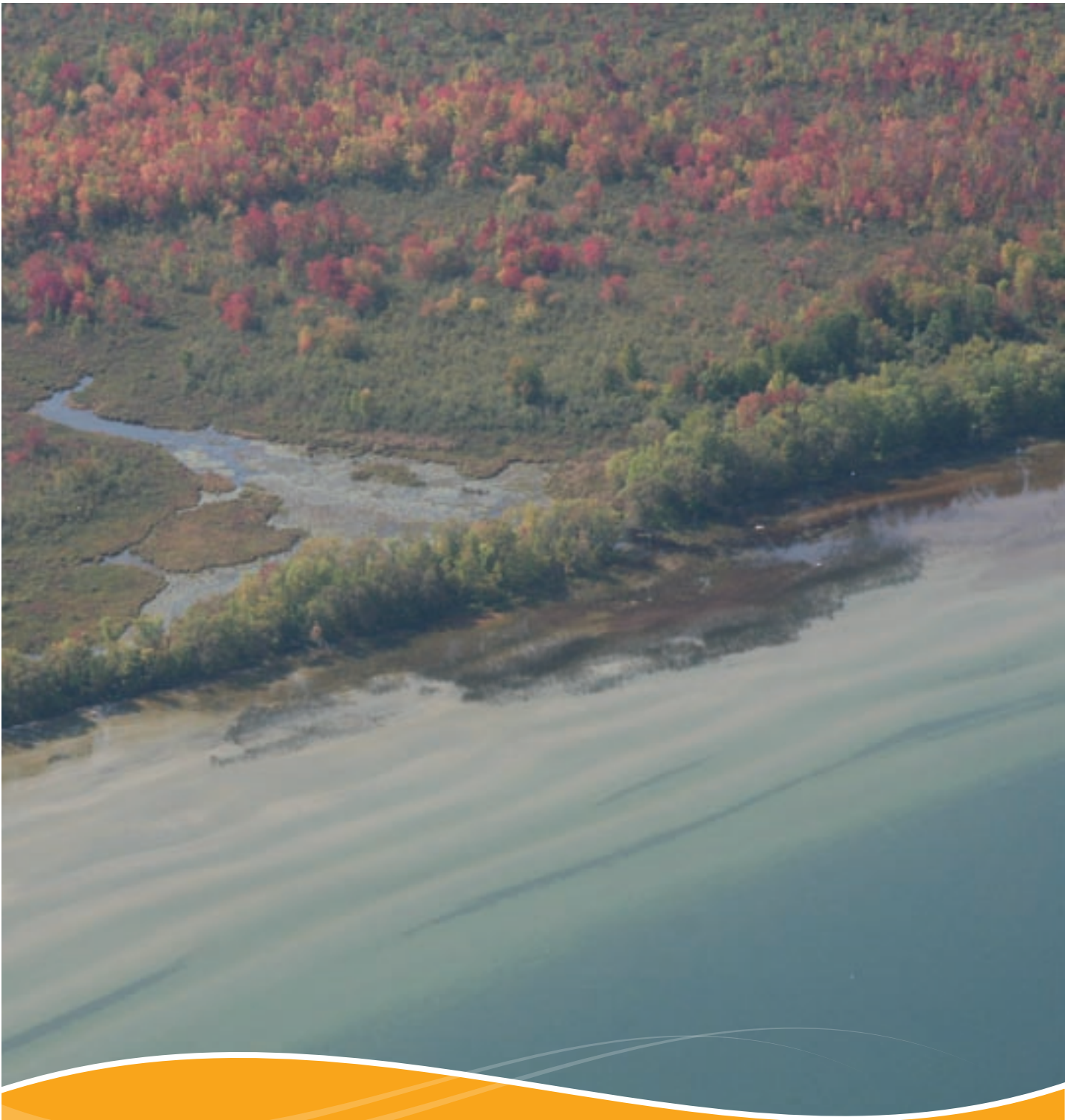
Policies:

3.1-SA Within two years of the date the Plan comes into effect, the MNR will develop Fish Community Objectives for Lake Simcoe and its tributaries. This process will be undertaken in collaboration with First Nations and Métis communities, public bodies, the Lake Simcoe Fisheries Stakeholder Committee, key stakeholders and the general public. These objectives will focus on the warm and coldwater fish communities of Lake Simcoe; however, the objectives will also address the entire aquatic community in both the Lake and tributaries. The Fish Community Objectives will be used by public bodies to inform decisions relating to the management of land, water and natural resources, increase the resilience of Lake Simcoe's aquatic communities to future impacts of *invasive species* and climate change, and ensure sustainable resource use and social benefit.

3.2-SA Within two years of the date the Plan comes into effect, the MNR will initiate, using an adaptive management approach, a review of its coldwater species stocking program, and will establish new stocking targets. This review will be done in collaboration with First Nations and Métis communities, public bodies, the Lake Simcoe Fisheries Stakeholder Committee, and other key stakeholders.

- 3.3-SA** Within five years of the date the Plan comes into effect, the MNR, in collaboration with First Nations and Métis communities, public bodies, the Lake Simcoe Fisheries Stakeholder Committee, and other key stakeholders, will complete a socio-economic evaluation of the monetary, ecological, social and cultural value and impact of the aquatic life resources within the Lake Simcoe watershed, beginning in the first year with a feasibility study of the socio-economic benefits of maintaining a healthy Lake Simcoe to foster a thriving recreational fishery.
- 3.4-SA** Beginning the date the Plan comes into effect, the MNR, in collaboration with First Nations and Métis communities, DFO, Parks Canada, the MOE, and the LSRCA, will establish base-line mapping of aquatic habitats in Lake Simcoe and its tributaries building on existing monitoring programs and established databases. The MNR will regularly review and update this information and include, where feasible, shoreline and in-water developments, including in-water structures, tributary barriers, channelizations, and hardened shorelines.
- 3.5-SA** Beginning the date the Plan comes into effect the MNR, in collaboration with the MOE, the LSRCA and other partners, will undertake research projects on the aquatic communities of Lake Simcoe and its tributaries. The focus of the research will be on filling knowledge gaps associated with the aquatic communities in the watershed that may include recommendations by the Lake Simcoe Science Committee among others. Research projects will be identified and undertaken that examine the biological components of the ecosystem, their processes and linkages. The research projects would build on existing knowledge or address knowledge gaps, and be integrated with existing and any new research programs in the watershed. Collaboration among research groups is encouraged. The focus of initial research projects may include:
- a. production dynamics and ecological function research tied to the coldwater fish community and the function of offshore food webs and ecosystems; or
 - b. an evaluation of the impacts of nearshore water quality, nutrients, *primary production dynamics*, *invasive species* and climate change on the fish community and the function of the nearshore foodwebs and ecosystems.

- 3.6-M** Beginning the date the Plan comes into effect, the MNR, in collaboration with the MOE and the LSRCA, shall develop and implement an annual aquatic community monitoring program for the *Lake Simcoe watershed*. Once the program is fully implemented, it is intended to cover the Lake, the tributaries and other inland *lakes* in the watershed. The program shall build upon existing aquatic community monitoring programs undertaken by the MNR, the MOE and the LSRCA. This program shall support an adaptive management approach, and may be altered from time to time to respond to changing environmental conditions and land, water and natural resource management needs. The components of the annual aquatic community monitoring program shall include one or more of the following:
- a. surveys of winter and open-water anglers;
 - b. fish diet and growth studies;
 - c. monitoring of nearshore and offshore fish communities;
 - d. monitoring of fish *biodiversity*;
 - e. monitoring of *invasive species*;
 - f. monitoring of *benthic* invertebrates; or
 - g. monitoring of aquatic habitat including macrophyte surveys.



Chapter 4

Water Quality

chapter four

CONTEXT

Clean water is critical to both human and ecological well-being.

Degraded water quality has historically placed significant stress on Lake Simcoe, its tributaries and the life they support. Stresses from urban, rural, recreational and agricultural activities have changed the landscape, vegetation, and *ecological functions* of the watershed and contributed to increases in the inputs of pollutants. Human activities in the watershed have also affected water quantity which can, in turn, significantly affect water quality. The primary stressors that degrade water quality include:

- excessive nutrients, primarily phosphorus;
- pollutants and contaminants, such as heavy metals, organic chemicals, sediments, and chlorides; and
- pathogens, such as *E. coli*.

In addition to these stressors emerging issues such as pharmaceuticals and personal care products, climate change and *invasive species* can also directly and indirectly impact water quality. Although the extent of the impact of climate change on water quality is uncertain, it is projected that it will influence the frequency, intensity, extent and magnitude of existing water quality problems. Some examples of climate change impacts on water quality may include:

- variations in stream flow regimes and lake levels affecting aquatic biota and habitats;
- increases in sediment, phosphorus loading, and concentrations of contaminants;
- increases in wind and flood transportation of nutrients, sediments and contaminants;
- drinking water odour and taste problems, as water intakes are subjected to increases in algae concentrations; and
- impacts to the nearshore area of *lakes* that may exacerbate the bioaccumulation of toxics by fish.

Excessive phosphorus has been the most significant cause of the water quality impairment in Lake Simcoe and its tributaries. It leads to the excessive growth of plants and algae in the lake, which contributes to the depletion of *dissolved oxygen* in the deep waters of the lake and degradation of the critical habitat of coldwater species.

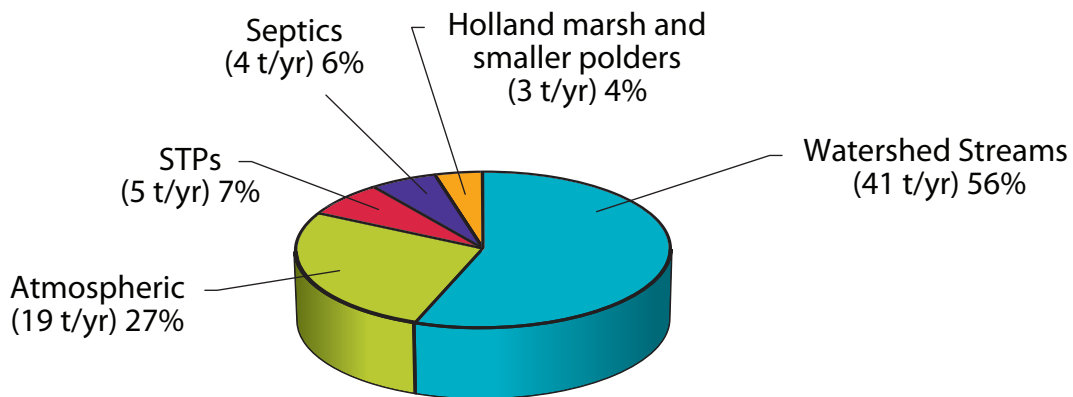


Human impact on the shoreline



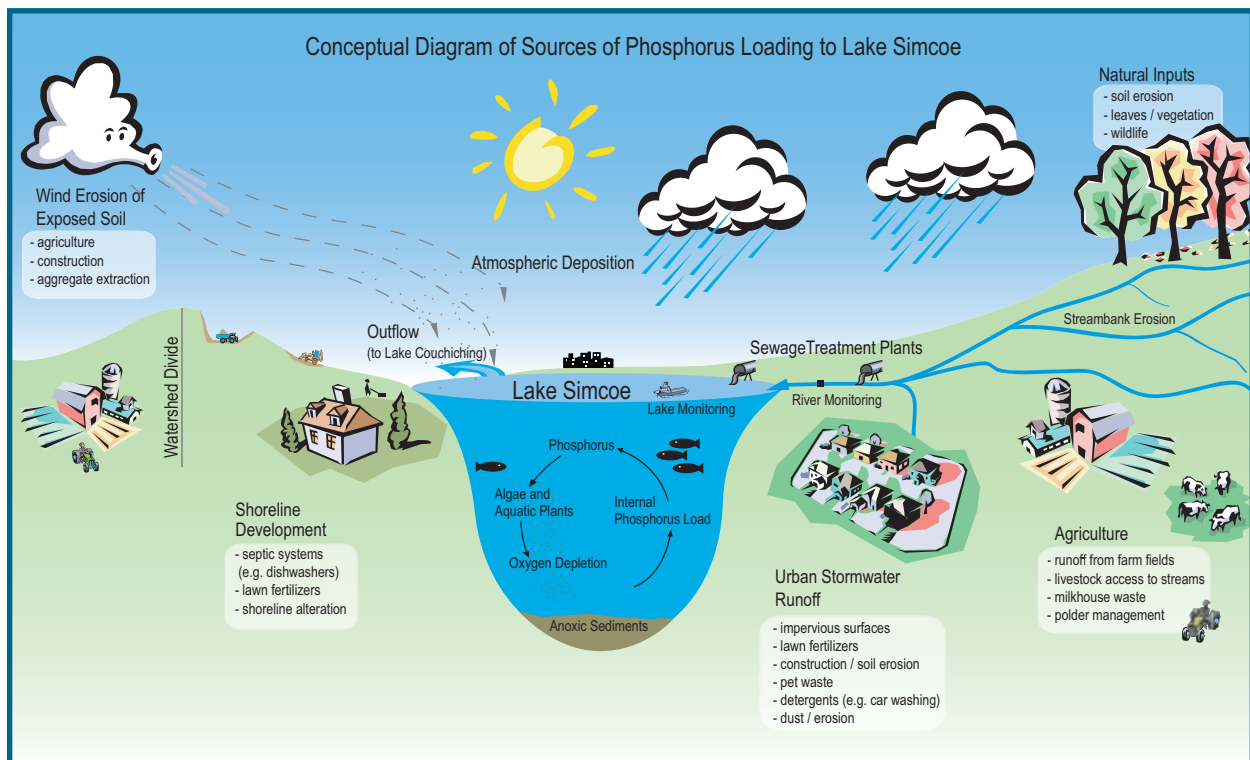
Algae bloom

Lake Simcoe Phosphorus Sources



Lake Simcoe Phosphorus Sources¹

¹ LSRCA and MOE Data Sets on Phosphorous Loadings for 2002-2007



Conceptual diagram of sources of phosphorus loading to Lake Simcoe and relationship between phosphorus and dissolved oxygen.

It is important to note that there is annual variation to phosphorus loads delivered to Lake Simcoe. The amount of phosphorus loading to the lake changes from year-to-year and annual variation does not necessarily represent an upward or downward trend in phosphorus loads. For example, changes in discharged loads, runoff, land use and the climate (which has the greatest impact on annual variation) will influence the amount of phosphorus loading. Therefore, to get a true picture of phosphorus loading trends to Lake Simcoe, an assessment averaged over many years must be used. The average phosphorus loading, over the last five reporting years (2002 – 2007), to Lake Simcoe is 72 Tonnes / year, with an annual range of 67 to 77 Tonnes / year.

The primary sources of excess phosphorus to Lake Simcoe and its tributaries include:

- effluent from *sewage treatment plants* serving urban communities and industry in the watershed;
- stormwater runoff from urban areas within the watershed;
- land use activities in rural, agricultural, urban and shoreline areas;
- septic systems; and
- atmospheric deposition of phosphorus in airborne dust caused by wind erosion from *site alteration* activities, construction sites, agricultural fields and *mineral aggregate operations*.

One of the biggest water quality challenges in Lake Simcoe is to reduce phosphorus loads to a level at which *dissolved oxygen* conditions could support a self-sustaining coldwater fish community. Based on estimates from current models, phosphorus loadings would need to be reduced to a level of approximately 44 tonnes per year to achieve the proposed *dissolved oxygen* target of 7 milligrams per litre (mg/L).

The Province set interim limits on *sewage treatment plants* and stormwater facilities around Lake Simcoe targeting phosphorus. These limits, set out in Ontario Regulation 60/08 (Lake Simcoe Protection) under the Ontario Water Resources Act, seek to control the phosphorus entering Lake Simcoe from specific municipal and industrial sources by:

- limiting phosphorus discharges from municipal and industrial *sewage treatment plants*;
- stopping new *sewage treatment plants* that would discharge phosphorus from being established; and
- making stormwater management facilities serving new *development* meet the highest design standards.

This regulation applies from April 1, 2008, to March 31, 2010, and is intended to protect Lake Simcoe's water quality until more permanent policies are developed, such as those in this Plan.

The policies in this chapter are intended to identify and address sources that cause water quality impairment and to enhance existing water quality. In many cases, activities may address more than one water quality parameter or ecosystem stressor. The Plan would impose stricter controls with respect to *sewage treatment plants*, stormwater management, septic systems and construction activities and encourage better management practices for agricultural, rural and urban communities.

To achieve ambitious reductions in phosphorus loadings, there would need to be reduced loadings from all sources that contribute to excess phosphorus throughout the watershed. This Plan would also support a coordinated, adaptive management, and phased approach to reducing excess phosphorus through the development of a phosphorus reduction strategy for the *Lake Simcoe watershed*.

Key Facts

- Phosphorus loads measured from 2004 to 2007 ranged from 70 tonnes per year (in 2006-07) to 77 tonnes per year (in 2003-04) and were at the high end of the previously published (1998 to 2004) range of 53 to 76 tonnes per year. Current loads are well below levels in the early 1990s, which exceeded 100 tonnes per year.
- Tributaries flowing into Lake Simcoe that currently are known to exceed the Provincial Water Quality Objectives for phosphorus include the East and West Holland, North Schomberg, Upper Schomberg, Maskinonge and Black Rivers as well as Tannery and Whites Creeks.
- A key indicator of improving water quality in recent years is the increase in deep-water *dissolved oxygen* concentrations during late summer to more than 5 mg/L from less than 3 mg/L in most years during the 1980s and early 1990s.
- Other pollutants of current or emerging concern in the watershed include chloride, toxic metals (e.g. chromium, aluminum, cadmium), organic chemicals, and pharmaceuticals.
- Based on Ontario's sport fish contaminant monitoring data used in the Guide to Eating Ontario Sport Fish, contaminant levels in sport fish (e.g., walleye, whitefish and carp) have decreased or remained stable over the last 10 to 15 years.

Targets:

- Reduce phosphorus loadings to achieve a target for *dissolved oxygen* of 7 mg/L in the lake (long-term goal currently estimated at 44 tonnes per year)
- Reduce pathogen loading to eliminate beach closures
- Reduce contaminants to levels that achieve Provincial Water Quality Objectives or better

Indicators:

- To evaluate progress in achieving the water quality-related objectives of the Plan, the following are *indicators* of environmental health relating to water quality in Lake Simcoe and its tributaries:
 - *Dissolved oxygen* in Lake Simcoe
 - Total phosphorus
 - concentration
 - loading
 - Pathogens
 - beach closures
 - Other water quality parameters
 - chlorides
 - other nutrients (e.g. nitrogen)
 - total suspended solids
 - heavy metals
 - organic chemicals

Sewage Treatment

The Plan recognizes that sewage treatment plants are essential to communities and industry in the *Lake Simcoe watershed*; they treat sewage that would otherwise impair water quality and contribute excessive amounts of nutrients, pathogens, pollutants and sediment to the Lake Simcoe watershed. Future growth in the watershed will result in a greater demand on these sewage treatment plants to manage more sewage at a higher level of treatment. The potential impacts of emerging issues such as pharmaceuticals and personal care products and the impacts of climate change on existing sewage treatment infrastructure also need to be considered. The following policies are intended to further improve water quality, including addressing emerging issues, and reduce excessive phosphorus loading to the lake by imposing requirements on existing approvals and placing restrictions on both phosphorus loadings and the establishment of new sewage treatment plants, with some exceptions.

- 4.1-DP** For a proposed *settlement area* expansion, establishment of a new *settlement area* or a *development* proposal outside of a *settlement area* that requires an increase in the existing *rated capacity* of a *sewage treatment plant* or the establishment of a new *sewage treatment plant*, an environmental assessment of the undertaking shall be completed or approved prior to giving any approvals for the proposal under the Planning Act or the Condominium Act, 1998.
- 4.2-DP** Within one year of the date the Plan comes into effect, the *Director* shall review and amend the approvals for all *sewage treatment plants* in the *Lake Simcoe watershed* to ensure each *sewage treatment plant* owner and operator is required to do the following:
- a. demonstrate compliance with the *Average Concentration Limit* for total phosphorus specified in the approval:
 - i. at a minimum on a monthly basis, or
 - ii. in the case of a *sewage treatment plant* with a seasonal discharge, on the frequency specified in the approval;
 - b. conduct an initial characterization of effluent using a manner specified by the *Director* within five years of the amendment; and
 - c. report back to the *Director* within six months of the initial characterization of effluent being completed.
- 4.3-DP** No new *municipal sewage treatment plant* shall be established in the *Lake Simcoe watershed* unless:
- a. the new plant is intended to replace an existing *municipal sewage treatment plant*; or
 - b. the new *sewage treatment plant* will provide sewage services to,
 - i. a *development* that is on *partial services*, or
 - ii. a *development* where one or more *subsurface sewage works* or *on-site sewage systems* are failing.

- 4.4-DP** No new *non-municipal sewage treatment plant* shall be established in the *Lake Simcoe watershed* unless the person applying to establish the plant can demonstrate that:
- the plant will result in a net reduction of phosphorous loadings to the watershed from the baseline conditions for the property that would be serviced by the new plant; or
 - the undertaking that the plant will serve will not add phosphorous loadings to the *Lake Simcoe watershed*.

Stormwater Management

These policies call for comprehensive master plans to improve the management of stormwater for both existing and planned *development*. Applications for new *major development* must demonstrate how phosphorus loadings and changes in water balance will be minimized. The MOE will place stringent requirements on approvals for new stormwater works and will also review and, if necessary, revise existing approvals.

- 4.5-SA** Within five years of the date the Plan comes into effect, municipalities, in collaboration with the LSRCA, will prepare and implement comprehensive stormwater management master plans for each *settlement area* in the *Lake Simcoe watershed*. The stormwater management master plans will be prepared in accordance with the Municipal Class Environmental Assessment and will include:
- a characterization of existing environmental conditions on a subwatershed basis, consistent with any relevant subwatershed evaluations, if available;
 - an evaluation of the cumulative environmental impact of stormwater from existing and planned *development*;
 - a determination of the effectiveness of existing stormwater management works at reducing the negative impacts of stormwater on the environment, including consideration of the potential impacts of climate change on the effectiveness of the works;
 - an examination of any stormwater retrofit opportunities that have already been identified by the municipality or the LSRCA for areas where stormwater is uncontrolled or inadequately controlled;
 - the identification of additional stormwater management retrofit opportunities or improvements to existing stormwater management works that could improve the level of treatment within a particular *settlement area*;
 - a description of existing or planned programs for regular maintenance of stormwater management works;
 - an identification of the recommended approaches for stormwater management in each *settlement area*; and
 - an implementation plan for the recommended approaches.

4.6-SA Municipalities are encouraged to implement a stormwater retrofit prior to the completion of a stormwater management master plan if a stormwater retrofit opportunity has been identified as a priority for a *settlement area* and is determined to be economically feasible.

4.7-DP Municipalities shall incorporate into their official plans policies related to reducing stormwater runoff volume and pollutant loadings from *major development* and *existing settlement areas* including policies that:

- a. encourage implementation of a hierarchy of source, lot-level, conveyance and end-of-pipe controls;
- b. encourage the implementation of innovative stormwater management measures;
- c. allow for flexibility in development standards to incorporate alternative community design and stormwater techniques, such as those related to site plan design, lot grading, ditches and curbing, road widths, road and driveway surfaces, and the use of open space as temporary detention ponds;
- d. support implementation of programs to identify areas where source control or elimination of cross connections may be necessary to reduce pathogens or contaminants; and
- e. support implementation of source control programs, which are targeted to existing areas that lack adequate stormwater controls.

4.8-DP An application for *major development* shall be accompanied by a stormwater management plan that demonstrates:

- a. consistency with stormwater management master plans prepared under policy 4.5, when completed;
- b. consistency with subwatershed evaluations prepared under policy 8.3 and water budgets prepared under policy 5.2, when completed;
- c. an *integrated treatment train approach* will be used to minimize stormwater management flows and reliance on end-of-pipe controls through measures including source controls, lot-level controls and conveyance techniques, such as grass swales;
- d. through an evaluation of anticipated changes in the water balance between pre-development and post-development, how such changes shall be minimized; and
- e. through an evaluation of anticipated changes in phosphorus loadings between pre-development and post-development, how the loadings shall be minimized.

4.9-DP Stormwater management works that are established to serve new *major development* in the *Lake Simcoe watershed* shall not be permitted unless the works have been designed to satisfy the *Enhanced Protection level* specified in Chapter 3 of the MOE's "Stormwater Management Planning and Design Manual 2003", as amended from time to time.

This policy does not apply if the works are intended to serve an *infill development* or a *redevelopment* within a *settlement area*, it is not feasible to comply with the specified design standard, and the person seeking to establish the works demonstrates that the works incorporate the most effective measures in the circumstances to control the quality and quantity of stormwater related to the *development* or *redevelopment*.

4.10-DP Every owner and operator of a new stormwater management works in the *Lake Simcoe watershed* shall be required to inspect and maintain the works on a periodic basis.

4.11-DP Every owner and operator of a new *priority stormwater management works* in the *Lake Simcoe watershed* shall be required to monitor the operation of works, including monitoring the quality of the effluent from the works, on a periodic basis.

4.12-SA The MOE will review the approvals issued under section 53 of the Ontario Water Resources Act in respect of existing *priority stormwater management works* within the *Lake Simcoe watershed*. If a review of an approval for an existing *priority stormwater management works* determines that the conditions in the approval are inadequate, having regard to the objectives of the Plan, including the conditions related to inspection, maintenance and monitoring, the approval will be referred to the *Director* for the purpose of determining whether an amendment to the approval is necessary to assist in meeting the objectives of the Plan.

On-Site and Subsurface Sewage Treatment

Septic systems that are inadequate or not functioning properly are potentially significant sources of pathogens that may eventually enter Lake Simcoe and its tributaries. It is estimated that the septic systems adjacent to Lake Simcoe contribute approximately 4.4 tonnes of phosphorus to Lake Simcoe annually. The following policies are intended to help improve water quality and prevent additional phosphorus loading to the lake as well as protect our natural heritage.

4.13-SA Within one year of the date the Plan comes into effect, the MMAH and the MOE will develop a proposal for a regulation under the Ontario Building Code Act, 1992, to designate the lands within 100 metres of the *Lake Simcoe shoreline*, other *lakes*, and any *permanent stream* of Lake Simcoe, as a prescribed area for required *on-site sewage system* maintenance re-inspections.

4.14-SA The MMAH, in consultation with the MOE, municipalities, conservation authorities, health units and industry partners, will consider new standards, including those being developed by the Bureau de Normalisation du Québec for small *on-site sewage systems* that evaluate new treatment unit technologies with respect to the reduction of pathogens and nutrients. The MMAH will consider the appropriateness of an amendment to Ontario's Building Code to incorporate the new standards.

4.15-DP Subject to other policies of the Plan, a new *on-site sewage system* or *subsurface sewage works* shall not be permitted within 100 metres of the *Lake Simcoe shoreline*, other lakes, or any *permanent stream* except in the following circumstances:

- a. a proposal for an *on-site sewage system* or *subsurface sewage works* that would serve an *agricultural use*, an *agricultural-related use* or a public open space;
- b. a proposal for an *on-site sewage system* or *subsurface sewage works* that would replace or expand the capacity of an existing *on-site sewage system* or *subsurface sewage works* that will serve a use that would have been permitted by the applicable zoning by-law, as of the effective date of the Plan; or
- c. a proposal for an *on-site sewage system* or *subsurface sewage works* that relates to a development proposal for only one dwelling, where the proposal would have been permitted by the applicable zoning by-law, as of the effective date of the Plan.

Construction and Mineral Aggregate Resource Activities

Land use practices that expose soils to wind and runoff have resulted in significant soil erosion impacting water quality in the Lake Simcoe and its tributaries. Overall atmospheric deposition accounts for a significant portion of the annual phosphorus load to Lake Simcoe, but we don't know the exact sources and quantities from those sources. These policies will assist in getting a better understanding of the sources and relative quantities of phosphorus delivered to the Lake through atmospheric deposition. In the meantime, the Plan identifies a number of actions ranging from mandatory conditions for subdivision agreements, site plans and for *site alteration*, while also promoting the implementation of effective and practical best management practices to reduce soil erosion and address atmospheric deposition from construction, aggregate and agricultural sites.

4.16-SA Within two years of the date the Plan comes into effect, the MOE will complete a study that identifies the sources of atmospheric deposition contributing phosphorus to the *Lake Simcoe watershed*.

4.17-SA Within three years of the date the Plan comes into effect, the MOE will:

- a. review measures, including regulatory controls and best management practices, to reduce water quality impairment, including the contribution of phosphorus loadings to the *Lake Simcoe watershed* from construction activities;
- b. evaluate the effectiveness of the measures; and
- c. identify preferred measures based on the review and the study referred to in policy 4.17, including the types of policies that could be included in the Plan.

4.18-SA Within three years of the date the Plan comes into effect, the MNR and the MOE, in consultation with the aggregate industry and key stakeholders, will determine the need for additional standards in the Aggregate Resources of Ontario-Provincial Standards for mineral resource aggregate activities within the *Lake Simcoe watershed*. The determination will be based on the findings of the study identified in policy 4.17 and the MNR's review of the Aggregates Resources of Ontario-Provincial Standards.

4.19-SA The mineral aggregate resources industry is encouraged to adopt best management practices as a proactive measure to reduce potential contribution of phosphorus loadings to the *Lake Simcoe watershed*.

4.20-DP Municipalities shall ensure that the following measures are incorporated into subdivision agreements and site plan agreements:

- a. keep the removal of vegetation, grading and soil compaction to the minimum necessary to carry out *development* activity;
- b. removal of vegetation shall not occur more than 30 days prior to grading or construction;
- c. put in place structures to control and convey runoff;
- d. minimize sediment that is eroded offsite during construction;
- e. seed exposed soils once construction is complete and seasonal conditions permit; and
- f. ensure erosion and sediment controls are implemented effectively.

4.21-HR *Site alteration* in the *Lake Simcoe watershed* shall be undertaken in a manner that incorporates the measures set out in policy 4.20.

Scientific Water Quality Monitoring and Research

Recognizing the need for an adaptive management approach to water quality issues, the following policies are intended to enhance the ability of the Province and its partners to effectively monitor water quality in the *Lake Simcoe watershed*, while promoting, conducting and supporting water quality research in key areas to help inform decision-making and future Plan policy amendments with the best available science.

4.22-M The MOE, in partnership with the MNR and the LSRCA, shall develop and implement an enhanced scientific water quality monitoring program that builds upon the monitoring program implemented through the LSEMS. This monitoring program shall be based on an adaptive management approach, and may be altered from time to time to respond to changing environmental conditions and management needs. At a minimum this monitoring program shall include:

- a. routine monitoring of the water quality of Lake Simcoe and its tributaries;
- b. monitoring of water quality parameters that affect the health of the Lake Simcoe ecosystem, for example, nutrients, pathogens, chlorides, sediments, heavy metals and organic chemicals;
- c. monitoring of biological *indicators* linked to water quality; and
- d. performance monitoring and reporting that evaluates the effectiveness of protection measures specified in this Plan that are designed to improve water quality.

4.23-SA The MOE, MNR and MAFRA, in collaboration with the LSRCA and other partners, will promote, conduct and support scientific research projects. These projects will build on existing research and monitoring programs, identify emerging issues and support the overall adaptive management approach of the Plan. Initial research will focus on one or more of the following:

- a. monitoring nutrients, including on-going validation of the phosphorus loading goal;
- b. tracking sources of pollutants, such as pathogens that are a cause of beach closures, and assessing other contaminants such as chlorides;
- c. enhancing existing lake water quality models that relate total phosphorus loads to *dissolved oxygen* and considering new models used in other aquatic ecosystems, as well as those that assess the impacts associated with *invasive species*, climate change, and other emerging issues;
- d. stormwater management, including effectiveness of stormwater management design and techniques, innovative technologies, *integrated treatment train approach*; and
- e. impact of organic chemicals and emerging compounds, such as personal care products, pharmaceuticals and endocrine disruptors in Lake Simcoe.

Phosphorus Reduction Strategy

In order to achieve the ambitious reductions in phosphorus loadings proposed in the Plan, there is a need to reduce loadings from all sources that contribute to excess phosphorus throughout the watershed. The following policies recognize this need by requiring the development of a phosphorus reduction strategy for the *Lake Simcoe watershed*, which will support a phased, coordinated and adaptive management approach to reducing excess phosphorus loadings. These policies also consider the need for innovative solutions to reducing phosphorus, like the proposal to conduct a feasibility study to determine the effectiveness of a *water quality trading* program in the watershed.

4.24-SA Within one year of the date the Plan comes into effect, the MOE, in collaboration with other Provincial ministries, the First Nations and Métis communities, the LSRCA and municipalities will develop a Phosphorus Reduction Strategy for the *Lake Simcoe watershed* for the purpose of reducing phosphorus loadings to achieve the target of *dissolved oxygen* of 7 mg/L. The Strategy will be designed to accommodate the implementation of the Growth Plan for the Greater Golden Horseshoe, where relevant. The components of the Phosphorus Reduction Strategy will include:

- a. the development of subwatershed phosphorus loading targets;
- b. if determined to be necessary, the development of phosphorus loading targets for specific areas of Lake Simcoe, including individual targets for Kempenfelt Bay, Cook's Bay, and the main basin;

- c. an assessment of sources or sectors that contribute phosphorus loadings to the watershed, including:
 - i. *sewage treatment plants*,
 - ii. tributary sources,
 - iii. *subsurface sewage systems*,
 - iv. stormwater runoff, and
 - v. sources of atmospheric deposition;
- d. an identification of practical and effective actions that should be taken to address each source or sector assessed under sub-paragraph c;
- e. the proposal of a long-term total phosphorus loading cap for each *sewage treatment plant in the Lake Simcoe watershed*. These long-term phosphorus loading caps will be integrated and consistent with phosphorus loading goal established in the Plan and targets referred to under sub-paragraph a. and b., and will consider the following:
 - i. detailed evaluations of treatment efficiency, flow capacity and economic feasibility in achieving various effluent limits,
 - ii. flow capacity needed to accommodate the population and employment growth allocated to the areas serviced by a *sewage treatment plant*,
 - iii. minimum standards for phosphorus removal, and
 - iv. timelines required for achieving compliance with the new loading caps; and
- f. an examination of how effluent re-use opportunities in the *Lake Simcoe watershed* may contribute to reducing phosphorus loadings to achieve the *dissolved oxygen* target of 7 mg/L.

4.25-SA Within one year of the date the Plan comes into effect the MOE will conduct a feasibility study for *Water Quality Trading* pursuant to subsection 75, (1.8), of the Ontario Water Resources Act.

4.26-SA Within one year of the date of the Plan comes into effect, the MOE, in consultation with municipalities will develop and implement a plan to promote the use of low-phosphate or phosphate-free products within the *Lake Simcoe watershed*.

Stewardship

Many of the designated policies and strategic actions described in this chapter cannot be implemented in isolation and will require active partnership with stewardship activities, described in detail in Chapter 8. Stewardship will augment the water quality policies by adding the voluntary efforts and activities of agricultural, rural and urban landowners and residents, and for those in charge of public lands.

Stewardship programming is intended to promote phosphorus reduction and pollution management by using best management practices that can be implemented by individuals on single or multiple properties. Examples include shoreline and riparian management (e.g. planting of native species) by appropriate shoreline and streamside landowners, nutrient management by farmers and municipalities, innovative and 'green' design by developers, urban planners and engineers (e.g. innovative stormwater infrastructure), and soil conservation and management on farms, mineral and aggregate resource operations, golf courses and municipal lands.



Chapter 5

Water Quantity

chapter five

CONTEXT

Extractions of large volumes of groundwater and surface water may be contributing to diminishing water supplies in the *Lake Simcoe watershed*, reducing base flow to streams and reducing the overall flow of water into Lake Simcoe. Adequate flow in rivers and streams is needed to sustain aquatic ecosystems and certain subwatersheds in the *Lake Simcoe watershed* are already under water quantity stress, causing changes in the aquatic habitats of rivers and streams and impacting aquatic communities.

Changes in water levels and flows can also affect other elements of the watershed such as water quality and the health of natural areas and shorelines. Watershed residents and users also depend on a sustainable water supply for a variety of uses, including drinking water, irrigation, industrial processing, navigation, recreation and wastewater assimilation.

Demand for water will likely intensify as continuing growth and *development* diminish available supplies and increase demand for water. In addition, climate change also has potential impacts on water quantity, including:

- demand for water potentially exceeding supply;
- changes in ice cover affecting evaporation, lake levels, shoreline erosion, precipitation, seasonality, and lake-effect snow;
- periodic failures of *sewage* and flood control infrastructure;
- reduction in ground water and artesian flows; and
- an increase in flooding and/or drought events.

The policies included in the Plan help increase the capacity of the *Lake Simcoe watershed* to adapt to the impacts of climate change. The MOE's Permit to Take Water Program, source protection planning under the Clean Water Act, 2006, the MNR's Ontario Low Water Response Program, would continue to play important roles in managing water quantity in the *Lake Simcoe watershed*.

To protect aquatic ecosystems in the *Lake Simcoe watershed*, an adequate portion of the available water supply must be reserved for the ecosystem and restricted from human consumption.



Non-essential water use



Irrigating golf courses

This Plan would support research to estimate the reserve flows required to maintain healthy aquatic ecosystems in the watershed. It would also promote greater efforts to conserve and use water more efficiently in order to maintain future demands for water within sustainable limits. Specific targets for protecting water quantity will be developed once the research has been completed.

Key Facts

- The use of large amounts of groundwater and surface water can cause reduced flow in streams, the lowering of the water table and a reduced total inflow of water to the Lake. At high risk of depletion (e.g., below the level to maintain base flow) is the Maskinonge River
- The State of the Lake Simcoe Watershed Report (LSEMS, 2003) pointed to decreases in streamflow that have affected the availability of aquatic habitats and resulted in the loss of recreational opportunities and impacts to the local economy
- Water quantity issues can bring with them significant impacts across the *Lake Simcoe watershed*. These issues are attracting more attention through initiatives such as source water protection under the Clean Water Act, 2006, which will lead to the development of “water budgets” that quantify the volumes of water in a watershed

Indicators:

- To monitor progress in achieving the water quantity-related objectives of the Plan, the following are *indicators* of environmental health relating to water quantity:
 - maintenance of in-stream flow regimes that are protective of aquatic ecosystem needs (as identified in the in-stream flow studies and implemented through the water-taking strategy); and
 - effective water conservation and efficiency plans (e.g., as measured through reductions in peak water demand, reduced water use per capita, progress in achieving municipal targets).

Policies:

Water Supply

The policies below will support the maintenance of adequate flows required to maintain healthy aquatic ecosystems in the *Lake Simcoe watershed*.

- 5.1-SA** The MOE and the MNR will develop in-stream flow targets for water quantity stressed subwatersheds in collaboration with LSRCA. This includes the development of targets for in-stream flow regimes and water extraction limits for the Maskinonge River subwatershed within two years of the date the Plan comes into effect. The targets will build on watershed information and assessments developed through Drinking Water Source Water Protection Program (Clean Water Act, 2006) and will consider the potential impacts of climate change and will be used to inform future strategies related to water taking. These strategies may lead to policies that:

- a. require the development of targets for all other subwatersheds, and set out how much water can be allocated among users in a subwatershed, including setting aside an allocation to support the natural functions of the ecosystem;
- b. specify requirements on the *Directors* when issuing or amending Permits To Take Water in that subwatershed; or
- c. address climate change adaptation for water taking in the watershed.

5.2-SA The LSRCA, in partnership with municipalities, will complete *Tier 2 water budgets* for all subwatersheds that have not been completed in the assessment report required under the Clean Water Act, 2006 for the Lake Simcoe and Couchiching/Black River Source Protection Area. Priority should be given to all stressed subwatersheds identified in Policy 5.1, where *Tier 2 water budgets* have not been completed under the Clean Water Act, 2006. The water budgets may be used to inform:

- a. municipal water conservation and efficiency plans, including those prepared under Policy 5.3 and municipal decisions concerning growth and *development*;
- b. water-taking strategies prepared under Policy 5.1 and decisions made by the *Director* concerning Permits To Take Water;
- c. the identification of significant groundwater recharge areas identified in Policy 6.36-DP of this Plan; or
- d. policies that would be included in future amendments to the Plan.

Water Conservation and Efficiency

The policies below will promote greater efforts to conserve and use water more efficiently throughout the *Lake Simcoe watershed*.

5.3-SA Within five years of the date the Plan comes into effect, the municipalities of Barrie, Orillia, New Tecumseth, Bradford West Gwillimbury, Innisfil, Oro- Medonte and Ramara will prepare and begin implementation of a water conservation and efficiency plan, that has regard to the recommended standards and practices for the municipal sector including those recommended by the Ontario Water Works Association. A water conservation and efficiency plan will, at a minimum:

- a. establish targets for water conservation and/or efficiency with timeframes for achieving these targets;
- b. identify and evaluate:
 - i. water conservation measures such as improved management practices, the use of flow-restricting devices and other hardware, water reuse and recycling, and practices and technologies associated with water reuse and recycling,
 - ii. water conservation incentives such as full-cost pricing, and
 - iii. methods for promoting water conservation measures and water conservation incentives, including public education and awareness programs for rural residents not served by a municipal water supply system;

- c. analyze the costs and benefits of the measures described in clause (a);
- d. require the use of specified water conservation measures and incentives;
- e. contain an implementation plan for those specified measures and incentives that reconciles the demand for water with the water supply;
- f. provide for monitoring and reporting of the effectiveness of the conservation plan and achievement of water conservation and/or efficiency targets; and
- g. consider the potential impacts of climate change.

5.4-SA The MAFRA, in cooperation with key stakeholders, will assist and encourage water conservation and efficiency efforts in the agricultural community through stewardship programs aimed at promoting the adoption of best management practices. Specific opportunities may include:

- a. education and outreach under the Environmental Farm Plan other *Lake Simcoe watershed*-focused programs, and related cost-share support to implement agricultural water conservation and efficiency best management practices; or
- b. in stressed subwatersheds, where adoption of individual best management practices through the Environmental Farm Plan does not address agricultural water supply challenges, investigation of a strategic approach to water supply planning to identify communal infrastructure, other stewardship programs, or cost-share and partnership opportunities, as appropriate.

5.5-SA The MOE will work with other water use sectors, such as the *major recreational use* sector and other commercial and industrial sectors, in the *Lake Simcoe watershed* to encourage the development and implementation of water conservation and efficient use practices for their sector.

5.6-DP An application to establish or expand a *major recreational use* shall be accompanied by a recreation water use plan that demonstrates:

- a. water use for maintenance or snow-making or both are kept to a minimum;
- b. grassed, watered and manicured areas are limited to sports fields surfaces, golf fairways, tees and greens, and landscaped areas around buildings and structures; grass mixtures that require minimal watering and upkeep will be used for sports fields and golf fairways where applicable;
- c. crossings of intermittent and *permanent streams* are kept to a minimum;
- d. water-conserving technologies (such as low-flow toilets and shower heads) are used in clubhouses and restaurants where applicable;
- e. water-conserving technologies (such as timed irrigation systems designed to reduce evaporation losses, and recycling of water from under greens) are used in the irrigation and watering of sports field surfaces, golf fairways, tees and greens, and landscaped areas around buildings and structures, where applicable;
- f. other water conservation technologies (such as rainwater harvesting or reuse of stormwater) will be used to reduce water use; and
- g. stormwater treatment facilities are used to capture and treat runoff from areas with impervious surfaces.