

# Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health

# 2021



Canada 

Ontario 

Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2021.

ISBN: PRINT: 978-1-4868-5342-7

PDF: 978-1-4868-5344-1

HTML: 978-1-4868-5343-4

Published by the Ministry of the Environment, Conservation and Parks and  
Environment and Climate Change Canada

Licensing and information:

To request a licence to reproduce any materials on this website for commercial purposes, or for information on Crown copyright generally, please contact the Queen's Printer's representative.

For further information, please contact:

Senior Copyright Advisor

Publications Ontario

416-326-5153

[Copyright@ontario.ca](mailto:Copyright@ontario.ca)

© Queen's Printer for Ontario, 2021

© Her Majesty the Queen in Right of Canada, represented by the Minister of Environment  
and Climate Change, 2021

Aussi disponible en français

Front cover photograph: Lake Ontario, Point Petre, Prince Edward County. © W. Bakowsky.

Back cover photograph: Lake Superior, Katherine Cove, Lake Superior Provincial Park. © Destination Ontario.

# Table of Contents



<b>Articles.....</b>	<b>8</b>
<b>Priority – Protecting Waters.....</b>	<b>17</b>
Annex 1: Nutrients .....	18
Annex 2: Harmful Pollutants.....	22
Annex 3: Wastewater and Stormwater .....	29
Annex 4: Discharges from Vessels .....	33
<b>Priority – Improving Coastal Areas.....</b>	<b>35</b>
Annex 5: Areas of Concern .....	36
Annex 6: Lakewide Management .....	51
<b>Priority – Protecting Habitat and Species .....</b>	<b>56</b>
Annex 7: Aquatic Invasive Species.....	57
Annex 8: Habitat and Species .....	61
<b>Priority – Enhancing Understanding and Adaptation.....</b>	<b>64</b>
Annex 9: Groundwater Quality.....	65
Annex 10: Climate Change Impacts and Resilience .....	67
<b>Priority – Engaging Communities – from Awareness to Action .....</b>	<b>71</b>
Annex 11: from Awareness to Action .....	72
Annex 12: Métis and the Great Lakes.....	75
Annex 13: First Nations and the Great Lakes.....	77

**THIS AGREEMENT IS EFFECTIVE THE 1ST DAY OF JUNE, 2021**

**BETWEEN**

**HER MAJESTY THE QUEEN IN RIGHT OF CANADA (CANADA)**

Represented By

The Honourable Jonathan Wilkinson, Minister of the Environment (and Minister Responsible for Parks Canada Agency)

The Honourable Marie-Claude Bibeau, Minister of Agriculture and Agri-Food

The Honourable Bernadette Jordan, Minister of Fisheries and Oceans

The Honourable Patty Hajdu, Minister of Health

The Honourable Seamus O'Regan, Minister of Natural Resources

The Honourable Omar Alghabra, Minister of Transport

**AND**

**HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO (ONTARIO)**

Represented By

The Honourable Jeff Yurek, Minister of the Environment, Conservation and Parks

The Honourable John Yakabuski, Minister of Natural Resources and Forestry

The Honourable Ernie Hardeman, Minister of Agriculture, Food and Rural Affairs

**WHEREAS** Canada and Ontario (the Parties) affirm that this Agreement is guided by the shared vision of a healthy, prosperous and sustainable Great Lakes for present and future generations;

**AND WHEREAS** the Parties recognize that the Great Lakes region is home to approximately 33 percent of Canada's population, and contains seven of Canada's twenty largest cities, and municipal sources around the Great Lakes directly provide drinking water to 60 percent of Ontarians;

**AND WHEREAS** the Parties acknowledge that the Great Lakes region plays a vital role in the physical, social and economic life of Canada, Ontario's Great Lakes basin contains 40 percent of the country's economic activity, including approximately 25 percent of Canada's agricultural production, and nearly half of Canada's manufacturing activity;

**AND WHEREAS** environmentally sustainable and responsible economic activity, resource development, and innovation is important to the long-term prosperity of the Great Lakes region;

**AND WHEREAS** the Parties acknowledge that the Great Lakes contain approximately 20 percent of the surface freshwater in the world, and that less than 1 percent of the water is renewed annually by precipitation;

**AND WHEREAS** the Parties have shared jurisdiction over the Great Lakes, which makes coordination and cooperation essential to their restoration, protection and conservation, and acknowledge that Ontario has the longest coastline of any jurisdiction on the Great Lakes;

**AND WHEREAS** the Parties acknowledge that the Great Lakes are ecologically important, supporting outstanding biological diversity and significant fisheries;

**AND WHEREAS** the Parties acknowledge the close connection between Great Lakes water quality and human health and the positive effects on individuals and communities from the use and enjoyment of healthy Great Lakes;

**AND WHEREAS** since 1971 the Parties have worked together through a series of Canada-Ontario Agreements that have guided their efforts to improve water quality and ecosystem health of the lakes, and contributed to meeting Canada's obligations under the Canada-United States Great Lakes Water Quality Agreement;

**AND WHEREAS** the efforts of the Great Lakes community contribute to the restoration, protection and conservation of the Great Lakes;

**AND WHEREAS** the Government of Canada is committed to advancing reconciliation with First Nations and Métis peoples through renewed nation-to-nation, government-to-government relationships based on recognition of rights, respect, co-operation and partnership;

**AND WHEREAS** First Nations and Métis within the Great Lakes basin consider the Great Lakes to be of spiritual, cultural, and ceremonial significance to their communities;

**AND WHEREAS** Traditional Ecological Knowledge may assist efforts to restore, protect and conserve the Great Lakes, and the Parties endeavour to consider this knowledge in all cases when it has been offered;

**AND WHEREAS** the Government of Canada is committed to implementing the United Nations Declaration on the Rights of Indigenous Peoples;

**AND WHEREAS** First Nations in Ontario have adopted a Water Declaration that expresses their objectives regarding water protection;

**AND WHEREAS** the Parties recognize that progress has been made in the Great Lakes in reducing the release of harmful pollutants, improving and protecting fish and wildlife habitat, restoring a number of Areas of Concern, and fostering a sense of stewardship;

**AND WHEREAS** the Parties recognize that, despite the progress made, the Great Lakes are currently exhibiting symptoms of stress due to human activities undertaken within the basin and elsewhere in the world;

**AND WHEREAS** the Parties recognize the need to strengthen efforts to address new and continuing threats to Great Lakes water quality and ecosystem health, including aquatic invasive species, excessive nutrients, harmful pollutants, discharges from vessels, climate change, and the loss of habitats and species;

**AND WHEREAS** the Parties recognize that science is the basis for shared understanding of chemical, physical and biological integrity of the waters of the Great Lakes, and for ensuring effective decision-making and action in respect of the Great Lakes;

**AND WHEREAS** the Parties recognize that in addition to offshore waters, nearshore areas must be restored, protected and conserved because they are the major source of drinking water for communities, are where most human commerce and recreation occur, and are the critical ecological link between watersheds and the open waters of the Great Lakes;

**AND WHEREAS** the Parties acknowledge that the vast majority of public stormwater and wastewater treatment infrastructure in Canada is owned, operated and maintained by provincial, territorial or municipal governments and that those governments are therefore also responsible for identifying priority actions and projects within their jurisdictions;

**AND WHEREAS** the Parties acknowledge that the federal Wastewater Systems Effluent Regulations, 2012, establish national effluent quality standards for secondary wastewater treatment in Canada;

**AND WHEREAS** the Parties recognize that restoration and enhancement of Great Lakes water quality and ecosystem health cannot be achieved by addressing individual threats in isolation, but rather depend upon the application of an ecosystem approach that addresses individually and cumulatively all sources of stress to the Great Lakes;

**AND WHEREAS** the Parties acknowledge that Canada is responsible for meeting its binational commitments in the Canada-United States Great Lakes Water Quality Agreement, and Ontario agrees to support Canada in the manner set out in this Agreement;

**AND WHEREAS** the Parties acknowledge that the quality of the waters of the Great Lakes may affect the quality of the waters of the St. Lawrence River downstream of the international boundary;

**AND WHEREAS** the Parties affirm their commitment to work together to implement the Canada-United States Great Lakes Water Quality Agreement and to advance Ontario's Great Lakes Strategy and the Great Lakes actions in Ontario's Environment Plan in a manner consistent with the vision and purpose of this Agreement;

**AND WHEREAS** the Parties are committed to continuing to work together, and to engaging the Great Lakes community on a good governance basis, to restore, protect and conserve the Great Lakes for present and future generations.

**NOW THEREFORE** the Parties have agreed as follows:

# ARTICLES



## ARTICLE I DEFINITIONS

In this Agreement:

- (a) “Agreement” means the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2021, including any Annexes;
- (b) “Canada-United States Great Lakes Water Quality Agreement” means the Great Lakes Water Quality Protocol of 2012 between Canada and the United States;
- (c) “Chemicals of Concern” means chemicals which Canada and Ontario agree are of concern to human health or the environment in the Great Lakes and should be considered a priority for specific action(s). A Chemical of Concern could be considered for nomination under the Chemicals of Mutual Concern Annex of the Canada-United States Great Lakes Water Quality Agreement;
- (d) “Good Governance” means pursue a decision-making process based on public participation, transparency and accountability;
- (e) “Great Lakes” means the waters of Lakes Superior, Huron, Michigan, Erie and Ontario and the connecting river systems of St. Marys, St. Clair including Lake St. Clair, Detroit, Niagara and St. Lawrence at the international boundary or upstream from the point at which this river becomes the international boundary between Canada and the United States, including all open and nearshore waters;
- (f) “Great Lakes Basin Ecosystem” means the interacting components of air, land, water and living organisms, including humans, and all of the streams, rivers, lakes, and other bodies of water, including groundwater, that are in the drainage basin of the Great Lakes and the St. Lawrence River at the international boundary or upstream from the point at which this river becomes the international boundary between Canada and the United States;
- (g) “Great Lakes community” means First Nations and Métis; municipal governments; conservation authorities; non-government organizations; the scientific community; the industrial, agricultural, recreational, tourism and other sectors; and members of the public with an interest in Great Lakes issues;
- (h) “Harmful Pollutants” means chemicals or pathogens that have an adverse effect on human or ecological health including, but not restricted to, Chemicals of Concern or substances of emerging concern;



- (i) “Nuisance Algae Blooms” means blooms of algae such as *Cladophora* that degrade fish and wildlife habitat, clog water intake pipes and foul shorelines and fishing equipment but which do not produce toxins;
- (j) “Ontario’s Great Lakes Strategy” means the current version of the document entitled “Ontario’s Great Lakes Strategy” prepared under section 5 of the *Great Lakes Protection Act, 2015* and published by the Government of Ontario;
- (k) “Ontario’s Environment Plan” means the 2018 draft document entitled *Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan* as posted by the government of Ontario, or its successor;
- (l) “Road salts” means substances used for deicing and other purposes that contain inorganic chloride salts with or without ferrocyanide salts;
- (m) “Harmful Algae Blooms”, also called blue-green algae blooms or cyanobacteria blooms, means a type of bacteria that undergoes photosynthesis and can be influenced by excessive phosphorus concentrations. Cyanobacteria can produce toxic substances called cyanotoxins with the potential to harm humans and other organisms.

## **ARTICLE II**

### **PURPOSE**

1. The purpose of this Agreement is to restore, protect and conserve Great Lakes water quality and ecosystem health in order to assist in achieving the vision of a healthy, prosperous and sustainable region for present and future generations.
2. The Parties commit to continuing to work together in a cooperative, coordinated and integrated fashion, with each other and with others around the Great Lakes on a good governance basis, to achieve the vision.
3. To achieve the vision, the Agreement:
  - (a) establishes principles that will guide the actions of the Parties;
  - (b) describes the development of Annexes to respond to existing or emerging environmental issues;
  - (c) sets in place administrative arrangements for the effective and efficient management of the Agreement; and
  - (d) establishes common priorities, results and commitments for the restoration, protection and conservation of the Great Lakes.
4. By defining a vision for the Great Lakes, specific results, and the commitment to action by the Parties, this Agreement is intended to give momentum to wider efforts and to facilitate collaborative arrangements and collective action among all people and organizations with an interest in the Great Lakes.
5. Implementation of this Agreement will contribute to meeting Canada’s obligations under the Canada-United States Great Lakes Water Quality Agreement and Ontario’s Environment Plan and Ontario’s Great Lakes Strategy.

## ARTICLE III PRINCIPLES

The following principles will guide the actions of the Parties under the Agreement:

- (a) Accountability – remain accountable to citizens by establishing clear results and commitments for this Agreement and providing regular reporting;
- (b) Adaptive Management – conduct activities with openness, innovation and a view to continuous improvement to ensure effective and efficient management of the Agreement;
- (c) Collaboration, Cooperation and Engagement – ensure that the decision-making process provides the Great Lakes community with meaningful opportunities to discuss, advise and participate directly in activities that support the Agreement, and incorporates consideration of opinions and advice from the Great Lakes community;
- (d) Communication – ensure that effective methods are used to inform the public of the importance of the Great Lakes, the increasingly complex environmental challenges faced by the Great Lakes and ongoing efforts to overcome the challenges, and to encourage collaborative and individual action and stewardship to restore, protect and conserve the Great Lakes;
- (e) Conservation – promote the conservation and efficient use of energy, water and other resources to sustain the physical, chemical and biological integrity of the Great Lakes;
- (f) Cumulative Effects – consider the combined impacts of individual actions on the environment;
- (g) First Nations and Métis – their identity, cultures, interests, knowledge and traditional practices will be considered by the Parties in the restoration, protection and conservation of the Great Lakes Basin Ecosystem;
- (h) Free Exchange of Information – collect data once, closest to the source, in the most efficient manner possible and share the information with others;
- (i) Net Gain – design human development and management actions to maximize environmental benefits rather than acting only to minimize environmental costs;
- (j) Polluter Pays – recognize that the polluter should be held accountable and bear the cost of its pollution;
- (k) Pollution Prevention – use processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health;
- (l) Precautionary Principle – where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation;
- (m) Science-Based Management – provide advice to establish management priorities, policies and programs based on best available science, research and knowledge, including Traditional Ecological Knowledge when offered;
- (n) Sustainability – consider social, economic and environmental demands to balance the needs of the present without compromising the ability of future generations to meet their own needs;

- (o) Virtual Elimination – adopt the principle of virtual elimination of Chemicals of Concern, as appropriate; and
- (p) Zero Discharge – apply the philosophy of zero discharge of releases of Chemicals of Concern, as appropriate.

## **ARTICLE IV ANNEXES**

- 1. The Parties agree to develop and implement Annexes that focus on environmental issues that are a priority for the Parties and will benefit from cooperative and coordinated action.
- 2. Through this Agreement, Canada and Ontario provide specific results and commitments to work together and with the Great Lakes community on a good governance basis to restore, protect and conserve water quality and ecosystem health in the Great Lakes. They are addressed in thirteen Annexes, which are grouped under five priorities:

### Protecting Waters

- 1. Nutrients
- 2. Harmful Pollutants
- 3. Wastewater and Stormwater
- 4. Discharges from Vessels

### Improving Coastal Areas

- 5. Areas of Concern
- 6. Lakewide Management

### Protecting Habitat and Species

- 7. Aquatic Invasive Species
- 8. Habitat and Species

### Enhancing Understanding and Adaptation

- 9. Groundwater Quality
- 10. Climate Change Impacts and Resilience

### Engaging Communities – From Awareness to Action

- 11. From Awareness to Action
- 12. Métis and the Great Lakes
- 13. First Nations and the Great Lakes

- 3. Each Annex shall include:
  - (a) a preamble, introducing the subject of the Annex and the articulation of what both Parties will strive to achieve in the long-term; and

(b) results for the Great Lakes specific to the subject of the Annex, and commitments that each Party will deliver jointly or separately, as specified for the duration of the Annex in order to achieve the intended results.

4. Annexes may be developed at any time, and will come into force upon signing by the Parties. The Parties commit to engaging the Great Lakes community on a good governance basis as appropriate when developing or amending Annexes.

## ARTICLE V ADMINISTRATION OF THE AGREEMENT

The COA Executive Committee provides oversight to thirteen Annexes under five priority areas



Protecting Waters	Improving Coastal Areas	Protecting Habitat and Species	Enhancing Understanding and Adaptation	Engaging Communities - From Awareness to Action
Nutrients	Areas of Concern	Aquatic Invasive Species	Groundwater Quality	From Awareness to Action
Harmful Pollutants	Lakewide Management	Habitat and Species	Climate Change Impacts and Resilience	Métis and the Great Lakes
Wastewater and Stormwater				First Nations and the Great Lakes
Discharges from Vessels				

### COA EXECUTIVE COMMITTEE

1. The oversight of the Agreement will be entrusted to the COA Executive Committee. The Committee will consist of Assistant Deputy Ministers, Regional Director Generals or most senior regional representatives or their delegates from all departments, ministries and agencies of the Parties who are responsible for leading or supporting one or more commitments in any of the Annexes. The Committee will be co-chaired by Environment and Climate Change Canada and the Ontario Ministry of the Environment, Conservation and Parks. The Committee will meet at least annually to ensure effective and efficient implementation of the Agreement.
2. Canada will invite the Ontario members of the COA Executive Committee to participate on the Canada-United States Great Lakes Executive Committee pursuant to Article 5 of the Canada-United States Great Lakes Water Quality Agreement. The COA Executive Committee will convene discussions prior to meetings of the Canada-United States Great Lakes Executive Committee to review and advise on issues to be raised at the meetings.

3. Canada will invite Ontario to participate on appropriate Annex-specific subcommittees to the Canada-United States Great Lakes Executive Committee, as required, to assist in the implementation of the Canada-United States Great Lakes Water Quality Agreement pursuant to Article 5 of that Agreement.
4. The COA Executive Committee will be responsible for:
  - (a) reviewing priorities on an annual basis and coordinating the implementation of the Agreement;
  - (b) undertaking annual evaluations and assessments of the Agreement, and recommending amendments and/or action to facilitate progress as appropriate;
  - (c) facilitating strategic discussions on issues such as infrastructure, science and innovation between signatory and non-signatory departments, ministries and agencies of the Parties and others to ensure the effective coordination of actions;
  - (d) overseeing the development, amendment and implementation of Annexes;
  - (e) overseeing the delivery of timely communications and public progress reporting, as described in Article VII, to the Great Lakes community and ensuring opportunities for engagement and enhanced collaborative action on Great Lakes;
  - (f) holding roundtable discussions, as appropriate, with invited representatives of relevant domestic Great Lakes bodies or jurisdictions that have an interest in the management of the Great Lakes and representatives of the Great Lakes community, including downstream interests along the St. Lawrence River; and
  - (g) developing common positions for representing Canadian interests and engaging in cooperative initiatives with United States agencies and the International Joint Commission.

#### **ANNEX LEADS**

5. To manage the implementation of each Annex, the Parties will identify federal-provincial Annex leads for:
  - (a) overseeing Annex-specific coordination, cooperation and integration of activities, including the establishment of Annex teams as needed;
  - (b) identifying lead and support departments, ministries and agencies for commitments under that Annex;
  - (c) coordinating implementation of the Agreement commitments including projects to achieve those commitments and undertaking an annual assessment of progress. Every effort will be made to ensure a coordinated and cooperative approach by maximizing the integration of activities of contributing departments, ministries, agencies and others;
  - (d) recommending a course of action to the COA Executive Committee or COA Executive Committee Co-Chairs when more authority or policy direction is required to achieve the results and commitments of the Agreement;

- (e) ensuring opportunities for engagement, participation, coordinated action and cooperation with the Great Lakes community as appropriate, to examine emerging issues, advise on projects and deliver Annex results and commitments;
- (f) reviewing science priorities within Annexes on an annual basis and holding roundtable discussions, as appropriate, to support science-informed results and commitments of the Agreement; and
- (g) collaboratively engaging First Nations and Métis communities in the delivery of Annex commitments, as appropriate.

## **ARTICLE VI SCIENCE**

The Parties agree to conduct, maintain, focus and coordinate science activities, programs, data and information, as well as support Traditional Ecological Knowledge and, when offered, consider this knowledge in decision-making, in order to contribute towards the achievement of the Purpose of the Agreement.

## **ARTICLE VII REPORTING**

The Parties agree to deliver to the public, reports on progress made under the Agreement in a timely and transparent manner: Canada under the Canada-United States Great Lakes Water Quality Agreement, Ontario under Ontario's *Great Lakes Protection Act*, 2015 and, jointly through COA Progress reporting.

## **ARTICLE VIII RESOURCES**

The Parties commit to providing the resources needed to implement the Agreement and the Annexes pursuant to it, subject to there being an appropriation for such purposes in Parliament or the Legislature, as the case may be, in the relevant fiscal year. The Parties agree to create opportunities for others to contribute resources, as appropriate, to achieving the Purpose of the Agreement.

## **ARTICLE IX NOTIFICATION**

1. Prior to undertaking any changes to the Canada-United States Great Lakes Water Quality Agreement, Canada will consult with Ontario.
2. Prior to undertaking any activities with the United States that may significantly affect this Agreement, Canada will notify Ontario.
3. Prior to undertaking any agreement with States of the United States that may significantly affect this Agreement, Ontario will notify Canada.

4. The Parties agree to continue to cooperate in anticipating, preventing and responding to threats to the Great Lakes. The Parties agree to facilitate the exchange of information using existing mechanisms to provide notice of any proposed activity that could have a significant impact on the waters of the Great Lakes.

## **ARTICLE X**

### **AMENDING THE AGREEMENT**

The Agreement may be amended by the Parties at any time. The Parties commit to engaging the Great Lakes community, as appropriate, when amending the Agreement. An amendment will be confirmed by an exchange of letters by the Parties setting out the amendment and the date it enters into force.

## **ARTICLE XI**

### **DISPUTE AVOIDANCE**

1. The Parties are committed to working collaboratively to avoid and resolve any dispute concerning the management of the Agreement and the performance of obligations set out in the Annexes.
2. The COA Executive Committee will make all reasonable efforts to resolve any dispute under this Agreement.
3. In the event that a dispute under the Agreement is not resolved by the COA Executive Committee, either Party may provide written notice to the other Party of the matter in dispute together with related information and documentation requesting further efforts by the Parties to resolve the matter. In that event, within 60 days of notice, the Parties will meet to discuss the dispute in a cooperative and collaborative manner. If the dispute is not resolved within 60 days of the meeting, or such longer period as the Parties may agree, the Parties may jointly retain a third party to provide mediation in connection with the resolution of the dispute.

## **ARTICLE XII**

### **ENTRY INTO FORCE**

This Agreement will enter into force on June 1, 2021, and will remain in force for five years, until May 31, 2026. The Agreement may be terminated earlier by either Party giving the other at least six months written notice.

## **ARTICLE XIII**

### **COMPLIANCE WITH LAW**

1. Nothing in this Agreement alters the legislative or other authority of the Parties with respect to the exercise of their legislative or other authorities under the Constitution of Canada.
2. The Parties acknowledge that the obligations in this Agreement are subject to the applicable laws of Canada and Ontario.

**ORIGINAL SIGNED BY  
ON BEHALF OF HER MAJESTY THE QUEEN IN RIGHT OF CANADA**

Minister of the Environment (and Minister Responsible for Parks Canada Agency)

Minister of Agriculture and Agri-Food

Minister of Fisheries and Oceans

Minister of Health

Minister of Natural Resources

Minister of Transport

**ON BEHALF OF HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO**

Minister of the Environment, Conservation and Parks

Minister of Natural Resources and Forestry

Minister of Agriculture, Food and Rural Affairs



## **PRIORITY – PROTECTING WATERS**

This Priority focuses on understanding and reducing excessive nutrients, reducing or eliminating releases of harmful pollutants, improving wastewater and stormwater management and protecting the Great Lakes from discharges from vessels in order to protect human and aquatic ecosystem health and well-being. Clean water is the foundation for healthy Great Lakes ecosystems, but is threatened by various sources of pollution and the adverse effects of this pollution are exacerbated by climate change. To address these issues, this Priority includes Annexes on Nutrients, Harmful Pollutants, Wastewater and Stormwater and Discharges from Vessels.

## **ANNEX 1: NUTRIENTS**

**The purpose of this Annex is to address the issue of excess nutrients and reduce harmful and nuisance algae blooms and zones of hypoxia.**

There continues to be an urgent need for a coordinated and strategic response to nutrient management issues in the Great Lakes, and in Lake Erie in particular. In the 1970s and 1980s, collaborative efforts to reduce phosphorus were successful and lake conditions improved. By 1985, phosphorus loadings into the Great Lakes were at or below targets identified in the Canada-United States Great Lakes Water Quality Agreement. However, since the mid-1990s there has been a resurgence of algae blooms in Lake Erie and the nearshore areas of Lakes Huron and Ontario, and algae blooms are beginning to appear in Lake Superior as well.

The reasons for the occurrence of algae blooms are now more complex than in past decades. The introduction of invasive species such as zebra and quagga mussels and round gobies, changes in agricultural production systems, increased urbanization, and climate change are all contributing factors. New solutions are required.

The Great Lakes are currently experiencing nutrient levels that impair human use and also result in harmful effects on ecosystem functions. This Annex recognizes that the continued environmental, social and economic health of the Great Lakes basin requires the effective and efficient management of nutrients from human activities. Through the 2014 Agreement, Canada and Ontario worked with many partners to establish phosphorus loading reduction targets for Lake Erie as well as develop the Canada–Ontario Lake Erie Action Plan to achieve those targets. This Annex will build on these achievements by addressing the need for improved understanding of nutrient issues while continuing to develop and promote actions to improve nutrient management.

Actions to understand and address issues related to nearshore water quality, aquatic ecosystem health, and harmful and nuisance algae blooms will continue for all the Great Lakes. Emphasis continues to be on Lake Erie and on working with our partners to implement the Lake Erie Action Plan. The scientific data, knowledge and policy approaches learned in Lake Erie will begin to be applied in Lake Ontario, as appropriate.

There are a number of complementary initiatives that contribute to the goal of reducing harmful and nuisance algae blooms and hypoxia in the Great Lakes. These include federal and provincial investments in nutrient related research and monitoring; green infrastructure, wastewater technologies and facilities upgrades addressed in the Wastewater and Stormwater Annex; and improvements in urban and rural land use and land management practices. Working with the Great Lakes community, this Annex strives towards the long-term goal of attaining the sustainable use of nutrients for the continued health and productivity of the Great Lakes ecosystem and economy. Specific commitments are provided to enhance the scientific understanding of nutrient dynamics, develop phosphorus targets and action plans, and increase the efficiency of agricultural nutrient use consistent with a healthy Great Lakes ecosystem and economy. Commitments in other Annexes including Wastewater and Stormwater, Lakewide Management, Climate Change Impacts and Resilience, Areas of Concern and Harmful Pollutants also contribute to reducing excessive nutrients.

**Result 1 – Development and implementation of action plans and approaches to work towards achieving phosphorus reduction targets for Lake Erie.**

Canada and Ontario will:

- (a) Meet annually to discuss priorities for advancing phosphorus reduction, monitoring and reporting and strategies for maximizing cooperation and coordination;
- (b) Work with partners to implement actions in the Canada-Ontario Lake Erie Action Plan;
- (c) Build on existing governance structures to ensure partner participation in the implementation of the Canada-Ontario Lake Erie Action Plan;
- (d) Report on Lake Erie phosphorus loads binationally and domestically on an annual basis;
- (e) In 2023, assess and report on progress towards achieving phosphorus reduction targets and actions identified in the Canada-Ontario Lake Erie Action Plan;
- (f) Support the implementation of binational and domestic adaptive management approaches to ensure effective management of the nutrients in the Lake Erie basin;
- (g) Support the development by 2022 and implementation of phosphorus management plans for Lake Erie priority watersheds, including the Thames River and Leamington area tributaries and key sectors; and
- (h) Implement funding programs to support projects that demonstrate effectiveness or increase adoption of new or existing beneficial management practices and innovative approaches to reducing phosphorus loads to Lake Erie and communicate results to promote their broad uptake.

**Result 2 – Establishment of phosphorus concentration and loading targets for priority tributaries, nearshore and offshore waters of Lakes Erie and Ontario.**

Canada and Ontario will:

- (a) For Lake Erie, develop, and review or revise, as appropriate, nutrient and biotic indicators for aquatic ecosystem health to ensure that they support and measure progress towards the results identified in this Annex; and
- (b) Establish additional tributary loading targets for Lake Erie, if required.

Canada will lead, with Ontario's support:

- (c) In cooperation with the United States, reassess the viability of setting science based numeric phosphorus loading reduction targets for the eastern basin of Lake Erie and establish a target if appropriate; and
- (d) In cooperation with the United States, synthesize, review, and assess the adequacy of Lake Ontario monitoring, research, and modeling to calculate phosphorus loads to Lake Ontario and establish binational phosphorus targets for Lake Ontario.

**Result 3 – Assess and manage Lake Ontario from a nutrients perspective in order to reduce nuisance and harmful algae blooms and maintain a healthy lakewide trophic system.**

Canada and Ontario will:

- (a) Identify and promote early actions that can be taken to reduce nutrient loadings to Lake Ontario, as needed; and
- (b) Develop a Canadian Nutrients Strategy for Lake Ontario to address harmful and nuisance algae blooms including in Areas of Concern and other nearshore areas.

**Result 4 – Increased understanding, development and adoption of practices and technologies to reduce the risk of excess nutrient loss from agricultural production, consistent with a sustainable and competitive agricultural sector.**

Canada and Ontario will:

- (a) Research and develop innovative approaches and technologies, and investigate the efficacy and economic value of new and existing agricultural beneficial/best management practices for improved nutrient, soil, and water management in agricultural production that will lead to improved water quality;
- (b) Conduct sub-watershed and field scale research to support the ongoing development and implementation of approaches and technologies for the reduction of losses of excess phosphorus from agricultural sources;
- (c) Continue to improve models and tools to assess risk of losses of excess phosphorus from agricultural landscapes; and
- (d) Support the agri-food sector's leadership in raising awareness and increasing adoption of environmental farm planning and beneficial management practices by providing tools, educational and demonstration opportunities, technical advice, and funding.

Ontario will:

- (e) Collaborate with soil health partners to implement actions in Ontario's Agricultural Soil Health and Conservation Strategy to support conserving and building healthy soil and helping reduce nutrient loss from farms by building soil health knowledge and expertise, improving soil health measurement, promoting beneficial practice adoption, and supporting decision making tools.

**Result 5 – Improve understanding of sources of nutrients, nutrient dynamics, and transport, as needed, and the role nutrients play in the development of algae blooms and hypoxia in the Great Lakes with an emphasis on Lakes Erie and Ontario.**

Canada and Ontario will:

- (a) Support monitoring and measurements to improve understanding of nutrient dynamics, concentrations and loadings, including forms and seasonality, for key Lake Erie and Ontario tributaries;
- (b) Monitor and report on stream discharges from selected Great Lakes tributaries for the purposes of calculating nutrient loads;

- (c) Estimate and report on seasonal and annual phosphorus loads from Canadian sources to Lake Erie and, based on available data, for Lake Ontario;
- (d) For selected tributaries, improve understanding of how the activities of different sectors and seasonal characteristics are influencing water quality at the shores of Lakes Erie and Ontario, including point and non-point sources and the role of sewage overflows and bypasses;
- (e) Enhance information on land use, soil and management practices relevant to excess phosphorus in the Great Lakes;
- (f) Conduct long term in-lake monitoring programs that track water quality and algal conditions, including monitoring *Cladophora* at sentinel sites in Lakes Erie and Ontario;
- (g) Deploy monitoring systems in Lakes Erie and Ontario to monitor oxygen levels, temperature, and algal pigments to track hypoxia and lake stratification;
- (h) Investigate the contribution of natural heritage features to reducing excess phosphorus from rural and agricultural landscapes;
- (i) Improve knowledge and understanding of the causal relationships between factors such as duration, intensity, frequency and timing of storms; aquatic invasive species; land use and management; hydrological processes; internal nutrient cycling; hypoxia and harmful and nuisance algae bloom production in the Great Lakes; and
- (j) Conduct research and modelling to improve our understanding of the factors contributing to *Cladophora* blooms in the Great Lakes and their impacts on water quality, ecosystem health and human use.

Canada will:

- (k) Conduct long term in-lake monitoring programs that track algae communities and associated toxins;
- (l) Develop and apply remote sensing technologies to detect and forecast cyanobacteria blooms in the Great Lakes;
- (m) Apply integrated in-lake and watershed ecosystem models, taking climate change into consideration where relevant, to support decision making through adaptive management;
- (n) Develop, apply and operationalize appropriate watershed models to support decision making for selected watersheds in Lakes Erie and Ontario; and
- (o) Investigate the influence of climate change on the Great Lakes, including nutrient and in-lake conditions, through the deployment of long term climate buoys.

Ontario will:

- (p) For Lake Ontario, extend seasonal coverage of water quality monitoring into and within the lake to better understand the impacts of extreme events and events that occur in the winter on algae growth.

## ANNEX 2: HARMFUL POLLUTANTS

**The purpose of this Annex is to guide cooperative and coordinated actions to reduce or eliminate releases of harmful pollutants into the Great Lakes basin.**

For 50 years, Canada and Ontario have been working together to reduce or eliminate the release of harmful pollutants into the Great Lakes basin.

There have been significant accomplishments in reducing the presence of a number of chemicals in the Great Lakes basin, including a more than 90 percent reduction in Canadian releases of mercury, dioxins and furans, and a more than 90 percent reduction in the amount of high-level PCBs in storage in Ontario. The concentrations of these chemicals are now significantly lower in the sediments, offshore waters and fish of the Great Lakes than they were in previous decades.

Notwithstanding these successes, further efforts may be required to better understand the potential sources and impact of some of these chemicals on the Great Lakes ecosystem and, where appropriate, to undertake new or additional risk management actions. Also, there is a need to address other chemicals that are used and released into the Great Lakes basin, which are known to or suspected to pose an increased risk to human health or the environment.

Industries, institutions, agricultural operations and residences are among the sources of chemicals to our waters. Some of these pollutants pass through municipal wastewater facilities, which are primarily designed to treat human waste by reducing nutrients and pathogens, but may be less able to effectively treat the wide range of chemicals being released to sewers. This Annex addresses the release of harmful pollutants from individual sources – those that are released into the sewer systems, and those that are discharged directly into the tributaries and lakes – and complements work, under the Wastewater and Stormwater Annex, to improve management of municipal wastewater and stormwater.

Canada and Ontario are actively engaged in programs and initiatives designed to assess and manage the risks posed by certain chemicals to human health and the environment. Federal initiatives include the Chemicals Management Plan (CMP), which assesses and manages the risks posed by chemicals in accordance with federal laws, including the *Canadian Environmental Protection Act, 1999*, the *Pest Control Products Act*, the *Canada Consumer Product Safety Act*, the *Food and Drugs Act* and the *Fisheries Act*. International efforts under the CMP, for example the Stockholm Convention on Persistent Organic Pollutants or the Convention on Long-Range Transboundary Air Pollution, can contribute to reductions of releases of Chemicals of Concern from out-of-basin sources that are deposited within the Great Lakes basin. Provincial initiatives aimed at protecting human health and the environment include the elimination of stand-alone coal-fired electricity generation, local air quality regulations, and ensuring there are stringent standards for ambient water quality, air quality, soil remediation and drinking water.

Under the 2014 Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, the Parties identified Chemicals of Concern that originated from anthropogenic (human) sources, and were potentially harmful to human health or the environment. The ten chemicals identified were: mercury, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), hexachlorobromododecane (HBCDD), short-chain chlorinated paraffins (SCCPs), perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), long-chained perfluoroalkyl carboxylic acids (PFCAs), lead and polycyclic aromatic hydrocarbons (PAHs). This Annex contains commitments to cooperate on specific research, monitoring, surveillance, and risk management actions for these Chemicals of Concern. In addition, this Annex focuses on actions to reduce risks and impacts from additional pollutants that can have an adverse effect on human and ecological health including plastic waste and microplastics.

Vigilance through monitoring and surveillance programs is required to detect if legacy chemicals are unexpectedly increasing, or new chemicals are appearing in various media (water, fish, sediment) in the Great Lakes. To effectively carry this out, new analytical and monitoring tools need to be developed and implemented.

The commitments in the Harmful Pollutants Annex have linkages to several other Annexes including Wastewater and Stormwater, Areas of Concern, Lakewide Management, Nutrients, Groundwater, Habitat and Species, From Awareness to Action, First Nations and the Great Lakes and Métis and the Great Lakes.

**Result 1 – Report on research and monitoring activities and knowledge gained under Canada-Ontario Agreements related to Chemicals of Concern and other harmful pollutants to assist in developing actions.**

Canada and Ontario will:

- (a) Within 12 months of the Agreement coming into force, prepare a report that summarizes the knowledge gained under the 2014 Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health in order to inform future programming and decision making specific to this Annex; and
- (b) In the final year of this Agreement, prepare a report that summarizes the knowledge gained under this Agreement, in order to inform priorities for the next Agreement.

**Result 2 – Releases of Chemicals of Concern and other harmful pollutants are reduced or eliminated within the Great Lakes basin.**

Canada and Ontario will:

- (a) Under their respective authorities, programs and strategies and in consultation with relevant sectors, as required, promote and support: life-cycle management; the use of safer chemical substances; best management practices and technologies which reduce or eliminate the use and release of Chemicals of Concern; and products containing Chemicals of Concern;
- (b) Periodically review and evaluate the progress and effectiveness of pollution prevention and control activities for Chemicals of Concern, adapting approaches as required;
- (c) Cooperatively develop and implement the Canadian component of binational strategies for Chemicals of Mutual Concern, where appropriate, as agreed to under the Canada-United States Great Lakes Water Quality Agreement; and
- (d) Cooperatively review and evaluate progress towards implementing binational strategies for Chemicals of Mutual Concern and adapt management approaches and other actions as required.

Canada will:

- (e) Work with continental and other international governments to reduce or eliminate the deposition of transboundary Chemicals of Concern;
- (f) For pollution prevention or control measures implemented under the *Canadian Environmental Protection Act, 1999* or other federal Acts for Chemicals of Concern, deliver compliance promotion and enforcement actions as appropriate; and
- (g) Provide funding support to projects that increase participation in the application of beyond compliance measures through developing, implementing, assessing and promoting the use of innovative approaches and best practices.

Ontario will:

- (h) Continue to work with municipalities and other agencies to increase diversion of materials containing Chemicals of Concern and other harmful pollutants from the waste stream through research, monitoring and education;



- (i) Work with key sectors to develop, support and enhance programs and best management practices that reduce the release of Chemicals of Concern;
- (j) Work with small and medium-sized enterprises, and others, who discharge to municipal sewer systems to reduce their inputs of Chemicals of Concern and other harmful pollutants to these systems;
- (k) Work with academia, industry, municipalities and stakeholders to promote the development of green technologies and activities supporting green chemistry;
- (l) Enhance education and outreach on Chemicals of Concern and other harmful pollutants in consumer products;
- (m) Undertake compliance promotion strategies and implementation of standards and guidelines to further reduce substances containing Chemicals of Concern and other harmful pollutants;
- (n) Continue education and outreach initiatives and activities to reduce releases of Chemicals of Concern and other harmful pollutants through the promotion of environmentally sound practices and pollution prevention measures;
- (o) Undertake additional projects to achieve reductions of Chemicals of Concern and other harmful pollutants from both in-basin and out-of-basin sources. These projects include pollution prevention, voluntary agreements and best management practices; and
- (p) Develop technology-based standards to support reductions in emissions to air of Chemicals of Concern and other harmful pollutants.

**Result 3 – Co-operatively undertake research, surveillance and monitoring activities to improve the scientific knowledge of the presence of Chemicals of Concern and other harmful pollutants in the Great Lakes and their potential impact to human and ecological health.**

Canada and Ontario will:

- (a) Under their respective authorities, programs and strategies, conduct coordinated research, monitoring and surveillance activities within the Great Lakes basin, as required, including:
  - (i) Identifying and assessing the occurrences, pathways, sources, loadings, transport and impacts of Chemicals of Concern and other harmful pollutants to identify where additional management may be required;
  - (ii) Non-target analysis of Great Lakes environmental media to support the detection and identification of unknown contaminants, to provide early warning for chemicals which could become Chemicals of Concern;
  - (iii) Reviewing and prioritizing research needs on a regular basis, taking into account progress made; and
  - (iv) Developing, improving and validating sampling and analytical tools, methods and techniques for the measurement of Chemicals of Concern and other harmful pollutants that impact human and ecological health in the environment as well as evaluating their potential impacts.
- (b) Take actions to advance knowledge on the extent to which Chemicals of Concern are released from end-of-life products;

- (c) Share data on harmful pollutants that may be impacting the Great Lakes, including sector specific data, unless prohibited by and in accordance with the relevant/applicable law;
- (d) Engage interested First Nations, Métis and other communities, that rely on Great Lakes fish as an important nutritional source for their diet, on reducing their exposure to harmful pollutants, to ensure that their specific consumption habits are considered, that advisories that are developed are appropriate for these communities, and that they are communicated appropriately; and
- (e) Continue to monitor chloride concentrations in water, to advance understanding of conditions, trends, and impacts to Great Lakes water quality and ecosystem health.

**Result 4 – Environmental quality criteria, which include guidelines, objectives, and/or standards for Chemicals of Concern and harmful pollutants, as needed, are established.**

Canada and Ontario will:

- (a) Work together to develop environmental quality criteria for Chemicals of Concern, as required; and
- (b) Complete chronic toxicity testing studies for polycyclic aromatic hydrocarbons (PAHs) to create a body of science sufficient to develop appropriate Environmental Quality Guidelines.

Canada will:

- (c) Maintain, periodically review and make publicly available a listing of current federal and Canadian environmental quality criteria for Chemicals of Concern.

Ontario will:

- (d) Develop site-specific chloride guidelines for areas that are primary habitat for chloride-sensitive species; and
- (e) Develop environmental indicators of wastewater treatment performance that are indicative of long-term impacts on ecosystem health.

**Result 5 – Plastic pollution in the Great Lakes basin is reduced.**

Canada and Ontario will:

- (a) Support capture and clean up projects aimed at preventing and removing plastic pollution from our waterways and land;
- (b) Working through the Canadian Council of Ministers of the Environment, support the development of an action plan to implement the Canada-wide Strategy and Action Plan on Zero Plastic Waste, in order to reduce plastic waste and pollution, including microplastics, that can end up in rivers and lakes in the Great Lakes basin;
- (c) Advance research, surveillance and monitoring activities on plastic and microplastic pollution in the Great Lakes basin, including:
  - (i) Sharing information on the occurrence, effects, sources, fate, mitigation and abatement methods; and
  - (ii) Working to standardize monitoring and analysis procedures.
- (d) Enhance awareness and education to reduce plastic waste and pollution in the Great Lakes basin.

Canada will:

- (e) Participate in binational Great Lakes-based initiatives that aim to reduce plastic pollution, including microplastics, in the Great Lakes;
- (f) Provide support to innovative technologies and processes;
- (g) Through its work under the Ocean Plastics Charter and the Canada-wide Strategy and Action Plan on Zero Plastic Waste:
  - (i) Facilitate the standardization of Extended Producer Responsibility programs applicable to plastic;
  - (ii) Develop national performance requirements and standards including for recycled content, compostability, reparability, and remanufacturing/refurbishment;
  - (iii) Develop agreements and tools to support the appropriate management of plastics; and
  - (iv) Develop and implement guidelines and tools to ensure sustainable procurement practices that incorporate best practice principles for plastics management.
- (h) Promote eligible investments in recycling facilities under applicable infrastructure and other funding programs.

Ontario will:

- (i) Take steps to reduce the amount of waste generated in the province, including plastic waste, and divert more waste from landfills, including:
  - (i) Transitioning from the current Blue Box Program to a producer responsibility model;
  - (ii) Working to increase the amount of waste diverted through the Industrial, Commercial and Institutional sector; and
  - (iii) Exploring opportunities for innovative technologies such as thermal treatment and chemical recycling that can recover valuable resources, such as plastic resins, synthetic fuels and electricity, from waste.
- (j) Work with industry partners to encourage best practices at industrial sites (industrial hygiene, filtering wastewater discharges), with a focus on sites in western Lake Ontario where the highest microplastic concentrations have been found;
- (k) Ensure strong enforcement for repeat offenders of plastic pollution by undertaking a review of existing policy and legislative frameworks and making any improvements necessary to respond to deposits and discharges of plastic and microplastics to water; and
- (l) Consider plastic pollution in wastewater and stormwater policies.

**Result 6 – When scientific evidence identifies a need, new Chemicals of Concern are identified and designated and existing Chemicals of Concern are periodically reviewed for removal.**

Canada and Ontario will:

- (a) Consistent with the principles of this Agreement, for each of their respective candidate Chemicals of Concern, Canada or Ontario will provide supporting rationale for nominating the chemical as a Chemical of Concern to each other, including but not limited to:
  - (i) Surveillance and monitoring data and/or other surrogate information (i.e., key industrial sectors and other sources of exposure) which indicates presence or a reasonable potential for presence in the Great Lakes and also any evidence that the chemical is having a demonstrated or likely detrimental impact on the Great Lakes;
  - (ii) An overview of historical and current pollution prevention and control actions; and
  - (iii) An identification of information and/or technology gaps.
- (b) Using the binational criteria for assessing Chemicals of Mutual Concern established under the Canada-United States Great Lakes Water Quality Agreement, assess and agree to the designation of Chemicals of Concern for priority action in the Great Lakes basin;
- (c) Determine those Chemicals of Concern for nomination to the Canada-United States Chemicals of Mutual Concern Subcommittee of the Canada-United States Great Lakes Executive Committee, as proposed binational Chemicals of Mutual Concern;
- (d) For those chemicals nominated by the United States for consideration as binational Chemicals of Mutual Concern, consider whether to identify these as Chemicals of Concern under this Agreement;
- (e) Periodically review the identified Chemicals of Concern and any new federal or provincial candidate chemicals, to determine whether they should remain or be included, respectively, as priorities for action in the Great Lakes basin; and
- (f) Through ongoing work under the Chemicals Management Plan and provincial programs, continue to assess, identify, and manage risks associated with chemicals that may negatively impact Great Lakes water quality and ecosystem health.

Canada will:

- (g) Nominate Chemicals of Concern for action to the Canada-United States Chemicals of Mutual Concern Subcommittee of the Canada-United States Great Lakes Executive Committee, for consideration as binational Chemicals of Mutual Concern.

## **ANNEX 3: WASTEWATER AND STORMWATER**

**The purpose of this Annex is to improve the management of wastewater and stormwater, to reduce pollution into the Great Lakes.**

Wastewater and stormwater convey nutrients, as well as harmful pollutants such as salt, pathogens, and contaminants of emerging concern, into the Great Lakes. Management of wastewater and stormwater is therefore critical for keeping the Great Lakes clean, to protect water quality, beaches and public health. Controlling the upstream sources of pollution, as well as these routes of pollution, is more effective – and less expensive – than cleaning up pollution after it reaches the lakes.

Consistent with the principle of adequate wastewater treatment under the Canada-United States Great Lakes Water Quality Agreement, this Annex focuses on managing nutrients, harmful pollutants and pathogens in wastewater and stormwater, and contributes to meeting the objectives of the Nutrients and Harmful Pollutants Annexes of this Agreement.

Improving wastewater and stormwater management requires significant investments, long-term planning, and clear standards and policies. Multiple partners play a role in the successful management of wastewater and stormwater including federal, provincial and municipal governments.

The Government of Canada makes Green Infrastructure funding available under the *Investing in Canada Infrastructure Program*, as established in an integrated bilateral agreement with Ontario. Federal and provincial funding under this program can support public infrastructure projects that result in increased capacity to treat and manage water and wastewater. Projects may include enhancing natural infrastructure, as well as upgrading water and wastewater infrastructure. In addition, the province provides formula-based funding under the Ontario Community Infrastructure Fund to help small, rural and northern communities build and repair core infrastructure, including wastewater and stormwater systems.

The Province of Ontario regulates municipal wastewater and stormwater through Environmental Compliance Approvals to protect the natural environment and human health. A key priority for Ontario is working with municipalities to improve monitoring and public reporting of wastewater bypasses and overflows. Ontario is committed to reviewing and updating its wastewater policies and developing a new stormwater management policy to enhance environmental protection and reduce pathogens and contaminants that may impact the Great Lakes.

This Annex aims to enhance wastewater and stormwater management to improve Great Lakes water quality and ecosystem health, such as through: promotion of eligible investments under infrastructure and other funding programs; enforcement of effluent quality standards; and, conducting research and monitoring that advance understanding of contaminant concentrations and trends to improve management actions.

**Result 1 – Excess nutrient loadings from stormwater and wastewater collection and treatment systems in urban and rural communities are reduced.**

Canada and Ontario will:

- (a) Identify and promote priority actions to assist municipalities to meet commitments in the Canada-United States Great Lakes Water Quality Agreement;
- (b) Promote infrastructure planning and eligible investments that support the reduction of excess nutrients from point sources such as municipal wastewater collection and treatment systems, including overflows and bypasses as priority considerations under applicable infrastructure and other funding programs;
- (c) Promote eligible investments, including investments in green infrastructure, that support the reduction of excess nutrients from non-point sources such as urban and rural stormwater (including stormwater from agricultural landscapes), as priority considerations under applicable infrastructure and other funding programs; and
- (d) Review or support demonstration of innovative practices and technologies that result in improved environmental protection, while reducing reliance on conventional infrastructure funding. Examples may include long term strategic planning for infrastructure, sewage treatment plant optimization, reducing runoff volume so less is collected by storm or combined sewers, phosphorus/water recovery and reuse, full cost recovery of municipal wastewater and stormwater services with incentives.

Ontario will:

- (e) Update wastewater policies, including policies specific to treatment requirements, sewage overflows and bypasses, and develop a new stormwater management policy to enhance environmental protection and reduce nutrient loadings;
- (f) Work with municipalities to implement approaches to improve monitoring and reporting of sewage overflows and bypasses, and continue to monitor incidents and municipal actions to minimize overflows and bypasses and achieve co-benefits of nutrient reduction;
- (g) Work with municipalities and other stakeholders to undertake monitoring of the performance and effectiveness of stormwater and green infrastructure and publicly communicate the results, including any co-benefits of nutrient reduction;
- (h) Where feasible, work with municipal partners toward reducing loadings through improvements to stormwater management systems (including facility rehabilitation and incorporation of green infrastructure and innovative treatment technologies);
- (i) Work with developers, municipalities, conservation authorities and others to promote and support the use of green infrastructure and low impact development systems for stormwater management, including clarifying and enhancing policies;
- (j) Support studies that improve understanding of the correlation between phosphorus load reduction and implementation of green infrastructure and low impact development;
- (k) Conduct a review of the Province's approach to rural stormwater and agricultural drainage management using an integrated watershed approach; and

- (l) Further explore septic systems as a source of nutrient contamination to Great Lake waters via groundwater, surface waters and preferential pathways.

**Result 2 – Contaminant loadings from stormwater and wastewater collection and treatment systems in urban and rural communities are reduced.**

Canada and Ontario will:

- (a) Consistent with Lakewide Action and Management Plans (LAMPs), identify and promote priority actions for contaminants (emerging and conventional) and pathogens from wastewater collection and treatment systems, urban and rural stormwater, rural domestic septic systems and other rural sources;
- (b) Promote infrastructure planning and eligible investments that support the reduction of contaminant and pathogen loadings as priority considerations under applicable infrastructure and other funding programs;
- (c) Undertake projects to sample effluent from wastewater treatment plants within the Great Lakes basin which may be used to better understand concentrations of contaminants entering the Great Lakes; provide baseline data to evaluate future control measures; and identify temporal trends; and
- (d) Explore research, monitoring and surveillance opportunities related to the management of at-source and upstream treatment technologies under their respective authorities to address harmful pollutants in wastewater effluents and residuals.

Canada will:

- (e) Continue to enforce effluent quality standards and wastewater system monitoring and reporting requirements under the *Wastewater Systems Effluent Regulations, 2012*;
- (f) Issue regular public reports on the number of days that beaches are open and safe for swimming at Great Lakes monitored beaches, through State of the Great Lakes reporting;
- (g) Work with road organizations, municipalities, conservation authorities and other partners to promote salt application best management practices for road organizations subject to Canada's Code of Practice for the Environmental Management of Road Salts; and
- (h) Review the progress achieved through the implementation of the Government of Canada's Code of Practice for the Environmental Management of Road Salts.

Ontario will:

- (i) Update Ontario wastewater policies and develop a new stormwater management policy, including policies specific to treatment requirements, sewage overflows and bypasses, to enhance environmental protection and reduce pathogens and contaminants in effluents;
- (j) Work with municipalities to implement approaches to improve monitoring and reporting of sewage overflows and bypasses, and continue to monitor incidents and municipal actions to minimize overflows and bypasses and achieve co-benefits of pathogen and contaminant reduction;
- (k) Work with municipalities and other stakeholders to undertake monitoring of the performance and effectiveness of stormwater and green infrastructure, and publicly communicate the results, including any co-benefits for pathogen and contaminant reductions;

- (l) Develop communication tools to provide more information to the public about septic systems, the importance of their maintenance and potential contamination of non-municipal drinking water wells, to protect public health and reduce potential impacts to Great Lakes water quality;
- (m) Enhance understanding of the causes of *E. coli*, algae and other substances that may impact the use and enjoyment of beaches;
- (n) Promote the use of enhanced beach management tools;
- (o) Build on existing drinking water source protection activities to ensure that environmental impacts to the Great Lakes ecosystem from road salt use are minimized;
- (p) Work with municipalities, conservation authorities, private sector and other partners to promote salt application best management practices, certification and alternatives for both public and private salt applicators, including on private roads, sidewalks and parking lots;
- (q) Assess pathways for road salt into groundwater, impacts of road salt use on groundwater, and groundwater as a source for salt contamination to surface water bodies and aquatic ecosystems;  
and
- (r) Investigate technologies or processes for preventing chloride from road salt entering groundwater and surface water.



## **ANNEX 4: DISCHARGES FROM VESSELS**

**The purpose of this Annex is to contribute to the achievement of the objectives under the Canada-United States Great Lakes Water Quality Agreement Annex 5 – Discharges from Vessels, whereby Canada and the United States have committed to prevent and control vessel discharges that are harmful to the quality of the waters of the Great Lakes, through the adoption and implementation of regulations, programs, and other measures that facilitate coordinated and cooperative implementation and enforcement, where appropriate.**

Under the Constitution of Canada, the federal Parliament has exclusive jurisdiction over navigation and shipping. Existing laws, regulations, regulatory programs, inspection protocols and enforcement regimes are designed to address threats to the Great Lakes from vessel discharges.

Discharges of polluting substances from vessels have been addressed under the Canada-United States Great Lakes Water Quality Agreement since it was first signed in 1972. Oil was originally the discharge of greatest concern. The introduction of the zebra mussel in 1988 focused attention on the potential for ships' ballast water discharges to introduce aquatic invasive species (AIS) into the Great Lakes.

The Canada-United States Great Lakes Water Quality Agreement includes commitments by the Government of Canada to work in cooperation and consultation with State and Provincial Governments, Tribal Governments, First Nations, Métis, Municipal Governments, watershed management agencies, other local public agencies, and the Public to adopt programs and measures, taking into account guidelines and standards developed by the International Maritime Organization, that protect the waters of the Great Lakes by: addressing discharges of harmful quantities of oil or hazardous pollutants, garbage, wastewater and sewage; taking measures to prevent the release of AIS, and pathogens, as a result of biofouling and ballast water; preventing harm from antifouling systems.

The Canada-United States Great Lakes Water Quality Agreement Progress Report of the Parties, presented to the International Joint Commission by Canada and the United States in 2019, reports that potential discharges of oil and hazardous substances, garbage, wastewater, ballast water and sewage from vessels are well-regulated; Canadian and United States domestic regulatory regimes and applicable international conventions have reduced the risk of discharges of concern from vessels. Canada and the United States are committed to the continued prevention and reduction of threats to the waters of the Great Lakes from all vessel discharges.

Under the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2021, this Annex includes a commitment to limit and control vessel discharges that are harmful to the quality of the Great Lakes through the implementation of priority actions under Annex 5 of the Canada-United States Great Lakes Water Quality Agreement.

**Result 1 – Continued implementation by Canada of commitments under the Canada-United States Great Lakes Water Quality Agreement, Annex 5 – Discharges from Vessels.**

Canada will:

- (a) Implement, for its part, the commitments and priority actions of Annex 5 (Discharges from Vessels) of the Canada-United States Great Lakes Water Quality Agreement through policy, legislation and/or regulations, research, compliance and enforcement.

## **PRIORITY – IMPROVING COASTAL AREAS**

This Priority focuses on restoring, protecting and conserving coastal areas of the Great Lakes including wetlands and beaches. The Areas of Concern (AOCs) Annex includes initiatives to support the ongoing restoration of water quality and ecosystem health in designated areas of the Great Lakes. The Lakewide Management Annex includes commitments to update and implement Lakewide Action and Management Plans (LAMPs) for each of the four Canadian Great Lakes and their major river connecting systems, and to continue implementation of the Great Lakes nearshore framework.

## **ANNEX 5: AREAS OF CONCERN**

**The purpose of this Annex is to restore water quality and ecosystem health in Areas of Concern.**

Areas of Concern (AOCs) are geographic areas in the Great Lakes that were identified in the mid-1980s because water quality and ecosystem health had been severely degraded by human activities to the point that beneficial uses were impaired. Restoring these areas not only benefits the local community, it also contributes to improving water quality and ecosystem health throughout the Great Lakes. Forty-three locations were formally recognized as AOCs by Canada and the United States pursuant to the 1987 Protocol to the Canada-United States Great Lakes Water Quality Agreement: 12 in Canada, 26 in the United States and five binational AOCs that are shared by the two countries.

The environmental degradation within AOCs is primarily a legacy of the past caused by industrial activities, agriculture, urban and rural runoff, municipal wastewater effluents, land-use planning and practices on urban and rural lands. These past practices resulted in degraded water quality, contaminated river and lake sediment, and severely impacted fish and wildlife populations and habitats.

Working with community members and local governments, Canada and Ontario are implementing Remedial Action Plans (RAPs) to restore beneficial uses within the AOCs. Considerable progress has been made and, by 2010, three of the Canadian AOCs had been fully remediated and officially delisted (no longer deemed to be an AOC): Collingwood Harbour in 1994, Severn Sound in 2003, and Wheatley Harbour in 2010. Two additional Canadian AOCs have had all recommended remedial actions completed and have been recognized as being in recovery: Spanish Harbour in 1999 and Jackfish Bay in 2011. Environmental monitoring is continuing to confirm restoration of water quality and ecosystem processes.

In the remaining Canadian and binational AOCs, continued efforts are needed to complete implementation of the RAPs to restore ecosystem quality. Through this Agreement, all actions required to achieve delisting criteria and restore beneficial uses will be completed in Nipigon Bay, Peninsula Harbour, Niagara River, Port Hope Harbour, Bay of Quinte and St. Lawrence River AOCs. The Parties will continue to make progress in Thunder Bay, St. Marys River, St. Clair River, Detroit River, Hamilton Harbour, and Toronto and Region AOCs. The Parties will also continue to monitor the restoration of beneficial uses in the Jackfish Bay and Spanish Harbour AOCs in Recovery, including to support the confirmation of delisting in Spanish Harbour.

The collaborative efforts described in this Annex support achievement of results of other Annexes of this Agreement. For example, restoration work in AOCs supports efforts to restore, protect and conserve the resilience of Great Lakes native species and their habitats, which is the focus of the Habitat and Species Annex.

This will contribute to the long-term goal of delisting the remaining AOCs and ensuring that environmental improvements achieved through the AOC process are sustained.



Map illustrating Great Lakes Areas of Concern

### **Result 1 – Advance remediation of AOCs through enhanced coordination and cooperation.**

Canada and Ontario will:

- (a) Meet annually to discuss priorities for advancing remediation of AOCs and strategies for maximizing cooperation and coordination.

### **Result 2 – Continue to implement actions required to achieve delisting criteria and restore the four beneficial uses that remain impaired in the Thunder Bay AOC: Degradation of Fish and Wildlife Populations, Degradation of Benthos, Beach Closings, and Loss of Fish and Wildlife Habitat; and, determine the status of one additional beneficial use that requires further assessment: Restrictions on Fish and Wildlife Consumption.**

Canada and Ontario will:

- (a) Assess the status of four remaining impaired beneficial uses and one requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption; and
  - (ii) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Degradation of Fish and Wildlife Populations, Degradation of Benthos, Beach Closings, and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairment that requires further assessment: Restrictions on Fish and Wildlife Consumption.
- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide financial and technical support for priority habitat restoration projects to improve riparian and nearshore habitat to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat.
- (c) Produce a preferred option for managing contaminated sediments in Thunder Bay AOC:
  - (i) Engage stakeholders, First Nations and Métis in building consensus on a preferred option to manage contaminated sediments to advance progress towards achievement of delisting criteria for Degradation of Benthos; and
  - (ii) Develop detailed project engineering design and cost estimate to support decision making related to project implementation.
- (d) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments.

### **Result 3 – Confirm restoration of beneficial uses and delist Nipigon Bay AOC.**

Canada and Ontario will:

- (a) Support infrastructure upgrades to the Township of Red Rock's sewage treatment facility from primary to secondary treatment;
- (b) Finalize the Nipigon Bay Remedial Action Plan Completion Report; and
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in the delisting of this AOC.

**Result 4 – Monitor recovery of beneficial uses in order to confirm achievement of delisting criteria and restore the three remaining beneficial uses in the Jackfish Bay AOC in Recovery: Degradation of Fish and Wildlife Populations, Degradation of Benthos, and Loss of Fish and Wildlife Habitat; and, determine the status of two additional beneficial uses that require further assessment: Restrictions on Fish and Wildlife Consumption, and Degradation of Aesthetics.**

Canada and Ontario will:

- (a) Assess the status of three remaining impaired beneficial uses and two requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Determine status of fish populations to assess progress towards achievement of delisting criteria; and
  - (iii) As appropriate, complete status assessments, prepare status assessment reports, and proceed with beneficial use impairment redesignation for Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairments that require further assessment: Restrictions on Fish and Wildlife Consumption, and Degradation of Aesthetics.

Ontario will:

- (iv) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Monitor the effectiveness of the natural recovery of Moberly Bay in Jackfish Bay to assess progress towards achievement of delisting criteria; and
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments.

**Result 5 – Complete remaining actions required to achieve delisting criteria and restore the two beneficial uses that remain impaired in the Peninsula Harbour AOC: Restrictions on Fish and Wildlife Consumption, and Degradation of Benthos; and, determine the status of two additional beneficial uses that require further assessment: Degradation of Fish and Wildlife Populations, and Loss of Fish and Wildlife Habitat.**

Canada and Ontario will:

- (a) Assess the status of two remaining impaired beneficial uses and two requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Determine status of fish populations and fish and wildlife habitat to assess progress towards achievement of delisting criteria; and

- (iii) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption and Degradation of Benthos; and, a designation status of the beneficial use impairments that require further assessment: Degradation of Fish and Wildlife Populations, and Loss of Fish and Wildlife Habitat.

Ontario will:

- (iv) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Monitor the effectiveness of the thin layer cap remediation of contaminated sediment:
  - (i) Review results of post-remediation monitoring to determine effectiveness of management option.
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in decision-making for removal of beneficial use impairments, designating the AOC as an AOC in Recovery and/or delisting this AOC.

Ontario will:

- (d) Conduct long-term monitoring of the effectiveness of the thin layer cap.

**Result 6 – Continue to implement actions required to achieve delisting criteria and restore the six beneficial uses that remain impaired in the St. Marys River AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Fish Tumours or Other Deformities, Degradation of Benthos, Restrictions on Dredging Activities, and Loss of Fish and Wildlife Habitat.**

Canada and Ontario will:

- (a) Assess the status of six remaining beneficial use impairments:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Determine status of fish populations to assess progress towards achievement of delisting criteria;
  - (iii) Conduct monitoring of fish liver tumours to assess progress towards achievement of delisting criteria; and
  - (iv) Complete status assessments, prepare status assessment reports, and as appropriate, proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Fish Tumours or Other Deformities, Degradation of Benthos, Restrictions on Dredging Activities, and Loss of Fish and Wildlife Habitat.
- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide support for habitat restoration to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat.



- (c) Complete a sediment management strategy and provide advice for managing contaminated sediments in the St. Marys River AOC to advance progress towards achievement of delisting criteria for Degradation of Benthos:
  - (i) Engage relevant stakeholders, First Nations and Métis, in building consensus to develop a sediment management plan for contaminated sediments east of Bellevue Marine Park; and
  - (ii) Continue to engage with local industry regarding the dredging of sediments in the Algoma boat slip.
- (d) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments; and
- (e) Communicate as needed with federal and state agencies in the United States on matters that advance restoration and delisting of this binational Area of Concern.

Canada will:

- (f) Monitor and manage sediment quality in the St. Marys River federal waterlot, as appropriate; and
- (g) Work with Batchewana First Nation to advance habitat restoration at Whitefish Island.

**Result 7 – Monitor recovery of beneficial uses in order to confirm achievement of delisting criteria and restore the two beneficial uses that remain impaired in the Spanish Harbour AOC in Recovery: Restrictions on Fish and Wildlife Consumption, and Degradation of Benthos.**

Canada and Ontario will:

- (a) Assess the status of two remaining beneficial use impairments:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption; and
  - (ii) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions of Fish and Wildlife Consumption and Degradation of Benthos.

Ontario will:

- (iii) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Monitor the effectiveness of the natural recovery of contaminated sediments in Whalesback Channel to assess progress towards achievement of delisting criteria for Degradation of Benthos; and
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in decision-making for removal of beneficial use impairments and delisting this AOC.

**Result 8 – Continue to implement actions required to achieve delisting criteria and restore four beneficial uses that remain impaired in the St. Clair River AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Benthos, Restrictions on Drinking Water Consumption, or Taste and Odour Problems, and Loss of Fish and Wildlife Habitat; and, determine the status of two additional beneficial uses that require further assessment: Degradation of Fish and Wildlife Populations, and Fish Tumours or Other Deformities.**

Canada and Ontario will:

- (a) Assess the status of four remaining impaired beneficial uses and two requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Conduct monitoring of fish and wildlife habitat (quantity and quality) to assess progress towards achievement of delisting criteria;
  - (iii) Determine status of fish and wildlife populations to assess progress towards achievement of delisting criteria;
  - (iv) Conduct monitoring of upstream/downstream water quality along the St. Clair River to assess progress towards achievement of delisting criteria; and
  - (v) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Benthos, Restrictions on Drinking Water Consumption, or Taste and Odour Problems, and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairments that require further assessment: Degradation of Fish and Wildlife Populations, and Fish Tumours or Other Deformities.

Canada will:

- (vi) Complete analysis of fish liver tumours to assess progress towards achievement of delisting criteria.

Ontario will:

- (vii) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Undertake remedial actions to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat;
- (c) Complete detailed engineering and cost estimates for the preferred sediment remedial option in the three priority zones in the St. Clair River to advance progress towards achievement of delisting criteria for Degradation of Benthos;
- (d) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments; and
- (e) Communicate as needed with federal and state agencies of the United States on matters that advance restoration and delisting of this binational Area of Concern.

Canada will:

- (f) Work with Walpole Island First Nation to restore wetland habitat.

Ontario will:

- (g) Track spills to assess progress towards achievement of delisting criteria for Restrictions on Drinking Water Consumption, or Taste and Odour Problems.

**Result 9 – Continue to implement actions required to achieve delisting criteria and restore four beneficial uses that remain impaired in the Detroit River AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Bird or Animal Deformities or Reproductive Problems, and Loss of Fish and Wildlife Habitat; and, determine the status of one additional beneficial use that requires further assessment: Degradation of Phytoplankton and Zooplankton Populations.**

Canada and Ontario will:

- (a) Assess the status of four remaining impaired beneficial uses and one requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Determine status of fish populations to assess progress towards achievement of delisting criteria;
  - (iii) Determine status of fish and wildlife habitat (quantity and quality) at priority areas to assess progress towards achievement of delisting criteria;
  - (iv) Finalize fish models to complete the long term fish and wildlife habitat plan; and
  - (v) As appropriate, complete status assessments, prepare status assessment reports, and proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Bird or Animal Deformities or Reproductive Problems, and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairment that requires further assessment: Degradation of Phytoplankton and Zooplankton Populations.

Canada will:

- (vi) Conduct monitoring studies on wildlife populations to assess progress towards achievement of delisting criteria;
- (vii) Complete analysis of fish liver tumours to assess progress towards achievement of delisting criteria; and
- (viii) Conduct monitoring to determine the status of Degradation of Phytoplankton and Zooplankton Populations.

Ontario will:

- (ix) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide technical and financial support to priority actions to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations.
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments; and
- (d) Communicate as needed with federal and state agencies of the United States on matters that advance restoration and delisting of this binational Area of Concern.

**Result 10 – Complete remaining actions required to achieve delisting criteria and restore the five beneficial uses that remain impaired in the Niagara River AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Degradation of Benthos, Beach Closings, and Loss of Fish and Wildlife Habitat.**

Canada and Ontario will:

- (a) Assess the status of five remaining beneficial use impairments:
  - (i) Determine status of fish populations and fish and wildlife habitat to assess progress towards achievement of delisting criteria;
  - (ii) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (iii) Continue to monitor water and sediment quality, biota, and benthos in the Niagara River AOC to assess progress towards achievement of delisting criteria; and
  - (iv) Complete status assessments, prepare status assessment reports, and as appropriate proceed with the beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Degradation of Benthos, Beach Closings, and Loss of Fish and Wildlife Habitat.

Ontario will:

- (v) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide technical and financial support for the design of remedial actions to address high bacterial levels at Queen’s Royal Beach; and
  - (ii) Provide technical and financial support for remaining priority coastal wetland and riparian habitat project(s) to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations.

- (c) Monitor the natural recovery of contaminated sediments in Lyons Creek East:
  - (i) Monitor the effectiveness of the natural recovery of contaminated sediments in Lyons Creek East to assess progress towards achievement of delisting criteria for Degradation of Benthos;
  - (ii) If required, assess the need for further actions to achieve delisting criteria; and
  - (iii) Provide technical advice to local agencies on applying the Lyons Creek East administrative controls protocol to ensure proper management of the contaminated sediment.
- (d) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments, designating the AOC as an AOC in Recovery and/or delisting this AOC; and
- (e) Communicate as needed with federal and state agencies of the United States on matters that advance restoration and delisting of this binational Area of Concern.

**Result 11 – Continue to implement actions required to achieve delisting criteria and restore eight beneficial uses that remain impaired in the Hamilton Harbour AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Degradation of Aesthetics, Degradation of Benthos, Restrictions on Dredging Activities, Eutrophication or Undesirable Algae, Beach Closings, and Loss of Fish and Wildlife Habitat; and, determine the status of three additional beneficial uses that require further assessment: Degradation of Phytoplankton and Zooplankton Populations, Fish Tumours or Other Deformities, and Bird or Animal Deformities or Reproductive Problems.**

Canada and Ontario will:

- (a) Assess the status of eight remaining impaired beneficial uses and three requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria Restrictions on Fish and Wildlife Consumption;
  - (ii) Conduct monitoring of water quality and algae to assess progress towards achievement of delisting criteria;
  - (iii) Determine status of fish populations to assess progress towards achievement of delisting criteria;
  - (iv) Conduct monitoring of aesthetics to assess progress towards achievement of delisting criteria;
  - (v) Conduct monitoring of fish liver tumours to assess progress towards achievement of delisting criteria;
  - (vi) Develop an approach to assess the status of Degradation of Phytoplankton and Zooplankton Populations; and

- (vii) As appropriate, complete status assessments, prepare status assessment reports, and proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Degradation of Aesthetics, Degradation of Benthos, Restrictions on Dredging Activities, Eutrophication or Undesirable Algae, Beach Closings, and Loss of Fish and Wildlife Habitat; and, a designation status for the beneficial use impairments that require further assessment: Degradation of Phytoplankton and Zooplankton Populations, Fish Tumours or Other Deformities, and Bird or Animal Deformities or Reproductive Problems.

Ontario will:

- (viii) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide technical and financial support to priority actions to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations; and
  - (ii) Continue to promote infrastructure funding for the Dundas sewage treatment plant to reduce phosphorus inputs into Cootes Paradise, as well as continue current funding for the completion of tertiary upgrades to the Woodward Avenue wastewater treatment plant to advance progress towards achievement of delisting criteria for Eutrophication or Undesirable Algae.
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments; and
- (d) Complete the Randle Reef Sediment Remediation Project to advance progress towards achievement of delisting criteria for Degradation of Benthos.

Canada will:

- (i) Lead and complete the Randle Reef Sediment Remediation Project in accordance with the Grant Funding Agreement for the Randle Reef Contaminated Sediment Remediation Project between Canada and Ontario and in accordance with Canada's agreements with the City of Hamilton, Hamilton Oshawa Port Authority, Stelco, City of Burlington, and Regional Municipality of Halton;
- (ii) Conduct monitoring for air, suspended sediment, and water during implementation of the Randle Reef Sediment Remediation Project to ensure minimal to no environmental impact during remediation;
- (iii) Conduct monitoring (fish and wildlife, benthos, water quality) during and after remediation to assess progress towards achievement of delisting criteria;
- (iv) Provide technical support and expert advice for the project; and
- (v) Hand over ownership, operation and maintenance and long term monitoring to the Hamilton-Oshawa Port Authority.

Ontario will:

- (vi) Support actions to restore a healthy, functioning fish community to achieve delisting criteria for Degradation of Fish and Wildlife Populations;
- (vii) Continue to provide technical and funding support for the implementation of the Randle Reef Sediment Remediation Project; and
- (viii) Provide regulatory oversight for the management of contaminated sediments at the Strathearne and Kenilworth slips.

**Result 12 – Continue to implement actions required to achieve delisting criteria and restore five beneficial uses that remain impaired in the Toronto and Region AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Beach Closings, Eutrophication or Undesirable Algae, and Loss of Fish and Wildlife Habitat; and, determine the status of one additional beneficial use that requires further assessment: Degradation of Phytoplankton and Zooplankton Populations.**

Canada and Ontario will:

- (a) Assess the status of five remaining impaired beneficial uses and one requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess the progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Complete analysis of wildlife populations to assess progress towards achievement of delisting criteria;
  - (iii) Determine status of fish populations to assess progress towards achievement of delisting criteria;
  - (iv) Conduct monitoring of water quality to assess progress towards achievement of delisting criteria;
  - (v) Develop an approach to assess the status of Degradation of Phytoplankton and Zooplankton Populations; and
  - (vi) As appropriate, complete status assessments, prepare status assessment reports, and proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Eutrophication or Undesirable Algae, Beach Closings, and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairment that requires further assessment: Degradation of Phytoplankton and Zooplankton Populations.

Ontario will:

- (vii) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) Provide technical and financial support for habitat restoration projects to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations;
  - (ii) Continue to promote funding of the Don River and Central Waterfront infrastructure projects, which includes the Ashbridges Bay Treatment Plant upgrades, that are required to reduce combined sewer overflows, improve water quality and advance progress towards achievement of delisting criteria for Beach Closings and Eutrophication or Undesirable Algae; and
  - (iii) Provide technical advice related to the Don River Naturalization and Portlands Flood Protection Project to advance progress towards achievement of delisting criteria for Loss of Fish and Wildlife Habitat.
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments.

Ontario will:

- (d) Support actions to restore a healthy, functioning fish community to achieve delisting criteria for Degradation of Fish and Wildlife Populations.

**Result 13 – Complete actions required to achieve delisting criteria and restore the one beneficial use that remains impaired and delist the Port Hope Harbour AOC: Restrictions on Dredging Activities.**

Canada will:

- (a) Assess the status of one remaining beneficial use impairment:
  - (i) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions on Dredging Activities.
- (b) Undertake remedial actions to achieve beneficial use impairment delisting criteria:
  - (i) As part of the federal Port Hope Area Initiative, continue to lead the funding, planning, consultation and engagement, oversight and implementation of remedial actions to remove and safely manage contaminated sediment from Port Hope Harbour.

**Result 14 – Complete remaining actions to achieve delisting criteria and restore four beneficial uses that remain impaired in the Bay of Quinte AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Aesthetics, Eutrophication or Undesirable Algae, and Degradation of Phytoplankton and Zooplankton Populations.**

Canada and Ontario will:

- (a) Assess the status of four remaining beneficial use impairments:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;



- (ii) Complete analysis of aesthetics conditions to assess progress towards achievement of delisting criteria;
- (iii) Develop an approach to refine delisting criteria for Degradation of Phytoplankton and Zooplankton Populations; and
- (iv) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Aesthetics, Eutrophication or Undesirable Algae, and Degradation of Phytoplankton and Zooplankton Populations.

Ontario will:

- (v) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption.

Canada and Ontario will:

- (b) Through the development and implementation of the Bay of Quinte Phosphorus Management Plan, continue to advance progress towards achievement of delisting criteria for Eutrophication or Undesirable Algae; and
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments, designating the AOC as an AOC in Recovery and/or delisting this AOC.

**Result 15 – Complete remaining actions required to achieve delisting criteria and restore the five beneficial uses that remain impaired in the St. Lawrence River AOC: Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Beach Closings, Eutrophication or Undesirable Algae, and Loss of Fish and Wildlife Habitat; and, determine the status of two additional beneficial uses that require further assessment: Fish Tumours or Other Deformities, and Degradation of Phytoplankton and Zooplankton Populations.**

Canada and Ontario will:

- (a) Assess the status of five impaired beneficial uses and two requiring further assessment:
  - (i) Improve understanding of the consumption of fish to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption;
  - (ii) Assess provincially significant wetlands to support the development of local strategies and actions and to assess progress towards achievement of delisting criteria;
  - (iii) Develop an approach to assess the status of Degradation of Phytoplankton and Zooplankton Populations; and
  - (iv) Complete status assessments, prepare status assessment reports, and as appropriate proceed with beneficial use impairment redesignation for Restrictions on Fish and Wildlife Consumption, Degradation of Fish and Wildlife Populations, Beach Closings, Eutrophication or Undesirable Algae, and Loss of Fish and Wildlife Habitat; and, a designation status of the beneficial use impairments that require further assessment: Fish Tumours or Other Deformities, and Degradation of Phytoplankton and Zooplankton Populations.

Ontario will:

- (v) Conduct monitoring of fish contaminants to assess progress towards achievement of delisting criteria for Restrictions on Fish and Wildlife Consumption; and
- (vi) Complete water quality monitoring at remaining nearshore areas of priority tributaries to assess progress towards achievement of delisting criteria for Eutrophication or Undesirable Algae.

Canada and Ontario will:

- (b) Monitor the natural recovery of contaminated sediments along the Cornwall waterfront:
  - (i) Monitor the effectiveness of natural recovery to assess progress towards achievement of the delisting criteria for Restrictions on Fish and Wildlife Consumption; and
  - (ii) Provide technical advice to local agencies on applying the Cornwall Sediment Strategy Administrative Controls Protocol to ensure proper management of the contaminated sediment.
- (c) Undertake a process to engage local governments, First Nations, Métis and the public in remediation and decision-making for removal of beneficial use impairments, designating the AOC as an AOC in Recovery and/or delisting this AOC; and
- (d) Communicate as needed with federal and state agencies of the United States on matters that advance restoration and delisting of this binational Area of Concern.

## **ANNEX 6: LAKEWIDE MANAGEMENT**

**The purpose of this Annex is to advance restoration, protection and conservation of the Great Lakes through collaboration among jurisdictions domestically and binationally and with the Great Lakes community on a lake-by-lake basis.**

Lakewide Action and Management Plans (LAMPs) provide a mechanism to assess and report on the state of the ecosystem, identify science and management priorities, conduct studies and outreach activities, and identify the need for and facilitate further action. The Canada-United States Great Lakes Water Quality Agreement outlines a commitment to update and implement LAMPs for each of the four Canadian Great Lakes including their major river systems of St. Marys, St. Clair, Detroit, Niagara and the international section of the St. Lawrence. It also contains commitments to implement a nearshore framework, and consult and cooperate with the Great Lakes community to assess the status of each Great Lake and address environmental stressors on a lakewide scale.

The nearshore areas of the Great Lakes have great biological diversity, provide numerous benefits and are the focal point for human interaction with the Great Lakes but are also subject to tremendous human impact. The nearshore framework provides a foundation for assessing and managing the nearshore including Great Lakes beaches. It is science-based, considers sources of stress and potential stress, and includes monitoring and reporting.

This Annex builds on and supports existing and new initiatives in priority geographies in each Great Lake to help achieve ecosystem objectives and to address those lakewide and nearshore issues that can be best addressed on a lakewide scale. It recognizes the important contributions of natural and agricultural systems in meeting objectives for water quality and ecosystem health. Commitments in other Annexes such as Nutrients, Areas of Concern, Habitat and Species, and Harmful Pollutants also support the objectives of this Annex.

The Great Lakes are Ontario's primary source of drinking water. This Annex includes commitments to further assess and address threats to sources of drinking water in connection with efforts under Ontario's *Clean Water Act, 2006* as well as through existing federal policies and programs. Commitments throughout the Agreement are augmented by ongoing federal and provincial programs such as the federal Contaminated Sites Action Plan, and provincial contaminated site remediation efforts.

**Result 1 – The status of each of the Great Lakes, including the connecting river systems, is regularly assessed and reported, and issues best addressed on a lakewide scale are coordinated and implemented binationally through LAMPs and with domestic agencies and organizations.**

Canada will lead, with Ontario's support:

- (a) Assessment and reporting on the state of the waters (physical, chemical and biological attributes) and ecosystem health of each Canadian Great Lake and its connecting channels including current and future potential threats and trends;
- (b) Identification of research, monitoring and other science priorities for the assessment of current and future potential threats to water quality and lake ecosystem health, including climate change, and for the identification of priorities to support management actions;
- (c) Ecosystem science and monitoring surveys, inventories, studies and outreach activities that support the above assessments and management actions;
- (d) Identification and coordination of required actions by government agencies and the Great Lakes community to address lake-specific priority threats to water quality and lake ecosystem health and the achievement of Lake Ecosystem Objectives;
- (e) Canadian input to development and implementation of lake-specific binational strategies to address objectives and any current and future potential threats to water quality and lake ecosystem health that are judged to be best addressed on a lake-by-lake basis; and
- (f) Publication of LAMPs for each lake, on a five-year rotational basis such that LAMPs for Lakes Superior, Huron (2022), Ontario (2023) and Erie (2024) will be completed.

**Result 2 – The Great Lakes community is engaged in decision making and taking action to restore, protect and conserve the lakes and connecting rivers.**

Canada and Ontario will:

- (a) Increase opportunities for engagement in assessing lake status, identifying priorities for science and action; and taking action to address lake specific issues, including:
  - (i) Opportunities for the Great Lakes community to review and provide input at various stages in the LAMP development process for each lake;
  - (ii) Develop a process to engage First Nations and Métis in assessing lake status, identifying priorities for science and action, and taking action to address lake-specific issues, for each Great Lake, through the Lakewide Action and Management Plans; and
  - (iii) Opportunities for the Great Lakes community to undertake actions that support the LAMP.

**Result 3 – The Great Lakes nearshore framework implementation is continued in cooperation with the Great Lakes community.**

Canada and Ontario will:

- (a) Complete an assessment of the Canadian Great Lakes nearshore waters by March 2022 which will include:
  - (i) An assessment of the state of the Canadian nearshore of the Great Lakes;
  - (ii) Identification of nearshore areas that are or may become subject to high stress due to individual or cumulative impacts on the chemical, physical or biological integrity of those areas;
  - (iii) Identification of nearshore areas that are of high ecological value;
  - (iv) Identification of priority nearshore areas for prevention, restoration and protection at an appropriate scale to support management action; and
  - (v) Identification of stresses (including climate change), causes, and sources of contamination for priority areas.
- (b) Maintain monitoring programs that collect the data required for the assessment of the Great Lakes Canadian nearshore (nearshore), which may include: water and sediment quality, benthic invertebrates community composition, nuisance and harmful algae blooms, coastal wetland health, water quality at drinking water intakes, and fish consumption advisory data;
- (c) Share data and results of nearshore assessments with the Great Lakes community through LAMP documents and other mechanisms;
- (d) Maintain currency of nearshore assessments;
- (e) Develop and share tools and approaches for communities and organizations to use the results of the nearshore assessment to take action to restore and protect nearshore waters; and
- (f) Explore the use of new technologies to enhance the understanding of coastal processes and ecosystem health.

**Result 4 – Initiatives and lake-specific priority actions to address current and future threats to water quality and ecosystem health, as identified through LAMPs, the nearshore framework, Ontario’s Great Lakes Strategy and other means.**

Canada and Ontario will:

- (a) Take action for Lake Ontario through such initiatives as:
  - (i) Western Lake Ontario Land to Lake Initiative;
  - (ii) Carruthers Creek to Moira River Watershed Planning and Big Data Initiative;
  - (iii) Niagara River Toxics Management Plan including the Niagara River water quality monitoring and biomonitoring; and
  - (iv) St. Lawrence River Strategy Initiative.

- (b) Take action for Lake Erie through such initiatives as:
  - (i) Grand River Water Management Plan and Southern Grand Rehabilitation Initiative;
  - (ii) The Thames River (*Deshkan Ziibi*) Shared Waters Approach to Water Quality & Quantity and Clear Water Revival;
  - (iii) Canadian Lake St. Clair Management Plan; and
  - (iv) The Niagara Coastal Community Collaborative.
- (c) Take action for Lake Huron through such initiatives as:
  - (i) Lake Huron Georgian Bay Initiative for Community Action; and
  - (ii) Healthy Lake Huron Clean Water, Clean Beaches Campaign (Southeast Shores).
- (d) Take action for Lake Superior through such initiatives as:
  - (i) The Lake Superior National Marine Conservation Area interim management plan.

**Result 5 – Potential risks to the Great Lakes as a source of safe drinking water are identified and assessed, and early actions to manage risks are undertaken.**

Canada will:

- (a) Collaboratively pursue strengthening the protection of the Great Lakes as a source of safe drinking water through existing binational mechanisms; and
- (b) Implement federal policies and programs that are protective of the Great Lakes as a source of safe drinking water.

Ontario will:

- (c) Identify sensitive areas and mitigate risks to drinking water;
- (d) Provide available datasets, studies and expertise to support the identification and assessment of issues and threats to drinking water sources; and
- (e) Maintain and/or develop programs to provide education and outreach on the protection of drinking water sources, to:
  - (i) Identify and support action to mitigate potential threats to source water; and
  - (ii) Encourage collaboration on protecting drinking water sources.

**Result 6 – Improved understanding and implementation of adaptive management approaches to outflow regulation strategies for the upper Great Lakes and the Lake Ontario-St. Lawrence River System lake levels.**

Canada and Ontario will:

- (a) Enhance understanding of the water budget within the Great Lakes basin, including lake supply, precipitation, evaporation, and watershed runoff, and factors that contribute to changing lake levels and the relationship with other natural lakes;

- (b) Continue to explore opportunities to collaborate on lake level adaptive management strategies as they relate to water quality and ecosystem health; and
- (c) Maintain and advance adaptive management plans proposed by the International Joint Commission for the Upper Great Lakes and the Lake Ontario-St. Lawrence River System.

**Result 7 – Coordinated science activities by Canada, Ontario and others to support the identified science priorities to restore, protect and conserve Great Lakes water quality and ecosystem health.**

Canada and Ontario will:

- (a) Work with the United States and others to support a binational Cooperative Science and Monitoring Initiative (CSMI) for Lakes Superior, Huron, Erie and Ontario on a five-year rotational basis, coordinating activities that are focused on science priorities identified through the LAMPs; and
- (b) Ensure necessary agreements are in place for the timely and effective exchange of data and information.

**Result 8 – Assessment and reporting on the state of the Great Lakes using science-based ecosystem indicators.**

Canada and Ontario will:

- (a) Support indicator development by maintaining monitoring programs, providing data and preparing indicator reports where applicable and encourage other Great Lakes government and non-government organizations to do the same;
- (b) Share Great Lakes data and information through existing means such as established fora, social media, agency websites and reports as well as investigate new opportunities to efficiently convey information on trends in Great Lakes water quality and ecosystem health; and
- (c) Explore approaches for communicating ecosystem health conditions and trends that consider variability of conditions within lakes, such as the western basin of Lake Ontario.

Canada will lead, with Ontario's support:

- (d) Establish and maintain a suite of comprehensive, science-based ecosystem indicators to assess the state of the Great Lakes, anticipate threats and measure progress against the general and specific objectives of the Canada-United States Great Lakes Water Quality Agreement; and
- (e) Develop a comprehensive binational assessment of the Great Lakes ecosystem based on agreed-upon environmental indicators.

Canada will:

- (f) Via Open Maps supported by the Federal Geospatial Platform initiative, provide the public with a single window access to Canada's Great Lakes data to enable easy data access, visualization, integration and analysis that support evidence-based decision-making across all the priority areas addressed under this Agreement.

## **PRIORITY – PROTECTING HABITAT AND SPECIES**

This Priority focuses on restoring, protecting and conserving the natural habitats and biodiversity of the Great Lakes. Thriving habitats and native fish and wildlife communities contribute to the social and economic vitality of the Great Lakes basin. Unfortunately, many human activities put pressures on the ecosystem and result in the loss or degradation of habitats, fragmentation of natural systems, reductions in the health and abundance of native species, and threats from invasive species. To address these issues, this Priority includes Annexes on Aquatic Invasive Species and Habitat and Species.



## **ANNEX 7: AQUATIC INVASIVE SPECIES**

**The purpose of this Annex is to ensure cooperative and coordinated efforts to reduce the threat of aquatic invasive species to Great Lakes water quality and ecosystem health.**

Aquatic invasive species (AIS) are a significant environmental and economic threat to Great Lakes ecosystems and biodiversity. AIS have severely damaged the Great Lakes by outcompeting native species, altering food webs and degrading critical habitats for fish and wildlife populations. They can also degrade water quality by increasing suspended solids, concentrating toxins, encouraging the growth of harmful algae blooms, and altering nutrient and energy flows within the food web. AIS threaten the Great Lakes economy by affecting important industries such as tourism, recreational and commercial fisheries, and disrupting water supply for municipal drinking water, power plants and industry.

Significant progress has been made to prevent the introduction and spread of harmful AIS to the Great Lakes basin by the Parties and complementary efforts in the United States. For example, new provincial and federal regulations are in place prohibiting possession of several high-risk AIS including Asian carps. Coordinated enforcement efforts by the province and several federal agencies have resulted in several successful interceptions and prosecutions under these regulations. In addition, federal regulations and international standards to address ballast water have helped to prevent introductions from this pathway. These successes emphasize the importance of the Parties' coordinated and strategic efforts to address this complex issue.

Building upon this success, this Annex includes the following results and commitments to: identify the risk of potential new AIS and pathways for introduction; ensure implementation of regulations to prevent or reduce the spread of AIS; support coordinated early detection and response to new invasions; improve the suite of tools available for detection, control and management of established AIS; and strengthen outreach effort to engage the broader Great Lakes community. These activities are supported by continued commitments to improve understanding of the impacts of AIS on the Great Lakes ecosystem, and the effects of climate change to inform decision making on management strategies. Actions to prevent the introduction and spread of AIS through the ballast water discharge of ships are also addressed in the Discharges from Vessels Annex of this Agreement.

AIS do not respect borders and successful prevention and control requires cooperation among all jurisdictions in Canada and the United States. The Parties will also provide leadership by working with all jurisdictions across the Great Lakes basin to ensure consistent rules and standards are in place that can be practically applied by industry and the public. They will continue to coordinate the implementation of the Canadian Action Plan to Address the Threat of Aquatic Invasive Species and the Ontario Invasive Species Strategic Plan. Ontario will continue to support commitments made by the Great Lakes and St. Lawrence River Governors and Premiers to work together to address AIS threats to our shared waters. Canada will continue its work with the United States to control sea lamprey through the Great Lakes Fishery Commission. Through the efforts described in this Annex, both Ontario and Canada will work together to meet the objectives and commitments of the Aquatic Invasive Species Annex of the Canada-United States Great Lakes Water Quality Agreement.

**Result 1 – Ballast water requirements protect the Great Lakes Basin Ecosystem from the discharge of AIS by ships.**

Canada will:

- (a) Taking into account guidelines and standards of the International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004, continue to implement ballast water regulations in Canada, and meet commitments under Annex 5 of the Canada-United States Great Lakes Water Quality Agreement.

**Result 2 – Coordinated risk assessments of potential new AIS and AIS pathways to inform prevention, monitoring, and control measures.**

Canada and Ontario will:

- (a) Jointly establish priorities for ecological risk assessments for potential new AIS and pathways to best support prevention of AIS including regulatory actions. For species and pathways identified as high priority, undertake risk assessments considering ecological and socio-economic impacts. Where appropriate risk assessments will be coordinated with management agencies from other jurisdictions within Canada and the United States; and
- (b) Continue to develop and implement science-based tools and methodologies to support ecological and socio-economic risk assessments for AIS and associated pathways.

**Result 3 – Regulations, policy, and management strategies are in place to prevent new and potential AIS, and to reduce the risk of their spread.**

Canada and Ontario will:

- (a) Assess and, where necessary, take steps to advise on prospective amendments, that may be considered by their respective Legislatures, to applicable federal and/or provincial legislation, regulations and policies to address gaps, if any, in preventing the introduction and establishment of new AIS and ensure clear accountability of agencies;
- (b) Clarify jurisdictional roles and responsibilities related to various taxa to ensure clear accountability of agencies; and
- (c) Continue joint enforcement efforts of existing regulations to prevent the introduction of AIS, such as Asian carp, to the Great Lakes basin across borders and through trade and other pathways.

**Result 4 – Effective control of sea lamprey resulting in suppression of their populations to target levels that support fish community objectives in all Great Lakes.**

Canada will:

- (a) Implement the sea lamprey control program in cooperation with the United States as coordinated through the Great Lakes Fishery Commission to reduce sea lamprey abundance to target levels that support fish community objectives in all Great Lakes;

- (b) In collaboration with United States agencies carry out, facilitate, or contribute to research about sea lamprey control methods and population assessments to optimize decisions that target control efforts, development of alternatives to lampricides, select control methods, and evaluate program effectiveness to deliver effective, integrated management of sea lamprey; and
- (c) Work with all involved jurisdictions to ensure that sea lamprey spread and control is considered in dam removal, remediation, or fishway projects. Planning for any new barriers specifically for sea lamprey control will include considerations for aquatic habitat connectivity and biodiversity.

**Result 5 – Prevention of AIS movement and spread in tributaries and through connected waterways.**

Canada and Ontario will:

- (a) Work collaboratively when planning construction of new, maintenance of existing, and removal of dams and barriers with respect to AIS movement, spread, and/or connectivity issues;
- (b) Improve understanding of the potential for AIS movement in watersheds, through canals, and intra-basin connections; and
- (c) With United States agencies, advance research and development of fishways that block sea lamprey and/or other AIS but allow movement of non-invasive fish and other organisms.

**Result 6 – Appropriate consideration of the potential to spread AIS during any transfer or use of water.**

Canada and Ontario will:

- (a) Consider and mitigate the risk of spreading AIS when evaluating any transfer or use of water.

**Result 7 – Early detection and response initiatives are developed and implemented for Canadian waters, complementary to United States domestic planning creating a basin-wide response framework.**

Canada and Ontario will:

- (a) Refine and maintain a coordinated federal/provincial early detection and response framework for Canadian waters for Asian carps that is guided by risk assessments, and includes detection programs, reporting protocols and coordinated agency responses;
- (b) Develop coordinated federal/provincial early detection and rapid response frameworks in Canadian waters for AIS, including the development of watch lists, reporting and surveillance protocols, and response strategies; and
- (c) Work with United States federal and state agencies through key mechanisms, such as the Great Lakes and St. Lawrence River Governors and Premiers AIS Task Force, the Canada-United States Great Lakes Water Quality Agreement Annex 6 Committee, and the Asian Carp Regional Coordinating Committee, to develop and advance Mutual Aid Agreements supporting basin-wide, cross-border surveillance and response actions for AIS.

### **Result 8 – Improved tools to detect, respond to and control AIS.**

Canada and Ontario will:

- (a) Promote research and development of innovative techniques, aimed at detecting and monitoring AIS in the Great Lakes and in pathways including trade, commerce, and recreation;
- (b) Promote research and development of control tools to better respond to and manage AIS; and
- (c) Explore opportunities with other provinces and the federal government to expand availability of control methods for invasive species in aquatic habitats.

### **Result 9 – Improved understanding of the ecosystem impacts of AIS and implementation of risk based management or adaptation measures.**

Canada and Ontario will:

- (a) Conduct research to assess the risks and support the prioritization of potential new and established AIS to Great Lakes Basin Ecosystems;
- (b) Monitor and report on the occurrence and status of priority new and established AIS and their impacts on Great Lakes ecosystems; and
- (c) Where priority AIS are established and eradication is not feasible, implement management strategies based on risk, and undertake control and adaptation measures as appropriate.

### **Result 10 – Improved understanding of the impact of climate change on AIS in the Great Lakes.**

Canada and Ontario will:

- (a) Continue to advance research to identify potential changes in species distributions and risks of new AIS due to the effects of climate change in the Great Lakes basin and incorporate findings in risk analyses of new AIS and pathways.

### **Result 11 – Increased awareness and actions by the Great Lakes community to prevent the introduction and spread of AIS.**

Canada and Ontario will:

- (a) Advance joint communications and outreach priorities to engage the Great Lakes community in preventing the introduction and spread of AIS;
- (b) Encourage citizen science to support early detection and tracking of AIS; and
- (c) Collaborate with key partners to expand communication networks and strengthen the collective impact of outreach ventures.

## **ANNEX 8: HABITAT AND SPECIES**

**The purpose of this Annex is to continue efforts to restore, protect and conserve the resilience of Great Lakes native species and their habitats.**

The Great Lakes support a rich diversity of fish, wildlife and plant species. Thriving habitats and native fish and wildlife communities contribute to the social and economic vitality of the Great Lakes region. Unfortunately, many human activities put pressures on the ecosystem that result in the loss or degradation of habitats, fragmentation of natural systems, threats and impacts from aquatic invasive species (AIS), and reductions in the health and abundance of native species.

This Annex focuses on collaborative efforts to restore, protect and conserve the diversity of habitats and species that make up the Great Lakes Basin Ecosystem while providing sustainable social, ecological and economic benefits.

Canada and Ontario support strategic conservation planning initiatives such as natural heritage system planning, and the National Framework for Canada's Network of Marine Protected Areas, including the National Marine Conservation Area System Plan. Collaboration through the Great Lakes Fishery Commission facilitates international shared management of fisheries through mechanisms under the Joint Strategic Plan for Management of Great Lakes Fisheries. Canada and Ontario also cooperate on activities to ensure the effective protection and recovery of species at risk and their habitats in Ontario.

The collaborative efforts in this Annex are supported by other Annexes of this Agreement. Lakewide Management and Action Plans contain actions that restore, protect and conserve native biodiversity. Annex 8 will deliver on the habitat and species components of the binational Cooperative Science and Monitoring Initiative (CSMI) as defined in the Lakewide Management Annex. The assessment of nearshore waters in the Lakewide Management Annex focusses on cumulative impacts to the ecosystem that affect habitat and species. Actions to restore degraded fish and wildlife habitat and populations are included in Remedial Action Plans in the Areas of Concern Annex. AIS represent a continued threat to native species and ecosystems. Actions to address AIS are found in the Aquatic Invasive Species Annex and complement management actions to protect and restore habitats undertaken in this Annex. Climate change is resulting in changes to physical conditions in the Great Lakes, such as temperature, precipitation, ice coverage and water levels, which in turn affect habitats and species. Research and adaptation actions are included in the Climate Change Impacts and Resilience Annex. Actions to assess and enhance resilience to climate change impacts are included in the Habitat and Species Annex as it pertains to habitat and species.

The Parties will continue to support research and monitoring programs that investigate the threats to aquatic habitats and species, identify methods for threat mitigation, and prioritize opportunities for restoration. The Parties will continue to use existing reporting mechanisms (e.g., Lakewide Action and Management Plans) and other means to report progress on the commitments in the Habitat and Species Annex.

**Result 1 – High quality habitats in need of protection, priority areas for restoration and habitat creation, and the most significant stressors to native species and habitats are identified.**

Canada and Ontario will:

- (a) Continue to undertake a baseline habitat survey to guide sustainable conservation actions and measure progress towards a goal of net habitat gain considering extent, condition, current protections and key threats and stressors for each Great Lake; and
- (b) Determine priority habitat in need of protection and restoration to maintain and enhance populations of native species, including species at risk, and improve the resilience of natural systems and processes while considering the broader Great Lakes ecosystem.

**Result 2 – An improved understanding of climate-related vulnerabilities and resilience of Great Lakes coastal wetlands.**

Canada will lead and Ontario will support:

- (a) Complete a science-based assessment of coastal wetland vulnerability to climate-related impacts; and
- (b) Identify adaptive measures and develop guidance to enhance wetland resilience.

**Result 3 – Great Lakes habitat and native species are protected, enhanced and/or restored to maintain ecosystem health.**

Canada and Ontario will:

- (a) Implement binational collaborative actions, guided by fish community objectives, to support management that reduces the loss of, and makes progress on rehabilitation of, native species such as:
  - (i) Lake Superior: coaster brook trout, lake sturgeon and walleye;
  - (ii) Lake Huron: lake sturgeon, lake trout and walleye;
  - (iii) Lake Erie and Lake St. Clair: lake sturgeon and lake trout;
  - (iv) Lake Ontario and St. Lawrence River: lake trout, Atlantic salmon, American eel, lake sturgeon; and
  - (v) Other key species to be identified.
- (b) Collaborate with the Great Lakes community to conserve and restore priority habitat through stewardship actions, beneficial management practices, tax incentives or other programs (e.g., Canada Nature Fund, Ecological Gifts Program) or actions consistent with government plans and strategies;
- (c) Conserve and protect Great Lakes fish and fish habitat through existing and potential future federal and provincial legislation and policy to contribute to aquatic ecosystem health, the supply of wholesome fish for human consumption and to provide and enhance fishing opportunities;

- (d) Support priority actions to restore and/or improve connectivity to Great Lakes tributaries for migratory fish to ensure continued progress of native species conservation;
- (e) Implement actions to restore, protect and conserve habitats for Great Lakes waterfowl, waterbirds and shorebirds through the Eastern Habitat Joint Venture and the North American Bird Conservation Initiative, consistent with domestic and international management strategies;
- (f) Promote the use of habitats as natural infrastructure recognizing their role in protecting people and property from natural and human influenced hazards as well as mitigating the impacts of climate change;
- (g) Strengthen the long-term protection of biodiversity and restoration of ecosystems through a network of aquatic and terrestrial protected areas;
- (h) Undertake and support research, monitoring and reporting on the status, use and value of Great Lakes natural resources focusing on native fish, aquatic dependent wildlife, aquatic food webs and habitats; and
- (i) Undertake and support studies that investigate the functions and ecosystem services of wetlands including hydrology, water quality and quantity, phosphorus reduction capabilities, carbon sequestration, and fish and wildlife habitat.

Canada will:

- (j) Implement a fish and fish habitat protection program that provides protection against harming fish and fish habitat consistent with fisheries management objectives and Great Lakes planning.

**Result 4 – An informed and engaged Great Lakes community involved in the restoration, protection and conservation of the resilience of native species and habitats and their sustainable use.**

Canada and Ontario will:

- (a) Promote stewardship activities by the Great Lakes community through technical transfer opportunities such as workshops, extension materials or training and through national and provincial initiatives;
- (b) Share with the Great Lakes community information on the baseline habitat survey and the significance to native species and their conservation; and
- (c) Build consensus and promote implementation of actions with the Great Lakes community on priorities and strategies for enhancing coastal wetlands resilience.

## **PRIORITY – ENHANCING UNDERSTANDING AND ADAPTATION**

This priority focuses on enhancing understanding of climate change and groundwater to advance adaptation, inform Great Lakes management decisions, and identify priorities for action. The Groundwater Quality Annex includes commitments to improve understanding of groundwater – surface water interactions and their influence on Great Lakes water quality and ecosystem health. The Climate Change Impacts and Resilience Annex includes initiatives to advance knowledge of climate change impacts, to assess climate change risks and vulnerabilities to the Great Lakes basin, and to better prepare communities to adapt and build resilience.



## **ANNEX 9: GROUNDWATER QUALITY**

**The purpose of this Annex is to gain a better understanding of how groundwater influences Great Lakes water quality and ecosystem health, and to identify priority areas for future action.**

Groundwater may represent as much as over 40 percent of the water entering the Great Lakes, either directly (via groundwater discharge along the coasts) or indirectly (via discharge into rivers and streams that then discharge into the lakes). As a result, the continued flow of good quality groundwater plays an important role in Great Lakes water quality and ecosystem health. Groundwater-transported contaminants and excessive nutrients can impair the quality of the waters of the Great Lakes, particularly the nearshore region, with potential effects on aquatic species, recreational waters and water supplies.

Because groundwater is an important source of water and a potential source of contaminants and excessive nutrients and a pathway for transfer to the Great Lakes, groundwater quality is linked to the successful delivery of key commitments in other Annexes, including Areas of Concern, Lakewide Management, Harmful Pollutants, Nutrients, and Habitat and Species.

Some areas near the Great Lakes are known to have contaminated groundwater. In some cases, initiatives are underway to direct management and/or implement remediation actions in these locations. They include numerous contaminated site risk assessment and remediation projects undertaken by private industry across the province, provincial contaminated site remediation efforts such as the Deloro Mine Site, and some of the work done through the Federal Contaminated Sites Action Plan, and the federal remediation of the Port Hope Area. These actions will protect or improve the water quality of the Great Lakes.

This Annex includes commitments to update a binational state of groundwater science report, identify priorities for future research, and identify priority areas and sites for monitoring, management or remediation actions to address groundwater impacts and stressors.

**Result 1 – A binational state of groundwater science report, based on collecting and compiling groundwater science findings, is updated and made available.**

Canada will, with Ontario's support:

- (a) By 2022, in cooperation with the United States, update the 2016 binational state of groundwater science report synthesizing relevant and available groundwater science; and
- (b) Assemble technical and scientific expertise to:
  - (i) Update the state of groundwater science as it pertains to implications for Great Lakes water quality and ecosystem health; and
  - (ii) Identify priorities for groundwater science.

**Result 2 – Improved understanding of groundwater-surface water interactions and their influence on the Great Lakes water quality and ecosystem health to inform management actions and decisions.**

Ontario will, with Canada's support:

- (a) Support the development of surface water-groundwater conceptual and numerical models at Great Lakes, basin, watershed and aquifer scales; and
- (b) Undertake and promote monitoring and research to improve understanding of groundwater influences on Great Lakes water quality and ecosystem health.

Ontario will:

- (c) Maintain its provincial groundwater, surface water and integrated climate change monitoring and use these data to update Ontario's contribution to the binational Great Lakes groundwater ecosystem indicator and explore groundwater-surface water interactions.

**Result 3 – Improved understanding of groundwater impacts and stressors on Great Lakes water quality and ecosystem health and identification of priority areas for the development of monitoring, management or remediation actions.**

Canada and Ontario will:

- (a) Facilitate the coordination, sharing and exchange of information and research to improve understanding of groundwater impacts on Great Lakes water quality and ecosystem health; and
- (b) Identify priority sites or areas where point sources may impact the water quality and ecosystem health of the Great Lakes, including nearshore areas.

## **ANNEX 10: CLIMATE CHANGE IMPACTS AND RESILIENCE**

**The purpose of this Annex is to continue to build understanding of climate change impacts, advance the integration of this knowledge into Great Lakes adaptation strategies and management actions, and help communities build climate resilience.**

Climate change impacts are being observed in the Great Lakes. Some of the most evident impacts include warmer water temperatures, changing precipitation patterns, extreme variability in lake levels, decreased ice coverage, and increased lake evaporation and extreme weather events.

National efforts to help Canadians adapt to climate change complement the commitments under this Annex. Natural Resources Canada's Adaptation to Climate Change program facilitates the development and exchange of information, knowledge and tools required to plan and implement practical measures that increase climate resilience. Regional adaptation planning, decision-making and action are supported through this program with the aim of helping communities and industry prepare for and adapt to local climate change impacts including increasing droughts, floods, coastal erosion and snow and ice storms. Canada also works with many partners to improve our ability to predict and manage flood risk.

Ontario's climate change programs and efforts will support the commitments of this Annex. This includes improving our understanding of climate change impacts by investing in regional scale climate change projections using the latest global climate model data. Ontario is also undertaking a provincial climate change impact assessment to further support communities, businesses and municipalities, including those in the Great Lakes watershed, in identifying vulnerabilities and impacts across the Province. Further, Ontario is developing an on-line tool to support the sharing of information by making practical climate impact information available for the public and private sectors. Ontario will continue to work with partners across the province to support local leadership and to build climate change adaptation knowledge.

Climate change affects physical, chemical and biological processes and aquatic ecosystems in the Great Lakes. It also impacts people, public health, communities, and infrastructure in the Great Lakes basin. For example, warmer water temperatures can result in increased algae blooms, changes to the rates of biological productivity, and effects on water quality; extremes in water levels pose significant risks to the Great Lakes including implications for water quality and ecosystem functions (see also the Nutrients, Harmful Pollutants, Lakewide Management and Groundwater Annexes); changes in precipitation patterns may affect shoreline processes and increase the concentration of nutrients, which may in turn increase harmful and nuisance algae blooms; and native fish and wildlife habitats, populations and diversity may be affected by changes to ecosystem functions and by new or expanded ranges of invasive species (see also the Aquatic Invasive Species and Habitat and Species Annexes).

This Annex contains commitments that will: improve our understanding of climate change impacts on Great Lakes water quality and ecosystem health; assess existing and future climate change vulnerabilities and risks; advance the integration of climate change considerations into Great Lakes management strategies; share climate change information with the Great Lakes community including decision-makers and resource managers; and help communities build climate change resilience and adapt to climate change.

## **Result 1 – Enhance knowledge and understanding of existing and future climate change impacts in the Great Lakes.**

Canada and Ontario will:

- (a) Maintain the monitoring of Great Lakes water levels and streamflow, via the cost-shared Ontario Hydrometric Network and binational work with United States federal and state agencies; and
- (b) Collaborate with others to apply national level climate research and modelling to regional scale projections for climate change elements such as air and water temperature, wind speeds, ice, humidity, streamflow, precipitation frequency, duration and intensity, and seasonal shifts, where feasible.

Canada will:

- (c) Maintain the monitoring of climate and weather variables, such as wind, temperature, precipitation, evaporation, wave height, water temperature, ice cover and Great Lakes water levels;
- (d) Improve the understanding of observed climate trends and variations and their effects on physical, chemical and biological processes affecting the Great Lakes; and
- (e) Provide support for the coordination of Synthetic Aperture Radar monitoring of the Great Lakes through the RADARSAT Constellation Mission.

Ontario will:

- (f) Work in collaboration with the academic community and others to update regional scale climate projections using latest global climate model data;
- (g) Share available down-scaled regional climate change data projections for the Great Lakes basin in Ontario;
- (h) Maintain Provincial networks for monitoring stream water quality and groundwater quantity and quality in the Great Lakes basin;
- (i) Operate and enhance existing integrated monitoring stations to support an understanding of how climate changes are influencing groundwater and stream water that potentially feed nutrients and contaminants into the Great Lakes; and
- (j) For Lake Ontario, extend seasonal coverage of water quality monitoring to capture extreme events and events that occur in the winter.

## **Result 2 – Assess existing and future climate change risks and vulnerabilities of the Great Lakes.**

Canada and Ontario will:

- (a) Building on national and provincial-level climate change impact assessments, explore the development of a Canada-Ontario Great Lakes climate change impact assessment;
- (b) Consider climate change impacts and changing climatic conditions in the development of management strategies and action plans under the Agreement;
- (c) Provide support for the development and implementation of regional Great Lakes adaptive management initiatives with a focus on impacts to Great Lakes water quality and ecosystem health, including initiatives related to lake level uncertainties, vulnerabilities and risks; and

- (d) Assess vulnerabilities of aquatic species and ecosystems to projected changes in climate including trends and variation in temperature and ice cover.

Canada will:

- (e) Improve regional scale models and analytical tools (e.g., Intensity Duration and Frequency or IDF curves, water level and wind/wave analyses) in order to increase understanding of the risks, vulnerabilities and opportunities associated with climate change impacts to the Great Lakes; and
- (f) Support the Province, which is the lead jurisdiction for flooding and flood mitigation, as Ontario directs municipalities using established legislation and technical guidance towards continued advancement in the identification of areas subject to natural hazards, and supports municipal use of floodplain maps to inform statutory obligations under the *Planning Act*.

**Result 3 – Share information on climate change impacts, risks and vulnerabilities with the Great Lakes community, and advance the integration of climate change considerations into Great Lakes management strategies.**

Canada and Ontario will:

- (a) Share climate and climate change impact-related data and information, including regional scale climate model outputs and research results, having implications for climate change impacts on Great Lakes water quality and ecosystem health with Great Lakes agencies, organizations and communities;
- (b) Communicate ongoing developments in science, strategies and actions to address climate change impacts within the Great Lakes;
- (c) Share data and expertise on water levels and water budgets of the Great Lakes, where feasible, as they relate to Great Lakes water quality and ecosystem health in order to promote the understanding of the impacts of climate change and advance action on climate change adaptation; and
- (d) Share information and results from the Provincial Climate Change Impact Assessment and the Canada in a Changing Climate series of reports.

**Result 4 – Communities are better prepared to adapt to climate change and build resilience.**

Canada and Ontario will:

- (a) Work with others to increase the ability to implement adaptation actions and promote the use of adaptive management tools in the Great Lakes basin;
- (b) Explore opportunities to help Great Lakes communities consider climate change impacts to Great Lakes water quality and ecosystem health including, but not limited to, shoreline erosion, drought, and flooding, as part of community adaptation planning and initiatives to build community resilience; and
- (c) Work through the Adaptation Policy Committee of the Canadian Council of Ministers of the Environment, to continue to advance work on adaptation, including work related to natural infrastructure, assessing risks associated with climate change, and measuring progress.

Ontario will:

- (d) Undertake a compilation of local (municipal and community) climate change planning and initiatives completed or underway in the Great Lakes watershed.

## **PRIORITY – ENGAGING COMMUNITIES – FROM AWARENESS TO ACTION**

This Priority focuses on creating opportunities for communities to actively engage in efforts that improve water quality and ecosystem health and contribute to the well-being of the Great Lakes community. The Great Lakes provide numerous benefits to the social and economic well-being of the people who live along their shores and in the watersheds. By promoting community action to keep the Great Lakes clean and healthy, enjoyment of the many benefits and prosperity they bring can continue for generations to come. Three Annexes address ways to increase and sustain these benefits: From Awareness to Action, Métis and the Great Lakes and First Nations and the Great Lakes.

## **ANNEX 11: FROM AWARENESS TO ACTION**

**The purpose of this Annex is to provide opportunities for local community action for the restoration, protection and conservation of the Great Lakes.**

The Great Lakes are an essential part of everyday life for the people who live along their shores and in the watersheds. They provide our drinking water, food and electricity, and moderate our climate. They provide recreation and tourism opportunities and connect us with our heritage. Their natural beauty nourishes our spirit. They are the economic backbone of Ontario. Ensuring that the Great Lakes are healthy, and that resources are managed sustainably, is of vital importance to both the lakes and the people who live and work here.

Despite the many benefits of living in the Great Lakes basin, many inhabitants are unaware of the connections among their activities, their quality of life and the health of the lakes. Everyone has a role to play in protecting, restoring and conserving the lakes through local actions. Increased information, education and awareness of the Great Lakes will increase overall appreciation for the Great Lakes and will motivate individuals to get involved. Local community action will help to restore, protect and conserve the Great Lakes while working to prevent new problems from arising and furthering the opportunities to enjoy all that the Great Lakes have to offer. Enhanced engagement of the Great Lakes community from all sectors will help to achieve shared Great Lakes outcomes.

Canada and Ontario have a range of initiatives to increase awareness and provide support for local community initiatives and will continue to engage the Great Lakes community on a good governance basis. The Great Lakes community has long contributed to the restoration, protection and conservation of the lakes. This Annex seeks to continue these efforts and to include a broad range of Canadians in dialogue, planning and priority setting, and activities that build awareness, expand Great Lakes experiences and encourage action on Great Lakes issues.



**Result 1 – Enhance engagement of the Great Lakes community through priority setting and working in partnership in the delivery of Agreement commitments.**

Canada and Ontario will:

- (a) Increase awareness and knowledge of the Great Lakes and engagement in their protection through: use of online engagement platforms and social media; State of the Great Lakes reports; Lakewide Action and Management Plans (LAMPs); actions to restore Areas of Concern; the implementation of the Lake Erie Action Plan; and other activities; and
- (b) Connect and inspire park visitors, residents of surrounding communities and students to the Great Lakes through events and programs at provincial and national parks, national marine conservation areas and protected areas (e.g., Ontario Parks Discovery Program, Healthy Parks Healthy People initiative), and by providing opportunities to participate in stewardship activities, citizen science initiatives and sustainable nature-based recreation.

Canada will:

- (c) Convene a binational Great Lakes Public Forum to discuss and receive comments on the state of the lakes and binational priorities for science and action;
- (d) Support enhanced public engagement in Great Lakes issues through citizen science under the Great Lakes Protection Initiative; and
- (e) Encourage and support community projects and initiatives to help restore, protect and conserve the Great Lakes through the delivery of the Great Lakes Protection Initiative and the EcoAction Community Fund.

Ontario will:

- (f) Encourage and support community projects that take action to help restore, protect, conserve and experience the Great Lakes, including projects that tackle specific issues such as building climate resiliency, tackling plastic pollution and litter clean-ups, reducing excess road salt, reducing harmful algae blooms, and other issues;
- (g) Work with school boards, school administrators and teachers to support the use of proven models and other opportunities that use the Great Lakes as a context for teaching and learning; and
- (h) Raise awareness and appreciation of the Great Lakes through communication of Ontario's Great Lakes Strategy Progress Report, Strategy review and other mechanisms, and convene a Great Lakes Guardians' Council meeting at least once per year to discuss priorities for Great Lakes action.

**Result 2 – Economic growth linked to opportunities derived from sustainable tourism and recreation dependent on the Great Lakes.**

Ontario will:

- (a) Identify opportunities for participation, linkages and efficiencies to better implement waterfront revitalization and promotion of the Great Lakes as a destination for visitors;
- (b) Encourage increased public access to waterfront areas where possible, to enhance community and tourist appreciation for the Great Lakes;

- (c) Continue to support waterfront festivals, sporting events, tourist experiences and heritage attractions (which include built heritage resources, archaeological resources, and landscapes of cultural heritage value) that build Great Lakes engagement and foster sustainable shoreline use;
- (d) Continue to promote and support sustainable waterfront trail systems that link communities and support local economies around the Great Lakes through walking, cycling and other trail activities;  
and
- (e) Work with the cruise ship industry to capitalize on and further enhance the Great Lakes cruising industry in order to attract more visitors and generate more economic activity.

## **ANNEX 12: MÉTIS AND THE GREAT LAKES**

**The purpose of this Annex is to reflect the interests and important role of Métis as contributors to the restoration, protection and conservation of the Great Lakes.**

Canada and Ontario work together with Métis on a good governance basis on a wide range of environmental protection issues. This Agreement supports opportunities for Métis, as members of the broader Great Lakes community, to participate in and contribute to Great Lakes restoration, protection and conservation initiatives. This Annex will provide a framework for Canada and Ontario to engage with Métis in the implementation of this Agreement and to consider their Traditional Ecological Knowledge to assist in restoring, protecting and conserving Great Lakes water quality and ecosystem health.

The preambular “Whereas” recitals of this Agreement provide further reference to Métis within the overall context of this Agreement.

**Result 1 – Métis actively engage in decision-making processes and take actions to restore, protect and conserve the Great Lakes.**

Canada and Ontario will:

- (a) Invite Métis to meet annually with COA Executive Committee co-chairs to discuss Great Lakes issues, as well as priorities and actions planned to achieve the Purpose of this Agreement;
- (b) Together with Métis, develop a process to engage Métis in decision-making and the application of Traditional Ecological Knowledge, when offered, as it relates to assessing lake status, identifying priorities for science and action, and taking action to address issues on a lakewide basis;
- (c) Together with Métis, develop and implement a process to engage Métis on remediation of Areas of Concern (AOCs), and decisions on Beneficial Use Impairment delisting and AOC delisting or designation as an AOC in recovery, taking into consideration Traditional Ecological Knowledge, when offered;
- (d) Provide opportunities for Métis to engage in the implementation of this Agreement and contribute to the restoration, protection and conservation of the Great Lakes;
- (e) Support the capacity building of Métis organizations and communities to address Great Lakes issues, including through the application of Traditional Ecological Knowledge;
- (f) Encourage and support Métis community projects and initiatives, including those related to Traditional Ecological Knowledge, to help restore, protect and conserve the Great Lakes through applicable programs; and
- (g) Invite Métis representatives to participate in COA Executive Committee meetings.

**Result 2 – Great Lakes fish consumption advisories are appropriate for the protection of Métis communities.**

Canada and Ontario will:

- (a) Engage with interested Métis to reduce the exposure to harmful pollutants of Métis communities that rely on Great Lakes fish as an important nutritional source for their diet, by ensuring that their specific consumption habits are considered, as well as that advisories that are developed are appropriate for these communities, and are communicated appropriately.

## **ANNEX 13: FIRST NATIONS AND THE GREAT LAKES**

**The purpose of this Annex is to reflect the interests and important role of First Nations as contributors to the restoration, protection and conservation of the Great Lakes.**

There are many First Nations communities within the Great Lakes basin. First Nations value their spiritual and cultural relationship to the waters of the Great Lakes. They contribute to the protection of Great Lakes water quality and ecosystem health through the wise use and management of land and water in their communities.

Canada and Ontario work together with First Nations on a good governance basis on a wide range of environmental protection issues. This Agreement supports opportunities for First Nations, as members of the broader Great Lakes community, to participate in and contribute to Great Lakes restoration, protection and conservation initiatives. This Annex will provide a framework for Canada and Ontario to engage with First Nations in the implementation of this Agreement and to consider their Traditional Ecological Knowledge to assist in restoring, protecting and conserving Great Lakes water quality and ecosystem health.

The preambular “Whereas” recitals of this Agreement provide further reference to First Nations within the overall context of this Agreement.

**Result 1 – First Nations actively engage in decision-making processes and take actions to restore, protect and conserve the Great Lakes.**

Canada and Ontario will:

- (a) Invite First Nations to meet annually with COA Executive Committee co-chairs to discuss Great Lakes issues, as well as priorities and actions planned to achieve the Purpose of this Agreement;
- (b) Together with First Nations, develop a process to engage First Nations in decision-making and the application of Traditional Ecological Knowledge, when offered, as it relates to assessing lake status, identifying priorities for science and action, and taking action to address issues on a lakewide basis;
- (c) Together with First Nations, develop and implement a process to engage First Nations on remediation of Areas of Concern (AOCs), decisions on Beneficial Use Impairment delisting and AOC delisting or designation as an AOC in recovery, taking into consideration Traditional Ecological Knowledge, when offered;
- (d) Provide opportunities for First Nations to engage in the implementation of this Agreement and contribute to the restoration, protection and conservation of the Great Lakes;
- (e) Support the capacity building of First Nations organizations and communities to address Great Lakes issues, including through the application of Traditional Ecological Knowledge;
- (f) Encourage and support First Nations community projects and initiatives, including those related to Traditional Ecological Knowledge, to help restore, protect and conserve the Great Lakes through applicable programs; and
- (g) Invite First Nations representatives to participate in COA Executive Committee meetings.

**Result 2 – Great Lakes fish consumption advisories are appropriate for the protection of First Nations communities.**

Canada and Ontario will:

- (a) Engage with interested First Nations to reduce the exposure to harmful pollutants of First Nations communities that rely on Great Lakes fish as an important nutritional source for their diet, by ensuring that their specific consumption habits are considered, as well as that advisories that are developed are appropriate for these communities, and are communicated appropriately.

