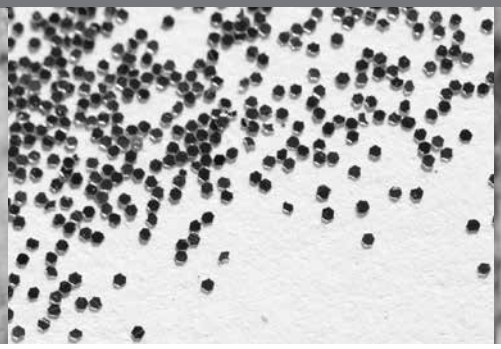
Small Things Matter

Annual Report 2014/2015 Supplement



Environmental
Commissioner
of Ontario

Select citations have been provided in this Supplement to the Annual Report. They are intended to help readers understand where the information the ECO cites comes from and to assist them in investigating an issue further should they be interested. Citations may be provided for: quotes; statistics; data points; and obscure or controversial information. Footnotes for these facts are generally only included if the source is not otherwise made clear in the body of the text and if the information cannot be easily verified.

ABBREVIATIONS

Legislation

EAA *Environmental Assessment Act*
EBR *Environmental Bill of Rights, 1993*
EPA *Environmental Protection Act*
ESA *Endangered Species Act, 2007*
FWCA *Fish and Wildlife Conservation Act, 1997*
LRIA *Lakes and Rivers Improvement Act*
NMA *Nutrient Management Act, 2002*
OWRA *Ontario Water Resources Act*
PPCRA *Provincial Parks and Conservation Reserves Act, 2006*
SSOWA *Safeguarding and Sustaining Ontario's Water Act, 2007*
TRA *Toxics Reduction Act, 2009*

Provincial Ministries

MOECC Ministry of the Environment and Climate Change
MMAH Ministry of Municipal Affairs and Housing
MNRF Ministry of Natural Resources and Forestry
OMAFRA Ontario Ministry of Agriculture, Food and Rural Affairs

Terms and Titles

AOC Areas of Concern
BMPs Beneficial Management Practices
CAZ Contaminant Attenuation Zone
COA Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health
COSSARO Committee on the Status of Species at Risk in Ontario
CPU Certificate of Property Use
EA Environmental Assessment
ECA Environmental Compliance Approval
ELA Experimental Lakes Area
ERT Environmental Review Tribunal
FLAP Fatal Light Awareness Program
GLWQA Great Lakes Water Quality Agreement
GNF Greenhouse Nutrient Feedwater
IUCN International Union for Conservation of Nature
LTA Leave to Appeal
NDMA N-Nitrosodimethylamine
NHIC Natural Heritage Information Centre
NPRI National Pollutant Release Inventory
PCBs Polychlorinated Biphenyls
PTTW Permit to Take Water
RASC Royal Astronomical Society of Canada
TSSA Technical Standards & Safety Authority
WMU Wildlife Management Unit

SECTION 1

REVIEWS OF SELECT DECISIONS ON ACTS, REGULATIONS, POLICIES AND INSTRUMENTS

1.1 Ministry of Agriculture, Food and Rural Affairs

Review of Posted Decision:

1.1.1 Regulatory Framework for the Application of Greenhouse Nutrient Feedwater to Agricultural Land

Decision Information

Registry Number: 011-8101
Proposal Posted: March 1, 2013
Decision Posted: December 22, 2014
Comment Period: 45 days
Number of Comments: 10
Decision Implemented: January 1, 2015

Registry Number: 011-8075
Proposal Posted: March 1, 2013
Decision Posted: December 19, 2014
Comment Period: 45 days
Number of Comments: 12
Decision Implemented: January 1, 2015

Description

Overview

Phosphorus and nitrogen-based fertilizers help plants grow, but when these nutrients find their way into lakes and rivers, they can also cause the growth of algae and plants in waterbodies. The oversupply of nutrients to aquatic systems, known as eutrophication, can negatively impact: ecosystem health; drinking water supplies; fisheries; recreation; tourism; and property values. Nutrient pollution is one of the most widespread water quality problems in Canada and around the world. In Ontario, the effects of nutrient pollution have been especially evident in Lake Erie for more than 50 years.

The Ministry of the Environment and Climate Change (MOECC) reported in 2012 that wastewater from some greenhouse operations around the Leamington, Ontario area were polluting waterbodies that flow into Lake Erie with high levels of nutrients. Subsequently, the MOECC and the Ministry of Agriculture, Food and Rural Affairs (OMAFRA) worked together to create a new alternative regulation under the *Nutrient Management Act, 2002* (*NMA*). Greenhouse operators can choose to register under this new regulation, which then governs how they store, transport and land apply greenhouse nutrient feedwater ("nutrient feedwater" or GNF).

Nutrient feedwater is a type of process wastewater produced by greenhouses, which farmers can beneficially use to fertilize and/or irrigate crops grown outdoors. Greenhouse operations that follow the rules in the new regulation no longer require an Environmental Compliance Approval (ECA) under the *Ontario Water Resources Act* (*OWRA*) to manage their nutrient feedwater. The MOECC will continue to regulate all other discharges and disposals of nutrient

feedwater and other greenhouse wastewater under the *OWRA* and the *Environmental Protection Act* (*EPA*).

Eutrophication of Lake Erie

During the 1960s and 1970s, Lake Erie and some of the other Great Lakes experienced algal blooms and other damaging effects of eutrophication. Sewage treatment plants were identified as the significant source of phosphorus loadings during this time. In response, the Canadian and American governments signed the *Great Lakes Water Quality Agreement* in 1972 to reduce nutrient loadings and clean up the lakes. By the 1980s, phosphorus loads into Lake Erie had decreased and the problems associated with eutrophication subsided – making it an international success story.

Unfortunately, eutrophication has once again become a problem in Lake Erie. During the early 2000s, the amount of algae in the lake began to increase and oxygen levels in the water started to decrease. In 2011, the western basin of Lake Erie experienced the largest toxic algal bloom in its history, spanning more than 5,000 square kilometres in size.

The sources of phosphorus in Lake Erie have changed since the 1970s. In 2011, the vast majority (around 70 per cent) of the external phosphorus loads to Lake Erie came from runoff from rural, agricultural and urban lands. Sixteen per cent of phosphorus loads to Lake Erie were from direct point sources, like sewage treatment plants. Indirect point sources, atmospheric deposition, and Lake Huron each contributed between four and six per cent.

Agricultural operations, particularly the application of fertilizer and manure to land, are now a major source of phosphorus loadings into Lake Erie. Most of this input happens during spring snowmelt and heavy rainstorms, when runoff waters transport phosphorus into nearby creeks, streams or rivers. In fact, researchers believe that an increase in three farming practices – no-till farming, autumn fertilizer application, and surface broadcasting of fertilizers – created conditions for enhanced runoff of phosphorus causing the 2011 algal bloom, in combination with weather conditions.

In 2014, the International Joint Commission released *A Balanced Diet for Lake Erie: Reducing Phosphorus Loadings and Harmful Algal Blooms*. The report provided a number of recommendations to improve the health of Lake Erie, including that governments should adopt new targets for phosphorus loadings. The report also made recommendations specific to agriculture, such as that governments should ban the application of manure, biosolids and commercial fertilizers containing phosphorus from agricultural operations on frozen ground or ground covered by snow for lands that drain to Lake Erie. In addition, the report recommended that governments strengthen and increase the use of regulatory mechanisms of conservation farm planning to reduce nutrient loading.

Greenhouse Wastewater

Ontario's 885 greenhouses enable farmers to grow fruits, vegetables and flowers year-round despite the hot, dry or snowy weather outside. Greenhouses generally produce three types of wastewater: stormwater (runoff from rain and snowmelt); sanitary sewage (wastewater from any kitchen or

bathrooms onsite); and process water (the water used in the greenhouse process to irrigate and wash crops).
Nutrient feedwater is a type of greenhouse process wastewater; it is generated when a nutrient solution is removed from a closed circulation system in a greenhouse. In this type of greenhouse system, nutrient-rich water is recycled until it is no longer optimum for growing greenhouse plants. While nutrient feedwater does not have the optimal nutrients for growing plants in greenhouses, it can have valuable nutrients for growing certain crops outdoors.

Wastewater from greenhouse operations, if not treated or disposed of properly, can pollute nearby streams, rivers and lakes with nutrients and metals. For example, in 2012 the MOECC found that greenhouse wastewater was responsible for the direct degradation of Sturgeon Creek and Lebo Drain watersheds near Leamington, Ontario.[1] Greenhouse operations are a major land use in these areas. There are approximately 230 greenhouse vegetable operations concentrated in the Niagara and Leamington areas. Sturgeon Creek and Lebo Drain, which flow into Lake Erie, are the most polluted waterways in Ontario with respect to phosphorous and nitrate, and in the top five most polluted with respect to potassium and copper, according to the MOECC.

The ministry discovered that 65 per cent of all greenhouses sampled in the Leamington area had discharged high levels of nitrate, phosphorous, potassium, and copper. In fact, the ministry found that the average concentrations of nitrate, phosphorus and copper from sampled greenhouse discharges that contained process wastewater were considerably higher than standards for water quality set out in provincial and federal guidelines.[2] The MOECC concluded that local greenhouse wastewater was contributing to the loading of nutrients into Lake Erie, compromising the province's commitments to achieve phosphorus reductions through international agreements to improve water quality in the Great Lakes.

Greenhouse operations have a number of options to dispose or discharge their wastewater. The MOECC considers all greenhouse wastewater (i.e., stormwater, sanitary sewage and process waters) as sewage. As a result, a greenhouse must obtain an ECA for sewage from the MOECC under the *OWRA* to discharge its wastewater to surface water, sewage works or to apply it to land. Where municipal sewer facilities are available, a greenhouse can discharge its wastewater directly into the sanitary sewer without an ECA. Alternately, a greenhouse can dispose of its wastewater at an approved waste disposal site, using an approved waste hauler. Despite these options, the greenhouse industry asked the provincial government for additional regulatory alternatives that are more predictable, less costly, and specifically geared towards the greenhouse sector.

New Regulatory Framework for Applying Nutrient Feedwater to Land

The new Greenhouse Nutrient Feedwater Regulation (O. Reg. 300/14) under the *NMA* contains rules-in-regulation for the management of nutrient feedwater generated from a greenhouse operation with a

[1] Ontario Ministry of the Environment and Climate Change (2012). *Summary, Greenhouse Wastewater Monitoring Project (2010 and 2011)*.
[2] Ontario Ministry of the Environment (2012). *Summary Greenhouse Wastewater Monitoring Project (2010 and 2011)*, page 12. Table 2 sets out these values as follows:

- Nitrate: average concentration 90.3 mg/L; standard 3.0 mg/L (as per Canadian Council of the Ministers of the Environment guideline);
- Phosphorus: average concentration 33.6 mg/L; standard 0.03 mg/L (as per Provincial Water Quality Objective); and
- Copper: average concentration 300 µg/L; standard 5.µg/L (as per Provincial Water Quality Objective)

closed circulation system that chooses to register with the OMAFRA. Greenhouse operations that choose to register under the new regulation can now store, transport, and apply nutrient feedwater to agricultural land without having to obtain an Environmental Compliance Approval for sewage works under the *OWRA*.[3] The regulation, along with two protocols[4] incorporated by reference, set out specific rules for generating, transporting, storing, and land applying nutrient feedwater, as well as education and training requirements.

Generating Greenhouse Nutrient Feedwater:
For the regulation to apply, a greenhouse operation has to register with the OMAFRA. Registration must include:

- the location of the properties that make up the farm unit (geographic area where the agricultural operation is located);
- the contact information of the controller(s) of the operation;
- the size of the greenhouse production area;
- confirmation that the operation has enough space to store the nutrient feedwater generated and received; and
- the estimated amount of nutrient feedwater and nutrients units (a measure of the amount of nitrogen and phosphate in the nutrient feedwater[5]) the operation is expected to generate and receive in a calendar year.

A greenhouse operation must renew its registration every five years and update certain information when it becomes out-of-date.

A greenhouse operation must complete either a 'GNF document' and 'GNF record,' or a more demanding 'GNF strategy,' depending on the number of nutrient units generated and received each year. A greenhouse operation that generates and receives five or more nutrient units each year (typically a greenhouse smaller than 5,000 square metres in size) must complete a GNF document and GNF record. The document must outline the types of crops grown in the greenhouse, how often nutrient feedwater will be generated and received, and a drawing of the farm unit to identify: the location of greenhouses generating feedwater; the location of existing and proposed permanent nutrient feedwater storage and any wells, tile inlets and outlets and surface waters that are within certain distances of the greenhouses or storages. If the nutrient feedwater will be stored or moved off the farm unit, the document must also include information on the storage and receiver. The GNF record must include information on the transfer of nutrient feedwater off the farm unit, including the volume, date and receiver for each shipment.

[3] The government passed a complementary amendment to O. Reg. 525/98 (Approval Exemptions) made under the *OWRA* to exempt nutrient feedwater generated at a registered greenhouse from the requirement to obtain an ECA for sewage works.
[4] Ontario Ministry of Agriculture, Food and Rural Affairs (2014). *2014 Greenhouse Nutrient Feedwater Management Protocol for Ontario Regulation 300/14 made under the Nutrient Management Act, 2002*; and Ontario Ministry of Agriculture, Food and Rural Affairs (2014). *2014 GNF Sampling and Analysis Protocol for Ontario Regulation 300/14 made under the Nutrient Management Act, 2002*.
[5] "Nutrient unit,"when used in respect of greenhouse nutrient feedwater, means a unit of the amount of nutrients in the greenhouse nutrient feedwater (as determined in accordance with: Ontario Regulation 300/14 (Greenhouse Nutrient Feedwater) made under the *NMA*; the GNF Management Protocol; and the GNF Sampling and Analysis Protocol) that gives the fertilizer replacement value of the lower of 43 kilograms of nitrogen as nutrient or 55 kilograms of phosphate as nutrient.

A greenhouse operation that generates or receives five or more nutrient units each year (typically a greenhouse larger than 5,000 square metres in size) must prepare a GNF strategy. In addition to all the information required in a GNF document and record, the strategy must include more details about the greenhouse operation, analytical results of the nutrient feedwater, transportation of nutrient feedwater, and storage facilities. The strategy must also demonstrate that the greenhouse operation meets the minimum storage capacity required by the regulation. A greenhouse operation must submit the strategy to the OMAFRA at the same time as the registration. In addition, a greenhouse operation must create a contingency plan to address potential management issues, such as unanticipated releases of nutrient feedwater. It does not have to submit the contingency plan to the OMAFRA.

A greenhouse operation must review and/or update the GNF strategy or document and record every year.

Storing and Transporting Nutrient Feedwater:
The regulation contains general rules for the storage of nutrient feedwater at an agricultural operation, including that no person shall:

- store nutrient feedwater at an agricultural operation, except if it is stored in either a permanent nutrient feedwater storage facility that is maintained to minimize leakage, or in a portable storage tank in accordance with certain rules;
- permit the discharge of stored nutrient feedwater into any waterbody, except for discharge through land application in accordance with the regulation; and
- permit water to enter a permanent nutrient feedwater storage facility, with some exceptions.

The regulation and the management protocol (*2014 Greenhouse Nutrient Feedwater Management Protocol for Ontario Regulation 300/14 made under the Nutrient Management Act, 2002*) outline additional requirements for the storage capacity of a GNF storage facility.

The regulation sets general rules for the transportation of nutrient feedwater, including that:

- no person can transport nutrient feedwater by pipeline to a destination other than an agricultural operation;
- no person shall transport nutrient feedwater to (or within) an agricultural operation except by: a vehicle that has a leakproof tank, an above ground direct flow application system, or a permanent underground pipeline designed by a professional engineer;
- only an independent carrier who meets requirements set in the regulation or a controller or employee of an agricultural operation where the nutrient feedwater is generated or received can transport nutrient feedwater by vehicle; and
- a person engaging in the business of transporting nutrient feedwater must use the services of an independent carrier who meets requirements set in the regulation.

The regulation also includes additional rules for transportation between agricultural operations and within a farm. The regulation prohibits any person from mixing nutrient feedwater with anything other than nutrient feedwater or liquid agricultural source materials.

Applying Nutrient Feedwater to Land:
An agricultural operation must prepare a GNF plan if it will store, receive or land-apply five or more nutrient units of nutrient feedwater within the farm unit in a year. The OMAFRA approves all GNF plans. The GNF plan must include:

- soil sampling results;
- the location of the operation receiving the nutrient feedwater;
- details of any nutrient feedwater storage;
- a diagram of the nutrient feedwater application area that shows features such as wells or shallow bedrock; and
- a contingency plan to address potential nutrient feedwater management issues, such as unanticipated releases of nutrient feedwater, and the inability to land apply as a result of weather conditions or unavailability of equipment.

If a GNF plan is required, an agricultural operation must complete a land application schedule every year. The schedule must include information on:

- the field where nutrient feedwater will be applied;
- crops that will be planted;
- the number of times and dates that nutrient feedwater or other nutrients will be applied in a year;
- the application rate and methods for nutrient application;
- the volume of nutrient feedwater to be applied in a year; and
- the nutrient feedwater application setbacks for the field.

An agricultural operation subject to a GNF plan must keep a record of every land application of nutrient feedwater.

There are a number of other rules for the application of greenhouse nutrient feedwater to farmland, including that:

- nutrient feedwater must be applied either by staff of the greenhouse or farm, or by a licenced applicator;
- nutrient feedwater is only applied on land that has a slope of less than 12 per cent;
- the amount of nutrient feedwater applied to the land shall not exceed 750 cubic metres per hectare (m^3/ha) (67,000 gallons per acre (gal/ac)) in a year. If an agricultural operation is subject to a GNF plan, this amount may be increased, but not exceed 1,500 m^3/ha, if certain conditions are met;
- nutrient feedwater application cannot exceed more than 130 m^3/ha (11,500 gal/ac) in a 24 hour period (this amount may be increased if a GNF Plan is required and other requirements are met);
- the application of nutrients to land is highly restricted between December 1 and March 31 and it must not be applied on land that is snow covered or frozen;
- only a maximum of 40 kilograms per hectare of nitrogen can be applied to land, through nutrient feedwater application, between October 1 and May 15. Also, during this period it can only be applied on living crops or on land with 30 per cent residue cover (residue needs to have a carbon to nitrogen ratio of at least 50:1);

- an agricultural operation must take all reasonable steps to ensure that nutrient feedwater does not pond on the surface of the land where it is applied. It cannot be applied at a rate that causes it to move more than 1.5 metres across the surface of the soil after it is applied;
- A direct flow application system (such as a drip system) can be used if the rules in the regulation are followed;
- Nutrient feedwater cannot be applied on land that has a depth of unsaturated soil that is less than 30 centimetres (cm). In addition, there are a number of rules regarding the application of nutrient feedwater where there is 30 cm or more of unsaturated soil;
- Nutrient feedwater cannot be applied on land that has a depth to bedrock of less than 30 cm and there must be 50 cm depth to bedrock if nutrient feedwater has higher regulated metal content; and
- Nutrient feedwater cannot be applied within:
    - 100 metres of a municipal well,
    - 15 metres of certain drilled wells, or
    - 30 metres of all other wells;
- Nutrient feedwater cannot be applied within:
    - 20 metres of a waterbody unless there is a vegetated buffer zone (an area that has a width of at least 3 metres, adjacent to a waterbody, and is maintained under continuous vegetated cover) between the waterbody and the field where nutrient feedwater is applied;
    - 13 metres of a waterbody, whether or not within the vegetated buffer zone, if the nutrient feedwater contains nitrogen and phosphorus;
    - 13 metres of a waterbody unless it has a low metal content, is not within the vegetated buffer zone, and certain conditions are met (i.e., it is injected or placed in a band below the surface of the soil; it is incorporated within 24 hours after the end of the land application; it is applied to land covered with a living crop; or it is applied to land with crop residue covering at least 30 per cent of soil); and
    - 3 metres of a waterbody if the field where nutrient feedwater applied is a peat, muck, bog or fen (i.e., soils contains more than 17 per cent organic carbon by weight); and
- Nutrients cannot be applied to land within the vegetated buffer zone of a waterbody except for some commercial fertilizer that is reasonable to establish or maintain its vegetation, under certain circumstances.

Sampling and Analysis of Nutrient Feedwater and Soil:
The regulation and the sampling protocol (*2012 GNF Sampling and Analysis Protocol for Ontario Regulation 300/14 made under the Nutrient Management Act, 2002*) contain requirements for analyzing nutrient feedwater and soil. For example, a registered greenhouse operation must have nutrient feedwater sampled and analyzed by a laboratory before it is transferred or applied to land. The laboratory tests the nutrient feedwater for specific nutrient content, including nitrogen, phosphorus, potassium, regulated metals, boron and sodium.

During the preparation of a GNF plan, the agricultural operations must have soil analyzed by a laboratory to determine concentrations of regulated metals and nutrients. Additionally, an agricultural operation must have soil analyzed every five years.

Training and Education for Nutrient Feedwater Management:
There are a number of training requirements in the regulation that must be completed before carrying out nutrient management practices. For example, nutrient feedwater generators, receivers and farmers wanting to prepare a GNF strategy, GNF plan or land application schedule for their own operations must complete online training. Independent carriers and people wanting to transport nutrient feedwater for and between agricultural operations that they do not own, operate or work from must also complete training requirements specified by the ministry.

Nutrient management consultants and people wanting to prepare a GNF strategy, GNF plan or land application schedule for agricultural operations they do not own, operate or work for must hold an "agricultural operation strategy and plan development certificate" in addition to completing the training requirements specified by the ministry.

There are also requirements for businesses and individuals that land apply nutrient feedwater for agricultural operations that they do not own, operate or work for to obtain a "prescribed material application business licence" and a "nutrient application technician licence." The OMAFRA's website recommends the completion of online training modules as well.

Records:
The regulation requires an agricultural or greenhouse operation to retain a number of records, such as the GNF strategy or plan, nutrient sampling and analysis results and records related to land application of nutrient feedwater. Records must be kept at the agricultural operation or at another location that is accessible at all times, if it is not practical to keep them at the agricultural operation.

Oversight and Enforcement:
The OMAFRA is responsible for approvals, training, education and outreach of the *NMA*. Under the new regulatory framework, the OMAFRA is responsible for accepting greenhouse registrations and GNF strategies, and for approving GNF plans. The MOECC's role is to ensure compliance with and enforcement of the regulation, including the inspection of greenhouses. The MOECC retains its responsibility for general enforcement of the *OWRA*, *EPA* and *NMA*, including the direct discharge of nutrient feedwater or other wastewater to surface water or groundwater under the *OWRA*.

Implications of the Decision

Land Application Restrictions to Protect Water Quality

The over-application of fertilizers and nutrients onto land can cause the loading of excessive nutrients into waterbodies. The ministries stated that the new regulation mitigates such potential adverse environmental impacts through rules designed to balance the amount of nutrient feedwater applied with the ability of the crops to use it. The regulation contains rules for applying nutrient feedwater to land that are designed to protect groundwater, surface water and soil quality. These rules include runoff provisions, maximum hourly, daily and yearly application rates, and setbacks from watercourses. While there are some new rules, many are similar to existing requirements under the *NMA* and *OWRA*, such as setbacks to wells and surface water, and the prohibition of applying nutrient feedwater to ground that is snow-covered or frozen.

Limited Potential to Reduce Nutrient Pollution

The regulation only applies to greenhouse operations that choose to register with the OMAFRA. While the regulation attempts to encourage the industry to reduce, reuse and recycle nutrients, if only a small portion of greenhouses choose to register, reductions in Great Lakes water pollution from greenhouses attributable to the new framework could be negligible. Additionally, the new regulation only applies to nutrient feedwater, which is one type of greenhouse process wastewater; it does not apply to other types of greenhouse process wastewater, stormwater or sanitary wastewater. Nutrient feedwater is only produced from greenhouse operations that use a 'closed circulation system.'

The OMAFRA and the MOECC estimated, through consultation with the greenhouse industry, that fewer than 10 per cent of the vegetable greenhouses in Ontario, or 30 operations, were likely to use this regulation to manage nutrient feedwater generated from their operations. The OMAFRA stated that since these projections were made, "attention to wastewater management in greenhouses has increased, leading to a reduction in the need to manage GNF in large quantities," which could further reduce the number of operations that opt into the regulation. According to the OMAFRA, as of May 2015, only four greenhouse operations had submitted registrations and it had not received any nutrient feedwater plans.

Source Water Protection Planning

The regulation and its protocols do not specifically address how the management and land application of greenhouse nutrient feedwater under the new framework will consider source water protection planning under the *Clean Water Act, 2006*. While the ECA application for a sewage works requires the applicant to identify source protection or drinking water threats, nutrient feedwater plans and strategies do not have a similar requirement. However, the OMAFRA stated on the Environmental Registry that it can be considered, noting that "in order to reduce the risks to drinking water, source protection plans may include policies with additional requirements to manage the activity of land applying GNF in vulnerable areas."

Public Participation & *EBR* Process

On March 1, 2013, the OMAFRA and the MOECC posted the *Discussion Paper on a Proposal for the Land Application of Nutrient Feedwater in Ontario* in two separate proposals on the Environmental Registry. The government provided a 45-day public review and comment period, and held meetings with the agricultural sector and Aboriginal communities in Leamington, Niagara Falls, Toronto and Guelph. The MOECC received 12 comments and the OMAFRA received 10 comments on the discussion paper.

Some farming and horticulture groups were generally supportive of the proposed regulatory framework. In particular, one greenhouse operator with experience in nutrient feedwater storage and application to land stated that the approach is a reasonable, cost-effective alternative to the site specific and potentially costly ECA process. While these groups generally supported the proposal, they raised concerns about specific aspects of the proposal. In particular, they asserted that the requirements for transportation and storage are too onerous, and that the proposed maximum daily and yearly land application rates are unreasonably restrictive.

Conversely, one horticulture group stated that the proposed regulatory framework will be an "administrative burden to government staff, an economic hardships to growers, and it is questionable whether adequate trained resources could be available to facilitate the development of the necessary [strategies and plans]." This group recommended a phased-in process, similar to what was carried out in the livestock sector for nutrient management plans. Another horticulture group stated that the scope of the proposal is too narrow and suggested that the framework be expanded to accommodate other wastewaters.

Other commenters expressed concern with the proposal. For example, one commenter disagreed with the use of tools under the *Nutrient Management Act, 2002* to reduce nutrient loadings. They stated that the Act's implementation has focused on creating uniform standards across operations, without the ability to address nutrient loadings issues specific to particular water bodies in certain geographic areas. Two commenters asserted that the existing tools under the *OWRA* are more effective at protecting water quality than the proposed framework. Moreover, one commenter recommended that nutrient feedwater be sampled and analyzed for parameters that may affect crop growth, soil health and water quality (e.g., metals) and that the strategies and plans also apply to greenhouses generating fewer than five nutrient units, since the concentrations of nutrients and metals may be very high even at small volumes.

The ministries posted decision notices on the Environmental Registry on December 19, 2014. The MOECC stated that "all comments received were considered and some changes were made to the proposal to increase flexibility where protection of the environment could be demonstrated." The OMAFRA indicated that some aspects of the regulatory proposal changed through consideration of comments, such as simplifying the approvals of strategies and plan, providing options for a longer land application season, requiring annual sampling and analysis, and providing more flexible storage requirements.

Both the MOECC and the OMAFRA failed to provide the public with a copy of the proposed regulation on either of the Environmental Registry notices before the regulation was made. Additionally, since the ministries posted the initial proposals, all links to the discussion paper were removed from Environmental Registry and the public is no longer able to access this document.

Statement of Environmental Values

The MOECC provided a summary of how it considered its Statement of Environmental Values in developing the new regulatory framework for nutrient feedwater. The ministry stated that it considered its principles of environmental management, pollution reduction/ environmental restoration, strategic management, and social, economic and other factors, and provided a brief description of how these principles were applied.

The OMAFRA also provided a summary of how it considered its Statement of Environmental Values in the development of this proposal. The ministry stated that it considered the purposes of the *Environmental Bill of Rights, 1993*, as well as the need to monitor the proposal's achievements of the provisions and commitments in the OMAFRA's Statement of Environmental Values upon implementation. The ministry also confirmed that it met its commitment to provide an open and consultative process.

ECO Comment

Excessive nutrient levels in lakes and rivers is one of the most widespread, costly and challenging environmental problems in North America. Nutrient pollution impairs water quality by promoting algal blooms, which can degrade ecosystem health and drinking water quality. Eutrophication has plagued the Great Lakes region, and particularly Lake Erie, since the 1960s. Recently, the MOECC found that wastewater from greenhouses is contributing to the loading of nutrients into Lake Erie and, thus, is compromising the province's commitment to reduce phosphorus loadings as required under international agreements.

Unfortunately, the new regulation created by the MOECC and the OMAFRA to address greenhouse nutrient feedwater has limited potential to reduce overall nutrient loadings to the Great Lakes from Ontario's greenhouses. These new rules only apply to one type of process wastewater from greenhouses and, even then, only to those greenhouses that choose to register under the new framework. Indeed, the OMAFRA predicted that less than 30 greenhouse operations will use this regulation. This means that approximately 200 greenhouses in the highlighted problem areas of Niagara and Leamington "will need to come into compliance with the requirements of the *OWRA* and the *EPA*,"[6] according to the OMAFRA. Given the MOECC's findings in 2012 that more than half of greenhouses in the Leamington area discharged wastewater with nutrient and metal concentrations higher than provincial standards for water quality, this new regulation is likely to make only a very small dent into the greenhouse nutrient management problem.

In order to achieve the province's vision that the Great Lakes be "swimmable, drinkable and fishable,"[7] the government has to do much more to address current water quality impacts from the agricultural sector. Since the sources of phosphorus in Lake Erie have changed since the 1960s, so should the government's tactics to reduce nutrient pollution. As a start, the MOECC should ensure that all greenhouse operations have the necessary approvals to discharge wastewater and are in compliance with these approvals. In cases of non-compliance, the ministry should take appropriate enforcement action.

On June 13, 2015, Ontario, Michigan, and Ohio agreed to a 40 per cent total load reduction in the amount of phosphorus entering Lake Erie's Western Basin by the year 2025, with an interim goal of a 20 per cent reduction by 2020. Furthermore, Ontario and the states committed to develop, in collaboration with stakeholders involved, a plan outlining proposed actions and timelines toward achieving the phosphorus reduction goals. Since scientists predict that there will be more sever harmful algae blooms in Lake Erie – similar to the outbreaks in 2011 and the summer of 2014, which made drinking water unsafe for almost half a million people in Toledo, Ohio – Ontario's commitments seem promising. Only swift action and co-ordinated effort to control eutrophication will once again make Lake Erie and the Great Lakes a success story.

[6] Ontario Ministry of Agriculture, Food and Rural Affairs (July 17, 2015). Information provided to the ECO.
[7] Government of Ontario (2012). *Ontario's Great Lakes Strategy*, page 30.

Review of Posted Decision:

1.1.2 Revisions to the Noxious Weeds List

Decision Information

Registry Number: 012-1204
Proposal Date: February 28, 2014
Decision Posted: May 9, 2014

Comment Period: 45 days
Number of Comments: 1,100
Decision Implemented: May 8, 2014

Registry Number: 012-1205
Proposal Date: March 14 2014
Decision Posted: December 19, 2014

Comment Period: 45 days
Number of Comments: 46
Decision Implemented: Jan. 1, 2015

Registry Number: 012-2634
Proposal Date: September 26, 2014
Decision Posted: December 19, 2014

Comment Period: 33 days
Number of Comments: 9
Decision Implemented: Jan. 1, 2015

Description

Overview

Ontario's *Weed Control Act* is intended to reduce infestations of unwanted plants that may negatively affect agriculture and horticulture, harbour plant diseases, or poison or harm livestock. To this end, the law prohibits the planting or depositing of "noxious weeds" anywhere in the province. The *Weed Control Act* also requires Ontario landowners to destroy all noxious weeds and their seeds unless they are sufficiently far from any agricultural or horticultural lands.

The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) is responsible for administering this law. The OMAFRA can designate a plant as a "noxious weed" by listing it in the regulation (R.R.O. 1990, Reg. 1096 (General)) made under the Act. This regulation also sets out methods for destroying these plants as well as rules to prevent their accidental release.

In May 2014, the ministry removed milkweed (*Asclepias spp.*) from its list of noxious weeds (see Environmental Registry decision notice #012-1204). In addition, this regulation amendment listed dog-strangling vine (*Vincetoxicum rossicum*) and black dog-strangling vine (*Vincetoxicum nigrum* (L.) Moench) as noxious weeds.

In January 2015, the ministry removed the following nine species from the list of noxious weeds (see Environmental Registry decision notices #012-1205 and #012-2634):

1. goat's-beard (*Tragopogon dubius*);
2. nodding thistle (*Carduus natans* L.)
3. scotch thistle (*Onopordum acanthium* L.);
4. wild carrot (*Daucus carota*);
5. Johnson grass (*Sorghum halepense* (L.) Persoon);
6. black-seeded proso millet (*Panicum miliaceum* L.) (black seeded biotype);

7. yellow rocket (*Barbarea* spp.);
8. Russian thistle (*Salsola pestifer* Aven Nelson); and
9. tuberous vetchling (*Lathyrus tuberosus* L.).

The ministry concurrently added the following nine species to the list of noxious weeds:

1. smooth bedstraw (*Galium mollugo* (L.));
2. wild chervil (*Anthriscus sylvestris* (L.) Hoffmann);
3. common crupina (*Crupina vulgaris* Cass.);
4. jointed goatgrass (*Aegilops cylindrica* Host);
5. kudzu (*Pueraria montana* (Lour.) Merr.);
6. wild parsnip (*Pastinaca sativa* L.);
7. serrated tussock (*Nassella trichotoma* Hackel ex Arech);
8. tansy ragwort (*Senecio jacobaea* L.); and
9. woolly cupgrass (*Eriochloa villosa* (Thunb.) Kunth).

In total, 11 species were added and 10 removed, and as of July 2015 the noxious weeds list included 25 plant species.

Background

The OMAFRA states that the recent changes to the noxious weeds list are intended to support biodiversity, and in particular the health of pollinators, without creating an undue burden on farmers. The ministry states that modern agriculture has the methods and tools to manage the delisted plants and that their presence in proximity to farmers' fields should not pose a threat to agricultural or horticultural activities. All the species removed from the list represent food sources for pollinators and/or other insect and bird species, while the species that were added are all considered invasive and/or difficult to control. In the case of the two dog-strangling vine species, these plants are considered a nuisance in agricultural fields, a serious threat to natural ecosystems, and a threat to the monarch butterfly (see below). In the case of the other nine species added to the list in January 2015, the OMAFRA regards them to be emerging threats to agriculture in Ontario.

Milkweed:
Milkweed is a perennial herbaceous plant known for its milky sap. Several species of milkweed can be found in Ontario. Common milkweed (*A. syriaca*) occurs throughout the province and grows in pastures, roadsides, and cultivated fields. It is considered widespread in many parts of the province and is somewhat poisonous to livestock. Swamp milkweed (*A. incarnata*) grows mostly in wet habitats, such as swamps, marshes, and ditches. Four-leaved milkweed (*A. quadrifolia*) is rare in Ontario and was listed as an endangered species in the province in 2010. Other species include whorled milkweed (*A. verticillata*) and green milkweed (*A. viridiflora*). Swamp milkweed is one of a number of milkweed species that are not considered a threat to agriculture; however, all species were included in the list of noxious weeds and all have been removed with this new amendment.

Milkweed species are the sole food source of the larvae (caterpillars) of the monarch butterfly (*Danaus plexippus*). Accordingly, if milkweed numbers are low, increased competition for food reduces the caterpillar survival rate and, ultimately, the overall size of the butterfly population.

The number of milkweed plants along the monarch's North American migration routes has been declining in recent years. For instance, one study estimates that milkweed plants in the American mid-west, a vital breeding ground for the monarchs during migrations, have declined by 58 per cent from 1999 to 2010. This reduction in milkweed habitat has been the primary factor in the significant population decline of the monarch over the past two decades, although habitat loss in monarch over-wintering grounds in Mexico and extreme weather events have also had impacts.

Figure 1 shows that the number of forest hectares occupied by monarchs in their Mexican over-wintering areas has been steadily dropping since data were first collected in 1994. Since all of the eastern North American monarchs over-winter in the same area every year, these figures are a good proxy for the size of the total population. The data suggest that over-wintering eastern monarch numbers have declined by 91 per cent over the past 20 years, with the numbers in the winter of 2013-2014 being the lowest ever recorded.

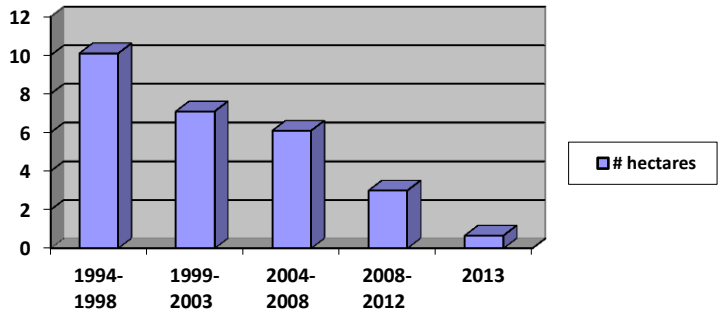


Figure 1. Forest surface area occupied by monarch butterfly colonies in Mexico (1993-2014)**.** Note: Except for 2013, forest surface areas are five-year averages. (Figure based on data published in: Rendón-Salinas, E. and Tavera-Alonso, G., *Forest Surface Occupied by Monarch Butterfly Hibernation Colonies in December 2013*, 2014).

The monarch butterfly is an important species ecologically. It is both a major food source for several species of birds and invertebrates and a unique pollinator that provides long-distance pollen transport during the course of its annual migration. This migration is in itself a fascinating phenomenon. It requires several generations, covers thousands of kilometres from Mexico to Canada, and is still not completely understood by scientists. It is possibly the most highly evolved migration pattern of any known species of insect.

Dog-Strangling Vine:
Dog-strangling vine was introduced to North America from eastern Europe in the 1800s by gardeners in the northeastern United States. In recent years it has spread into southern Ontario, growing in a wide range of habitats, including old fields, stream banks, forests, tall grass prairies and alvars. It spreads quickly along roadsides and ditches and is very aggressive; it can crowd out native species and create dense mats of vegetation. Once established, this plant can be difficult to control.

Dog-strangling vine can have a number of negative impacts, including:

- altering ecosystem structure and function by producing heavy shade as well as root chemicals that discourage the growth of other plants (alleopathy);

- altering wildlife habitat;
- reducing insect populations in invaded areas, because pollinators and plant-eating insects avoid dog-strangling vine; and
- consequently reducing populations of birds and small mammals that feed on insects.

Dog-strangling vine's impacts are particularly noticeable in southern Ontario forests. For example, conifer plantations were established in some parts of the province in the mid-1900s to control flooding and erosion. These pines are aging and some are dying, but the natural succession to native hardwoods is hindered as this non-native plant suppresses hardwood seedling establishment. Similarly, dog-strangling vine makes forest reforestation efforts more difficult and expensive by outcompeting planted tree seedlings, forcing land managers to spend more money on weed control and the purchase of larger seedlings. Dog-strangling vine also affects monarchs. It is in the same family as milkweed (*Asclepiedaceae*) and monarchs sometimes mistakenly lay their eggs on its leaves. Unfortunately, the monarch caterpillar is not adequately sustained by the plant.

The OMAFRA added two species of dog-strangling vine that are considered invasive species in Ontario to the noxious weeds list: dog-strangling vine (*Vincetoxicum rossicum*) and black dog-strangling vine (*Vincetoxicum nigrum* (L.) Moench). The ministry stated in the regulation proposal notice that the addition of dog-strangling vine to the noxious weed list will "provide more tools to local weed inspectors to address this invasive plant species."

Other Species Removed from the Noxious Weeds List:
The wild carrot is the plant from which the cultivated carrot was developed using selective breeding. It is also known as Queen Anne's lace. A biennial that reproduces by seed, it is commonly found in old pastures, roadsides and meadows. The wild carrot is not considered a problem for cultivated crops and can be controlled in pastures by occasionally rotating to a cultivated crop for a year or two. It is a major food source for the eastern black swallowtail (*Papilio polyxenes*) butterfly larvae, a food source for native bees, and the shape and size of its flowers makes them a mating platform for many insect species.

Goat's beard, nodding thistle, and Scotch thistle are similar to the wild carrot in that they are also biennial plants that grow on roadsides, in meadows and in pastures. They provide habitat and are food sources for birds and other wildlife. The two thistles can create problems because livestock avoid them, leading to the thistle's eventual domination in pastures. This problem can be avoided through improved grazing management (e.g., the thistles are edible when they are young).

Johnson grass is different from the four species described above in that it is a naturalized perennial grass, reproducing by both seed and rhizome (underground plant stem). Although it occurs in about 13 counties in southern and southwestern Ontario, most of the rhizomes are unable to survive our winters. It is a food source for birds and other animals. It is somewhat invasive but can be controlled by tillage, as well as by repeated mowing or managed grazing.

Black-seeded proso millet is a naturalized annual grass that is more difficult to control than most annual grasses; however, it can be managed through the use of sanitary crop production processes (e.g., cleaning farm equipment between fields) and crop rotations. The seeds are attractive to birds and some farmers are now growing this plant for the birdseed market.

Yellow rocket is another early successional biennial plant that prefers to grow in disturbed areas or in those that are slightly degraded. It is not particularly invasive but will spread into grain fields. Its nectar is attractive to bees and flies of various kinds and its foliage is a food source for caterpillar and moth larvae as well as livestock.

Russian thistle, like the other two thistles removed from the list (see above), is a biennial plant that prefers disturbed habitats such as crop fields but can invade pastures as well. It can be controlled in pastures with timed grazing (the immature plants are edible by livestock) and through herbicides and/or mowing in crop fields. Its seeds are attractive to granivorous birds and small mammals.

Tuberous vetchling is a naturalized perennial vine that reproduces both by seed and by underground tubers. It occurs in cultivated fields, pastures, meadows, orchards, and roadsides in southern Ontario. It is a member of the bean family (a legume) and provides food and cover for various mammals and birds.

Other Species Added to the Noxious Weeds List:
Smooth bedstraw is a perennial plant that reproduces both by seed and by underground rhizome. Unlike many weedy plants, it is suited for a wide range of conditions, including healthy soils, which allows it to out-compete more desirable plants in well-managed pastures. Chemical control is difficult; high dosages of systemic herbicides are needed because of the underground rhizomes. When an infestation is severe, farmers need to rotate out of hay and into a field or cover crop for at least two years.

Wild chervil is a member of the parsley family, like the wild carrot, and is also a biennial that reproduces by seed. It is very invasive and can out-compete native plants in a variety of habitats, including pastures. It is resistant to many herbicides and has a large tap root that makes it hard to control, as it can regrow from just a small piece of root. It can also host a disease that affects many vegetable crops, such as carrots, celery, and parsnips. Repeated mowing or grazing can work as a control because it eventually depletes root reserves.

Common crupina has not yet been found in Ontario (or Canada), according to the Canadian Food Inspection Agency. However, it is a highly invasive species that infests pastures, rangelands and hayfields to the point where it forms dense stands, dominating all other species. It is often listed as a noxious weed by agencies outside of its adopted range (as Ontario has now done).

Jointed goatgrass is an annual grass that invades crop fields, and in particular wheat fields. It is genetically related to wheat and can cross-pollinate with it, compounding the difficulties associated with its control. It competes for nutrients and water with crops, reducing yields and quality.

Kudzu is a perennial climbing vine, noted for being extremely aggressive and quick-growing (up to 30 centimetres per day). It spreads by underground runners and climbs on trees, hydro poles, buildings or anything else in the vicinity. It crowds out existing vegetation and can even cause power outages. It grows mostly in disturbed areas and requires abundant sunlight, but can also grow in unfavourable conditions. To date it has been found in only one Ontario location, near Leamington on the shores of Lake Erie, but the warming climate may facilitate its spread northward.

Wild parsnip is, like the other two members of the parsley family described above (wild carrot and wild chervil), a biennial that spreads via seed and prefers disturbed areas (i.e., is early successional).

However, this plant has a sap that contains chemicals that can cause human skin to react to sunlight. The result can be severe burns, rashes, or blisters. It is very invasive and negatively affects biodiversity, quality of forage crops, and weight gain and fertility in livestock that eat it.
Serrated tussock is a perennial grass that has become a significant problem in Australia, but has not yet arrived in Ontario. It invades grasslands and out-competes the existing vegetation while producing up to 140,000 seeds per plant. It is indigestible to livestock, which leads to selective grazing and eventual dominance by the invader.

Tansy ragwort is another biennial that grows in disturbed habitats but invades grazed pastures and hay fields. It can reproduce from the regeneration of plant fragments and one plant can produce 150,000 seeds that can remain viable in soil for up to 15 years. The plant contains alkaloids that spoil honey and can cause cumulative liver damage in grazing animals.

Wooly cupgrass is an annual grass that invades agricultural crops, particularly corn and soybean fields. Its seeds are often spread by farm equipment and it is more difficult to control than most annual grasses. It is well established in the U.S. mid-west and has been identified in Quebec, but has not yet been found in Ontario.

Implications of the Decisions

Improving Monarch Habitat in Ontario

Addressing the habitat needs of the monarch butterfly is perhaps the most notable implication of this update, as the plight of the monarch has become a major international concern. Leaders of Mexico, Canada, and the United States have committed to creating a tri-national working group for conserving the monarch. In Ontario, the government had designated the monarch butterfly as a species of special concern under the *Endangered Species Act, 2007* in 2004; however, the *Weed Control Act*'s prohibition on planting milkweed and its requirement to eradicate it anywhere near farms has been (as the ECO previously pointed out) entirely incongruent with that designation. The OMAFRA has finally resolved this conflicting direction. Ontario's habitat for monarch butterflies may marginally increase as a result of this decision; nevertheless, the clearing of agricultural fields of milkweed in the due course of typical farming practices remains a serious constraint on monarch habitat.

It is now legal to plant milkweed in all parts of Ontario. Some Ontario residents had already begun to grow milkweed in their gardens in response to stories in the media about the decline in monarch populations. Until this regulatory change was made, these individuals were technically breaking the law. Now individuals may plant milkweed freely. To reduce potential conflicts with agriculture, however, the OMAFRA recommends that people in agricultural areas who wish to grow milkweed choose a species, such as swamp milkweed, that is innocuous to agriculture.

The listing of dog-strangling vine as a noxious weed may also help the plight of monarchs in Ontario, given this plant's effect as a destructive decoy to egg-laying monarchs.

A Greater Focus on Invasive Species and Biodiversity Conservation

The other changes to the noxious-weed list appear to signal a shifting in focus away from naturalized plants that sometimes cause problems in agriculture (e.g., wild carrot, goat's beard, the three thistle

species, etc.), but which can be reasonably well controlled, to invasive species for which natural controls (e.g., natural predators, significant competition, a cold climate) may be absent or reduced. Most of the naturalized species that were removed from the list are early successional species that do not pose a threat to well-established ecosystems, nor to properly managed agricultural operations. At the same time, they enhance the range of food supplies for many different species of insects and animals, and the habitat for all sorts of creatures, from microbes to mammals.

The eleven species added to the list appear to pose real threats to both biodiversity and agriculture. Some are difficult to manage because of their ability to spread underground (e.g., smooth bedstraw, kudzu), while others are prolific producers of seed (e.g., serrated tussock, tansy ragwort). Some of the added species destroy biodiversity in pastures because livestock avoid them, resulting in their gradual domination of the field (e.g., common crupina).

While management options to control these species may be developed in the future (or may already exist but not be well known in Ontario), it seems prudent to try to prevent these species from becoming a problem in the first place. Putting them on the noxious weed list will help to prevent such problems by requiring landowners subject to the Act to remove these plants from their properties, and by providing the professionals whose job it is to manage these invasive plants with the tools and authority necessary to do so.

Public Participation & *EBR* Process

In February 2014, the OMAFRA posted a proposal to delist milkweed and add dog-strangling vine to the noxious-weed list on the Environmental Registry for a 45-day comment period, receiving 1,100 comments (#012-1204). None of the comments opposed the decision and most supported it enthusiastically. Two agricultural organizations supported the proposal to delist milkweed, but they suggested that the ministry should prohibit the intentional planting of milkweed. A number of other commenters expressed some concern about the reported toxicity of milkweed to cattle, but supported the proposal nonetheless.

Some of the other issues raised by commenters included the following:

- Queen Anne's lace, another plant on the noxious-weed list, is an important nectar supply and host plant for the black swallowtail butterfly;
- given the current pollinator crisis, careful thought should be given before adding any more plants to the list;
- the public should receive more help in identifying the different species of milkweed so that they know which ones are safe to plant in rural areas;
- the entire *Weed Control Act* should be revisited, to determine whether or not it is necessary;
- the list of noxious weeds should be re-examined to see if other changes need to be made; and
- the inclusion of dog-strangling vine on the list will result in more herbicides being used.

The OMAFRA also reported that their consultation with stakeholders and experts on this proposal had clarified that there are two related, but distinct, plant species in Ontario that are referred to as dog-strangling vine and that these should be listed separately as dog-strangling vine (*Vincetoxicum rossicum*) and black dog-strangling vine (*Vincetoxicum nigrum* (L.) Moench).

In March 2014, the OMAFRA posted a new proposal to delist four plant species (#012-1205) on the Environmental Registry for a 45-day comment period. A total of 46 comments were received, 44 of which were from municipal weed inspectors. The majority of the inspectors supported the removal of all four species from the list. Wild carrot had the most negative responses (15 out of 44) and goat's beard had the fewest (5). The other two comments received were from a conservation authority and an agricultural organization. The former supported removal of all four species; the latter opposed all but wild carrot.

In September 2014, the OMAFRA posted a third proposal to delist nine plant species and add nine other plants to the noxious weed list (#012-2634) on the Environmental Registry for a 33-day comment period, receiving 7 comments. Three were from individuals, another three were from organizations, and one was from a group of law students. Many commenters supported the delisting of five of the proposed species. However, several commenters recommended that the other four plants (colt's-foot, dodder, cypress spurge, and leafy spurge) be retained on the list, citing issues such as the level of difficulty to control, potential crop losses, and impact on biodiversity. Another commenter advised the ministry not to delist cypress and leafy spurge because of the same issues, and because they are toxic to cattle. The ministry decided to leave these four species on the noxious-weed list after considering these comments.

The commenters generally supported the proposed additions to the list, with a few notable exceptions. One commenter argued that wild parsnip should not be added to the list as it is a host plant for the black swallowtail butterfly larvae. This commenter also noted that the latter is a specially protected invertebrate under Schedule 11 of the *Fish and Wildlife Conservation Act, 1997*. Another commenter asserted that wild parsnip is not invasive and grows near the water's edge, making spraying problematic. Another commenter argued that tansy ragwort is the host plant of the cinnabar moth (*Tyria jacobaeae*), which biologically controls the tansy ragwort, making inclusion on the list unnecessary.

Several general comments were made, including the following: phragmites and Japanese knotweed should be on the list; only native species should be used for habitat restoration; and alternative farming practices that control weeds naturally should be encouraged.

Statement of Environmental Values

The OMAFRA stated that it considered its Statement of Environmental Values (SEV) during the development of these proposals and ensuing decisions in a number of ways. It had considered the purposes of the *Environmental Bill of Rights, 1993* (*EBR*), including "the protection and conservation of biological, ecological and genetic diversity", and it had also considered its vision of a "thriving rural Ontario, agriculture, and food sectors", as set out in its SEV. The ministry also declared its plans to ensure achievement of its SEV commitments through liaison with both local weed inspectors regarding progress in implementing the changes and with the Ministry of Natural Resources and Forestry regarding milkweed prevalence and monarch population numbers. Finally, the ministry pointed out that the open process that it conducted for these decisions is consistent with its SEV commitment on consultation.

ECO Comment

The ECO supports the recent changes to Ontario's list of noxious weeds. In particular, the OMAFRA's decision to no longer require the destruction of milkweed is a positive contribution to conservation efforts to improve habitat for the monarch butterfly. Allowing milkweed to grow in this part of the monarch's breeding grounds will likely help the overall effort to reverse the decline of this at-risk migratory species. The monarch's life cycle, which sees it travel each year between Mexico, the United States, and Canada, necessitates a collective effort spanning borders. The removal of nine other common plant species from the list of noxious weeds should also benefit pollinators and biodiversity. Most of these plants are non-invasive, naturalized species that provide habitat and food for many different birds and insects.

The approach taken by the ministry in making these changes to the noxious-weed list is also praiseworthy. In the past, the *Weed Control Act* has narrowly focused on controlling plants that may create problems for farmers. However, as with milkweed, many of these plants have significant ecological roles to play. Weeds are often pioneer species that move quickly into disturbed habitats to initiate the early stages of plant succession. Once established, they provide food and habitat for many different species. Many weeds have a broader and more important ecological function than has been previously recognized by agricultural legislation such as the *Weed Control Act*.

Invasive plant species, on the other hand, can be detrimental to agriculture, to specific ecosystems, and to biodiversity in general. Because they are not native, and have not had decades or longer to become naturalized, invasive species lack the natural controls (e.g., competition, pests, diseases, climatic conditions, etc.) that would ordinarily keep them in check. This can result in the invasive species outcompeting native species, reducing biodiversity and negatively impacting ecosystem complexity and resilience.

From a policy perspective, determining whether a plant's contribution to a particular managed or natural ecosystem is negative or beneficial, or something in between, is a balancing act of competing factors, interests and priorities. The ministry's recent decisions to add primarily invasive species to the noxious-weed list, while removing the least problematic native or naturalized species, seems to have struck the appropriate balance.

Finally, the proposal to delist milkweed elicited a huge outpouring of public interest and supportive comments. The ECO is pleased that the OMAFRA chose to post all three of these regulatory amendments on the Environmental Registry for public comment. However, the *Weed Control Act* is not prescribed under the *EBR* for public consultation; accordingly, there is no assurance that this type of public consultation will occur in the future. The *Weed Control Act* should be prescribed under the *EBR*, so that the public is guaranteed the right to comment on future changes to this Act, its regulation, and in particular, changes to the list of noxious weeds.

1.2 Ministry of the Environment and Climate Change

Review of Posted Decision:

1.2.1 Orders to Provide Financial Assurance and Remove Woodwaste from a Closed Sawmill Site

Decision Information

Registry Number: 010-8352
Proposal Posted: November 24, 2009
Decision Posted: August 25, 2014
Comment Period: 30 days
Number of Comments: 1
Decision Implemented: July 25, 2014

Description

On July 25, 2014, the Ministry of the Environment and Climate Change (MOECC) issued a Director's Order (#1804-7RQLUN) under the *Environmental Protection Act* (*EPA*) to the owner of a closed sawmill operation in the Township of Opasatika, Cochrane District. Under the Order, Tembec Industries Inc. ("Tembec") was ordered to: submit an action plan (with implementation dates) for removing all wood residue deposited on the site outside of an approved waste disposal area; submit financial assurance to the ministry to cover the cost of closing the unapproved area; and notify the MOECC Director within 10 business days of any change in the company's relationship to the site or in its activities and operations at the site.

Background

The sawmill on the Opasatika site was established in about 1977, and its name and ownership have changed over the years. In 2001 Tembec acquired a 50 per cent interest in the company that owned the site, and took complete control in 2004 before permanently closing the sawmill operation a year later.

In January 2007, upon request by the MOECC, Tembec provided the ministry with an environmental site assessment report. The report described: an MOECC-approved waste disposal and transfer site on the property (the "Approved Waste Disposal Site" or "landfill"), where 151,000 cubic metres (m^3) of wood residue was located; and an adjacent area (the "Unapproved Wood Residue Storage Area"), where approximately 459,000 m^3 of wood residue had been deposited without ministry approval. Tembec refers to this unapproved area, which received wood residue during the historical operations at the site, as the "Former Log Storage Area."

Tembec has been reclaiming usable woodwaste from the Approved Waste Disposal Area since 2007 and from the Unapproved Wood Residue Storage Area since 2008, burning it as fuel at the company's nearby Kapuskasing operations.

Wood Residue:
Wood residue is a by-product of tree harvesting and timber processing, and can include wood chips, sawdust and shavings. According to the ministry, the leachate produced when water flows through wood residue, or when wood residue decomposes, can have an adverse impact on groundwater, nearby surface waters and aquatic life.

The Approved Waste Disposal Site:
The Approved Waste Disposal Site has operated under ministry authorization since February 1996, when the MOECC issued the site a Certificate of Approval (#A580905). The Certificate of Approval – now an Environmental Compliance Approval (ECA) – has been updated several times over the years, most recently in November 2014. The ECA imposes several conditions on the operation of the Approved Waste Disposal Site. For example, Tembec must:

- construct and maintain a 30-metre-wide fire break around the perimeter of the landfill;
- limit the elevation of the landfill's wood residues to less than six metres;
- secure the waste disposal site with fencing, barriers or natural features, and lock the site's entrance gates when the landfill is not being operated; and
- conduct environmental monitoring programs for groundwater, surface water and leachate.

Moreover, the ECA requires Tembec to submit an annual "woodwaste reclamation report" that: sets out Tembec's method for progressively reclaiming wood residues from the landfill site; sets out the method for properly closing portions of the landfill after the usable/reclaimable wood residues are removed; and provides a target date for the complete closure of the landfill.

In Tembec's March 2014 woodwaste reclamation report, the company indicated that it intends to remove an estimated 11,000 green (i.e., wet) metric tonnes of usable biomass material per year from the approved landfill site, with all usable biomass expected to be removed by 2022. Tembec stated that the landfill closure, which will commence only once all usable biomass has been removed from the approved site, will follow the landfill standards found in O. Reg. 232/98 (Landfilling Sites) under the *EPA*, and will include the sloping, capping and seeding of the Opasatika landfill. Tembec indicated that the company will formally close the landfill within two years of ceasing reclamation activities.

In addition to an annual woodwaste reclamation report, the ECA also required Tembec to submit $662,000 in financial assurance for the emergency closure, post-closure maintenance and monitoring of the approved landfill site. The ministry informed the ECO that Tembec has provided the required $662,000 in the form of a surety/performance bond.

The Unapproved Wood Residue Storage Area:
In February 2008, the MOECC asked Tembec to provide an evaluation of the costs to properly close the Unapproved Wood Residue Storage Area. The company initially submitted a closure cost estimate of $682,000 in November 2010, but reduced this estimate to $519,000 in July 2014 after accounting for 125,825 m^3 of wood residue that had been removed from the unapproved area between 2009 and 2013.

According to Tembec, the company submitted an action plan to the MOECC in May 2008 to gradually remove usable wood residue (i.e., woodwaste that can be burned as fuel at Tembec's Kapuskasing operations) from the unapproved area, and to transfer the remaining (unusable) material into the Approved Waste Disposal Site. Tembec stated that the remaining wood residue in the unapproved area will be down to 167,242 green metric tonnes by the start of 2016.

The Director's Order

Under the *EPA* a ministry Director can require the owner of a facility to: take certain actions and environmental measures; and to submit financial assurance, which the Crown will hold for the

performance of environmental measures. In July 2014, the MOECC issued a Director's Order (#1804-7RQLUN) under the *EPA* to Tembec with respect to the Unapproved Wood Residue Storage Area at the closed Opasatika sawmill.

The Director's Order commanded Tembec to:

- submit $519,000 in financial assurance (in addition to the $662,000 financial assurance provided for the approved landfill) to the ministry by July 15, 2014 in the form of a certified cheque, irrevocable letter of credit, or another method authorized by the Director;
- submit to the MOECC by August 30, 2014 an updated action plan, with implementation dates, for the removal of all wood residue from the Unapproved Wood Residue Storage Area; and
- notify the Director within 10 business days of any change in the company's relationship to the site or any change in its activities and operations at the site during the time the Order is in force.

The Order states that the Director may, from time to time, alter the amount or type of financial assurance required upon the Director's initiative or upon application and the submission of the company. The Order has no expiry date.

Implications of the Decision

Increased Confidence That Wood Residue Will be Removed From the Unapproved Area

Following directions given in the Director's Order, on August 21, 2014, Tembec submitted to the MOECC an action plan that specifies the company's plan for removing the remaining wood residue from the Unapproved Wood Residue Storage Area. The plan specifies three actions:

1. Based on an annual schedule included in the action plan, Tembec will continue to remove usable wood residue from the Unapproved Wood Residue Storage Area, such that all usable material is removed by December 31, 2022.
2. Within one year of removing the usable wood residue, the unusable material will be consolidated in the Approved Waste Disposal Site.
3. The company shall provide an annual report to the ministry by June 30th summarizing reclamation activities and plans for the upcoming year.

The action plan's reclamation schedule and reporting requirements improve the likelihood that Tembec will continue removing wood residue from the unapproved area.

Wood Residue Will Remain in the Unapproved Area for Several More Years

Tembec's December 2022 deadline to remove the usable wood from the unapproved area means that thousands of tonnes of wood – unlawfully dumped many years ago – will likely remain in the unapproved area for up to another seven years. Unlike the approved site (which operates under an ECA with conditions on storage, operation and closure), the unapproved area is not subject to any requirements, such as limiting the elevation of woodwaste, maintaining a fire break, or conducting environmental monitoring. As a result of this decision, wood residue in the unapproved area will remain

with little or no environmental protection for several more years, potentially creating an environmental threat.

Financial Assurance Should Cover the Costs of Closing the Unapproved Area

In response to the Director's Order, Tembec provided the MOECC with $519,000 in financial assurance for the unapproved waste area in the form of a surety bond. According to the MOECC, Tembec calculated this financial assurance amount using the ministry's *Guideline F-15, Financial Assurance Guideline* (June 2011), which was prepared to help ministry staff administer financial assurance and help regulated parties comply with requirements. The ministry also reviewed Tembec's estimated closure costs and the associated calculations before accepting the financial assurance. The ministry now has financial assurance in the form of surety bonds for both the approved landfill area and the unapproved waste storage area. Because surety bonds are a valid and low-risk method of receiving financial assurance, funds should be readily available to the ministry to close the unapproved area should the company be unable or unwilling to do so.

The Ministry Will be Kept Aware of Tembec's Relationship to the Site

The ministry has had problems before with contaminated sites changing hands or being abandoned, leaving the MOECC with an environmental threat that needs rehabilitating (see Part 2.1 of this Annual Report). The Order's requirement that Tembec notify the Director of any change in the company's relationship to the site (or any change in activities/operations at the site), should help keep the MOECC better informed about potential changes in ownership or operations that might affect the removal of wood from the unapproved area. Having this awareness could enable the ministry, in some circumstances, to more promptly: order Tembec to take steps to prevent or reduce the risk of an adverse environmental effect; and/or order that financial assurance be used to perform environmental measures.

Public Participation & *EBR* Process

In November 2009, the MOECC posted a proposal notice on the Environmental Registry for the Director's Order to Tembec. The sole comment received on this proposal was from Tembec's manager of environmental operations. The commenter stated that Tembec had already instituted an aggressive campaign to reclaim the biomass remaining at the site, as the biomass "is a valuable resource that is one of the key components in the energy management plan for [Tembec's] Kapuskasing Operations to derive steam from biomass." According to the commenter, Tembec had provided an estimate in July 2008 to close the entire unapproved storage area as if it were a landfill, but the company later concluded that closing the site by capping it would mean that no value could be derived from the site's biomass resource. The commenter therefore reasoned that the unapproved storage area should not be capped and no financial assurance should be required. Alternatively, if this area were to be closed and capped, the commenter argued that the remaining material should be consolidated into a large pile and that only the pile – not the entire area – be capped. The commenter provided an alternate closure plan (and closure cost estimates) based on this consolidated-pile approach.

The MOECC advised the ECO that, given Tembec's reclamation of wood residue from the site for its Kapuskasing operation, the ministry accepted the company's approach to consolidate the unusable woodwaste from the unapproved area with the adjoining approved woodwaste disposal site once all

usable material had been removed. According to the MOECC, the ministry responded to this comment by asking Tembec to revise its financial assurance calculation for the unapproved area's closure. The final financial assurance calculation provided by Tembec, and final value requested by the MOECC, was $519,000.

Almost five years passed between when the MOECC first proposed issuing a Director's Order to Tembec and when the ministry actually issued the Order. When asked by the ECO for the reason for this delay, the ministry explained that it had been proactively working to obtain financial assurance for environmental hazards at two Tembec sites: the Opasatika site and a closed kraft mill in nearby Smooth Rock Falls. Since the Smooth Rock Falls site closed in 2006, the ministry had been working with both Tembec and the Town of Smooth Rock Falls "on various aspects of the site to ensure decommissioning and closure activities were done in an orderly and environmentally responsible manner. Once financial assurance was in place for the Smooth Rock Falls site, the ministry used that experience to complete the process for the Opasatika site." The MOECC reported that, at the same time, the ministry was monitoring Tembec's progressive removal of woodwaste at the Opasatika site; according to the ministry, between 2008 and 2013, Tembec removed 196,348 m^3 (46 per cent) of the woodwaste from the site.

Statement of Environmental Values

The MOECC considered its Statement of Environmental Values in making this decision. It documented this consideration by describing how requiring Tembec to provide financial assurance and remove woodwaste from the unapproved site addresses a number of principles, including:

- an ecosystem approach to environmental protection and resource management;
- a consideration of effects on current and future generations;
- a precautionary approach;
- pollution prevention;
- the polluter-pays principle;
- using a range of tools that encourage environmental protection and sustainability; and
- increased transparency and public engagement.

ECO Comment

The ECO applauds the MOECC for issuing a Director's Order to Tembec. Even though Tembec has been making annual progress removing usable wood residue from both the site's approved and unapproved waste disposal areas, the action plan required by the Order increases the likelihood that Tembec will maintain this progress. Moreover, the financial assurance provided by Tembec gives confidence that funds will be available to remove the wood residue from the unapproved area if Tembec becomes unable or unwilling to do so in the future. In other cases, even large, reputable companies have been known to abandon a site or go bankrupt, leaving the government and people of Ontario to deal with, and pay the costs of, the environmental clean-up. (For examples and further discussion on the importance of financial assurance, see Part 2.1 of this Annual Report.)

Nevertheless, Tembec's reclamation schedule means that thousands of tonnes of unlawfully dumped wood residue will remain in place for several more years. The ministry itself has cautioned "there is clear scientific evidence that, if improperly managed, wood residue can negatively impact the

environment, contaminate water and destroy fish habitat." Although there is no evidence that the wood residue in the unapproved area is currently contaminating water or destroying fish habitat, or is likely to do so in the near future, the ECO is of the opinion that wood residue that is unlawfully discarded without oversight or approvals is, by definition, "improperly managed," and poses a possible environmental threat that needs addressing.

If the conditions in the approved area's ECA are considered necessary to protect the natural environment from wood residue leachate, then the lack of storage conditions for the adjacent but unlawfully dumped wood likely represents at least the potential for an environmental risk. To address this risk, the ministry could have ordered Tembec to take actions to ensure that the unapproved area meets the same storage and operation conditions as the approved area. Instead, the ministry chose to allow unlawfully dumped wood to remain in place for several more years without any storage requirements.

The Opasatika mill example exemplifies the need for the MOECC to ensure compliance at even ministry-approved sites. Despite the Opasatika mill having an MOECC-approved landfill site since 1996, mill operators unlawfully dumped more than three times the wood residue in the unapproved area than in the approved area. It is the ministry's responsibility to undertake sufficient inspections and enforcement to ensure that environmental regulations and approvals are followed, contraveners are punished and that Ontario's environment is safeguarded.

Finally, the ECO is troubled that it took the MOECC almost five years to finally order Tembec to submit financial assurance and a wood reclamation action plan for the unapproved area. The ministry's reported reason for the delay – that financial assurance for another Tembec mill had to be addressed first to determine how to proceed – seems unreasonable. Surely the financial assurance processes for the two mills could have proceeded in tandem, considerably shortening the delay in securing financial assurance and minimizing the province's financial and environmental risk.

Review of Posted Decision:

1.2.2 Regulatory Framework for the Application of Greenhouse Nutrient Feedwater to Agricultural Land

Decision Information

Registry Number: 011-8075
Proposal Posted: March 1, 2013
Decision Posted: December 19, 2014

Comment Period: 45 days
Number of Comments: 12
Decision Implemented: January 1, 2015

Registry Number: 011-8101
Proposal Posted: March 1, 2013
Decision Posted: December 22, 2014

Comment Period: 45 days
Number of Comments: 10
Decision Implemented: January 1, 2015

Environmental Registry decision #011-8075 was reviewed in conjunction with the decision for Environmental Registry #011-8101 (Ontario Ministry of Agriculture, Food and Rural Affairs). Please see Section 1.1.1 for the full review.

Review of Posted Decision:

1.2.3 8th Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health

Decision Information

Registry Number: 011-9290
Proposal Posted: April 24, 2014
Decision Posted: December 19, 2014

Comment Period: 70 days
Number of Comments: 32
Decision Implemented: December 18, 2014

Description

Overview

On December 18, 2014, the governments of Ontario and Canada signed the 8th *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health* (COA or "8th COA"). The COA defines the parties' shared vision and goals for the Great Lakes, and guides co-operation between the federal and provincial governments to restore, protect and conserve them.

Background

It may be argued that nothing is more essential to Ontario's economic, social and cultural well-being than the Great Lakes. They provide drinking water for over 10 million Ontarians. They help to generate 80 per cent of the province's electricity, driving hydro-electricity plants and providing cooling water for other power plants. They support 95 per cent of Ontario's agricultural lands. They provide countless opportunities for recreation, and they are are home to myriad species of plants, fish and wildlife. Moreover, the Great Lakes basin is responsible for 40 per cent of Canada's economic activity.

But the Great Lakes are in trouble. Both their water quality and ecosystem health are deteriorating as a result of a host of threats, ranging from urban growth and the deposition of nutrients and harmful pollutants, to aquatic invasive species, habitat loss and climate change. Some beaches are frequently closed due to unsafe bacterial levels, some native species are in decline and water levels are receding. By all accounts, the Great Lakes are headed for a crisis.

For over 40 years, the Canadian and Ontario governments have collaborated in developing solutions to the problems plaguing the Great Lakes. Their co-operation is essential because each level of government has jurisdiction over different aspects of the Great Lakes. For example, while the federal government has jurisdiction over shipping and navigation, Ontario is responsible for drinking water and wastewater.

The COA is an action plan to guide co-operation between both levels of government to protect, restore and conserve water quality and ecosystem health in the Great Lakes, and enable Canada to meet its commitments under the binational *Great Lakes Water Quality Agreement* (GLWQA). For more information about the GLWQA, see the box below.

The first in a series of COAs was negotiated in 1971, in anticipation of the signing of the first GLWQA. The initial COA's purpose was primarily to reduce phosphorus pollution in the Great Lakes. The agreement led to the creation of programs to introduce and improve sewage treatment. That work was hailed as a success; phosphorus levels in the Great Lakes declined dramatically in the years that followed. In Lake Erie, phosphorus levels were reduced by 82 per cent.

Over the years, the COA has been revised and renewed to reflect emerging threats to the Great Lakes and changes to the GLWQA (to read the ECO's comments on past COAs, see Part 3.1 of our 2007/2008 Annual Report, and Part 4 of our 2002/2003 Annual Report). The COAs have helped the parties achieve success on a number of fronts: there have been significant reductions in releases of critical pollutants in the Great Lakes basin, and progress in restoring ecosystem quality to Areas of Concern (AOC) has resulted in the delisting of three Canadian AOC.

The 8th COA was signed on December 18, 2014. Signatories representing Ontario include the Minister of the Environment and Climate Change, the Minister of Natural Resources and Forestry and the Minister of Agriculture, Food and Rural Affairs. The five-year agreement will expire on December 17, 2019.

The Canada-United States Great Lakes Water Quality Agreement

The Canadian and United States governments signed the first *Great Lakes Water Quality Agreement* (GLWQA) in 1972, recognizing the need to work together to protect and restore the Great Lakes. The GLWQA formalized the parties' goals and commitments to address a range of problems facing the Great Lakes basin and St. Lawrence River. Most notably, the original GLWQA established basinwide water quality objectives, and included commitments to address municipal and industrial pollution on both sides of the border.

The GLWQA has been updated four times. The 1972 agreement was replaced in 1978, with the parties agreeing to an expanded goal "to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem," – considered an early example of adopting an ecosystem approach, which still guides the GLWQA today. In 1983, amendments established target loads for reducing phosphorus inputs into each of the Great Lakes. In 1987, the parties added a new annex that identified the most seriously degraded areas in the basin as "Areas of Concern," or AOC, and directed the Parties to develop and implement Remedial Action Plans to clean them up. The 1987 agreement also mandated the development and implementation of Lakewide Management Plans to restore and protect the ecosystem health of each of the Great Lakes.

In September 2012, the parties signed a renewed and modernized GLWQA that came into force on February 12, 2013. This latest GLWQA addresses an expanded range of environmental issues threatening the Great Lakes today, including aquatic invasive species, habitat and species loss, and climate change impacts. The GLWQA confirms the parties' shared vision and common objectives for the Great Lakes, and establishes short- and long-term commitments for restoring and protecting water quality and ecosystem health.

The COA is a mechanism for Canada to meet its obligations under the GLWQA.

The 8th Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health

The 8th COA was formally negotiated over a two-and-a-half year period, starting in June 2012 and concluding with the signing of the agreement in December 2014. The end product is a revamped agreement, incorporating principles and important concepts not found in earlier agreements.

The formal purpose of the COA 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."[1]

The COA consists of a "framework agreement," which is signed by the parties, and 14 annexes. The framework agreement includes a lengthy preamble followed by 12 articles that explain the purpose, guiding principles and administration of the agreement. But the real substance of the COA — the part that deals with environmental issues and commits the parties to action — is contained in the annexes.

Preamble:
The preamble to the COA includes several new statements that formally recognize the critical importance of the Great Lakes and key approaches to restoring, protecting and conserving them. The parties now:

- acknowledge the close connection between Great Lakes water quality and human health;
- recognize that environmentally sustainable and responsible economic activity, resource development and innovation are important to the long-term prosperity of the Great Lakes region;
- acknowledge that First Nations' and Métis' relationships with the Great Lakes and their traditional knowledge may assist in restoring, protecting and conserving the Great Lakes;
- commit to engaging the Great Lakes community on a good governance basis;[2] and
- affirm their commitment to working together to advance the environmental goals of Ontario's Great Lakes Strategy.

Guiding Principles, Governance and Review:
The parties substantially revised some of the articles that form the main body of the agreement. In particular, the agreement adopts several new or revised guiding principles, such as:

- the need for engagement with the Great Lakes community;
- consideration of the cumulative effects of individual actions on the environment;
- considering the identity, cultures, interests, knowledge and traditional practices of First Nations and Métis; and
- recognition of the "polluter pays" principle.

The need to apply an ecosystem approach is no longer included as a guiding principle in the 8th COA, but it is found in the agreement's preamble.

[1] Environment Canada and the Ontario Ministry of the Environment and Climate Change (2014). *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health*, Article II(1).
[2] "Good Governance," as defined in the 8th COA, "means pursue a decision-making process based on public participation, transparency and accountability."

A new COA Executive Committee will oversee the agreement. For day-to-day work, the COA Management Committee remains responsible for implementing the goals, results and commitments over the five year period of the agreement. Federal-provincial annex leads will continue to manage the implementation of each annex. The Annex Implementation Committee, which under the previous agreement was responsible for managing the implementation of the annexes and for overseeing annex leads, appears to have been discontinued.

The parties have agreed to report jointly on their progress under the COA "in a manner that generally aligns with reporting requirements under the [GLWQA] and Ontario's Great Lakes Strategy."[3] It is not clear how this will work in practice; the first progress report under the GLWQA must occur in 2017, while reporting on key results under the Great Lakes Strategy is expected in 2015 and a full review of the Strategy should occur in 2018. There is no commitment for an independent review of the parties' progress under the COA.

Annexes:
The parties lay out their plans for restoring, protecting and conserving the Great Lakes in the COA's annexes. While the most recent COAs each included just 4 annexes, the 8th COA contains 14, grouped under 5 priorities: (1) protecting waters; (2) improving wetlands, beaches and coastal areas; (3) protecting habitat and species; (4) enhancing understanding and adaptation; and (5) promoting innovation and engaging communities (see Table 1). The first ten annexes of the COA generally correspond with the ten annexes of the GLWQA. The remaining four, which are under the priority of "promoting innovation and engaging communities," are exclusive to the COA.

Under each annex, the parties identify:

- **Goals** – the parties' long-term visions of what they wish to achieve;
- **Results** – outcomes that the parties will pursue in order to contribute to achieving their goals; and
- **Commitments** – actions that the parties promise to undertake in order to contribute to achieving their goals and results.

In total, the 8th COA establishes 37 goals, identifies 76 results and includes 289 commitments, 75 of which are exclusively Ontario's. The remaining commitments are either exclusively Canada's or are shared between both parties. By contrast, the 7th COA included just 13 goals, 37 results and 178 commitments.

Table 1. Annexes in the 8th *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health* (grouped under five priorities).

Priority	Annex	Description
Protecting Waters	1 – Nutrients	These annexes address the connection between clean water and a healthy Great Lakes ecosystem. Nutrients, harmful pollutants and discharges from vessels all threaten water

[3] Environment Canada and the Ontario Ministry of the Environment and Climate Change (2014). *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health*, Article VI.

Priority	Annex	Description
	2 – Harmful Pollutants	quality. These annexes focus on the goals of reducing phosphorus loadings (which cause harmful algal blooms), reducing or eliminating the release of "Chemicals of Concern" into the Great Lakes basin, and protecting the Great Lakes from discharges of harmful pollutants from vessels.
	3 – Discharges from Vessels	
Improving Wetlands, Beaches and Coastal Areas	4 – Areas of Concern	These annexes focus on protecting, restoring and conserving coastal areas of the Great Lakes, which comprise important and fragile ecosystems. They include a goal to complete priority actions for delisting in five Areas Of Concern, and commit to significant progress in other AOC, including developing and implementing contaminated sediment management strategies. Other goals include managing lakewide ecosystem conditions and threats, including updating and implementing Lakewide Action and Management Plans, and improving the ecological health of the nearshore, including developing and implementing an integrated nearshore framework.
	5 – Lakewide Management	
Protecting Habitat and Species	6 – Aquatic Invasive Species	Annexes under this priority address threats to the natural habitats and biodiversity of the Great Lakes. They include goals to reduce the threat of existing and potential new aquatic invasive species, and to restore, protect and conserve Great Lakes habitats that support aquatic dependent species, including adopting a target of "net habitat gain." Ontario specifically commits to developing and making available new and/or updated evaluations of wetlands within the Great Lakes basin.
	7 – Habitat and Species	
Enhancing Understanding and Adaptation	8 – Groundwater Quality	These annexes focus on science and investigation of existing and emerging stressors in the Great Lakes, such as climate change impacts and the influence of groundwater on water quality and ecosystem health. All three annexes include goals related to collecting scientific information and increasing understanding to support future decisions and actions.
	9 – Climate Change Impacts	
	10 – Science	
Promoting Innovation	11 – Promoting Innovation	The Annexes under this priority aim to improve the well-being of Great Lakes communities. The

Priority	Annex	Description
and Engaging Communities	12 – Engaging Communities	goals of these annexes include creating new economic opportunities in the Great Lakes that are environmentally sustainable and improve water quality and ecological health, and providing communities including, in particular, First Nations and Métis with opportunities to get involved in the restoration, protection and conservation of the Great Lakes.
	13 – Engaging First Nations	
	14 – Engaging Métis	

Many of the commitments in the 8th COA involve reviewing, monitoring, tracking, researching, or sharing information about Great Lakes issues, while fewer will lead to tangible, on-the-ground results. Most commitments do not include timelines; however, notable among Ontario's responsibilities under the agreement are the following time-bound commitments:

- Support Canada in developing science-based phosphorus concentration and load reduction targets for Lake Erie by 2016 (Environment Canada undertook public consultation on proposed binational phosphorus load reduction targets over the summer of 2015);
- Develop and begin implementing a phosphorus management strategy for Lake Erie by 2018;
- Help Canada develop an integrated binational nearshore framework by 2016, followed by implementation; and
- Work with Canada to develop, within two years, an early detection and rapid response framework for aquatic invasive species in Canadian waters.

Other of Ontario's commitments include: to take measures to reduce the quantity and improve the quality of municipal and industrial wastewater combined sewer overflows and stormwater in five AOC; to support demonstration projects to increase the adoption of agricultural practices that increase nutrient use efficiency and reduce phosphorus losses, and, with Canada, to continue to roll out the binational *Biodiversity Conservation Strategy*[4] for all of the Great Lakes.

Ontario makes a number of commitments aimed at making the Great Lakes region "a key contributor in the growth of the water sector/market, and a global leader in applying innovative technologies, services and solutions to remedy environmental problems."[5] The province commits to engaging the Great Lakes community, including First Nations and Métis, in Great Lakes initiatives. For example, the parties promise to invite First Nations and Métis to meet annually with the COA Executive Committee co-chairs to discuss Great Lakes issues, priorities and actions planned to achieve COA goals. The parties also commit to identifying and supporting one or more pilot projects to demonstrate the use of traditional knowledge in contributing to understanding and addressing Great Lakes issues.

[4] Under the *Great Lakes Water Quality Agreement (Annex 7 – Habitat and Species)*, Canada and the U.S. agreed to, within two years, develop and begin implementing lakewide Biodiversity Conservation Strategies. Biodiversity Conservation Strategies have now been completed for each of the Great Lakes.

[5] Environment Canada and the Ontario Ministry of the Environment and Climate Change (2014). *Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health*, Annex 11, Result 1.1.

New Approach to Harmful Pollutants:
For the last 20 years, the parties to the COA have committed to reducing releases of persistent bioaccumulative toxic substances, identified as "Tier I" substances, with the goal of their "virtual elimination." They also committed to achieving reductions of other harmful pollutants, including "Tier II" substances (i.e., those that have the potential for causing widespread impacts or have already caused local adverse impacts on the Great Lakes environment). In the 7th COA, signed in 2007, the parties outlined the reductions of Tier I substances that they expected to make by 2010, including reductions of more than 90 per cent for dioxins and furans, mercury and high-level polychlorinated biphenyls. In the 2007-2010 progress report on the 7th COA, the parties reported that they had achieved their targets for all of those substances.

The 8th COA marks a shift away from the Tier I/Tier II approach to pollutants and the identification of specific reduction targets. The parties commit to reviewing and reporting on past and current activities related to Tier I and Tier II substances, and to continue to implement actions to manage those substances. However, the parties acknowledge a need to address many other chemicals that are used and released into the Great Lakes basin. Consequently, under the 8th COA the parties agree to establish a new process to identify "Chemicals of Concern" (which may include Tier I and Tier II chemicals), with input from the Great Lakes community, and to undertake research, monitoring and other actions related to those substances. Within six months of the COA coming into force, the parties must establish a work plan and timelines for undertaking their commitments related to Chemicals of Concern.

Under the 8th COA, virtual elimination is no longer a specific goal. Instead, the parties adopt the guiding principle of virtual elimination of Chemicals of Concern "as appropriate"; their goal is to "reduce or eliminate" the use and release of Chemicals of Concern within the Great Lakes basin.

Implications of the Decision

A Revitalized Plan for Tackling Great Lakes Problems

While it is similar in format to past agreements, the 8th COA reflects a more detailed vision for the Great Lakes and the parties' shared responsibility for protecting and restoring them. New features added to the COA such as the annexes regarding groundwater quality and discharges from vessels, as well as a greater emphasis on the nearshore environment, agricultural runoff and aquatic invasive species, respond to some of the emerging and most pressing threats to the Great Lakes. These new features bring the COA into step with the GLWQA, ensuring the parties are able to co-operatively implement Canada's responsibilities under that agreement. Also keeping in step with the GLWQA, the 8th COA acknowledges the need to consider the cumulative effects of individual sources of stress on the Great Lakes. This new direction, if followed, should provide the parties with a more complete understanding of the health of the lakes and hopefully lead to more protective action where necessary.

The 8th COA goes beyond simply addressing Canada's responsibilities under the GLWQA; this is the first COA to specifically recognize the need for climate change adaptation strategies in the Great Lakes (a recognition that is missing from the GLWQA). New annexes emphasizing the need to promote innovations in environmentally sustainable economic activities on the Great Lakes and engage communities, including First Nations and Métis, are also exclusive to the COA. The goals and commitments under these new annexes add a new facet to Great Lakes protection that should

enhance collective knowledge, lead to collaboration between more players, and build greater capacity for long-term action to protect and restore the Great Lakes.

Real Action to Reduce Phosphorus in Lake Erie and Address Problems in the Nearshore

The commitments in the 8th COA to develop phosphorus concentration and load reduction targets, as well as a phosphorus management strategy for Lake Erie, should hopefully lead to real improvements in that lake. Lake Erie is in a crisis. Despite improvements made in the 1980s, the lake is again experiencing excessive phosphorus levels, although the primary source has shifted from municipal wastewater to non-point source agricultural and urban runoff.[6] Too much phosphorus, compounded with the effects of climate change and aquatic invasive species, impairs water quality and ecosystem health, drinking water, fisheries, recreation and tourism. One of the most obvious signs of excessive nutrient enrichment and corresponding reduced available oxygen (known as eutrophication) is severe algal fouling of the lake and fish die-offs. In 2011, Lake Erie experienced its largest algal bloom ever. The specific action set out under the 8th COA to reverse this problem is urgently needed.

Similarly, the 8th COA commits to improved management of highly stressed and vulnerable nearshore areas of the Great Lakes. Nutrients entering the lakes from urban and farm lands become trapped and concentrated near the shore due to currents and complex biological interactions, a process known as the "nearshore shunt" (for more information, see the ECO's 2010/2011 Annual Report, Part 2.1). This process concentrates nutrients and productivity in the nearshore, resulting in harmful algal blooms along beaches, and decreases productivity in the offshore.

Aligns with Ontario's Great Lakes Strategy

The Ministry of the Environment and Climate Change (MOECC) has stated that the province negotiated the 8th COA to support the implementation of Ontario's Great Lakes Strategy. Indeed, in the preamble to the agreement the parties "affirm their commitment" to work together to "advance the environmental goals of Ontario's Great Lakes Strategy;" a commitment that is also reflected in the purpose of the renegotiated agreement.

Ontario's Great Lakes Strategy, finalized in 2012, sets out Ontario's goals and priorities to achieve its vision of healthy Great Lakes that are "drinkable, swimmable and fishable." Many of the Strategy's goals and priorities are aligned with those of the COA. The COA's new annexes promoting engagement of the Great Lakes community are particularly in line with the Great Lakes Strategy's focus on engaging and empowering communities. The commitments by both Canada and Ontario under the COA should reinforce the province's efforts to create new opportunities for smaller-scale community projects throughout the Great Lakes region through funding, education and partnerships.

To read the ECO's comments on Ontario's Great Lakes Strategy, see Part 5.1 of our 2012/2013 Annual Report.

[6] In the 1960s and 1970s, sewage treatment plants were the main cause of high nutrient loadings in Lake Erie. Today, while municipal sewage treatment plants remain a contributor, the primary source of phosphorus in Lake Erie is diffuse runoff from rural and urban lands. See: International Joint Commission (2014). *A Balanced Diet for Lake Erie: Reducing Phosphorus Loadings and Harmful Algal Blooms, Report of the Lake Erie Ecosystem Priority*, page 4.

Commitments Should Increase Knowledge and Spur Future Action

Many of the commitments under the 8th COA, if fulfilled, should result in defined, measurable action to protect and restore the Great Lakes. However, relatively few will lead directly to on-the-ground results. Most commitments are to research, review, monitor, track, update criteria and policies, and develop standards — all interim steps. Ultimately, those interim steps should support further, more direct action to benefit the Great Lakes, but those future, more tangible actions (and the parties responsible for undertaking them) are not specified in this agreement.

Some commitments are so vague that it is unclear what action will be taken to fulfil them. For example, Ontario's commitment to "improve understanding of cumulative impacts of water withdrawals, diversions, and consumptive uses on the water resources and ecosystems of the Great Lakes basin" is worthy as a goal, but does not bind the province to any clear action. Although some progress may be made in achieving the parties' goals, the lack of detail provides little certainty on whether, how and when results will be achieved.

Finally, the absence of timeframes for fulfilling most commitments, as well as the lack of accountability for the various commitments beyond the government level, will make evaluating the parties' progress under the COA challenging.

Goals No Longer Include Virtual Elimination of Critical Pollutants

The parties seem to have retreated from their goal of virtual elimination of certain critical pollutants. While the latest COA espouses the adoption of the principle of virtual elimination "as appropriate," the goals, results and commitments in Annex 2 no longer clearly reflect this. Instead, they focus primarily on managing harmful pollutants, or in reducing *or* eliminating them. The removal of the specific goal of virtual elimination in the COA could signal a shift in the parties' priorities.

Managing the discharge of harmful chemicals and reducing the volume that ends up in the Great Lakes are both positive actions. So too is identifying and targeting a wider range of "Chemicals of Concern." However, by removing the specific goal of virtual elimination, this agreement could effectively prolong or diminish efforts to fully eliminate discharges of the most critical pollutants. As a result, harmful pollutants in the Great Lakes, and their negative effects on the aquatic environment and human health, could persist further into the future.

Inadequate Funding

One of the ECO's critiques of recent COAs is that the agreement does not commit to sufficient funding to fulfil the commitments it contains, and is not transparent about how funds are distributed.

In early COAs, the parties pledged to pay specific sums toward the fulfilment of their commitments under the agreement. For example, under the 3rd and 4th COAs (in 1982 and 1986, respectively), the parties agreed to contribute equally to costs pursuant to the agreement up to a defined maximum annual combined contribution.

More recently, including in the 8th COA, each party has simply made a commitment to "provid[e] 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." Ontario does also commit to providing funding for some purposes (e.g., to support eligible municipalities for water infrastructure asset management). However, the agreement does not specify funding amounts or other details. The lack of specific and unqualified funding commitments in the COA means there is no assurance that the parties will dedicate adequate funds to fulfil their obligations.

Ontario has budgeted $46.5 million dollars over the five-year life of the agreement (i.e., $9.3 million per year) for activities related to the COA. This funding commitment does not include additional provincial investments in infrastructure for water and wastewater. The province has also committed $46 million specifically for sediment remediation in Randle Reef, within the Hamilton Harbour Area of Concern.

The government has not explained how it will allocate the relatively modest annual budget of $9.3 million to the province's multiple commitments under the COA. However, it is unlikely that it will be enough to make a serious dent in the work the parties need to do to achieve their goals.

Public Participation & *EBR* Process

On April 24, 2014, the MOECC posted a proposal notice on the Environmental Registry (#011-9290) inviting the public to comment on the proposed COA. In its decision notice, posted on the Registry on December 19, 2014, the MOECC reported that it received 32 comments during the 70-day public consultation period, and that 10 additional comments were submitted in response to a concurrent posting by the Government of Canada. The MOECC confirmed that it analyzed and considered all 42 comments in finalizing the text of the agreement. The province also reported that it convened several engagement sessions during the development of the 8th COA to obtain input from specific groups.
Commenters were overwhelmingly supportive of the draft agreement in purpose and principle. However, some commenters were dismayed by the absence of concrete, ambitious targets and timelines. One commenter recommended that "the actions identified in each Annex should be written in language that leads to implementation, i.e., identifying specific outcomes with target dates and budgets in addition to the broad responsibilities of each level of government." Many commenters were also concerned about whether there would be adequate funding to support work under the COA. Some commenters urged the MOECC to explicitly include funding commitments of appropriate resources in the COA.

Some commenters questioned whether the rights and interests of First Nations and Métis would be sufficiently recognized under the agreement, particularly if funding is not provided to ensure adequate First Nations and Métis capacity and representation. A commenter representing First Nations noted that environmental conservation "may require significant sacrifices from First Nations communities" and that there is a need "to better ensure that the burden of conservation does not unduly fall upon First Nations."

Some commenters believed that the COA does not sufficiently focus on urban threats to the Great Lakes. One recommended that the COA include a commitment to engage with municipalities, conservation authorities and others to develop a strategy to "proactively manage urban growth and retrofit our urbanized landscapes within the western end of Lake Ontario."

Environmental non-governmental organizations and others were concerned about the COA's approach to harmful pollutants in Annex 2. They requested that the list of Tier I and Tier II pollutants be re-

established in the agreement, and emphasized the need to focus on virtual elimination, zero discharge, and a life cycle, cradle to cradle approach to identifying and managing harmful pollutants. One organization charged that Annex 2 lacked the requisite sense of urgency to deal with persistent, bioaccumulative toxins that still persist and are still being released in the Great Lakes, and that its goal regarding chemicals of concern represented "a step back" from previous COAs. Another organization suggested that this Annex should specifically address synergistic and cumulative effects. Others lamented the lack of action-oriented commitments regarding harmful pollutants (i.e., most are to research, monitor, track, etc.). An environmental non-governmental organization asserted that the commitments made in Annex 2, while important, will not actually reduce the amount of wastewater pollution flowing into Great Lakes waters.

An industry association suggested that the COA include certain key concepts such as protecting confidential business information, and requiring professional standards and sound governance. Commenters also noted the need for a consistent definition of "chemicals of concern" between Canada, Ontario and the U.S., as inconsistencies could lead to a competitive disadvantage. Industry commenters also noted the need for chemical pollutants to be managed "based on sound science."

Commenters expressed their desire to see specific issues addressed in the COA, such as:

- a stronger link to source water protection;
- invasive carp;
- microplastics;
- the presence of flame retardants, pharmaceuticals, endocrine disrupting substances and nuclear medicines in sewage treatment plant effluent; and
- transportation of oil by pipeline and rail in the Great Lakes region.

One organization urged the parties to ban the transport of what it called "extreme energy" (i.e., tar sands bitumen, fracked oil and gas, fracking wastewater and nuclear waste) on, under and near the Great Lakes and St. Lawrence River.

Many commenters provided detailed remarks and suggestions on specific aspects of the COA. One organization was pleased to see the principles of cumulative effects and polluter pays added to the agreement. Others were pleased to see an annex devoted to climate change, and a commitment to continue implementing climate change adaptation actions. Other commenters supported the setting of a target of net habitat gain, and urged that the same target be established specifically for wetlands. Several commenters shared concerns about the COA's goals and commitments regarding AOC.

The comments submitted reveal a deep interest by members of the Great Lakes community in being engaged, and a strong commitment to protecting and restoring the Great Lakes ecosystem. Several commenters expressed a willingness to help the parties fulfil the COA's objectives, offering specific services to the parties and asking to be involved in the work to meet specific COA commitments. A group of commenters from the environmental non-governmental community also advocated for the creation of a public advisory body that could provide input to the COA Executive Committee.

Statement of Environmental Values

The MOECC confirmed to the ECO that it considered its Statement of Environmental Values in making the policy decision to sign the 8th COA, as required under the *Environmental Bill of Rights, 1993*. The ministry described the principles that it considered, including the principles of: environmental management; pollution reduction/environmental restoration; and strategic management.

The MOECC also described the social, economic and other considerations that went into the ministry's decision. In particular, the ministry stated: "the 8th COA is built on the premise that social and economic solutions are part of environmental protection, including the principle of Sustainability."

The MOECC noted that "the 8th COA has a strong emphasis on science and research in order to develop a better understanding of the changes rapidly taking place in the Great Lakes — for example those caused by the introduction of invasive species and the changing climate."

Other Information

Bill 66 – The Great Lakes Protection Act, 2015

In February 2015, the Ontario government introduced Bill 66, the Great Lakes Protection Act, 2015 in the legislature. The purpose of the proposed legislation is "to protect and restore the ecological health of the Great Lakes-St. Lawrence River Basin" and "to create opportunities for individuals and communities to become involved in the protection and restoration of the ecological health of the Great Lakes-St. Lawrence River Basin."

The proposed legislation has been introduced twice before (in 2012 and 2013), but died on the order paper. With Bill 66, the MOECC says that it has strengthened the proposed legislation "to reflect comments and new priorities." The draft legislation was posted on the Environmental Registry for a 60 day public consultation period (Registry #012-3523).

The ECO will review the Great Lakes Protection Act, 2015 if passed, in a future Annual Report.

Regulatory Amendments to Implement the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement

The Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement commits Ontario, Quebec and the eight U.S. Great Lakes states to act together to protect, conserve and restore the Waters of the Great Lakes-St. Lawrence River Basin. In November 2014, the provincial government finalized regulatory amendments to support the implementation of the agreement. In particular, the amendments relate to the management of water taking and intra-basin transfers between Great Lakes watersheds.

For more information about this decision, see Part 3.1.1 of our Annual Report.

Microplastics in the Great Lakes

There is growing concern about the environmental and possible health effects of microplastics (discarded plastic particles measuring 5 millimetres or less in diameter) in freshwater environments, including the Great Lakes. The MOECC is involved in ongoing research initiatives regarding microplastics in Lake Ontario and wastewater treatment plant discharges.

For more information, see Part 3.2 of our Annual Report.

ECO Comment

Ontario has jurisdiction over 10,000 kilometres of Great Lakes and St. Lawrence River shoreline — almost all of Canada's share. As such, Ontario has a weighty responsibility to reverse the trend of declining ecological health in the Great Lakes. As the list of threats to the Great Lakes grows, so too will the effort and resources needed to achieve and maintain Ontario's vision of healthy Great Lakes that are drinkable, swimmable and fishable.

The provincial and federal governments have come a long way since the first COA in 1971.The 8th COA is comprehensive and ambitious in its scope. Not only does it make commitments to address a range of issues not tackled in earlier agreements, but it embraces an expanded vision for the Great Lakes in the future. That vision sees an active role for the communities connected to the Great Lakes – something the ECO has noted was missing in past COAs – and recognizes the Great Lakes' potential to be a centre for innovative and environmentally sustainable economic activity.

Over the years, the ECO has commented on a wide range of problems facing the Great Lakes and suggested ways that Ontario could take action (for example, see Part 2.1 of our 2010/2011 Annual Report). The ECO is pleased that Ontario will be working on a number of pressing issues, such as reducing phosphorus loadings in Lake Erie (in fact, in June 2015, Ontario signed an agreement with Ohio and Michigan that commits to reducing phosphorus pollution in Lake Erie by 40 per cent by 2025), developing a framework to protect the nearshore environment, protecting coastal wetlands, and studying climate change adaptation. It is disappointing, however, that the COA does not commit to more direct and substantive actions that would lead to demonstrable improvements in the Great Lakes, such as setting more targets for water quality improvements and reduction of pollutants. The ECO urges Ontario to carry out its commitments in a way that prioritizes actions that will yield urgently needed environmental improvements.

The COA continues to lack some of the essential elements of a successful plan, namely: defined timelines for completion of most commitments; identification of who is accountable for specific commitments; and clear assurance of sufficient funding. The Ontario government should explain to the public: what actions it will take to fulfil each of Ontario's commitments (including those shared with the federal government); which ministry or agency is responsible for each action; when each action will be completed; and how the work will be funded. Making this information public would facilitate future evaluation and reporting and, even more importantly, give Ontarians greater assurance that the commitments made in the 8th COA will actually come to fruition during the life of the agreement. Finally, as the ECO has suggested before, the parties' progress should be subject to independent review.

Agreements and plans are of little use if the funding is not there to implement them. The problems in the Great Lakes are enormous; resolving them will require an enormous investment. While $9.3 million annually for implementing the COA seems like a lot of money, it is a far cry from recent funding commitments made by Ontario for other major projects in the province – such as $1.2 billion for a contract to extend toll Highway 407, over $1.5 billion in operating funding and additional investments for the 2015 Toronto Pan-Am and Parapan American Games, and $60 million annually for forest access roads. The Ontario government can and should afford Great Lakes protection and restoration the same level of importance as it does for other major projects. With a more significant funding investment, Ontario could achieve real progress in reversing the damage that has been done in the Great Lakes. The province would also expand its capacity to establish processes and systems to protect the Great Lakes in the future, including developing and implementing climate change adaptation strategies.

The benefits of investing in the Great Lakes are indisputable. The ECO once again urges the Ontario government to dedicate the resources needed to fulfil its commitments under the COA and make Ontario's vision of the Great Lakes a reality.

Review of Posted Decision:

1.2.4 New Regulations to Enable Continued Research in the Experimental Lakes Area

Decision Information

Registry Number: 012-0621
Proposal Posted: January 16, 2014
Decision Posted: March 14, 2014
Comment Period: 30 days
Number of Comments: 14
Regulations Enacted: March 13, 2014

Description

Overview

The Experimental Lakes Area (ELA) is a unique, world-renowned freshwater research centre in northwestern Ontario. In 2014, the Government of Ontario, the Government of Canada, and the Winnipeg-based International Institute for Sustainable Development (the "Institute") entered into a series of agreements that would see Ontario and the Institute take over operation of the ELA from the federal government. As part of this arrangement, in March 2014, the provincial government passed two new regulations under the *Environmental Protection Act* (*EPA*) and the *Ontario Water Resources Act* (*OWRA*) to exempt authorized ELA experiments from some provisions of the *EPA* and *OWRA*. These exemptions allow research that would otherwise be prohibited under Ontario's environmental laws to continue at the site under certain conditions.

Background

Founded in 1968, the ELA is a research facility located on a collection of 58 small lakes and drainage basins, approximately 50 kilometres southeast of Kenora, Ontario. The location was chosen because it meets important geographic criteria; namely, there is a high density of small lakes deep enough to experience thermal stratification (the separation of a lake into different temperature layers), an ecosystem characteristic common in larger, deeper lakes. In addition, the area's Precambrian Shield bedrock allows for few groundwater connections, meaning the lakes and their drainage basins are largely self-contained systems making them easier to control and study. Furthermore, its isolated location leaves the area relatively unaffected by external human influences.

These factors combine to make the ELA an ideal natural laboratory where long-term, whole-ecosystem research and monitoring work can be undertaken. Historically run by government scientists, the ELA routinely hosts researchers from universities across Canada and around the world, as well as some from private industry. These scientists come to the ELA to make use of the unique opportunity to manipulate entire lake ecosystems (e.g., by adding a certain chemical, hormone or metal to the water) in order to test theories and determine environmental effects in a manner that would be impossible in a laboratory.

The ELA was initially created as a site for research into human-caused (as opposed to naturally occurring) eutrophication, the blue green algae-producing phenomenon that plagued Lake Erie in the 1960s and 1970s, and that continues to be a problem today. Scientists suspected that high levels of an unknown nutrient or mineral were to blame, but no one knew the controlling factor. Over several years

in the late 1960s and early 1970s, ELA scientists added different contaminants to a number of lakes. Eventually, Lake 226 was split with a plastic divider curtain. Carbon and nitrogen where added to both sides, but phosphorus was added to only one; when the half with the phosphorus, a nutrient common in detergents and fertilizer, turned bright green with algae, the scientists had their answer.[1] This research provided the scientific basis for a phosphate control program in the St. Lawrence-Great Lakes basin, and for restrictions on phosphate-containing laundry and dishwasher detergents in Canada and around the world.

The ELA has also been at the centre of research into the adverse ecosystem effects of lake acidification, a by-product of acid rain.[2] In one eight-year long experiment, scientists added sulfuric acid to a lake, incrementally lowering the pH from 6.8 to 5.0 (thus raising the acidity level). Among other adverse ecosystem effects, scientists found that acidification severely affected the food web at pH levels of 5.8 and that no species of fish reproduced at a pH of 5.4 or lower. Prior to this study, the common belief was that ecosystem disruption only took place at lower pH levels. The researchers specifically identified the uniqueness of their ELA work, noting that the disruptions they observed could not have been predicted in a laboratory, and that larger species "cannot be realistically studied in an experimental vessel smaller than a whole ecosystem." This work is widely credited with directly influencing the development of the *Canada-United States Air Quality Agreement* to address transboundary air pollution leading to acid rain.

More recently, in an experiment likely impossible to undertake elsewhere in the world, researchers mimicked the impacts of atmospheric mercury on lake ecosystems by adding mercury to an ELA lake and surrounding wetland.[3] Over three years, the average annual mercury load to the lake was increased by 120 per cent, to levels experienced by lakes in more polluted regions. At the end of this period, the concentration of mercury in the lake's water and biota was 30-40 per cent higher as a result of the experiment. The researchers learned not only how mercury concentrations in fish responded over time to the addition of mercury to the lake water, but also how the response differed with various background conditions. This provided a better understanding of how fish populations are affected by atmospheric mercury, as well as how mercury concentrations could be expected to decrease as mercury loadings decline. This information can help regulators set useful mercury emission controls.

The ELA has also hosted numerous other research projects on, for example: the negative impact of birth control hormones on fish populations;[4] the increased generation of greenhouse gases as a result of hydroelectric dam-related flooding;[5] and the impacts of aquaculture on native fish habitats and populations.[6] Ongoing environmental monitoring throughout the ELA's history has also yielded a rich

[1] Schindler, D.W. (1974). Eutrophication and Recovery in Experimental Lakes: Implications for Lake Management. *Science* 184(4139): 897-899.
[2] Schindler, D.W. et al. (1985). Long-term Ecosystem Stress: the Effects of Years of Experimental Acidification on a Small Lake. *Science* 228(4706): 1395-1401.
[3] Harris, R.C. et al. (2007). Whole-Ecosystem Study Shows Rapid Fish-Mercury Response to Changes in Mercury Deposition. *Proceedings of the National Academy of Sciences of the United States of America* 104(42): 16586-16591.
[4] Kidd, K. A. et al. (2007). Collapse of a Fish Population After Exposure to a Synthetic Estrogen. *Proceedings of the National Academy of Sciences in the United States of America* 104(21): 8897-8901.
[5] Kelly, C. A. et al. (1997). Increases in Fluxes of Greenhouse Gases and Methyl Mercury Following Flooding of an Experimental Reservoir, *Environmental Science and Technology* 31(5): 1334-1344.
[6] Paterson, M.J. et al. (2011). The Effects of an Experimental Freshwater Cage Aquaculture Operation on *Mysis diluviana*. *Journal of Plankton Research* 33(1): 25-36.

dataset of baseline information about: physical lake characteristics; watershed hydrology; air, precipitation and lake water chemistry; and food web composition and abundance.[7]
Over one thousand peer-reviewed articles, research papers, reports, books and other publications have detailed work undertaken at the ELA. This research has led to the reshaping of both national and international policies on a range of environmental issues. Many scientists and environmental policy makers around the world have acknowledged the importance of the work conducted at the ELA for lake and reservoir management. As one non-governmental organization put it "the experience gained at ELA by many scientists has resulted in the dissemination of environmental expertise and problem solving throughout the world, improving human conditions, protecting the environment and saving millions of dollars for citizens and government agencies."[8]

In May 2012, the federal Department of Fisheries and Oceans announced that it would no longer fund the operation of the ELA. On April 24, 2013, following a public outpouring of support for the ELA, the Ontario government announced that it was working with the federal government and other partners, including the Institute, to ensure the "sustained long-term operations"[9] of the ELA. A year later, in April 2014, the parties announced that they had signed a series of agreements that would see Ontario take control of the facility from the federal government and provide up to $2 million per year in funding, while the Institute would oversee operational management of the ELA.

New Regulations to Support the ELA

In anticipation of the pending agreements among the federal government, the province and the Institute, the Ministry of the Environment and Climate Change (MOECC) finalized two new environmental regulations in March 2014. These new regulations create a process to authorize ELA research projects that might otherwise violate the *EPA* and the *OWRA*, for example, when it involves releasing a contaminant into a lake in order to observe its effects.

The MOECC notes that this new regulatory approach is consistent with past practice at the ELA, where previously "the Department of Fisheries and Oceans would seek MOE's input on potential conditions to ensure experiments were carried out in an environmentally responsible way, and request MOE's written endorsement of experiments before allowing them to proceed." Now that the ELA is no longer federally managed, an explicit provincial regulatory mechanism was needed to ensure appropriate environmental oversight.

The new regulations, O. Reg. 60/14 (Experimental Lakes Area) under the *EPA* and O. Reg. 61/14 (Experimental Lakes Area (Water Resources)) under the *OWRA*, came into effect on March 13, 2014. Under the new regulations, proposed ELA experiments that would otherwise violate the *EPA* or *OWRA* must obtain a statement of authorization from an MOECC Director before they can lawfully proceed. The statement of authorization provides an exemption from certain provisions of the *EPA* and *OWRA* for projects within the ELA that meet established criteria. These criteria, set out in O. Reg. 60/14, are as follows:

[7] International Institute for Sustainable Development website (accessed August 12, 2015). *Experimental Lakes Area: Ecosystem Experimentation*. http://www.iisd.org/ela/ecosystem-experimentation.
[8] Sosiak, A. et al. (May 25, 2012). Letter from the leadership of the North American Lake Management Society to the Minister of Fisheries and Oceans re Closure of Experimental Lakes Area.
[9] Ontario Office of the Premier (April 24, 2013). News Release, *Ontario Supporting the Experimental Lakes Area*.

1. The experiment has been approved by the expert panel established by the operator of the ELA for the purpose of evaluating the scientific merit of proposals to conduct research within the ELA.
2. The experiment is not likely to cause an adverse effect beyond the lake on which the experiment is to be conducted or the lake's catchment area.
3. The experiment will not cause irreparable harm to the natural environment.
4. There is an appropriate written plan to monitor the natural environment to ensure that,
    i. there are no adverse effects beyond the lake on which the experiment is to be conducted or the lake's catchment area; and
    ii. the experiment will not cause irreparable harm to the natural environment.
5. There is an appropriate written plan to manage and, if necessary, remediate the adverse effects resulting from the experiment.
6. There is an appropriate written plan to prevent and manage any unanticipated spill or other unanticipated environmental incident that may occur during the experiment.
7. There is an appropriate written plan to ensure that all persons who may be affected by the conduct of the experiment are given timely notice of the experiment, including the nature of the experiment and when and where it will be conducted.

Once a statement of authorization has been issued, certain sections of the *EPA* (set out in O. Reg. 60/14) and *OWRA* (set out in O. Reg. 61/14) do not apply to the experiment. These include provisions that: prohibit contamination and discharge of polluting material and/or sewage; allow Orders and injunctions to be issued; require parties to notify the ministry of contamination and spills; require approval of a facility or production process; require approvals for sewage works or the taking of water; and bestow a duty to mitigate and restore the environment from environmental damage.

Ontario Regulation 60/14 also provides for the issuance of a statement of non-authorization, which revokes an experiment's statement of authorization, meaning the experiment is no longer exempt from provisions of the *EPA* and *OWRA*. The Director is required to issue a statement of non-authorization for an experiment if he or she is satisfied that:

- The experiment has caused an adverse effect beyond the designated lake or the lake's catchment area;
- The experiment has caused or is likely to cause irreparable harm to the natural environment; or
- A monitoring program is not being carried out to ensure that there are no adverse effects beyond the designated lake or the lake's catchment area, and that the experiment will not cause irreparable harm to the natural environment.

The MOECC noted in the Environmental Registry decision notice that "technical guidance on the process and criteria for obtaining an authorization is under development."

Implications of the Decision

The authorization system established by the regulatory amendments provides a mechanism for managing the risks inherent in conducting whole-lake research. It does this by ensuring that public notice, monitoring, management, emergency and remediation plans are all in place prior to the commencement of work, and by prohibiting research that carries unacceptable risks.

Specifically, researchers undertaking experiments within the ELA that may violate the *EPA* or *OWRA* will now have to obtain a statement of authorization from the MOECC before they can lawfully proceed with their work. In order to obtain a statement of authorization, researchers must demonstrate that the project will not have unacceptable adverse impacts and will not cause irreparable harm to the natural environment. It remains to be seen what evidence researchers will be expected to present for these screenings, as guidance materials are still being developed.

Researchers must also prepare written plans for all stages of their experiment. As part of these planning stages, applicants must submit a plan to notify potentially affected persons prior to an authorization being issued, including First Nations and Métis communities. Although there may be some increased administrative work associated with these steps, researchers would likely prepare these plans when designing their experimental methodology regardless.

Provisions relating to statements of non-authorization ensure that experiments that pose a significant risk of irreparable harm to the natural environment or have adverse effects outside the experiment area, will not be allowed to continue. Similarly, experiments that are not properly monitored for these problems will also be shut down.

Public Participation & *EBR* Process

The proposal notice for the new regulations was posted on the Environmental Registry in January 2014 for a 30-day comment period. The MOECC did not provide a draft version of the proposed regulations, but it did provide a fairly detailed overview of their proposed content and intended purpose in the proposal notice. Fourteen comments were received through the Environmental Registry, most of which were fully supportive of the proposed regulations.

Many commenters took the opportunity to simply state their support for the ELA and for Ontario's move to ensure the continued operation of the facility. Others went further and explained their satisfaction with the MOECC's proposed approach to balancing the potential risks presented by experiments against the value of freshwater research.

A few commenters raised concerns around the impacts of the ELA on nearby Aboriginal communities and the need for comprehensive public consultation. While strongly endorsing the MOECC's proposal for the regulations overall, some commenters also noted that Aboriginal communities in the region should be part of the decision-making process regarding the ELA.

In the Environmental Registry decision notice, the MOECC explained that, as a result of the comments received (and in particular the comment from a Métis organization), the province "reached out to Aboriginal communities and organizations to begin discussions on the changes at ELA, including developing the appropriate protocols for communications about potential future experiments."

Statement of Environmental Values

The MOECC considered its Statement of Environmental Values in developing the new *EPA* and *OWRA* regulations. Ministry documentation explained how the new regulations are consistent with the principles of: environmental management; pollution reduction and environmental restoration; and strategic management.

In general, the ministry emphasized that these new regulations, in supporting the work of the ELA, will "support sound environmental decision-making, evidence-based policy, and wise management of freshwater resources both in Ontario and other jurisdictions." It also explained that the MOECC "worked to balance environmental oversight and protection with the need for objective scientific evaluation of research proposals, and a desire to minimize the administrative burden for researchers."

ECO Comment

The ECO strongly supports Ontario's efforts to continue the operation of the ELA. Scientific research and monitoring are at the foundation of sound environmental management. Without objective and comprehensive research to inform decision making, the government is blind to the likely outcomes of its decisions and thus unable to weigh expected benefits against potential negative outcomes. Similarly, without monitoring, there is no way to effectively track consequences and fully understand the impact of human actions on the environment.

It is difficult to overstate the ELA's contribution to the field of freshwater ecosystem research. It is respected around the world as one of the few (if not only) places where scientists can conduct long-term, freshwater ecosystem-level experiments. As the examples set out above demonstrate, it has influenced decision making throughout Canada and around the world in a myriad of ways.

The ECO agrees with the ministry that the authorization system set out in the regulations strikes an appropriate balance among the need for: environmental oversight and protection; a science-based approach to evaluating research proposals; and minimizing researchers' administrative burdens. The ECO hopes that the new management arrangement for the ELA can serve to revitalize the facility and public interest in the valuable research taking place there. With appropriate government support, the scientific value of the ELA to environmental decision making will continue for decades to come.

Review of Posted Decision:

1.2.5 Introduction of the Living List Framework under the *Toxics Reduction Act, 2009*

Decision Information

Registry Number: 012-0764
Proposal Posted: March 13, 2014
Decision Posted: December 17, 2014

Comment Period: 60 days
Number of Comments: 12

Description

Overview

Since 2010, the Ontario government has required certain facilities to track the production, use and discharge of toxic substances, and to plan for their reduction, under the *Toxics Reduction Act, 2009* (*TRA*). The Act governs toxic substances prescribed in O. Reg. 455/09 (General) made under the *TRA*, and it requires the Minister of the Environment and Climate Change to consult with experts and members of the public about possible changes to this prescribed list of toxic substances at least once every five years. In late 2014, the Ministry of the Environment and Climate Change (MOECC) finalized *The 2014 Living List Framework under Ontario's Toxics Reduction Program*, which sets out the process and criteria to be used by the ministry when considering any changes to the toxic substances list.

Background

Toxics are substances believed to be harmful to humans, animals and/or the natural environment. Toxics can occur naturally in the environment, be deliberately manufactured for a particular use, or be a by-product of another process. Common toxics include asbestos, benzene and lead. Ontario's sizable and diverse industrial sectors (e.g., manufacturing, electricity generation, mining and quarrying, etc.) are responsible for the production and release of numerous toxics each year.

The Toxics Reduction Act*:*
As the cornerstone of a broader provincial Toxics Reduction Program, the *TRA* requires certain facilities to track the production, use and discharge of toxic substances in Ontario, and to prepare a plan to reduce such substances. The Act's stated purposes are "to prevent pollution and protect human health and the environment by reducing the use and creation of toxic substances; and to inform Ontarians about toxic substances."[1] The *TRA* aims to achieve these goals in part by regulating manufacturing and certain mineral processing facilities that use toxic substances.[2] These facilities are required to:

- track and quantify how each toxic substance: enters the facility; is created, used and/or transformed; and leaves the facility, as well as what happens to the substance after it leaves;

[1] Section 1 of the *Toxics Reduction Act, 2009*.
[2] Mineral processing facilities are only included if they use chemicals to separate, concentrate, smelt or refine metallic or non-metallic minerals from an ore. Furthermore, to be regulated under the *TRA*, a facility must otherwise be required to provide information on applicable toxic substances to the National Pollution Release Inventory, or, if the substance is acetone, under section 4 of O. Reg. 127/01 (Airborne Contaminant Discharge Monitoring and Reporting) made under the *Environmental Protection Act* (see sections 4 and 7 of Ontario Regulation 455/09 (General) made under the TRA).

- develop a toxic substance reduction plan for each toxic substance used in the facility and post a publically available summary of the plan on the internet (facilities are not required to implement these plans, but may choose to do so voluntarily); and
- prepare an annual report on the facility's use, creation and release of toxic substances and its progress in implementing its toxic substance reduction plans, and share portions of this report with the public.

"Toxic substances" are defined in the Act as any substances prescribed by regulation. O. Reg. 455/09 currently prescribes any substance listed in the National Pollutant Release Inventory (NPRI),[3] as well as acetone, as toxic substances. The NPRI is a federally administered, national inventory of pollutant releases, disposals and transfers for recycling; it currently lists 363 substances.

For a full overview of the *TRA* see Part 4.2 of the ECO's 2009/2010 Annual Report.

Implementation of the TRA *to Date*:
The *Minister's Report on Toxics Reduction 2014*[4] states that 2010 and 2011 compliance rates showed that 99 per cent of facilities met the tracking, planning and reporting requirements of the *TRA*. Moreover, the report estimated that 40 per cent of regulated facilities have voluntarily committed to implementing their reduction plans. The report also notes that there was a 17 per cent decrease nationally between 2008 and 2012 in total releases of substances listed in the NPRI (and thus also prescribed under the *TRA*). It is impossible to know what portion, if any, of this reduction can be credited to the *TRA*, but the MOECC states that this decrease was the result of "a combination of investments in emission control technologies; facility closures, and production decreases for certain substances in base metal smelters, in other manufacturing facilities, and coal-fired electricity generating stations."[5]

Some sections of the *TRA* have not yet been proclaimed into force, such as the requirement under section 11 that facilities prepare reports on "substances of concern." A substance of concern is a substance that is potentially hazardous to human health or the environment, but which is not tracked through NPRI and for which the MOECC has limited information regarding its use or release in Ontario. Like toxic substances, substances of concern are defined under the Act as those substances prescribed by regulation. The MOECC has never prescribed any substances of concern, nor has the ministry set any deadline to enact this section of the *TRA* or to develop such a regulation. Other unproclaimed provisions relate to enforcement tools, such as the ability to issue administrative penalty orders, and to the power of the Lieutenant Governor in Council to make regulations respecting, for example, the manufacture and sale of consumer products containing toxic substances.

The Living List Framework

The Minister is required to consult with experts and the public about possible changes to the list of prescribed substances at least once every five years. In December 2014, the MOECC finalized *The 2014 Living List Framework under Ontario's Toxics Reduction Program* (the "Framework"), a policy that sets

[3] In the form specified in the most current NPRI Notice in which the substance is listed, as set out in section 3 of Ontario Regulation 455/09 (General) made under the *TRA*.
[4] Section 12 of the *TRA* requires the Minister of the Environment and Climate Change to prepare an annual report describing the progress in implementing the Act. The *Minister's Report on Toxics Reduction 2014* is the most recent version of this annual report available as of July, 2015.
[5] Ontario Ministry of the Environment (2014). *Minister's Report on Toxics Reduction 2014*, page 2.

out a three-part process for this review. The three parts of the Framework are: 1) nomination and screening; 2) review and public participation; and 3) decision making.

Guiding Principles:
The Framework states that the review process will be in accordance with the following seven guiding principles:

1. Open: the public should be informed and participate in the process.
2. Transparent: the Framework should be clearly set out, with established criteria for screening and review. Information about opportunities for public participation will be publicly communicated.
3. Science-based: science-based criteria will be used in the evaluation of nominations.
4. Flexible and Robust: challenges associated with data gaps, resource limitations and/or other unique factors will be addressed through different approaches, as needed.
5. Outcome-driven: the review process will consider how a proposed action would contribute to health and environmental goals.
6. Build on and acknowledge existing relevant programs: the review will consider existing controls on substances under consideration.
7. Integrate performance measurement: the effectiveness of the Framework itself and of decisions made under the Framework will be evaluated periodically.

Part One: Nomination and Screening:
The Framework's process begins when a member of the public or the MOECC proposes a change to the list of prescribed toxic substances (i.e., a "nomination"). Substances can be nominated for possible addition to or deletion from the list, or to change the way the substance is listed (e.g., changing how the substance is defined). Throughout the process, the ministry will use a website to provide status updates about each nomination as it moves through the Framework process, including information about "screening, review and decision steps, including summaries of information relied upon to support reviews and rationale for decisions."

The nomination form requires, at a minimum, the substance name and Chemical Abstracts Service Registry Number[6] (if available), a statement of rationale for the proposed addition, deletion or change, and contact information for the nominator(s). However, nominators may provide additional supporting information if they like.[7] Nominations can be submitted at any time.

All nominations undergo screening by the MOECC to determine whether a full review is appropriate. The screening criteria set out in the Framework are whether the substance:

[6] A Chemical Abstracts Service Registry Number, or CAS RN, is a unique number assigned to a specified chemical substance; it is used to connect substance-specific information within the CAS Registry, a database of disclosed chemical substance information. See: Chemical Abstract Service website (accessed March 23, 2015). *CAS Registry and CAS Registry Number FAQs*. https://www.cas.org/content/chemical-substances/faqs.

[7] The Framework sets out several categories for which nominators can choose to provide additional information. These categories correspond with the environmental and human health criteria set out in Part Two: Review and Public Consultation (e.g., "specified hazard properties specific to the nominated form of the substance," which includes subcategories relating to "persistence," "potential to bioaccumulate" and "wildlife toxicity.")

- is or is not already on the toxic substances list (e.g., a nomination to add may be rejected if the substance is already prescribed and a nomination to delete may be rejected if the substance is not currently prescribed);
- is likely used, created or emitted in Ontario by a regulated facility (e.g., a nomination to add may be rejected if it could be confirmed that the substance is not used or is not likely to be used by a regulated facility);
- has identifiable hazardous properties (e.g., a nomination to delete may be rejected if a substance is recognized as being highly hazardous); and
- is within the current policy scope of the *TRA*.

The ministry states in the Framework that it will use "established hazard classifications available from authoritative bodies such as … the World Health Organization" in applying the screening criteria. It also notes that the screening process will be flexible insofar as certain information may not be available for some substances and "expert judgment may need to be applied" in some cases. The Framework commits the MOECC to publicly disclose on the website the process it used and information it relied upon when screening decisions. In the Framework, the ministry reports that additional guidance material has been developed to provide further detail to nominators about the screening process, however, the title and/or location of this material were not provided.

Part Two: Review and Public Consultation:
If nominations pass the screening stage, the ministry will conduct a full review, which will ultimately result in a recommendation regarding what changes should be made to the prescribed toxic substances list, if any. During its review, the ministry will consider scientific and contextual information, as well as stakeholder and expert opinion. Public input will be solicited and considered via the Environmental Registry and public meetings.

The review process is divided into three steps, as set out in Figure 1.

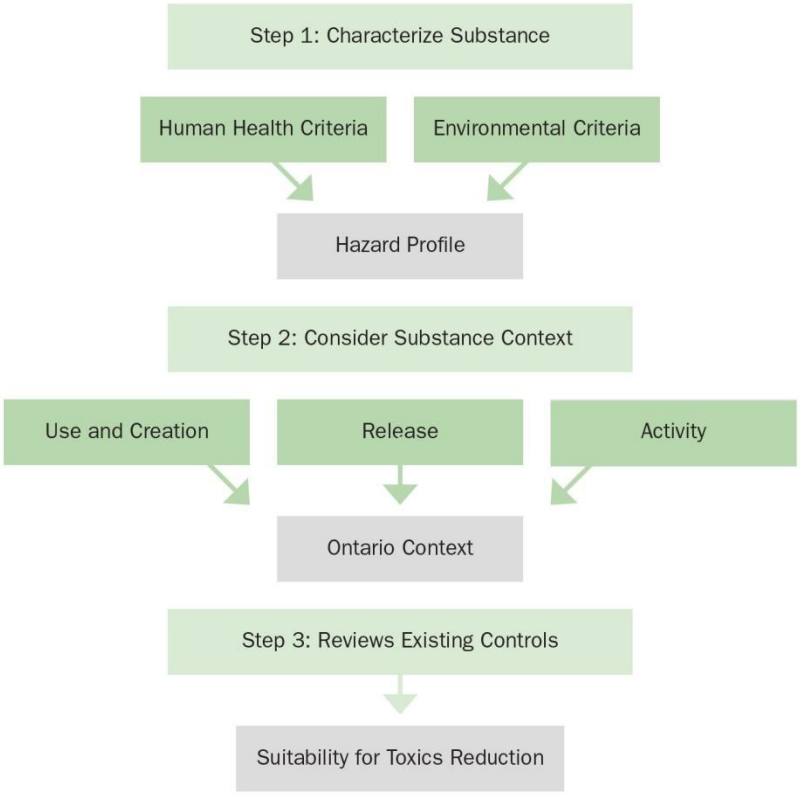


Figure 1. Step-by-step application of review criteria during the review step. In this figure, boxes for Steps 1, 2, and 3 identify the specific task associated with each step. Boxes below Steps 1 and 2 identify the criteria or factors the ministry must consider in those steps. Arrows point to the output of the step. (Source: MOECC, *The 2014 Living List Framework under Ontario's Toxics Reduction Program,* 2014).

To complete the first step in the review, the ministry must characterize the hazard posed by the substance by considering environmental and human health criteria. The environmental criteria set out in the Framework are:

1. persistence (half-life in air, water and soil/sediment);
2. bioaccumulation (bioconcentration factor or bioaccumulation factor);[8]

[8] Bioaccumulation refers to the accumulation of chemicals within an organism over time as a result of exposure to the chemical in the natural environment. The bioaccumulation factor reflects the degree to which bioaccumulation occurs, with a higher bioaccumulation factor indicating that a particular substance has a greater tendency to bioaccumulate in a given organism. Bioconcentration refers to the accumulation of chemicals within an organism over time as a result of absorption through its respiratory and dermal surfaces only (i.e., exposure through diet is excluded). The bioconcentration factor reflects the degree to which bioconcentration occurs. See: Arnot, J.A. and Gobas, F.A.P.C. (2006). A Review of Bioconcentration Factor (BCF) and Bioaccumulation Factor (BAF) Assessments for Organic Chemicals in Aquatic Organisms. *Environmental Reviews* 14(4): 257-297.

3. aquatic toxicity;
4. wildlife toxicity; and
5. form and associated bioavailability.[9]

The human health criteria set out in the Framework are:

1. acute toxicity (i.e., adverse effects resulting shortly after a single exposure);
2. chronic toxicity (i.e., adverse effects resulting from repeated or long-term exposure; carcinogenicity, mutagenicity, and endocrine disruption are all associated with chronic toxicity); and
3. whether there are other, similar properties of the substance that have "scientific evidence of probable serious effects on human health or the environment."

The Framework establishes that, when evaluating these criteria, the MOECC will "focus on readily available, peer-reviewed sources of information" including, for example, the International Agency for Research on Cancer.

In the second step of the review the MOECC will incorporate Ontario-specific contextual information about the use and release of the substance, and other activities associated with its production and use. The following questions will guide the review in this assessment:

- Are discharges primarily associated with industrial sources and/or a regulated sector?
- Generally, how does the substance enter a process, how is it used or created, and what is its role in the final product?
- Is the substance used or created by *TRA*-regulated facilities?
- Is there reason to believe that there may be an increase or decrease in the use, creation or release of the substance in Ontario?

The MOECC may also consider environmental data when available, such as whether discharge concentrations exceed safety thresholds.

Finally, in step three the ministry will incorporate information about existing tools used to manage the substance, including federal government initiatives and other provincial programs.

Once the MOECC has completed this review, it must consult with the public before developing a final proposal whether to change the prescribed toxic substances list. The MOECC will accept questions, feedback and additional information from the public and will hold a public meeting, which will be advertised on the Environmental Registry (presumably via an information notice). To facilitate public engagement, the ministry will publish an overview of the scientific and contextual information reviewed and a summary of how the substance is currently managed in Ontario. This information will also include explanations of any uncertainties in the information and how they were addressed within the review process.

[9] Generally, bioavailablity refers to the rate or degree to which a substance is available to be absorbed into an organism. Different forms of the same chemical may have different levels of bioavailability. It should be noted, however, that a precise definition seems to evade the scientific community. See: Semple, K.T. et al. (2004). Defining Bioavailability and Bioaccessibility of Contaminated Soil and Sediment is Complicated. *Environmental Science & Technology* 38(12): 228A-231A.

After considering information and comments received through the above processes, the MOECC will then prepare a second Registry notice advising the public of the recommended course of action. Accordingly, this second notice will be one of two types depending on whether the ministry decides to recommend a change to the prescribed list or not. If the ministry concludes that changes should be made to the list of prescribed toxic substances in O. Reg. 455/09, a regulatory proposal notice will be posted on the Registry. If no changes to the regulation are proposed, the ministry will post an information notice advising the public of the decision.

Part Three: Decision Making:
The ministry will consider any comments received in response to a regulatory proposal notice, as well as the input of other agencies or jurisdictions, when reaching a final decision about any proposed change to the toxic substances list. According to the Framework, the expected environmental and economic benefits associated with any proposed change, as well as the costs to industry, may be considered under a regulatory impact assessment, a policy tool used to "correlate the need for a regulation with the regulatory instrument being proposed, to set out the assessed risks, costs and benefits or regulatory proposals, to compare the effectiveness of non-regulatory alternatives, and to assess the impact on a range of economic factors, including trade, investment and labour mobility."[10] The ministry will post the final regulatory decision to the Registry and notify the nominators of the outcome.

Implications of the Decision

Clear Process for Evaluating Proposed Changes

The Framework sets out a step-by-step process for proposing, evaluating and reaching a decision concerning potential changes to the list of prescribed toxic substances in O. Reg. 455/09. The public's entitlements to notice and participation at each stage are clearly set out, as are the MOECC's responsibilities to consider certain types of information and to provide the public with specific decision-making details. However, the Framework does not establish timelines for the ministry to complete each step of the screening, review and decision-making processes, and it is unclear whether the ministry will screen and review nominations as they are received or on some other scheduled timeline.

Mandated Public Involvement in Decision Making

The Framework process embraces the public notice and comment rights established in the *Environmental Bill of Rights, 1993* (*EBR*). The Framework sets out clear obligations for the MOECC to keep nominators advised of the outcomes of the screening, review and final decision stages of the process, and to regularly communicate status and information updates to the public through a dedicated government website. The Framework specifically declares that "nominations received, outcomes of screening, summaries of the review, key engagement meeting dates, and government decisions will all be made publicly available."

Nominations rejected at the screening stage will not be subject to public consultations, but there will be public meetings about all nominations that undergo a ministry review. The Registry will be used to advise the public of these meetings, as well as to provide public notice and an opportunity to comment

[10] Under *Ontario's Regulatory Policy*, a regulatory impact assessment is required for all regulatory proposals in Ontario. See: Government of Ontario (2014). *Ontario's Regulatory Policy*, pages 3-4.

on any proposed regulatory changes. Overall, the Framework sets out a robust public participation process for nominations that reach the review stage, allowing interested parties to access information about, and participate in, the consideration of changes to the prescribed list of toxic substances.

Precautionary Approach Applied

The Framework states that flexibility may sometimes be required in the screening, review and decision processes when there is imperfect or little information about a given substance. Although the Framework does not discuss what alternative screening and review processes may be employed in such situations, it does state that the process used and information considered will be described in public communications. In these cases, the MOECC will follow "a precautionary, science-based approach in its decision-making approach to protect human health and the environment." This indicates that in those cases where precise hazards are uncertain, but there is evidence of significant risks, the ministry will favour the decision which is more protective of human health and the environment.

Some Nominations May be Considered Together

The Framework notes that, in times of high nomination volumes or in the case of complex nominations, the "ministry may need to prioritize nominations and/or batch the screening and posting of screening decisions in order to best use its available resources." Similarly, the Framework provides that "reviews may be undertaken by the ministry in batches, based on chronology (i.e., substances batched as received) or commonality (i.e., substances batched as a class, or by sector or use)." This means that not every substance will necessarily be the subject of a standalone screening and/or review as some substances may be evaluated together. The Framework does not provide much detail as to how decisions to batch nominations will be made, or how the screening and review processes might be modified to accommodate this change.

Criteria Leave Room for Interpretation

In some cases, the screening and review criteria are not clearly explained. For example, persistence in air, water and soil is an environmental criterion that informs the hazard profile of a substance, but the Framework offers no indication of what level of persistence is either acceptable or troubling. Although the Framework refers to an additional guidance document that provides further detail about the criteria used in the screening process, the name and location of this document are not provided.

Additionally, the Framework does not provide direction on how the ministry should weigh or apply the review criteria (i.e., the environmental and human health risks) and the substance's context (i.e., details about its use, creation and release in Ontario) when determining whether a nomination should advance. For example, the Framework requires that a substance's hazard profile be determined during the review stage by examining its environmental and health implications, but there is no discussion of how different types of implications should be ranked or considered cumulatively. Without such guidance, it is somewhat unclear what hazard level (or threshold) necessitates that a substance should or should not be prescribed as toxic.

No Triggers for Ministry-led Nominations

Although the Framework specifies that the MOECC may put forward its own nominations for changes to the prescribed toxic substances list, it provides no information on what might trigger the ministry to make a nomination. Having an established system for the ministry to proactively identify possible changes to the list would help ensure that the ministry removes inappropriate substances from the list and adds toxic substances to the list in a timely manner.

Other Mechanisms to Change the List of Prescribed Toxic Substances

The Framework process is not the only means by which changes can be made to the prescribed list of toxic substances set out in O. Reg. 455/09. As the Framework notes, since the list of toxic substances directly incorporates substances on the NPRI list, any change to that list is automatically adopted into the regulation. Although these changes are not subject to the *EBR* right to comment (because they do not involve a provincial regulatory amendment), the MOECC nonetheless posts an information notice about the change on the Environmental Registry. Furthermore, the Framework explains that "it is the ministry's intention to consider any proposed changes to NPRI under the Living List Framework and to work with NPRI by sharing information prior to any decisions being made by either jurisdiction."

Public Participation & *EBR* Process

The policy proposal notice for the Framework was posted on the Environmental Registry in March 2014 for a 60-day comment period. Twelve comments were received by the ministry. The proposal notice included a thorough explanation of the *TRA* and provided a draft version of the Framework, which contained discussion questions for commenters to consider. The notice also included hyperlinks to the *TRA* and O. Reg. 455/09.

Many Comments from Industry

Two-thirds of the comments came from industry associations whose members are among those subject to the *TRA*. Most of these organizations were generally supportive of the proposal while still suggesting further refinements. Some of these suggestions centred on adding criteria to the screening or review stages in order to narrow the prescribed toxic substances list. For example, one commenter suggested that the MOECC should only consider nominations to add substances that are already on the federal Ingredient Disclosure List under the *Hazardous Products Act*. Another suggested that "suitability for management" be a central review criterion in order to avoid listing substances that facilities use but have no ability to reduce or avoid; this issue was raised by multiple commenters.

Several of the industry associations, as well as a commenter who identified itself as operating two regulated industrial facilities in Ontario, expressed significant concern about the administrative burden associated with the *TRA* generally, which they perceive to result from a misalignment with federal toxics tracking and reporting obligations. In this respect, many of the commenters suggested that the MOECC should work, through the Framework process or otherwise, to better align the prescribed list of toxic substances (and the *TRA*'s requirements generally) with federal pollutant lists or programs. Some commenters noted that Schedule I (Toxic Substances List) of the *Canadian Environmental Protection Act, 1999* is a better reference for federally recognized toxics than the NPRI, which lists pollutants which may or may not also be toxic. The facility owner suggested that streamlining the *TRA* processes

would help address this issue and offered several suggestions for how this might be done; for example, by removing entire categories of substances from the toxic substances list, such as those in natural feedstock materials. It also expressed concern about a lack of detail in the draft Framework and requested further public consultation sessions.

Ongoing public engagement relating to the Framework's implementation was also a common focus for industry. Suggestions relating to this issue included: make the effective communication of outcomes and decisions a guiding principle; model the stakeholder engagement process after that used for the NPRI; allow a single party to make a nomination instead of requiring two individuals to sign on (given that some products may not be well-known and only one facility or company may be familiar with the product); create a mechanism for stakeholders to submit relevant confidential information without having to make it publicly available; and conduct an evaluation of the Framework after the first year of implementation to assess its effectiveness.

Other comments from industry associations included:

- The MOECC should address information gaps and uncertainty using internationally recognized approaches;
- The MOECC must be mindful that when making any regulatory changes, facilities may need substantial advance notice in order to develop and implement data collection and tracking programs for newly added substances;
- The MOECC needs to clarify when during the screening and review process it will consider the economic impact and administrative burden relative to the environmental benefit of a proposed change; and
- The Framework should set out a timetable for the nomination process (i.e., how much time it should take to complete the screening, review and decision-making steps).

Concerns about TRA *Implementation*

The remaining comments voiced general support for greater control of toxics in the waste management system and in society generally. One commenter, an environmental law organization, stated that, when the *TRA* was being developed, the MOECC identified 155 non-NPRI substances in a 2008 discussion paper[11] that it believed should be considered for future regulation under the *TRA* (20 substances listed in Schedule 3 of the discussion paper and 135 substances identified as reproductive toxins, neurotoxins and mutagens, as well as other carcinogens, and listed in Schedule 4 of the paper). The commenter expressed alarm that none of these substances have yet been prescribed under O. Reg. 455/09 and called for them to be added immediately.

The commenter also expressed dismay that section 11 of the *TRA* regarding substances of concern has yet to come into force, and asked the MOECC to immediately enact that section, as well as sections 30 (respecting administrative penalties) and 50(1)(0.1)-(0.2) (permitting regulations regarding toxic substances in consumer products). The commenter also made several specific suggestions about the Framework process, including that all chemicals listed as toxic under the *Canadian Environmental Protection Act, 1999* be added to O. Reg. 455/09 and that no substances on the NPRI or European Union REACH program lists be removed from O. Reg. 455/09 if the substance is used in Ontario.

[11] Ontario Ministry of the Environment (2008). *Creating Ontario's Toxics Reduction Strategy: Discussion Paper*.

Changes to the Proposal

As a result of some of these comments, the MOECC made a number of adjustments to the proposed Framework, including:

- expanding the descriptions of some of the guiding principles;
- clarifying that the nomination process is electronic and that status updates and information will be shared via a website;
- accepting nominations that are submitted by only one nominator, although the form will provide space for two or more nominators and the ministry will encourage this practice;
- clarifying that confidential business information that meets the requirements of the *Freedom of Information and Protection of Privacy Act* will not be disclosed to the public;
- requiring nominators to provide a rationale summarizing the reasons for their nomination;
- adding "bioavailablity" to the list of environmental criteria considered at the review stage;
- clarifying and expanding the list of contextual information to be considered at the review stage;
- adding guidance on the MOECC's collection of information "to assist in determining the timing of implementation for any possible change;"
- adding references to the precautionary approach in the section addressing information gaps and uncertainty; and
- clarifying that a regulatory impact assessment may be undertaken in the course of reaching a final decision.

Other Public Participation Opportunities

The draft Framework was developed through a multi-stakeholder process that involved representatives from environmental, labour and public health groups, academia and industry. Several of the industry associations who commented on the Registry Proposal Notice identified themselves as having participated in this multi-stakeholder group. These parties had generally high praise for the MOECC's management of these consultations, with one saying that "the process was capably managed by the Ministry, and the views of a diverse group of stakeholders were considered and good dialogue took place during the process."

In its Registry decision notice regarding the Framework, the MOECC noted that it intends to convene this multi-stakeholder group from time to time to address Framework implementation issues. It also stated that stakeholders are welcome to provide comments and suggestions at any time.

Statement of Environmental Values

The MOECC provided the ECO with a copy of its Statement of Environmental Values (SEV) consideration document. This document details how several principles of environmental management from the ministry's SEV were considered in making this decision. For example, the MOECC states that principles of pollution reduction and environmental restoration were reflected in this decision as "it promotes pollution prevention and augments previous legislation by focusing on reducing the use and creation of toxic substances."

ECO Comment

The ECO is pleased that the MOECC has clearly prioritized stakeholder involvement in the process for developing the Framework, and that public participation and transparency are priorities throughout the Framework process. Empowering the public to propose and offer input on possible changes to the prescribed list of toxic substances, and ensuring access to information about how decisions are made, are consistent with the goals of the *EBR*. The ECO hopes the Framework process will lead to the development of an evolving list of prescribed toxic substances that effectively protects the environment and human health, without being unnecessarily burdensome on regulated facilities.

This commitment to public participation and transparency should be further strengthened by setting out clear timelines for considering and deciding on nominated substances. The ministry could also strengthen transparency, as well as accountability by providing additional guidance on how the ministry will apply and weigh the screening and review criteria for nominations. The Framework fails to explain how the criteria will inform a decision about whether or not a substance meets the threshold for recommending a change to the existing toxic substances list. Such a discussion would contribute to a common understanding of how criteria are to be applied and weighed during the decision-making process, as well as contribute to fair and consistent decisions. Possibly, the additional guidance material on the screening process referenced in the Framework helps address this issue, but since the ministry failed to provide the title or location, the ECO was unable to find the document online.
The ECO is also pleased to see the explicit acknowledgement and endorsement of the precautionary approach in the Framework. We encourage the MOECC to apply this approach generously throughout the Framework process, particularly when applying the screening criteria.

Creating the Framework process, however, does not in itself satisfy the *TRA* requirement for the Minister to actively consult on potential changes to the toxic substances list every five years (for which the first five-year period ended in January 2015). Now, the ministry must identify high-priority substances to be considered for addition to either the substances of concern or toxic substances lists. It is insufficient for the government to leave the identification of potentially toxic substances to the public alone. A good starting point would be for the ministry to prioritize the review of the 135 non-NPRI substances identified as reproductive toxins, neurotoxins, mutagens and carcinogens in the MOECC's 2008 *Creating Ontario's Toxics Reduction Strategy: Discussion Paper*. In addition, the ECO encourages the MOECC to proclaim section 11 of the *TRA* into force and begin compiling its list of substances of concern.

Review of Posted Decision:

1.2.6 Water Taking and Transfers: Implementing Ontario's Commitments under the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement

Decision Information

Registry Number: 012-1607
Proposal Posted: April 24, 2014
Decision Posted: November 27, 2014

Comment Period: 46 days
Number of Comments: 21
Regulations filed: November 27, 2014; Regulations and statutory provisions came into force January 1, 2015

Description

Overview

In November 2014, Ontario's Ministry of the Environment and Climate Change (MOECC) filed regulatory changes that support the implementation of the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*.[1] Key provisions of the *Ontario Water Resources Act* were also proclaimed. Together, these changes, which came into force on January 1, 2015, enable increased government oversight of water takings from the Great Lakes-St. Lawrence River Basin, including new or increased transfers between Great Lakes watersheds.

Background

Ontarians depend on the fresh water resources of the Great Lakes for many aspects of their lives: for drinking, agricultural purposes, industrial processes and recreation. The Great Lakes are also critical to sustaining healthy ecosystems. But the water resources of the Great Lakes-St. Lawrence River Basin[2] are not infinite. The ever-growing demand on fresh water supplies, coupled with the anticipated effects of climate change, threaten Great Lakes water levels, putting at risk ecosystems, drinking water sources, and fishing and shipping industries essential to Ontario's economic prosperity.

Water Takings and Transfers in the Great Lakes:
For all of the above reasons, Ontario's water resources – and, in particular, withdrawals and transfers of water from one watershed to another – need to be managed wisely. The province's legislative and policy framework for managing water includes the regulation of water withdrawals of more than 50,000 litres per day through the Permit to Take Water Program under the *Ontario Water Resources Act* (*OWRA*), and a ban on transferring water out of the Great Lakes-St. Lawrence River Basin and Ontario's other major water basins[3] (for more information about the Permit to Take Water Program, see Part 3.4

[1] Ontario Regulation 225/14 (Water Taking and Transfer) made under the *Ontario Water Resources Act*, amending Ontario Regulation 387/04 (Water Taking Regulation) was filed with the Registrar of Regulations on November 27, 2014; this regulation came into force on January 1, 2015.
[2] Under Article 103 of the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*, the Great Lakes-St. Lawrence River Basin is the watershed of the Great Lakes and the St. Lawrence River upstream from Trois-Rivières, Quebec within the jurisdiction of the parties. Each Great Lake is considered its own watershed within this larger basin.
[3] Out-of-basin transfers are banned not only from the Great Lakes-St. Lawrence River Basin, but also from the Nelson Basin and the Hudson Bay Basin.

of our Annual Report). Until recently, however, transfers within the Great Lakes-St. Lawrence River Basin ("intra-basin transfers") were not specifically regulated. Intra-basin transfers can lower the level of an individual watershed, potentially putting stress on its ecosystems.

What is an "intra-basin transfer"?

An intra-basin transfer occurs any time that water is taken from one watershed and moved to another watershed – *even if the water is subsequently returned, in whole or part, to the original watershed.*

For example, if water is withdrawn from Watershed A and used in Watershed B (e.g., for an industrial process or as part of a drinking water system), the water was "transferred" the moment that it crossed the boundary from Watershed A to Watershed B.

The Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement:
Recognizing that the waters of the Great Lakes-St. Lawrence River Basin are a shared public treasure, the Premiers of Ontario and Quebec and the governors of the eight U.S. States bordering the Great Lakes[4] signed the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement* (the "Agreement") in December 2005. The Agreement requires the parties to take measures to ensure the sustainability of the region's water resources. In particular, the parties agreed to:

- take measures to ban out-of-basin transfers of water;
- regulate water takings from the basin and intra-basin transfers;
- develop and implement water conservation and efficiency goals, objectives and programs in each jurisdiction, based on basin-wide goals and objectives; and
- strengthen the scientific basis for sound decision making related to Great Lakes water management.

The Safeguarding and Sustaining Ontario's Water Act, 2007*:*
In 2007, to fulfil its commitments under the Agreement, the provincial government passed the *Safeguarding and Sustaining Ontario's Water Act, 2007* (*SSOWA*). The *SSOWA* banned out-of-basin water transfers as required by the Agreement. Out-of-basin transfers had, in fact, already been prohibited in Ontario by regulation since 1999, but the *SSOWA* enshrined the ban (and a number of exceptions to it) in legislation. The *SSOWA* also added a provision to the *OWRA* that formally incorporates the precautionary principle as it is cited in the Agreement. Additionally, it updated a number of the general water taking provisions of the *OWRA* to conform to the Agreement.

Regulating Intra-Basin Transfers under the OWRA:
Several of the amendments to the *OWRA* made by the *SSOWA* in 2007 were not proclaimed until 2015 – almost eight years later – as the necessary regulations to give them effect had not yet been made. In November 2014, the MOECC announced its intention to proclaim these provisions at the same time as it finalized the necessary regulatory amendments (discussed below). Most significantly, the newly proclaimed amendments to the *OWRA* enable the regulation of transfers of water between Great Lakes watersheds.

[4] The States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, and Wisconsin, and the Commonwealth of Pennsylvania.

While a permit to take water has long been required to take more than 50,000 litres of water per day, there were no formal restrictions on the movement of that water from one watershed to another within the basin. The MOECC Director had broad authority to impose conditions on permits to take water; however, there was no assurance that a Director would impose conditions on a permit that would control potential intra-basin transfers of water being taken from Great Lakes watersheds.

Now, water takings from Great Lakes watersheds that involve new or increased[5] intra-basin transfers of over 379,000 litres per day (the "threshold amount") are not allowed, with some well-defined exceptions based on standards established in the Agreement (see Figure 1). In particular, certain municipal drinking water systems may be permitted to exceed the intra-basin transfer threshold if the amount of the new or increased water taking that is lost through consumptive use (i.e., the portion of water that is withdrawn and not returned due to evaporation, incorporation into products or other processes) is less than 19 million litres per day, and if the following criteria are met:

- the new or increased transfer amount (less water lost through consumptive use) is returned, after use, to the same watershed from which it was taken;
- the transfer cannot be reasonably avoided through efficient use and conservation of existing water supplies;
- the amount of water transferred is reasonable given the purpose of the transfer;
- the transfer will not result in significant individual or cumulative impacts on the quantity or quality of the waters of the basin;
- the transfer incorporates water conservation and efficiency measures; and
- the transfer satisfies all other laws, as well as all other criteria included in regulations.

Users (be they municipal drinking water systems or others) may also be permitted to undertake intra-basin transfers of water based on the same thresholds and criteria if they can demonstrate that conservation of existing water supplies is not a feasible, environmentally sound and cost effective alternative to the transfer, and there are no other feasible, environmentally sound and cost effective alternatives. Notably, such users are not required to return the water to its source watershed "if it is not feasible, environmentally sound or cost effective to satisfy that criterion." In these circumstances, notice of the application for the permit authorizing the transfer must also be given to all of the parties to the Agreement.

There is also an exception for transfers (by anyone) for which the portion of the new or increased water taking that is lost through consumptive use is 19 million litres per day or more. In addition to meeting the criteria listed above, applications for such permits are subject to review by the Regional Body established under the Agreement. For this type of application, the Minister of the Environment and Climate Change (not an MOECC Director) is responsible for deciding whether to issue a permit.

[5] A "new transfer" is a transfer that arises either from a new water taking, or from a pre-existing water taking where no water was previously being transferred. An "increased transfer" is the transfer of an additional amount of water where there was a pre-existing water taking and transfer (based on *OWRA* subsection 34.5(1)).

Figure 1. Thresholds and restrictions for the permitting of water taking and new or increased intra-basin transfers under the *Ontario Water Resource Act*.

Other amendments to the *OWRA* made in 2007 but not proclaimed in force until 2015:

- enable the MOECC Director to impose a wider range of conditions in permits to take water, and to impose requirements on "related transferors" (i.e., people other than the permit holder);
- expand the Lieutenant Governor in Council's regulation making powers related to water taking and transfers; and
- require the MOECC to post for public comment a copy of the joint periodic assessment of the cumulative impacts of water taking required under the Agreement.[6]

For the ECO's detailed review of the *SSOWA*, please see Section 4.2 of the Supplement to the ECO's 2007/2008 Annual Report.

[6] In 2013, the parties released their first cumulative impact assessment report, covering the period 2006-2010. The report concludes that the cumulative hydrologic effect of consumptive uses and diversions is small relative to inflows (i.e., precipitation, surface water runoff to the lakes or river, diversions into some lakes, and connecting channel flows into each of the lakes or river). In fact, the report concludes that "the net effect of Consumptive Uses and Diversions is positive for the Basin," as "more water is diverted into the Basin than the total combined amount of water diverted out of the basin or withdrawn and not returned." However, the report noted that "the specific contribution made by Diversions and Consumptive uses at any given point in time or space, separate and apart from natural variability, is uncertain given the complex hydrologic, geographic and temporal variability of uses, and other factors" and that "a small hydrologic effect may still lead to significant impacts on ecosystems or other water uses depending on the scale or type of impacts being evaluated." See: Great Lakes-St. Lawrence River Water Resources Regional Body and great Lakes-St. Lawrence River Basin Water Resources Council (2013). *Cumulative Impact Assessment of Withdrawals, Cunsumptive Uses and Diversions 2006-2010*, page 3.

Table 1. Water Taking and Transfer Thresholds in Perspective.

***OWRA* Threshold**	**Threshold Amount (litres per day)**	**Equivalent to the Combined Daily Water Use of the Following Number of Ontarians:*[ǂ]**
Threshold for requiring a permit to take water	50,000	192
Threshold for requiring a permit for a new or increased intra-basin transfer	379,000	1,458
Limit on daily consumptive use	19,000,000	73,077

*****Based on average total daily water use of 260 litres per person per day in Ontario.
[ǂ] Numbers are rounded to the nearest person.

Amendments to Ontario's Water Taking Regulation

On November 27, 2014, the MOECC filed regulatory amendments to support the implementation of the Agreement. The regulatory amendments came into force on January 1, 2015. The MOECC stated that these amendments "are consistent with best practices in other jurisdictions," and "set a basin-wide, common decision-making standard for new proposals."

Many of the amendments to O. Reg. 387/04 (formerly the "Water Taking" regulation; now renamed "Water Taking and Transfer") were necessary in order for the 2007 amendments to the *OWRA* to come into force. Key aspects of these regulatory amendments are discussed below.

Compliance with the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement:
O. Reg. 387/04 already required the MOECC Director to consider certain matters (e.g., the impact of the water taking on the ecosystem, water availability, whether the water taking is in a high use watershed) when considering an application for a permit to take water. To align with the Agreement, the amendments to O. Reg. 387/04 require the MOECC Director to consider additional matters when making permitting decisions, including: the amount of water that will be lost through consumptive use; issues related to the return of water after use; and other matters including whether the water taking is in compliance with other laws or international agreements.

The amended regulation also confirms Ontario's obligations under the Agreement to provide all parties to the Agreement with prior notice of and an opportunity to comment on a proposal for a water taking in which the amount of water that would be lost through consumptive use exceeds 19 million litres. The regulation requires the Director to ensure that notice and an opportunity to comment are given prior to making a decision on such an application.

Establishing the Boundaries of Great Lakes Watersheds:
While the *OWRA* identifies the five Great Lakes watersheds for the purposes of intra-basin transfers (i.e., Lake Superior; Lake Huron; Lake Erie; Lake Ontario; and the St. Lawrence River), it left the job of defining the area comprising each watershed up to regulations.

Consistent with the Agreement and with practice in other jurisdictions, the amended regulation defines each of the Great Lakes watersheds to include its upstream and downstream connecting channels (see Table 2). As a result, connecting channels are considered part of more than one Great Lakes watershed; for example, the St. Mary's River is both a downstream connecting channel of Lake Superior, and an upstream connecting channel of Lake Huron. By defining the watershed boundaries in this manner, the movement of water from a Great Lakes watershed to its downstream connecting channel is excluded from the definition of an intra-basin transfer.

The regulation refers to a data file (including mapping), available on an Ontario government website, that shows the Great Lakes-St. Lawrence Basin watershed boundaries. Adjustments may be made to the watershed boundaries based on new or more detailed information.

Table 2. Great Lakes Watersheds and Their Upstream and Downstream Connecting Channels, as Defined in O. Reg. 387/04 (Water Taking and Transfer).

Name of Great Lakes Watershed	Upstream Connecting Channels	Downstream Connecting Channels
Lake Superior	not applicable	St. Mary's River
Lake Huron	St. Mary's River	Detroit River Lake St. Clair St. Clair River
Lake Erie	Detroit River Lake St. Clair St. Clair River	Niagara River
Lake Ontario	Niagara River	not applicable

Not only is the movement of water from a watershed to its downstream connecting channel not considered an intra-basin transfer, but the regulation specifically exempts an even broader class of transfers from the regulatory restrictions on transfers: transfers between the watershed of a Great Lake and a *watershed* of its downstream connecting channel. Based on this exemption, the regulatory restrictions would not apply to transfers of water from Lake Erie to Lake Ontario, because Lake Ontario is a watershed of the Niagara River – a downstream connecting channel of Lake Erie. Transfers between the St. Lawrence River and Lake Ontario are also exempt if the water is taken within 10 kilometres from the point at which Lake Ontario flows into the St. Lawrence River.

Direction for Determining Amounts of Water:
The amended regulation provides direction on how to calculate certain amounts of water referred to in the *OWRA*, including:

- average amounts of water;
- whether a new or increased transfer would meet or exceed the threshold amount (i.e., triggering the need for a permit);

- the amount of water that may be lost through consumptive use[7]; and
- deemed current transfers (the "baseline amount"), i.e., the maximum amount of water any holder is authorized to take under the holder's permit as of January 1, 2015. Transfers up to that amount will not be considered a new or increased transfer for purposes of the *OWRA* permit requirements.

The regulation also includes provisions for dealing with cases that involve multiple permits to take water, and for dealing with projects involving staged increases in water uses.

Exemption for Watering Livestock Theoretically Narrowed:
Water takings for the watering of livestock or poultry or for domestic purposes (other than for water taking by a municipal drinking water system or public utility) continue to be exempt from the requirement to obtain a permit to take water. However, water takers for those uses will require a permit for any new or increased transfers in excess of the threshold amount (379,000 litres per day). According to the MOECC, though, no existing livestock or poultry operation uses that volume of water per day.

Exemption for Permits to which the Environmental Assessment Act *Applies:*
Also under the amended regulation, permits to which the *Environmental Assessment Act* applies are exempt from the *OWRA* restrictions on intra-basin transfers if the environmental assessment for the project was approved before January 1, 2015 (or, in cases where the Municipal Class Environmental Assessment applies, the notice of completion was issued before January 1, 2015, and there is no outstanding "bump-up" request[8] for the project).

Amendments to the EBR *Regulation to Classify Water Transfer Permits*

In addition to the amendments to the water taking and transfer regulation, the MOECC amended O. Reg. 681/94 (Classification of Proposals for Instruments) under the *Environmental Bill of Rights, 1993* (*EBR*). Effective January 1, 2015, proposals for permits to take water that would allow intra-basin transfers of water under the *OWRA* are Class I proposals subject to the public notice and consultation requirements of the *EBR*.

As with other permits to take water, proposals for permits authorizing an intra-basin transfer for less than one year are not required to be posted on the Environmental Registry for public consultation. Proposals for permits to take water authorizing transfers of water for the purposes of irrigation of agricultural crops or watering livestock or poultry also need not be posted. Also excepted from public consultation requirements are proposals by a permit holder, made before January 1, 2017, for "deemed current transfers," i.e., requests to have the MOECC Director deem the permit holder to be currently transferring an amount of water specified by the Director (also known as "baseline amounts").

[7] Consumptive use is to be determined using general consumptive use coefficients, published in: Ontario Ministry of Natural Resources (2014). *Consumptive Use Coefficients – Reporting under the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement*, Technical Backgrounder.
[8] Under Part II of the *Environmental Assessment Act*, any person may request that the Minister of the Environment and Climate Change refer a proponent's application for approval of an undertaking (or a matter that relates to the application) to the Environmental Review Tribunal for a hearing and decision. This is commonly referred to as a "bump up" request.

Implications of the Decision

Intra-Basin Water Transfers are Finally Regulated

With these amendments, Ontario has put in place all of the regulatory measures required to fulfil its obligations under the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*. It has been a long time coming; the Agreement was signed almost ten years ago, and the necessary amendments to the *OWRA* were made in 2007, but could not come into force until these regulatory amendments were made.

In particular, the amended regulations provide the direction and clarity needed to enable the regulation of intra-basin transfers in the Great Lakes-St. Lawrence River Basin. Whereas previously only the taking of water required approval, as of January 1, 2015, anyone wanting to make a new or increased transfer of more than 379,000 litres of water per day from one Great Lakes watershed to another must obtain specific approval to do so. Regulating intra-basin transfers will ensure that only transfers meeting the requirements of the *OWRA* (and the Agreement) will be permitted, and will enable continued oversight of permitted transfers – something that was not required before. The requirement that water transferred under a permit must be returned to the same Great Lakes watershed from which it was taken should also ensure that more water remains in its source watershed (although that will depend, in part, on how strictly the exceptions to that requirement are applied).

However, the reach of these regulatory amendments is limited; not all intra-basin transfers are subject to the *OWRA*'s transfer prohibitions and restrictions. All pre-existing transfers (no matter how large) are exempt from the intra-basin transfer restrictions. In addition, any new transfers or increased transfers of less than 379,000 litres of water per day are not subject to the intra-basin transfer restrictions, including the requirement to return water to its source watershed. The definition of watershed boundaries and the exemptions exclude even more transfers (see next section, below).

Definition of Watersheds Excludes Potentially Significant Transfers

The decision to define a Great Lakes watershed's boundaries to include both upstream and downstream connecting channels could allow significant movements of water within the Great Lakes Basin, potentially affecting water levels, without the oversight afforded to intra-basin transfers. For example, water taken from Lake Huron and returned to the St. Clair River (a downstream connecting channel of Lake Huron) would ultimately end up in Lake Erie; however, this movement of water would not be considered an intra-basin transfer under the *OWRA*, and, consequently, the prohibition on intra-basin transfers, and corresponding criteria and environmental conditions applicable to permitting such transfers (including return after use requirements), would not apply. The exemption for transfers from one watershed to a watershed of a downstream connecting channel excludes even more transfers from the intra-basin transfer restrictions of the *OWRA*.

The MOECC's definition of watershed boundaries is consistent with the Agreement and the approach adopted by other jurisdictions. In a 2009 discussion paper on managing Ontario's water resources,[9] the

[9] In August 2009, the provincial government released a discussion paper for public consultation (Environmental Registry #010-6530) to seek input on implementing the *Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement*, as well as phase two of the water taking charges program. The paper, entitled *Stewardship – Leadership – Accountability. Safeguarding and Sustaining Ontario's Water Resources for Future Generations*, discussed options for: a provincial water

Ontario government explained that the reason for taking this approach to defining watershed boundaries would be "to address situations where communities take water from a Great Lake and discharge it to a downstream connecting channel" – presumably a reference to municipalities that currently divert water in that manner as part of their drinking water systems. But this broad definition, together with the additional exclusions, means that other, possibly significant, movements of water within the basin would be excluded from the intra-basin transfer restrictions of the *OWRA* altogether, including the protective environmental criteria established in the Agreement.

Water takings that involve movements of water but that do not qualify as intra-basin transfers under the *OWRA* will still require a permit for the water taking, triggering a consideration by the MOECC Director of such factors as the amount of water that will be lost through consumptive use and the return of water after use. However, there is no guarantee that such consideration would result in conditions being included in the permit that would be equivalent to the restrictions and environmental protections applicable to intra-basin transfers under the *OWRA*. Similarly, while the Director is empowered to include conditions in a permit governing the return of water after use, there is no assurance that such conditions would be included.

Enhanced Opportunities for the Public to Participate

Cumulative Impact Assessments:
Under the Agreement, the parties are required to periodically conduct joint assessments of the cumulative impacts of withdrawals, diversions and consumptive uses from each watershed of the basin. These assessments will inform reviews of the criteria for managing water takings and transfers, as well as basin-wide conservation goals and objectives.

With the final amendments to the *OWRA* made in 2007 now in force, future cumulative impact assessments prepared under the Agreement will have to be posted on the Environmental Registry. Further, the Minister of the Environment and Climate Change must highlight the parts of the assessment that "give consideration to climate change and other significant threats to the waters of the Great Lakes-St. Lawrence River Basin."[10] Members of the public will have the right to comment on what actions the Ontario government should take in response to the assessment. After considering those comments, the Minister must publish a response statement that summarizes the actions the government plans to take in response to the assessment. This process will enable Ontarians to more readily obtain information about the effects of water takings and transfers, and to participate more fully in the government's decisions resulting from that information.

Participation under the Environmental Bill of Rights, 1993*:*
Even without the amendments to O. Reg. 681/94, most proposals for permits to take water that authorize intra-basin transfers of over 379,000 litres per day would have been subject to the requirements of the *EBR*, since permits to take more than 50,000 litres of water per day were already prescribed. On the same basis, Ontario residents would have already had the right to seek leave to

conservation and efficiency strategy; managing new or increased intra-basin transfers in the Great Lakes – St. Lawrence River Basin; and implementing phase two water taking charges.
[10] Subsection 34.6(5) of the *Ontario Water Resources Act*.

appeal (i.e., challenge) a decision whether to issue a permit that authorizes an intra-basin transfer,[11] and to submit applications for review and investigation under the *EBR* related to such permits.

However, the amendment to O. Reg. 681/94 specifying that it applies to permits to take water that would authorize a new or increased transfer clarify the government's intent that the public be entitled to participate not only in decisions about the taking of water but also about the movement of that water from one Great Lakes watershed to another. It should also ensure that the MOECC includes relevant information about a proposed intra-basin transfer in the corresponding proposal notice for the permit posted on the Environmental Registry (including, for example, the watersheds involved and the ministry's rationale if it proposes to allow water to be returned to a different watershed than that from which it is to be taken), resulting in more transparent and accountable decision making by the ministry.

None of the 82 proposal notices for permits to take water posted on the Environmental Registry between January 1 and March 31, 2015 included any information about intra-basin transfers, so it remains unclear what information will be included in proposal notices for permits to take water that authorize intra-basin transfers. Because of the broad definition of the Great Lakes watershed boundaries and the various exceptions from the *OWRA* permitting requirements and *EBR* notice requirements, there will likely be few proposed permits authorizing intra-basin transfers, and even fewer that are actually posted on the Registry.

Public Participation & *EBR* Process

The MOECC gave notice of the proposed regulatory amendments (and its intention to proclaim the associated amendments to the *OWRA*) on the Environmental Registry (#012-1607) on April 24, 2014. The proposal was posted for a 46-day public comment period. In its decision notice, posted on November 27, 2014, the MOECC stated that it received 21 comments on the proposal.

The MOECC reported that it held public engagement sessions on the proposal in Sault Ste. Marie, Toronto, Kingston and London. The ministry also met with regulated water users and First Nations in July and August 2014 to discuss implementation of the Agreement.

In addition to public consultation on the notice posted in April 2014, the ministry reported that in developing the proposed regulatory amendments, it considered comments on a discussion paper regarding intra-basin transfers that the ministry released in August 2009. The ministry received 61 comments in response to that discussion paper. Further, the MOECC reported that between 2009 and 2011, the MOECC and the Ministry of Natural Resources and Forestry regularly consulted with an Agreement Advisory Panel (consisting of representatives of the municipal, industrial/commercial and agricultural sectors, environmental non-governmental organizations and First Nations) for input on potential approaches for managing intra-basin transfers, among other things.

Commenters were strongly supportive of fulfilling Ontario's commitments under the Agreement, and in particular the proclamation of the amendments to the *OWRA* made by the *SSOWA*. However, many also had concerns about specific aspects of the proposed regulatory amendments. In particular, several commenters were disappointed by Ontario's decision to define the Great Lakes watersheds to include both downstream and upstream connecting channels. Not swayed by the fact that the definition is

[11] Appeals are made to the Environmental Review Tribunal. This third-party right to seek leave to appeal under the *EBR* is a unique opportunity for the public to participate in important and environmentally significant government decisions.

consistent with that used in the Agreement and by other jurisdictions, many commenters argued that this definition is not based on science and will effectively exclude large intra-basin transfers from provincial oversight or monitoring under the Agreement. Only two commenters (representing municipal drinking water systems) explicitly supported the definition of watershed boundaries and the exemption for transfers to the watershed of a downstream connecting channel.

Some commenters opposed requirements to return water to the source watershed from which it was taken; others, by contrast, asserted that the regulations should do more to ensure that water is returned to its source watershed as close as possible to the withdrawal point, to protect sub-watersheds. Commenters also raised concerns about other issues such as: access by smaller municipal water systems to ground water in adjacent watersheds; the use of a 90-day period to calculate average amounts of water taken per day; deemed current transfers; application of the regulation, particularly consumptive use requirements, to agriculture; and Aboriginal water rights in the context of the regulatory proposal and the Agreement. One industry commenter asserted that the ministry did not provide enough time for public comment, and noted that the ministry could have provided additional time under the *EBR.*

Environmental non-governmental organizations supported classifying proposals for intra-basin transfers under the *EBR.* However, some were disappointed that transfers for some uses are exempted, and urged the MOECC to take steps to ensure that all permits authorizing intra-basin transfers are subject to the *EBR* regardless of the use to which the transfer is being made.

Statement of Environmental Values

The MOECC confirmed to the ECO that it considered its Statement of Environmental Values in making this decision, as required by the *EBR*. In particular, the ministry reported that it considered the principle of environmental management, asserting that the regulatory changes will enhance the protection, sustainable use and management of the basin waters. The ministry also confirmed that it considered the principle of strategic management, stating that the decision enhances public engagement by requiring proposals for new or increased intra-basin transfers or consumptive uses to be posted on the Environmental Registry for public consultation.

Further, the MOECC confirmed that it considered the social and economic impacts of the regulatory amendments, and stated: "the ministry has developed a balanced approach toward regulating intra-basin transfers and managing water withdrawals and consumptive use while meeting the standards of the Agreement, conserving water, and minimizing the regulatory burden on Ontario's water users."

Other Information

Amendments to the Safe Drinking Water Act, 2002

In addition to amendments to the *OWRA*, the *SSOWA* made amendments to the *Safe Drinking Water Act, 2002* that could not be proclaimed in force until these regulatory amendments were made. Specifically, the amendments to the *Safe Drinking Water Act, 2002* require applicants for approval of new municipal drinking water systems to provide proof that they have a permit to take or transfer water, and to require the MOECC Director to ensure that a permit has been issued before granting such approval.

The Water Taking Charge

The *SSOWA* also gave the Ontario government authority under the *OWRA* to develop regulations to charge commercial and industrial users a fee for the water that they take and use. Accordingly, in 2009 the MOECC began charging a small water-taking fee to certain permit to take water holders under O. Reg. 450/07 (Charges for Industrial and Commercial Water Users), made under the *OWRA*.
For a discussion of the water-taking charge program, see Part 3.3 of our Annual Report.

Water Conservation and Efficiency

In November 2010, the government of Ontario passed the *Water Opportunities and Water Conservation Act, 2010,* which amended four provincial statutes[12] and created the *Water Opportunities Act, 2010*. The purpose of the legislation is to foster the growth of an Ontario-based industry in water and wastewater technologies and services. The legislation also helps the Ontario government meet its water conservation and efficiency commitments under the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*. In November 2012, Ontario adopted basin-wide water conservation goals and objectives, identical to those developed in 2007 under the Agreement.

Also in 2012, the MOECC released Ontario's Great Lakes Strategy, which commits to fulfilling Ontario's responsibilities under the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement*. The Strategy includes, as a potential action, "assessing programs on meeting Ontario's water conservation goals and objectives, and reporting regularly."

For more information about the *Water Opportunities and Water Conservation Act, 2010,* see Part 5.4 of the ECO's 2010/2011 Annual Report. To see what the ECO had to say about *Ontario's Great Lakes Strategy*, see Part 5.1 of the ECO's 2012/2013 Annual Report.

ECO Comment

With four of the five Great Lakes and the St. Lawrence River within its borders, Ontario has more power than any other party to the Agreement to curb intra-basin transfers and to conserve and protect the waters of the Great Lakes watersheds. The regulatory amendments necessary to regulate intra-basin transfers, and fully satisfy Ontario's commitments under the Agreement, are now in place – but the ECO is dismayed that it took so long to happen.

Back in 2007/2008, upon the passage of the *SSOWA,* the ECO called for greater restrictions on intra-basin transfers to minimize potential harm to ecosystems within the basin. At the time, the MOECC said that it wanted to pass the *SSOWA* quickly to establish the framework for implementing the Agreement, and explained that a new policy decision to include more strict provisions than those in the Agreement would require substantive dialogue and debate and, therefore, more time. However, after eight years – ample time for policy development and consultation – the Ontario government has maintained the *status quo* in the amended *OWRA* regulations, aligning the province's rules with the Agreement but going no further.

[12] The *Ontario Water Resources Act, 2010*; the *Building Code Act, 1992*; the *Green Energy Act, 2009*; and the *Capital Investment Plan Act, 1993*.

In the 2013 Cumulative Impacts Assessment for the basin,[13] the parties to the Agreement concluded that, while the cumulative hydrologic effects on water levels of diversions and consumptive uses in the basin are small, they "may still lead to significant impacts on ecosystems or other water use depending on the scale or type of impacts being evaluated." The report also identified uncertainties about the specific contribution made by diversions and consumptive uses due to "the complex hydrologic, geographic and temporal variability of uses, and other factors."

Given this uncertainty and the potential for significant ecosystem harm, as well as the recognition of the precautionary principle in both the Agreement and the *OWRA*, the ECO is disappointed that the Ontario government did not prove more cautious in these regulatory amendments. For example, although the *OWRA* provides regulation-making power to lower the consumptive use threshold that triggers additional restrictions on transfers (currently 19 million litres per day), the government chose to maintain the *status quo.* Lowering this threshold may not have resulted in less consumptive use, but it would have, at a minimum, broadened the scope of the government's oversight of transfers within the basin and increased transparency and accountability for decisions to approve high-volume consumptive uses.

Perhaps most significantly, the government should have narrowed the boundaries of the Great Lakes watersheds so that more water takings would be subject to the restrictions and environmental protections applicable to intra-basin transfers under the *OWRA*. The ECO shares commenters' concerns about the definition of the Great Lakes watershed boundaries, which amounts to a blanket exemption for the movement of water between watersheds and their downstream connecting channels (and even the watersheds of their downstream connecting channels). This definition goes well beyond accommodating the needs of particular users that rely on such movement of water. A more targeted approach would have been for the province to create specific exemptions for certain types of users, while still regulating other, potentially large new or increased transfers of water from one Great Lakes watershed to another.

The ECO is pleased that the MOECC promptly classified permits to take water that authorize new and increased water transfers under O. Reg. 681/94 to confirm that they are subject to the public participation provisions of the *EBR*, as is appropriate. Further, with the proclamation of the *OWRA* amendments made under the *SSOWA* the public will now also be entitled to comment on cumulative impact assessments prepared under the Agreement, and to be told what steps the Ontario government will take in response to those assessments. Access to information about cumulative impacts will enhance the public's ability to participate in important decisions about water takings and transfers within the basin.

The ECO urges the MOECC to rigourously evaluate the effects of *all* water takings and transfers within the basin, and to ensure that all permits to take water include conditions that are as protective as possible of the Great Lakes watersheds. The MOECC should review and revise the Act and regulations as warranted – with full public consultation – to ensure that Ontario's management of the Great Lakes is and continues to be ecologically sustainable.

[13] This report was not posted on the Environmental Registry, as it pre-dated the proclamation of the amendments to the *OWRA* made by the *SSOWA*. Future Cumulative Impact Assessments must be posted on the Environmental Registry.

1.3 Ministry of Natural Resources and Forestry

Review of Posted Decision:

1.3.1 Policy Guidance on "Harm and Harass" under the *Endangered Species Act, 2007*

Decision Information

Registry Number: 011-9405
Proposal Posted: July 10, 2013
Decision Posted: August 14, 2014
Comment Period: 47 days
Number of Comments: 15
Decision Implemented: August 8, 2014

Description

Overview

One of the key ways that the *Endangered Species Act, 2007* (*ESA*) is intended to protect species at risk in Ontario is by prohibiting the killing, harming or harassing of a member of an extirpated, endangered or threatened species. However, until recently there was no formal guidance to support the application of this prohibition; in particular, there was no explanation of what it means to "harm" or "harass."

In August 2014, the Ministry of Natural Resources and Forestry (MNRF) finalized *Policy Guidance on Harm and Harass under the Endangered Species Act* (the "Policy"). The Policy sets out the approach for assessing whether a proposed activity is likely to kill, harm or harass a threatened or endangered species. The Policy will guide both the ministry and proponents in determining whether the *ESA* prohibition will likely apply to a given situation, and, consequently, whether the proponent should obtain authorization from the ministry before proceeding with the activity.

Background

The Endangered Species Act, 2007:
The *ESA* has three purposes: 1) to identify species at risk; 2) to protect species at risk and their habitats, and promote species recovery; and 3) to promote stewardship activities to assist in the protection and recovery of species at risk.

An independent group of scientific experts, the Committee on the Status of Species at Risk in Ontario (COSSARO), assesses and reviews species' at-risk status. Based on COSSARO's assessments, species determined to be at risk are listed in a regulation (O. Reg. 230/08 (Species at Risk in Ontario List)) and classified into one of four categories: special concern, threatened, endangered or extirpated. The level of protection afforded to a listed species under the *ESA* depends on this classification.[1]
Fundamental to the *ESA* are two provisions:

[1] For example, the Act's prohibitions on harming or harassing a member of a protected species or damaging or destroying their habitat only apply to species classified as extirpated, endangered or threatened; not to species of special concern. Similarly, recovery strategies are required for endangered and threatened species, while only management plans are required for species of special concern.

- Section 9, which prohibits killing, harming, harassing, capturing or taking a live member of a species listed as extirpated, endangered or threatened, as well as activities such as possessing, transporting, collecting, buying and selling those species; and

- Section 10, which prohibits damaging or destroying the habitat of a species listed as endangered or threatened.

The Act allows for exemptions from the section 9 and 10 prohibitions in certain circumstances, provided the proponent obtains an authorization from the MNRF. For example, the Minister may issue a permit authorizing an activity otherwise prohibited under sections 9 or 10 if an "overall benefit" to the species will be achieved through requirements imposed by the permit. In some circumstances, the MNRF may also authorize an otherwise prohibited activity by way of an agreement with the activity's proponent.

Initially, project-specific permits and agreements were the only way a proponent could get an exemption from the *ESA* prohibitions. All requests for these exemptions were reviewed individually by the MNRF. However, as part of the ministry's transformation plan (see Part 2.1 of the ECO's 2012/2013 Annual Report), the Ontario government made extensive *ESA* regulatory amendments in 2013. These amendments exempt proponents of a broad range of activity types from the need to obtain a permit or agreement to contravene the *ESA's* prohibitions. Activity types include: forest operations; hydro-electric generating stations; mineral exploration; drainage works; and pits and quarries. Instead of obtaining an approval for an activity that would otherwise result in the contravention of one or both of the *ESA* prohibitions, proponents of these activity types are now simply required to follow rules set out in a regulation.[2] Under most of these new exemptions, proponents must register a notice of the activity with the MNRF.

You can find a more thorough overview of the *ESA* in the ECO's special reports about the Act, *The Last Line of Defence* (February 2009) and *Laying Siege to the Last Line of Defence* (November 2013).

The Harm and Harass Policy

For the first six years that the *ESA* was in force, there was no formal guidance to assist proponents with interpreting the section 9 prohibition. In particular, there was no uniform definition of what it meant to "kill," "harm" or "harass" a species. This left open questions such as whether indirect or delayed effects of a proposed activity could be considered contraventions of the Act.

In 2010, the ECO became aware that MNRF staff were relying on unpublished, internal policy guidance to interpret section 9. Despite the ECO's urging at that time, the MNRF failed to post the guidance on the Environmental Registry for public notice and consultation. Eventually, in 2013, the MNRF posted a draft policy on the Environmental Registry (#011-9405) and, in August 2014, released the final document, *Policy Guidance on Harm and Harass under the Endangered Species Act.*

The purpose of the Policy is to "outline the overall approach and considerations that the Ministry or a proponent will use in determining whether a proposed activity is likely to kill, harm or harass a member of a protected species under clause 9(1)(a) of the *ESA*." The Policy states that "this determination will be carried out primarily in the context of determining whether it is advisable for the proponent to apply

[2] For example, proponents may be required to prepare a mitigation plan for minimizing the effects of the activity on species at risk.

for an authorization (e.g., permit) or register a notice of activity under the Act prior to proceeding with the activity." (See "Carefully Chosen Words," below, for a discussion of the ministry's very deliberate wording of the purpose of this Policy.)

However, the Policy "first and foremost" encourages proponents to look for opportunities to carry out their activities without causing adverse effects on species at risk or their habitat. It also provides examples of potential alternative approaches such as changing the timing, methodology or location of an activity to avoid causing adverse effects on a protected species.

Carefully Chosen Words: for Activities "Likely" to Harm or Harass, it is "Advisable" to Seek a Permit or Register

Unlike the prohibitions in some other environmental statutes (for example, the *Environmental Protection Act*), the *ESA* does not prohibit activities; it only prohibits certain effects of an activity. In other words, the *ESA* does not prohibit an activity that *is likely to* or *may* kill, harm or harass a species; section 9 only prohibits the *actual* killing, harming or harassing of a member of a protected species. Consequently, the Act does not technically require proponents to have a permit or register in order to undertake any activity, even if the activity is likely to kill, harm or harass. However, if they proceed with the activity and *actually* kill, harm or harass without such authorization, they could be prosecuted under section 9.

In *Policy Guidance on Harm and Harass under the Endangered Species Act*, the ministry takes the position that if an activity is "likely" to kill, harm or harass, then the proponent should apply for a permit or register the activity prior to proceeding. The ministry's rationale appears to be that if the anticipated harm or harassment does in fact ensue as a result of an authorized activity (then – and only then – triggering the section 9 prohibition), the proponent would nonetheless be compliant with the *ESA* and not be exposed to prosecution.

The Policy defines key terms used in the section 9 prohibition:

> **Kill** – "An activity that kills a living member of a protected species is one that results in the death of the member."
>
> **Harm** – "An activity that harms a living member of a protected species is one that results in a physical injury, or change to one or more of its physiological processes, and adversely affects the ability of the member to carry out one or more of its life processes."
>
> **Harass** – "An activity that harasses a living member of a protected species is one that disrupts its normal behaviour in a manner that adversely affects the ability of the member to carry out one or more of its life processes."

In addition to these definitions, the document includes a glossary of additional terms that are central to applying the Policy. For example, for the purposes of the Policy, "activity" includes "all the components associated with all stages of the activity," including "components associated with site access and investigation, site preparation and construction, operation and maintenance, closure, decommissioning and completion, and rehabilitation and restoration stages." The glossary also explains terms such as "delayed effects," "indirect effects" and "life processes."

The Policy sets out six "guiding principles" to consider when assessing a proposed activity's likelihood of killing, harming or harassing a member of a protected species:

1. **Species protection and recovery** – Determining whether an activity will adversely affect a member of a protected species requires consideration of how the activity is expected to affect the ability of that member to carry out its life processes. Life processes are processes that support a member of a species' survival and normal development such as reproduction, rearing, feeding, hibernation, resting, dispersal, migration and diurnal movement. Activities that do not adversely affect the ability of a member of a protected species to carry out its life processes would generally not be considered to harm or harass that member.

2. **Uncertainty and risk management** – The best available scientific information, including information obtained from community knowledge, is to be used to determine whether an activity is likely to kill, harm or harass a protected species. Where there is scientific uncertainty regarding a species' biology or the effects of a proposed activity on a species, such uncertainty is "not considered a justifiable reason to postpone assessment decisions." The Policy mandates the use of a risk management approach, meaning that if the effects of an activity on a protected species cannot be predicted with reasonable confidence, "determinations will generally err on the side of caution in favour of affording greater protection to the species."

3. **Adaptive management** – New knowledge about species at risk, their needs and the effects of human activities on them is gained through research and monitoring activities. As the MNRF's understanding grows, the ministry's "future approaches, guidance and decisions for protecting and recovering species at risk will be adapted accordingly."

4. **Presence of a species** – To determine whether a member of a protected species will be present when a proposed activity is taking place or if the member will be affected by any delayed effects of the activity, a proponent should consider evidence of species' presence. Evidence may include: known species occurrences; auditory or visual observations of the species; observations of dens, nests, hibernacula, eggs or other features; or other evidence suggesting the presence of the species.

5. **Case-by-case determinations** – Because the biology and behaviours of a species are unique, determining whether an activity at a particular location is likely to kill, harm or harass species at risk will generally need to be done on a species-by-species, case-by-case basis.

6. **Ecological relationships** – In determining whether an activity is likely to kill, harm or harass a particular protected species, a proponent must consider the importance of any ecological relationships that the species depends on to carry out their life processes, and how those relationships are likely to be affected by the activity.

The Policy establishes a framework for evaluating whether a proposed activity is likely to kill, harm or harass a protected species. The framework involves making two key determinations: (1) the likelihood that an anticipated effect on a protected species will occur, based on the activity details; and (2) the severity of the effect on the species, based on biological factors (see Table 1).

Table 1. Considerations in Determining the Likelihood of Killing, Harming or Harassing a Member of an At-risk Species. (Source: Based on Ontario Ministry of Natural Resources and Forestry, *Policy Guidance on Harm and Harass under the Endangered Species Act*, August 2014).

Key activity-related details (likelihood)	Key biological factors (severity)
• Proximity to species • Timing • Intensity • Duration and persistence of effects • Frequency • Permanency	• Site fidelity • Concentration of individuals • Mobility • Ecological sensitivities • Current condition • Life stage • Response to disturbance

The framework includes a short explanation for each of the activity-related details and biological factors, including some advice regarding circumstances in which, generally, there will be a greater risk that the activity will kill, harm or harass. For example, there is a greater risk if an activity occurs within or near areas where members of a protected species show site fidelity. Similarly, an activity that is likely to affect members of a species during a particularly sensitive period of time, such as spawning or nesting, is generally more likely to kill, harm or harass. In some cases the advice is less clear-cut: for example, the Policy notes that having limited mobility (a biological factor) may put a protected species at greater risk of being killed, harmed or harassed, but goes on to explain that in other circumstances a highly mobile species may be at greater risk of being killed, harmed or harassed.

The MNRF notes in the Policy that both the activity details and biological factors are to be considered collectively, not in isolation. The ministry also acknowledges that not all activity details or biological factors will be relevant in every case. In the case of activity details, the ministry advises that "consideration of direct and indirect effects and immediate and delayed effects of an activity are important when evaluating the activity-related details" and that all components of an activity should be considered. Finally, the Policy recognizes that cumulative effects of other human activities and natural events may intensify the effects of a proposed activity on a protected species.

The likelihood and severity of the effects of the activity are to be evaluated on a continuum from low to high in order to determine whether the proposed activity is likely to kill, harm or harass. As likelihood and severity of the effects both increase, so does the likelihood that an activity will kill, harm or harass a protected species (see Figure 1).

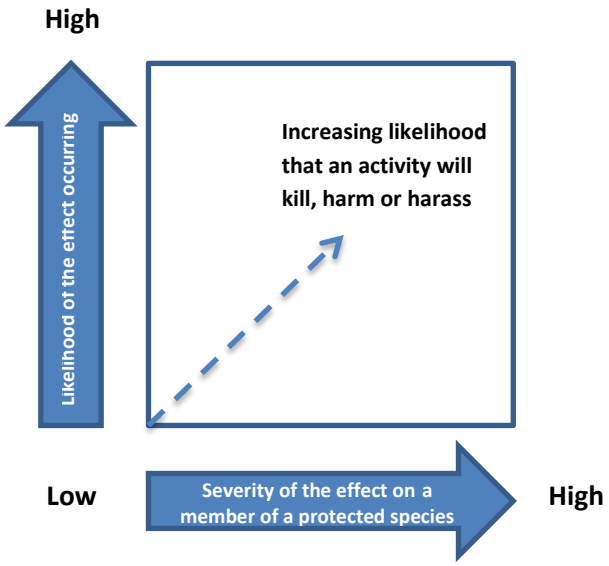


Figure 1. Diagram representing the MNRF's approach to determining whether an activity is likely to kill, harm or harass a protected species. (Based on Ontario Ministry of Natural Resources and Forestry, *Policy Guidance on Harm and Harass under the Endangered Species Act*, August 2014).

Implications of the Decision

Terms and Intent are Clarified

The definitions of key terms provide important guidance for determining whether an activity would, in fact, contravene the section 9 prohibition. The clarification of the meaning and scope of the terms "harm" and "harass" is particularly helpful – for example, prior to this guidance it was not clear that, to be considered harm or harassment, an activity must adversely affect the ability of the member of a protected species to carry out one or more of its life processes. The direction that an assessment of whether an activity will kill, harm or harass must include a consideration of all components of the activity, as well as a consideration of direct, indirect and delayed effects, is also of key importance.

Similarly, the guiding principles provide helpful clarification – for example, that determinations should include a consideration of ecological relationships, and should generally err on the side of caution in the face of uncertainty about potential effects of an activity. Perhaps most significantly, the Policy confirms that assessments are to be made on a case-by-case basis.

Finally, the lists of activity details and biological factors to be used to evaluate the likelihood and severity of potential effects of an activity create a baseline of information that, if relevant, must be considered in every assessment. The explanations of those details and factors enhance this guidance.

Together, the clarification of key terms, guiding principles and lists of details and factors should support a level of consistency in assessing activities that was not possible before this Policy was released. The guidance will also help proponents and ministry staff demonstrate their reasoning, based on the Policy, for arriving at a particular decision regarding an activity.

Yet Uncertainty, Inconsistencies will Persist

The value of formal guidance on how to interpret and apply the *ESA* (or any statute) is to provide greater certainty for those to whom it applies. As noted above, the definitions, guiding principles and lists of details and factors to be considered should improve the ability of proponents and ministry staff to determine whether a proposed activity is likely to kill, harm or harass protected species. Nevertheless, the MNRF's framework remains open to broad interpretation.

There is little guidance on how to identify or consider direct, indirect, immediate and delayed effects when evaluating activity-related details. There is also no real guidance about how to incorporate additional considerations, such as ecological relationships or cumulative effects, into the analysis. In essence, the Policy merely lists factors and details to consider on a case-by-case basis. The process of assessing an activity remains largely subjective.

Most importantly, there is little practical advice for determining where to place a proposed activity on the likelihood/severity continuum (essentially a sliding scale of low to high risk of harm), or how to interpret the result. This is probably the greatest source of uncertainty in the Policy (see the next subsection for further discussion of this problem).

As a result, following this guidance may not provide sufficient certainty for proponents about whether they should seek a permit or register an activity. If a proponent assesses an activity in accordance with the Policy and concludes in good faith (with or without ministry input) that a permit or registration is not advisable, but – contrary to expectations – the activity harms or harasses a member of a protected species, the proponent could be prosecuted. This uncertainty may lead some proponents, out of an abundance of caution, to seek permits or register activities even in cases where the likelihood of harm is negligible.

Threshold for Seeking Authorization is Undefined

It is clear that proponents of activities that are certain to kill, harm or harass should obtain a permit or register the activities to avoid contravening the *ESA*. However, it is implicit in the Policy that there is some lower level of risk (i.e., likelihood) of harm to a protected species that does not merit a recommendation that the proponent seek a permit or registration; otherwise, the Policy's low-high continuum for the likelihood and severity of adverse effects would be unnecessary as it would simply be a question of whether there was any risk at all. On the continuum, it is only when the likelihood of harm reaches some undefined threshold that it will become advisable for the proponent to obtain a permit (or register the activity).

Unfortunately, the MNRF does not clearly articulate the existence of this threshold, or explain what the threshold is. This latter omission is likely because it would be extremely difficult to identify a single threshold of risk that would address the specific circumstances of all endangered and threatened species. However, some guidance is necessary to assist proponents in identifying that threshold on a case-by-case, species-by-species basis. Without this direction, proponents are left in the position of not being able to confidently interpret the significance of an activity's position on the continuum – or, more to the point, whether they should apply for a permit or register a notice of activity.

Public Participation & *EBR* Process

The MNRF posted a policy proposal notice on the Environmental Registry on July 10, 2013 and provided 47 days for the public to submit comments. On August 14, 2014 – almost a year after the comment period closed – the MNRF posted a decision notice on the Environmental Registry. The ministry reported that it received 15 comments, the majority of which, according to the ministry, were generally supportive of the proposal. Commenters included environmental non-governmental organizations, industry associations, government bodies (federal and provincial) and others.

Comments on the draft Policy included concerns that the guidance is too vague and discretionary; several commenters stated that the Policy needs clearer, stronger, more definitive language. Some commenters argued that the draft Policy needed to be more precautionary, could be strengthened by requiring a consideration of community knowledge, or should require cumulative effects to be considered as part of the assessment framework. Others argued that the Policy was already too strict, setting a tone of "no risk tolerance," "manage to zero," and "protection at all cost," and that it gives too much power to MNRF district staff to decide whether or not to grant authorizations. One commenter identified a need for balance in the guideline between protecting species at risk and socio-economic realities.

Some commenters were concerned about the implications of the Policy for particular sectors. For example, one commenter argued that agriculture should be exempt from the Policy given the stability of agricultural landscapes and their ability to both provide habitat for species at risk and produce food. Similarly, commenters encouraged the government to recognize the positive role that sustainable forest management practices can have on enhancing and maintaining species at risk habitat, and noted that local populations have flourished in conjunction with forest management activities that have taken place for generations.

In the decision notice posted on the Environmental Registry, the MNRF identified four minor changes that it made to the final Policy based on the public's comments:

- Revising language to reflect the regulatory changes to the *ESA* that resulted from the recent modernization of approvals process;
- Clarifying that the list of factors identified in the Policy is not exhaustive, but represents the more important factors (although the ECO observed little such clarification in the final policy other than the addition of the word "key" in front of "biological factors" and "activity-related details");
- Clarifying that "best available information" includes community knowledge; and
- Replacing the terms "offsite/onsite effects" with "direct/indirect effects," to better align with existing policy under the *ESA*.

Statement of Environmental Values

The MNRF supplied the ECO with a copy of its Statement of Environmental Values (SEV) consideration document. The document detailed several principles of resource stewardship from the ministry's SEV that the ministry considered in the context of the proposal. For example, in reference to the principle that "an ecosystem approach to managing our natural resources enables a holistic perspective of social, economic and ecological aspects and provides the context for integrated resource management," the

ministry reported that "the policy recognizes the need to consider the details of the proposed activity along with the cumulative effects of other human and natural alterations occurring at or near a member of a protected species in determining whether an activity will kill, harm or harass an individual."

Other Information

Guidance for Prohibition on Damaging or Destroying Habitat

In 2012, the MNRF released its policy guidance on applying the section 10 prohibition on damaging or destroying the habitat of endangered or threatened species, *Categorizing and Protecting Habitat under the Endangered Species Act*. The ECO reviewed that policy in Part 2.4 of our 2011/2012 Annual Report, and found that it could lead to inconsistent – and potentially damaging – decisions regarding permitting needs because of the ministry's subjective, sliding-scale approach to determining whether a proposed activity was likely to damage or destroy the habitat of protected species.

ECO Comment

The ECO recognizes that developing a methodology for predicting future outcomes of an activity on species at risk can be challenging. Developing this Policy was likely a difficult task for the MNRF, given the case-by-case nature of predicting the effects of a specific activity on a particular species at a given location. In this context, the ECO is pleased that the MNRF has finally released some guidance on how it will make these determinations, by clarifying terminology and providing direction on the approach to be taken. It is also encouraging that the MNRF emphasizes, above all, avoidance of harm by considering alternatives to activities that cause adverse effects on species at risk or their habitats.

Unfortunately, however, the guidance falls short in terms of practical application. While a determination of whether an activity is likely to harm or harass a protected species may ultimately be species- and case-specific, the MNRF could have provided more detailed direction on how to rank an activity's likely effects and the severity of those effects on the continuum – and how to interpret the result. The Policy should also provide more guidance on how to incorporate considerations such as ecological relationships and cumulative effects into the analysis. Examples of activities that have been evaluated using the Policy's approach would have been helpful. It could have been even more instructive to include sample evaluations showing, step-by-step, how the Policy framework is intended to function.

The MNRF has made a legitimate policy decision that activities with a lower level of risk may proceed without seeking authorization or registration. However, what that level of risk is remains unclear (and may not be the same for every species). The ministry should have been explicit that such a threshold exists and explained its rationale for taking that approach. And while defining one specific threshold may not be realistic, the MNRF could do more to explain to proponents – at least qualitatively – how to determine what the threshold should be on a case-by-case basis. Ideally, the ministry would establish a relatively low threshold by recommending that a proponent obtain a permit or register when there is any reasonable likelihood of harming, harassing or killing. Not only would this impose certain obligations and restrictions on more proponents to protect the species in question (as well as provide certainty for proponents that they will not be prosecuted if, in fact, they kill, harm or harass a member

of a protected species), but it would enable the ministry to maintain oversight of most potentially risky activities so that it may enforce the *ESA* and its regulations if necessary.

Given the species-specific nature of applying the *ESA*'s prohibitions, the MNRF should do everything it can to supply proponents with information about protected species that may be affected by a proposed activity. A starting point would be to include, in government response statements for endangered and threatened species,[3] guidance regarding types of activities the government would or would not consider to be likely to harm or harass members of a particular species. The MNRF already takes this approach in the context of the *ESA* prohibition on damaging or destroying habitat, by identifying, in Habitat Protection Summaries, activities that are generally compatible or not compatible with regulated habitat. While such guidance could not realistically cover every conceivable activity (or address all site-specific circumstances), it would take some of the guesswork out of the process for proponents of many of the most common activities, and result in more consistent application of section 9 in general.

[3] A government response statement is a document required under subsection 11(8) of the *ESA* that summarizes the actions that the government intends to take in response to a recovery strategy for threatened and endangered species.

Review of Posted Decision:

1.3.2 Range Management Policy in Support of Caribou Conservation and Recovery

Decision Information

Registry Number: 011-9448
Proposal Posted: July 10, 2013
Decision Posted: December 29, 2014

Comment Period: 89 days
Number of Comments: 31
Decision Implemented: December 17, 2014

Description

Overview

In December 2014, the Ministry of Natural Resources and Forestry (MNRF) released its *Range Management Policy in Support of Woodland Caribou Conservation and Recovery* (the "Range Management Policy"). This policy explains how the MNRF will consider the condition of woodland caribou (forest-dwelling boreal population) ranges when assessing and authorizing specific activities, as well as in broader planning and decision-making processes. The policy seeks to manage species habitat and cumulative disturbance in order to support self-sustaining caribou populations. In circumstances where the MNRF is not the approval authority for an activity within a caribou range, the Range Management Policy will act as the basis for any advice provided by the MNRF to the authorizing agency.

Background

The woodland caribou (*Rangifer tarandus caribou*) is an iconic Canadian species and an important part of the boreal forest ecosystem. Once widespread in the province, expansion of human settlement and development has contributed to the loss of as much as 40 to 50 per cent of the historic area of caribou distribution since the mid-1800s. Ontario's forest-dwelling boreal population of woodland caribou ("caribou") is listed as threatened under the *Endangered Species Act, 2007* (*ESA*) and forms part of the threatened boreal population under the federal *Species at Risk Act*. There is also a forest-tundra woodland caribou ecotype in Ontario, which resides further north and is not currently considered to be at risk.

Caribou require large tracts of habitat and prefer mature, undisturbed coniferous forest or peatlands mixed with hilly or upland areas. They generally avoid areas of younger, recently disturbed forest, which provide them with little food and are favoured by other species (e.g., moose, deer) that attract predators like wolves and black bears. Caribou also have specific habitat requirements for calving and post-calving periods. Females generally travel to isolated areas with abundant food (e.g., lichens) to calve, and often return to these same areas over and over. In addition to the condition of the habitat itself, connectivity within and between habitat areas is important to enable seasonal movement, disturbance avoidance and genetic exchange.

The loss, degradation and fragmentation of habitat are serious threats to caribou. Natural events (such as forest fires and forest blowdowns) and human activities (such as forestry, mining, oil and gas exploration and development, hydro-electric development and tourism) can contribute to cumulative

habitat disturbance. Such disturbances not only cause direct physical loss of habitat, but also indirectly threaten caribou by increasing predation pressure.

Other threats to caribou include: disease and parasites; hunting;[1] climate change and severe weather; noise and light disturbance; vehicle collisions; and pollution. Because caribou have relatively low reproductive rates, it is difficult for populations to recover from substantial population declines.

Legislation and Policies for the Protection and Recovery of Caribou

General Protection under the Endangered Species Act, 2007*:*
The *ESA* prohibits killing, harming and harassing caribou, as well as damaging or destroying its habitat, except in accordance with an authorization from the MNRF. An *ESA* authorization generally takes the form of an overall benefit permit, which the MNRF issues after it has individually reviewed an activity and imposed conditions that would require the proponent to take steps to achieve an "overall benefit" for the species.[2]

In July 2013, the MNRF created a number of new exemptions from the *ESA*'s general prohibitions. Instead of requiring a permit under the *ESA*, proponents of certain activities, including commercial forestry operations, may instead follow a series of rules set out in regulation, including, in some cases, registering a notice of their activity with the ministry.[3] (For further information refer to O. Reg. 242/08 and the ECO's 2013 Special Report *Laying Siege to the Last Line of Defence: A Review of Ontario's Weakened Protections for Species at Risk*.)

Ontario's Woodland Caribou Conservation Plan:
The *ESA* requires recovery strategies and government response statements to be prepared for threatened and endangered species. In 2009, the Ontario government released *Ontario's Woodland Caribou Conservation Plan* (the "Conservation Plan"), which is the government response statement to the 2008 recovery strategy. The Conservation Plan outlines the Ontario government's intended actions to protect and recover caribou. Its goal is to:

> maintain self-sustaining, genetically-connected local populations of Woodland Caribou (forest-dwelling boreal population) where they currently exist, improve security and connections among isolated mainland local populations, and facilitate the return of caribou to strategic areas near their current extent of occurrence.

The Conservation Plan commits the Ontario government to adopt a "Range Management Approach," in which discrete ranges serve as the ecological context for planning and management decisions. A "range" is the broad geographic area used by a caribou population that provides both present and future habitat. Under this approach, ranges are the basis "for evaluating habitat conditions and

[1] Although there is no open hunting season for caribou, poaching, incidental harvest, and subsistence hunting may occur.
[2] For example, in order to achieve an overall benefit for caribou, the MNRF might require a proponent to implement silvicultural practices to create habitat that will be suitable for caribou in the future.
[3] Commercial forestry operations on Crown land are not required to obtain a permit for any operations conducted before July 1, 2018. The introduction of this exemption coincided with the date that woodland caribou (and other transition species) began to receive habitat protection under section 10 of the *ESA*. Commercial forestry activities on Crown lands were also granted an initial one year transition exemption from sections 9 and 10 of the Act when the *ESA* came into force in 2008.

identifying caribou habitat, assessing population trends, and assessing and addressing cumulative impacts."
The plan states that Ontario will establish "range-specific population-based objectives (e.g., population health measures)," and that achieving these objectives "will require that all management decisions reflect and stay within known thresholds of range-level disturbance (human and natural)." The 2009 Conservation Plan also describes how the Range Management Approach could be applied in decision-making processes (i.e., it describes how the Range Management Policy might work), noting that "development may not be approved" in ranges that are insufficient to sustain caribou.

For more information on the Conservation Plan, see Section 4.16 of the Supplement to the ECO's 2009/2010 Annual Report.

Habitat Protection under the ESA*:*
Under the *ESA*, the MNRF may designate protected habitat for individual species in a regulation. In May 2007, the then Minister of Natural Resources committed to passing such a species-specific habitat regulation for caribou by June 2009 (this would have provided habitat protection to caribou four years earlier than it would have received automatically under the Act). In January 2011, the ministry posted an information notice on the Environmental Registry (#011-2303) that outlined its "proposed approach" to protecting caribou habitat by regulation. However, no further action has been taken to develop this regulation.

Instead, in the absence of such a regulation, caribou habitat is protected according to the Act's general habitat definition (i.e., an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding). In 2013, the MNRF released the *General Habitat Description for the Forest-dwelling Woodland Caribou (Rangifer tarandus caribou)*, which characterizes caribou habitat for the purposes of the general habitat protection.[4]

The 2013 caribou habitat description describes three categories of habitat that may be found within a given caribou range:

- Category 1 – High Use Areas (lowest tolerance to alteration): habitat features within a range (i.e., "sub-range" features) that currently exhibit repeated, intensive use (e.g., nursery areas, winter use areas and travel corridors).
- Category 2 – Seasonal Ranges (moderate tolerance to alteration): large sub-range habitat features that encompass the majority of current caribou distribution during all seasons (i.e., large interconnected tracts of mature, conifer dominated, low shrub forest that are relatively undisturbed and unfragmented and interspersed with wetlands and lakes).
- Category 3 – Remaining Areas within the Range (highest tolerance to alteration): remaining areas that support caribou indirectly by maintaining the refuge function within the range (i.e., areas that have biophysical feature and forest composition consistent with seasonal ranges but are currently young or disturbed).

[4] This general habitat description was developed according to the ministry's broader habitat policy, *Categorizing and Protecting Habitat Under the Endangered Species Act* (see: Part 2.4 of the ECO's 2011/2012 Annual Report).

The Federal Recovery Strategy:
Environment Canada released its *Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada* in 2012. The federal recovery strategy identified critical habitat for boreal caribou as:

> i) the area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for an ongoing recruitment and retirement cycle of habitat, which maintains a perpetual state of a minimum of 65% of the area as undisturbed habitat; and ii) biophysical attributes required by boreal caribou to carry out life processes.

According to Environment Canada, maintaining 65 per cent undisturbed habitat in a range provides a 60 per cent probability that a local caribou population will be self-sustaining. Even with 65 per cent undisturbed habitat, there remains a 40 per cent risk that the caribou population will not be self-sustaining, so it is considered a *minimum* disturbance threshold. This disturbance management threshold is based on Environment Canada's 2011 scientific assessment report on caribou critical habitat.[5]

The federal recovery strategy also sets out an expectation for Ontario to develop range plans. Range plans are supposed to outline how land and resource development activities in a given range will be managed to maintain or attain a minimum of 65 per cent undisturbed habitat.

The Government of Canada, on the recommendation of the federal Minister of the Environment, may issue an order prohibiting the destruction of critical habitat on provincial lands if the Minister is of the opinion that the laws of the province do not effectively protect critical habitat.

The Range Management Policy

The December 2014 Range Management Policy describes how the MNRF intends to implement a Range Management Approach in order to achieve the Conservation Plan's caribou conservation goal. Under the policy, ranges are the geographic and ecological basis for evaluating caribou habitat and populations, as well as for managing cumulative effects.

The policy sets out a four-stage process: (1) delineating caribou ranges; (2) conducting an integrated range assessment and documenting range condition for each range; (3) integrating the Range Management Policy into planning and decision making (e.g., authorizing activities within caribou ranges); and (4) monitoring, evaluating and reporting on the effectiveness of policy implementation.

The MNRF began to implement these steps concurrently with the release of the Range Management Policy. Beforehand, the MNRF had conducted monitoring of caribou across the continuous distribution between 2008 and 2013, including: two-stage winter distribution surveys; recruitment surveys; GPS collar deployment; and collecting genetic material.[6] The ministry used the data collected to develop baseline information on population, habitat state and range condition.

---

[5] See: Environment Canada (2011). *Scientific Assessment to Inform the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada: 2011 update*.

[6] For further information refer to the individual Integrated Range Assessment Reports, available at: Ontario Ministry of Natural Resources and Forestry website (accessed August 12, 2015). *Woodland caribou.* http://www.ontario.ca/environment-and-energy/woodland-caribou. See also: Ontario Ministry of Natural Resources and Forestry (2014). *State of the Woodland Caribou Resource Report, Part Two*.

The Range Management Policy states that caribou conservation is achieved when a caribou population is stable or increasing and range condition is considered sufficient to sustain caribou. As such, the overall objective of the policy is "to maintain or move towards a sufficient range condition in all caribou ranges in Ontario." However, the policy only applies to the area of continuous distribution of woodland caribou (see *Range Delineation and Revision* below), excluding the Lake Superior Coast Range (Figure 1).

Figure 1. Caribou Ranges in Ontario. (Source: Ontario Ministry of Natural Resources and Forestry, *Range Management Policy in Support of Woodland Caribou Conservation and Recovery*, December 2014).

The MNRF also states in the policy that "implementation of the Range Management Approach, described by this policy will constitute range plans that consider the requirements and direction in the *Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population in Canada* (Environment Canada 2011) and the protection of critical habitat under the federal *Species at Risk Act*."

Range Delineation and Revision:
Caribou are found across the boreal forest in an area known as the "continuous distribution," in which populations freely mix. The discrete population of caribou along the shore of Lake Superior and adjacent islands is considered to be part of the continuous distribution. Between these two regions is the area known as the "discontinuous distribution" (Figure 1). In this area, isolated caribou populations exist, but geographic or man-made barriers prevent these populations from mixing freely. Caribou are not present in many areas of the discontinuous distribution.

The MNRF subdivided the area of continuous distribution into 14 ranges (including the Lake Superior Coast range). Local populations within a range are subject to similar demographic influences. The MNRF states that it chose to subdivide the continuous distribution into ranges "as both a precautionary measure against scale-dependent monitoring bias (i.e., trend detection), and as a practical and defendable means of applying caribou conservation efforts."

The *Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario* (the "Integrated Assessment Protocol") sets out the criteria used to determine range boundaries.[7] These criteria include: animal movement and animal survey data; spatial extent; evidence of shared geography; habitat functions and behavioural responses; predominant risk factors; and conformity to existing ecological or administrative boundaries. The 2014 *State of the Woodland Caribou Resource Report* states that caribou ranges will be reviewed periodically to determine whether their boundaries should be adjusted in order to better support the implementation of the policy.

Integrated Range Assessment and Determination of Range Condition:
The condition of each range is assessed according to the Integrated Assessment Protocol. Range assessments are then documented in Integrated Range Assessment Reports, which are publicly available on the MNRF's website.

The Integrated Assessment Protocol establishes a risk assessment process that evaluates population size, population trend (i.e., increasing, stable or declining) and habitat disturbance in order to estimate the degree of risk to caribou within a given range – often expressed as the probability of persistence of the population. This approach is in accordance with the federal Critical Habitat Framework for caribou.

The ministry then considers the amount and arrangement of habitat in a range in combination with the risk assessment. The MNRF states that if the actual amount and arrangement of habitat is close to a natural forest condition, then the range condition may reflect or be better than the risk assessment alone suggests. Conversely, if one or both of these factors do not align with the natural condition, it suggests a diminished or strongly diminished condition compared to what is indicated by the risk assessment.

The outcome of an integrated range assessment is a determination of range condition along a continuum that represents the ability of a range to support a self-sustaining caribou population. There are three assessment outcomes that fall within this continuum:

1. Range condition is *sufficient* to sustain caribou.

[7] For documentation on the delineation of the 14 ranges within the area of continuous distribution and the area of discontinuous distribution see: Ontario Ministry of Natural Resources and Forestry (2014). *Delineation of Woodland Caribou Ranges in Ontario*.

2. *Uncertain* if range condition is sufficient to sustain caribou.
3. Range condition is *insufficient* to sustain caribou.

For example, ranges that are considered sufficient to sustain caribou would typically have a stable or increasing caribou population, low amounts of disturbance, and an amount and distribution of habitat consistent with the estimated natural condition. However, unlike the federal approach for assessing range condition, there are no specific thresholds that define these categories.

The most recent integrated range assessments were published in December 2014. Of the 13 ranges covered by the Range Management Policy, 2 were assessed as *sufficient*, 2 were assessed as *insufficient*, and the remaining 9 ranges were categorized as *uncertain* (Table 1).

The Range Management Policy notes that both the range condition and the supplemental information contained in the Integrated Range Assessment Reports will be considered in ministry planning and decision-making.

Table 1. Range condition and cumulative disturbance (natural and anthropogenic) of Ontario's forest-dwelling caribou ranges. (Adapted from: Ontario Ministry of Natural Resources and Forestry, *State of the Woodland Caribou Resource Report, Part Two*, 2014).

Range Name	**Range Condition** (Sufficient/insufficient condition to sustain caribou; or uncertain if condition may sustain caribou)	**% Disturbance (Natural; Anthropogenic)**
Berens	Uncertain	28.7 (19.4; 9.3)
Sydney	Insufficient	62.7 (16.2; 46.6)
Churchill	Uncertain	41.3 (5.4; 35.9)
Brightsand	Uncertain	43.5 (10.4; 33.1)
Nipigon	Uncertain	38.4 (4.6; 33.8)
Pagwachuan	Uncertain	31.0 (0.5; 30.5)
Kesagami	Insufficient	43.7 (2.0; 41.7)
Swan	Sufficient; *additional population trend data required*	23.5 (20.3; 3.2)
Spirit	Uncertain	28.6 (25.1; 3.5)
Kinloch	Uncertain	19.6 (14.1; 5.5)
Ozhiski	Sufficient; *additional population trend data required*	27.6 (20.0; 7.6)
Missisa	Uncertain	14.4 (5.0; 9.4)
James Bay	Uncertain	6.6 (4.3; 2.3)

Integrating the Range Management Policy into Decision Making:
The Range Management Policy states that the ministry will apply three principles in planning and decision making:

1. Ranges will be managed such that the amount of cumulative disturbance remains at or moves towards a level that supports a self-sustaining caribou population.[8]
2. The amount and arrangement of habitat within a range will be managed consistent with the level that has been estimated to occur in natural landscapes.[9]
3. Within a range, forest composition, pattern and structure will be managed to promote the maintenance of the ecological function of sub-range habitat features for caribou in the context of range condition.[10]

In addition to these three principles, the policy states that "all MNRF-led planning and decision-making will be consistent with meeting the policy objective." Moreover, "where [the] MNRF does not have the primary legal responsibility for authorization of activities on Crown Land, or where it is a commenting agency for other Government processes, advice will be consistent with this policy."

The policy does not discuss in any further detail how these principles will be employed in its various approval processes or whether activities will be prevented from proceeding if they are not aligned with these principles. The Range Management Policy states that additional guidance on the integration of the policy into land use and resource management planning processes will be developed and made publicly available "as necessary."

The Range Management Policy also provides some guidance to assist proponents and the MNRF to determine if an activity requires a permit (or registration) under the *ESA*. The policy states that the MNRF will consider three factors when determining whether an activity is likely to adversely affect caribou or their habitat under the *ESA*:[11]

- Range condition (i.e., insufficient, uncertain or sufficient);
- Category of habitat affected (i.e., high use areas, seasonal ranges and/or remaining areas of range), as set out in the 2013 Caribou Habitat Description; and
- Activity details (i.e., location and extent, proximity, timing, intensity, duration and persistent effects, frequency, and permanency).

The range condition and the category of habitat affected will inform the relative tolerance of the habitat to alteration, and therefore the level of risk that an activity would pose to caribou (Figure 2). For example, Category 1 habitat (high use areas) in a range that is insufficient to sustain caribou would be highly intolerant to alteration; therefore an activity that affected such an area would be considered to pose a high risk to the caribou population in question.

[8] With respect to cumulative disturbance, the Range Management Policy refers to the empirical model produced by Environmental Canada (2008 and 2011) that predicts the likelihood of persistence of a caribou population relative to the amount of cumulative disturbance in a range. The policy states that this model "or an equivalent" should be used when estimating the likelihood of caribou persistence.

[9] The Range Management policy states that maintaining or moving towards the estimated amount of habitat that is within the middle fiftieth percentile of the simulated ranges of natural variation is assumed to avoid extreme conditions that may increase risk to caribou. The policy also notes that science-based simulation models have been used to estimate the arrangement of habitat within each range. The MNRF may use other information and data for ranges where simulated ranges of natural variation or estimates of natural habitat arrangement are not available, for example, ranges in the Far North.

[10] The Range Management Policy states that activities that impair or eliminate the connectivity of sub-range habitat features are likely to adversely affect their ecological function.

[11] Range condition is considered in addition to general MNRF policies on *ESA* protections (*Policy Guidance on Harm and Harass under the Endangered Species Act*, see Section 1.3.1 of this Supplement; and *Categorizing and Protecting Habitat under the Endangered Species Act*, see Part 2.4 of the ECO's 2011/2012 Annual Report).

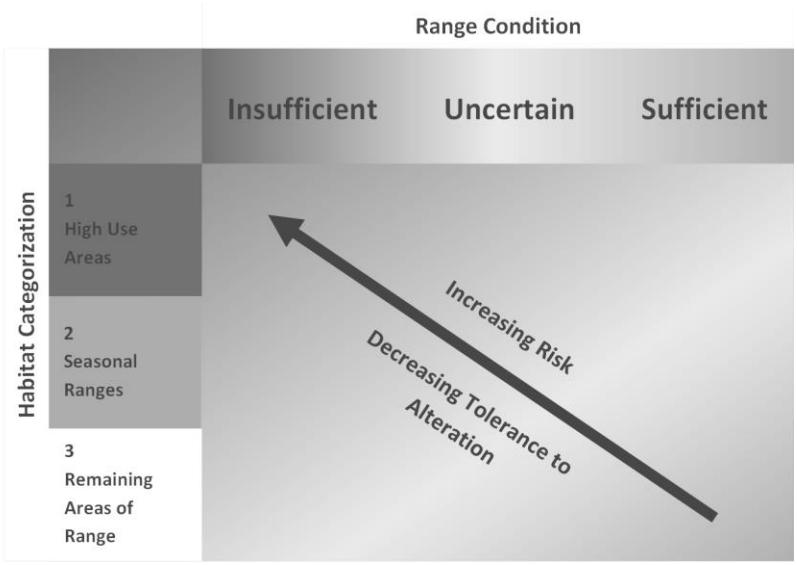


Figure 2. Relative risk to caribou and tolerance to alteration based on range condition and habitat categorization. (Adapted from: Ontario Ministry of Natural Resources, *Range Management Policy in Support of Woodland Caribou Conservation and Recovery*, 2014).

If the activity assessment suggests that the activity is not likely to comply with the *ESA*, a proponent may require a permit or authorization.[12] However, the Range Management Policy does not identify a specific threshold at which a permit will be required. If an overall benefit permit is required, the Range Management Policy states that the range condition may inform how severe a predicted adverse effect may be and, therefore, the extent of the requirements a proponent will need to fulfil in order to achieve an overall benefit to caribou.

Monitoring, Evaluation and Reporting:
The Range Management Policy states that the Range Management Approach operates within an adaptive management framework. The initial draft policy suggested that Integrated Range Assessment Reports would be reviewed after five years, but the final policy does not impose a review timeline. However, it does state that subsequent integrated range assessments (based on monitoring of caribou population and habitat) will be used to evaluate whether the implementation of the Range Management Policy is successful, and that such evaluations will inform any future policy reviews.

Implications of the Decision

Lack of Direction on Disturbance Thresholds and Habitat Restoration

The Range Management Policy states that cumulative disturbance within ranges will be managed to support a self-sustaining caribou population; however, the policy does not describe any circumstances in which activities would not be allowed to proceed. For example, the policy does not commit to a

[12] The policy notes that in the early stages of activity planning, proponents should refer to the Best Management Practices for Woodland Caribou in Ontario series (i.e., for mineral, energy, tourism and aggregate activities) to explore options to comply with the *ESA*.

management threshold for cumulative disturbance, such as the federal recovery strategy's recommendation to maintain or attain a minimum of 65 per cent of the area of each range as undisturbed habitat.[13] While such a disturbance management threshold would not necessarily guarantee caribou persistence within a range, it would provide a consistent and transparent decision-making tool for authorizing and planning activities that disturb caribou habitat.

Similarly, the Range Management Policy does not suggest that activities may not be authorized to proceed in ranges that have been deemed insufficient to sustain caribou, contrary to the Range Management Approach as envisioned under the 2009 Conservation Plan. In fact, the MNRF's Integrated Range Assessment Reports state that:

> Caribou ranges that are assessed as uncertain or insufficient to sustain caribou should not be interpreted as policy direction to stop sustainable resource management. The Range Management Policy and other planning documents (e.g., forest management guides, caribou best management practices) provide resource managers with the tools that support sustainable use of Ontario's natural resources while maintaining or improving conditions for caribou.

Moreover, the policy does not acknowledge the possibility of denying an *ESA* permit for a given activity, but simply suggests that greater efforts may be needed to achieve an overall benefit where range condition is insufficient.

The draft documents posted for consultation appeared to contemplate some limits on disturbance (e.g., "management decisions may have more or less flexibility" depending on range condition), but even these non-committal statements are absent from the final Range Management Policy.

Although the draft Range Management Policy stated that "improving" range condition should be a priority and that proactive improvement may be required in some circumstances, the final policy does not discuss the need for habitat restoration in ranges that are insufficient to support a self-sustaining caribou population (e.g., in the Kesagami and Sydney ranges).

Despite a stated goal of "moving towards a sufficient range condition in all caribou ranges in Ontario," the decision-making process set out in this policy suggests that, in effect, mitigation of adverse effects – not prevention or remediation – will more likely be the ultimate outcome of this policy. Unfortunately, given caribou's sensitivity to disturbance, the mere mitigation of adverse effects is likely insufficient to ensure the species' persistence across the continuous distribution.

Limited Applicability of the Range Management Policy

The Range Management Policy discusses human-caused disturbance to caribou habitat in a general sense, but it does not specifically identify or discuss the activities that constitute or cause disturbance, or list those that fall within the MNRF's regulatory authority. In fact, the MNRF appears to have limited authority over many activities that affect caribou. For example, the MNRF is the primary approval authority for forestry, oil and gas, and aggregate activities; however, most infrastructure and development activities (e.g., pipelines, mining and minerals, transportation, electricity generation and

[13] However, the policy does reference Environment Canada's empirical model for predicting the likelihood of persistence of a caribou population.

transmission) are regulated by other ministries or agencies that may or may not seek out (or listen to) the MNRF's input. The MNRF can only ensure that the Range Management Policy is applied to these activities that affect caribou if the activity requires an MNRF approval (e.g., under the *Public Lands Act*, the *Fish and Wildlife Conservation Act, 1997* or the *ESA*).

Moreover, several activities that adversely affect caribou qualify for permit exemptions under the *ESA*, including early exploration mining. In addition, many types of development and infrastructure projects (e.g., transportation, advanced mining exploration), as well as forestry operations, may be eligible for time-limited exemptions. Proponents of exempt activities must follow rules set out in O. Reg. 242/08 (the General regulation made under the *ESA*), and are not subject to project-specific conditions. As a result, activities that qualify for *ESA* exemptions will not be directly subject to the Range Management Policy unless other MNRF approvals are required.

The Range Management Policy recognizes that achieving Ontario's caribou conservation goal requires the co-operative adoption of the policy across provincial agencies, organizations, individuals and communities. However, the policy does not explicitly discuss how activities within caribou ranges that fall outside of the MNRF's authority will be dealt with by the ministry. The policy merely states that it will constitute the framework within which the MNRF will provide "advice" where it is not the authorizing agency. In circumstances where the ministry has no regulatory authority, the extent to which caribou range condition is considered in decision making will ultimately be at the discretion of the relevant approval authority, regardless of any of the MNRF's collaboration efforts.

The Range Management Policy has geographic limitations as well; although the draft policy included the Lake Superior Coast Range, the finalized Range Management Policy does not apply to this range. The MNRF has not provided any information on how it intends to manage disturbance within the Lake Superior Coast Range.

Public Participation & *EBR* Process

The MNRF posted a proposal notice on the Environmental Registry for the draft Range Management Policy on July 10, 2013. The notice was reposted twice in order to extend the comment period. Comments were ultimately accepted until October 7, 2013, for a total comment period of 89 days. The ministry also sent letters to stakeholders, Aboriginal communities and organizations, federal partners and other ministries. The ministry received a total of 31 comments from: northern Ontario residents, municipalities and municipal organizations; provincial and federal government bodies; an Ontario First Nation; environmental non-profit organizations; forest industry stakeholders; and organizations with interests in angling, hunting and trapping.[14]

Many commenters expressed concerns regarding the potential social and economic impacts of the Range Management Policy, and a number requested that the ministry undertake a socioeconomic impact analysis. Several of these commenters discussed concerns about the consequences of the policy on specific industries or activities, such as: forestry; trapping; hunting; and tourism. Some commenters asserted that the MNRF should not attempt to protect and recover caribou at the expense of other species.

[14] However, the MNRF stated that six of these comments were not applicable to the proposal.

A number of these same commenters challenged the validity of the scientific basis of the draft policy (e.g., background information, range boundaries and disturbance determinations), while some questioned whether it would be effective considering the anticipated effects of climate change. One commenter asserted that the Lake Superior Coast Range should not be subject to the policy as proposed in the draft. A number of commenters advocated for additional public consultation, including on the collection of background information, determining range boundaries, and the development of Integrated Range Assessment Reports.

Several commenters questioned how the MNRF would co-ordinate the implementation of the Range Management Policy with other legislation, instruments and policies such as the *Crown Forest Sustainability Act, 1994*, current Forest Management Plans and the *Forest Fire Management Strategy for Ontario*.

Some commenters asserted that the Range Management Policy would not provide sufficient protection for caribou. Several of these commenters noted that the policy did not articulate any thresholds beyond which activities within caribou ranges would not be permitted. A number of commenters, including the federal Canadian Wildlife Service, observed that the policy does not refer to the components of critical habitat as defined in the national recovery strategy (i.e., a minimum of 65 per cent undisturbed habitat, and the presence of biophysical attributes required to carry out life processes). Similarly, the Canadian Wildlife Service noted that key sections of the policy fail to acknowledge the need for restoration in ranges with less than 65 per cent undisturbed habitat.

Other commenters argued that the policy appears to be premised on allowing all proposed development activities to proceed and mitigating their adverse impacts, rather than managing the development itself. One commenter asserted that the policy exhibits overconfidence in the ministry's science-based simulation models. Another commenter stated that the policy overemphasizes the importance of sub-range habitat components to the potential detriment of the range as a whole.

Several commenters, including the Canadian Wildlife Service, also expressed doubts about the MNRF's ability to implement the policy effectively given the recent regulatory exemptions under the *ESA* for certain activities. Some also questioned whether the MNRF would be able to undertake both the internal and external co-ordination required to implement the Range Management Policy across the province.

Comments not Solicited on Supporting Documents

The proposal notice for the Range Management Policy included links to two other documents: the draft *Guidance for Assessing Impacts of Activities on Woodland Caribou and their Habitat* and the draft *Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario*. However, the ministry's proposal notice did not invite members of the public to submit comments on these policies, characterizing them as "technical documents" (see Part 1.2, pages 19-20, of the ECO's 2013/2014 Annual Report).

The decision notice for the Range Management Policy stated that content from the draft *Guidance for Assessing Impacts of Activities on Woodland Caribou and Their Habitat* was integrated into the Range Management Policy and therefore eliminated. The MNRF finalized the *Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario* and made it available to the public by request only.

Statement of Environmental Values

The MNRF states that it considered its Statement of Environmental Values while developing the Range Management Policy, and provided the ECO with documentation describing how the ministry applied each of the statement's principles of resource stewardship during the decision-making process.

For example, to explain how it considered the principles of exercising "caution and special concern for natural values in the face of … uncertainty," and the commitment "to anticipate and prevent negative environmental impacts," the MNRF stated that the policy establishes a lower tolerance for risk in resource management decisions in ranges where the condition is not sufficient to sustain caribou. Additionally, the ministry stated that in ranges where range condition is not sufficient to support caribou, the Range Management Policy identifies that resource management decisions should result in improved range condition and reduced risk to caribou, which supports the principle of "rehabilitating degraded environments."

The ministry explained that the scientific underpinnings of the policy demonstrate the application of the principles of "a sound understanding of natural and ecological systems," and fostering "applied research and sharing of scientific and technological knowledge." The MNRF also noted the potential to apply "adaptive management" respecting range boundaries and conditions, and stated that these may be adjusted in response to revised delineation criteria or new information from research studies or integrated range assessments.

The MNRF also stated, with regard to advancing several of its Statement of Environmental Values principles, that the ministry is committed to educating and collaborating with other agencies and planning authorities in order to support the implementation of the Range Management Policy across multiple sectors and activities. With respect to the principle of properly valuing natural resources, the ministry noted that it "strived to balance social, economic and environmental concerns in the protection and recovery of caribou," and stated that the policy "provides the opportunity for ecological, social and economic considerations" in the resource management decision making and approval process. However, there was no explanation of how this "balance" was achieved in the development of the policy.

Other Information

On December 29, 2014, the MNRF released its five-year report on progress towards the protection and recovery of woodland caribou, as required by the *ESA* (see Environmental Registry #012-3013). The three part report:

- discusses the progress made towards recovery actions and commitments in the Conservation Plan, including the status of policy, planning and resource management commitments;
- provides technical details and communicates key findings of the monitoring and assessment of caribou within Ontario's Continuous Distribution (except Lake Superior Coast);
- describes the distribution of caribou and summarizes the findings from the initial integrated range assessments; and

- provides a technical summary of information on the MNRF's Collaborative Provincial Caribou Research Program that discusses the findings of research commitments under the Conservation Plan.

ECO Comment

The MNRF's goal for caribou management is to maintain or move toward a "sufficient" range condition in all caribou ranges in Ontario. Key to achieving this goal is the limitation of human-caused disturbances in the province's 14 caribou ranges. Unfortunately, the ministry's Range Management Policy does not provide the clear and detailed guidance that is needed to ensure that the condition of all ranges will be sufficient to sustain caribou over the long term. Put simply, it does not say if and when the Ontario government will ever say no to activities that adversely affect caribou habitat. It has now been almost a decade since caribou were listed under the *ESA*, and the Ontario government has developed numerous policies for their protection and recovery – but caribou are arguably in the same uncertain position of risk and habitat loss as before any of this started.

The MNRF's failure to set explicit limits on disturbance is troubling. For example, the ministry's Range Management Policy does not expressly acknowledge the *minimum* 65 per cent undisturbed habitat threshold identified in the federal recovery strategy, which would provide just a 60 per cent chance that caribou populations will be self-sustaining. These are odds not much better than a coin toss.

The ECO warned five years ago that the Ontario government's 2009 Caribou Conservation Plan conferred little or no concrete responsibilities to ministries beyond the MNRF. The new Range Management Policy follows in the same path: it will likely only affect the limited scope of development over which the MNRF has actual regulatory authority. Indeed, the MNRF providing mere "advice" to other ministries and agencies will not be an effective approach to maintaining and improving caribou range condition.

It is not apparent that the MNRF has the will or, in some cases, the ability to prevent activities that would further threaten the condition of caribou ranges. The shortcomings of the Range Management Policy cast doubt on the Ontario government's commitment to achieving its caribou conservation goal. The harsh reality is that there is limited compatibility between caribou and the disturbance caused by such common development and resource management activities as forest operations, mining and transportation projects. As development pressures and the effects of climate change continue to mount in northern Ontario, the provincial government must make some difficult decisions about caribou habitat. If the Ontario government actually intends to support the long-term survival of caribou, there will be circumstances in which the maintenance and improvement of caribou ranges will have to take priority over other interests. The ECO urges the MNRF to prohibit additional anthropogenic disturbance in caribou ranges, when necessary.

The MNRF's recent efforts to monitor caribou and develop baseline information are one cause for optimism. The scale and complexity of the work undertaken to complete the integrated range assessments is almost without precedent in the MNRF's history of wildlife management. The ECO encourages the ministry to continue these efforts through ongoing caribou monitoring and regular reviews of its integrated range assessments. Because the Ontario government has not opted to take a precautionary approach to protecting caribou habitat, ongoing and comprehensive monitoring will be of critical importance as the MNRF implements the Range Management Policy. Given the

government's commitment to undertake an adaptive management approach, one hopes that this wealth of information will be applied to decision making that protects and recovers caribou.

Review of Posted Decision:

1.3.3 Ontario Protected Areas Planning Manual 2014 Edition and Planning Guidelines

Decision Information

Registry Number: 011-9717
Proposal Posted: August 16, 2013
Decision Posted: March 26, 2014

Comment Period: 46 days
Number of Comments: 3
Decision Implemented: March 26, 2014

Registry Number: 011-7467
Proposal Posted: December 5, 2012
Decision Posted: March 26, 2014

Comment Period: 44 days
Number of Comments: 4
Decision Implemented: March 26, 2014

Description

Overview

The Ministry of Natural Resources and Forestry (MNRF) is responsible for managing the province's system of protected areas, which includes provincial parks and conservation reserves. In March 2014, the ministry finalized a new edition of the *Ontario Protected Areas Planning Manual* (the "Planning Manual"), as well as four supplementary guidelines:

- *Examining Protected Area Management Direction Guideline* (the "Examination Guideline");
- *Adjusting Protected Area Management Direction Guideline* (the "Adjustment Guideline");
- *Guideline to Involvement During Protected Area Management Planning* (the "Involvement Guideline"); and
- *Guideline to Management Planning for Protected Areas in the Context of Ecological Integrity* (the "Planning Guideline").

These documents set out the policies and procedures that guide the ministry's process for developing management direction for protected areas. They explain how the ministry will prioritize the maintenance of ecological integrity of provincial parks and conservation reserves in its management decisions, as well as how opportunities for restoration will be considered.

Background

Protected areas are among the most useful tools for conserving biological diversity. They can safeguard biodiversity 'hotspots' and act as a refuge from development pressures on wildlife, including rare and at-risk plants and animals. For example, in the Temagami area, which contains five provincial parks and eight conservation reserves, there are at least 25 species at risk. They also can function as natural corridors to facilitate the movement of species, and contribute to the protection of vital ecosystem services, like producing clean air and water. Additionally, our provincial parks and conservation reserves provide people with an important place to connect with nature and offer numerous recreational opportunities.

The challenges are daunting. The MNRF's *State of Ontario's Protected Areas Report* (2011) has identified a number of pressures that threaten the ecological integrity of Ontario's protected areas, including:

- the effects of climate change;
- air and water pollution, including acid rain;
- human activities that disrupt natural processes, including the suppression of wildfires and disruption of natural hydrological functions by dams and water crossings;
- land use changes in surrounding areas (e.g., agricultural or urban development) that can isolate protected areas and reduce connectivity;
- hyper-abundant species and invasive species, such as zebra mussels and the invasive common reed (*Phragmites australis*); and
- recreational activities and development within protected areas.

The 637 regulated provincial parks and conservation reserves in Ontario have been established to protect representative ecological, geological and cultural heritage features. They are governed by the *Provincial Parks and Conservation Reserves Act, 2006* (*PPCRA*), which sets out two principles to guide all aspects of the management and planning of protected areas: (1) maintenance of ecological integrity shall be the first priority and the restoration of ecological integrity shall be considered; and (2) opportunities for consultation shall be provided. The *PPCRA* also states that protected areas should be managed to: permanently protect biodiversity; provide opportunities for ecologically sustainable outdoor recreation and appreciation of Ontario's natural and cultural heritage; and facilitate scientific research.

The *PPCRA* requires every protected area to be covered by ministry-prepared "management direction;" the MNRF is responsible for developing either a management statement or a management plan depending on the complexity of the issues being addressed. Management direction describes how the protected area will contribute to the achievement of the *PPCRA*'s objectives and identifies site-specific policies to guide the management of an area over a 20-year time period. Generally, management direction: establishes the purpose of, and vision for, a protected area; describes objectives (e.g., protection, recreation or scientific objectives); and defines management policies, including zoning, permitted activities and management actions. The ministry may also use secondary plans to address specific complex or technical issues.

The *PPCRA* requires the ministry to prepare a planning manual to guide the development of management direction. The MNRF previously released a planning manual and related directives in the 1980s and 1990s, but the ministry approved the first *PPCRA* edition of the manual in 2009. The 2009 edition deferred a number of key details to a series of 13 subsequent supplementary guidelines (see Part 3.8 of the ECO's 2009/2010 Annual Report for a review of the manual's first edition). In place of these 13 guidelines, the ministry developed four consolidated guidelines (the Examination, Adjustment, Involvement and Planning Guidelines) between 2012 and 2014.

In the ECO's 2012/2013 Annual Report, we reviewed the state of management direction for Ontario's protected areas and found that the vast majority of management plans and statements were outdated. For example, less than 15 per cent of management direction explicitly addressed the legal mandate of the *PPCRA*, including the maintenance of ecological integrity. Further, many of the current management plans and statements were approved at a time when the MNRF had different priorities for protected areas; for example, some permit planned development that may be at odds with the law's

current direction or allow activities that run counter to maintaining ecological integrity. Since we last reported on this issue, some progress has been made – as of July 2015, the ministry had finalized new or amended management direction for 11 protected areas.

Ecological Integrity:
Ecological integrity is a concept that centres on the overall health of an ecosystem, and is informed by a system's natural composition, diversity and processes. Under the *PPCRA*, ecological integrity is "a condition in which biotic and abiotic components of ecosystems and the composition and abundance of native species and biological communities are characteristic of their natural regions and rates of change and ecosystem processes are unimpeded." According to the MNRF, "ecosystems have integrity when they have intact native biological components (plants, animals and other organisms), abiotic components (such as geology and water), and processes (such as reproduction and population growth)." The heart of the definition is the "naturalness of a protected area." Ecosystems have integrity when they can be described as whole, intact or unimpaired.

The complexity of natural systems makes managing protected areas for ecological integrity a challenging task; however, there are several key elements in taking an ecological approach to management. First, it is necessary to decide how ecological integrity will be defined and measured for a particular area (e.g., which fundamental processes, species or features need to be intact). Second, because protected areas and their ecological processes are inevitably affected by the activities and conditions beyond their boundaries, they should be managed within the context of the broader landscape. And third, adequate baseline information, ongoing monitoring and adaptive management are needed to be able to address the highest priority issues.

The 2014 Planning Manual

The Planning Manual provides policy direction and defines the minimum requirements for protected areas management planning. Much of the content of the previous edition of the manual has been reformulated and moved into the supplementary guidelines, leaving the manual to provide a streamlined overview of the planning process in its entirety. Additional changes to the 2014 edition of the Planning Manual align the manual's direction with the new guidelines, and address recent amendments to the *PPCRA*, which include removing the statutory deadlines for preparing management direction and extending the review cycle for management direction from 10 years to 20 years (see Part 4.6 of the ECO's 2012/2013 Annual Report for further details). The basic steps of the process, however, remain largely unchanged.

The manual sets out the general steps of the planning cycle, including: pre-planning; scoping; information analysis; developing management options; developing preferred management direction; finalizing management direction; implementation; monitoring and assessment; and examining and adjusting management direction. The Planning Manual also identifies several guiding principles, including: maintaining ecological integrity: providing opportunities for involvement (as required by the *PPCRA*); risk management; adaptive management; and landscape-level planning.

Although amendments in 2012 to the *PPCRA* extended the review cycle for management direction from 10 to 20 years, the Planning Manual directs that subsequent examinations should be more frequent. The manual confirms that the initial examination of management direction will occur 20 years after the document is approved. However, successive examinations will then be completed on a 10-

year cycle, unless the direction is replaced; a replacement will restart the 20-year review period. Moreover, the MNRF may initiate full or scoped examinations at any time on a discretionary basis.

The Examination Guideline

The Examination Guideline provides direction for conducting a review of existing management direction. The key issues addressed during examinations are: whether the existing management direction is relevant, effective and current; and what changes are required to allow the MNRF to manage the protected area until the next examination. Although the ministry considers "relevant local information" during this process, there is no public involvement in the ministry's internal review. At the conclusion of an examination, the ministry may decide to retain the current management direction, make an administrative update, or amend or replace the direction.

The Examination Guideline also provides suggested timelines for implementing examination outcomes, "subject to available staff and financial resources." These timelines include the following:

- Administrative updates – one year;
- Amendments – two to three years, depending on complexity; and
- Replacements – three to five years, depending on complexity.

The Adjustment Guideline

The Adjustment Guideline establishes direction for making adjustments to approved management direction, and provides a step-by-step approach for both administrative updates and amendments. Adjustments may be prompted by an examination or a proposed development. For example, in 2012, the ministry proposed a scoped amendment to the management plan for Algonquin Provincial Park to extend the leases for private cottages beyond the established phase-out date of 2017.

The Involvement Guideline

The *PPCRA* states that opportunities for consultation must be provided with respect to the planning and management of protected areas. Moreover, management statements and plans constitute environmentally significant policies under the *Environmental Bill of Rights, 1993*; therefore, the ministry is required to post proposals for management direction on the Environmental Registry, and solicit and consider comments from the public.

The Involvement Guideline sets out the requirements for involving Aboriginal communities, the public and stakeholders during the protected area management planning process. It allows for early involvement prior to initiating a planning project or formal public consultation. This requires initiating contact with interested or affected Aboriginal communities, and may also be appropriate for public and stakeholder audiences, depending on the specifics of the planning project. Requirements generally include posting a policy proposal notice on the Environmental Registry, and considering comments submitted by stakeholders. Between one and three involvement opportunities are provided during the management planning process, depending on the level of planning complexity as determined by the MNRF.

The Planning Guideline

The MNRF's management planning process is focused on identifying specific "values" (e.g., species, geological features, ecological processes) and then identifying "pressures" (i.e., threats) on those values. The Planning Guideline provides detailed guidance on several stages of this management planning process (from scoping through to finalizing the management direction). The bulk of the management direction is determined in the "information analysis" stage. This stage addresses ecological integrity by identifying and analyzing values and pressures to determine management priorities and actions to mitigate or eliminate pressures on the values.

Identifying Values:
The Planning Guideline recognizes both tangible and intangible values, which generally fall into one of four categories: natural heritage (e.g., rare species, ecological processes); cultural heritage (e.g., Aboriginal cultural heritage values, archaeological values); outdoor recreation – provincial park (i.e., resources supporting ecologically sustainable recreational uses); and traditional outdoor heritage – conservation reserve (i.e., resources supporting ecologically sustainable traditional outdoor heritage uses).

The Planning Guideline also states that the protected area boundary and protected area as a whole can also be considered values in the context of the broader landscape. This direction represents modest progress compared to past policy, where ministry staff typically did not consider management actions beyond the regulated boundary of a protected area. A more inclusive ecosystem approach to management is a well-accepted best practice. As noted by the ECO in our 2006/2007 Annual Report, the boundaries of protected areas are artificial constructs that do not reflect natural boundaries and, as such, the MNRF should take a broader view of its management actions for protected areas.

The most important values in the management planning process are called "values of conservation interest." According to the ministry, these values are the primary focus of management and should not be compromised by development or use of any kind. Some characteristics of values of conservation interest include that they:

- are the most significant values in contributing to the maintenance and restoration of ecological integrity;
- are often characterized by, or rely upon, ecological processes;
- may significantly contribute to reducing the effects of climate change;
- may be associated with the reason a protected area was established;
- may be protected under legislation or policy; and
- should directly reflect the purpose and objectives in the *PPCRA* (e.g., representation values).

Common types of values of conservation interest include: habitat for species at risk; provincially significant wetlands; and critical landform-vegetation associations. For example, the provincially significant baymouth dune formations and vegetation communities at Sandbanks Provincial Park would likely constitute such a value in a new management plan.

Although recreational activities (e.g., swimming, hunting, fishing) and educational programs (e.g., astronomy programs at Bon Echo Provincial Park and public wolf howls at Algonquin Provincial Park) are not themselves considered values, the resources that facilitate them (e.g., guided trails, interpretive

centres, beaches, wildlife) may constitute values. Similarly, although social and economic benefits inform the role of a protected area and uses within that area, these benefits are not considered values.

Identifying Pressures to Values:
The Planning Guideline defines pressures as "any natural disturbance or anthropogenic (human) activity or facility (including associated activities) that has an impact on a value, including any ecological process associated with a protected area." Pressures generally fall into the following categories: alien/invasive species; climate change; loss of connectivity; disturbance events; fragmentation; hyper-abundant species; pollution; and visitation. These can include: legacy pressures that are no longer occurring but still having an impact; current pressures; and future pressures that are anticipated to occur. For example, there are invasive species in Komoka Provincial Park that are associated with historical agricultural uses, including garlic mustard, which displace native plants and adversely affect the park's ecological integrity.

Considerations for identifying pressures include:

- the broader geographical context;
- the impact of pressures (i.e., the footprint and nature of a pressure, and the type and intensity of activity associated with the pressure);
- the role of natural disturbance events (e.g., fire, native insect defoliation) with respect to non-ecological values or protected area infrastructure;
- cumulative effects; and
- the anticipated impacts of climate change.

Analysis of Values and Pressures:
Once ministry staff identify values and pressures, they assess them together using a risk analysis approach, which distinguishes those values under pressure from those that are not. The guideline lays out a clear methodology for the risk analysis process to allow planning teams to determine which values are under the greatest threat and are considered priorities for management action. Generally, values of conservation interest are a higher priority than other values (including in circumstances where values conflict), and values under pressure are accorded a higher priority than those that are not. This process may also help determine which topics should be addressed by a secondary plan. For example, the *Quetico Provincial Park Forest Fire Management Plan*, the only fire management plan for any provincial park, describes how the ministry will manage forest fires in the park for the 2009-2019 period (see Section 4.15 of the Supplement to the ECO's 2009/2010 Annual Report).

Identifying Management Actions and Effectiveness Monitoring Needs:
The ministry then determines what management actions will address these priorities. Generally, management actions should address the underlying cause of a pressure, "thereby reducing, mitigating or removing negative impacts, protecting values and restoring natural ecological processes." For example, in 2000 the MNRF amended the *Presqu'ile Provincial Park Management Plan* to direct the development of a cormorant management strategy for the park to address impacts from cormorants on specific park values. Among other considerations, the guideline encourages actions that are: specific, measurable, achievable, relevant and time-bound.

At this stage, the guideline also directs ministry staff to identify effectiveness monitoring needs and, if appropriate, develop preliminary zoning (i.e., divide a protected area into zones where common

objectives, intentions and direction for management can be established). Following further analysis, assessment and consultation, the selected management actions are ultimately incorporated into and inform the policies of the final management direction.

Implications of the Decision

Management Actions Based on Ecological Integrity

The Planning Guideline provides the necessary internal guidance for ministry staff to ensure that ecological integrity is the first priority in planning protected areas, as mandated by the *PPCRA*. The guideline sets out a defensible risk assessment process and it provides clear decision-making criteria for determining management priorities and actions for protected areas.

The Planning Guideline's direction will equip ministry staff to address the most pressing problems and protect the most important ecological features and processes. Values of conservation interest have top priority; this should strengthen the ministry's hand in maintaining ecological integrity.

Moreover, the Planning Guideline excludes activities, programs and social or economic benefits from the definition of value. This means that while these factors will still be allowed to inform the management planning process, they will not determine management choices. This focused definition of value will help to ensure that management planning, at least in principle, will not be unduly influenced by external interests that could potentially conflict with the maintenance and restoration of ecological integrity.

Management Planning Process Gaps

The 2012 *PPCRA* amendments left several gaps in the timelines for management planning projects. Some of these gaps are now filled by the timelines set in the Planning Manual and Examination Guideline. For example, the ministry's commitment to examine management direction on a 10-year review cycle (subsequent to the first examination) goes beyond the requirements of the amended legislation. Further, protected areas could benefit from the flexibility provided under the Examination Guideline to initiate examinations outside of the normal review cycle at the ministry's discretion. The manual and guidelines also reaffirm the 20-year horizon for management direction.

In addition, the management planning process will likely benefit from the aspirational timelines provided in the Examination Guideline for the completion of the adjustment/replacement process. However, these aspirational timelines appear to only apply to existing management direction. Prior to the *PPCRA* amendments, the MNRF was required to prepare management direction for new protected areas within five years of their creation. But because the *PPCRA* amendments removed this valuable deadline, and the Planning Manual and guidelines do not establish a timeline for new management direction, the MNRF is no longer required to ensure that a new protected area has management direction in place by a specific date.

Without a legislated or policy deadline or adequate resources to undertake management planning, new protected areas may be left without management direction for many years. For example, Turtle River-White Otter Lake Provincial Park was created in 1989, but it remained without a management plan for 23 years (see Part 4.6.1 of the ECO's 2012/2013 Annual Report). In 2013, the MNRF established three

new provincial parks (Strawberry Island, Queen Elizabeth the Queen Mother M'Nidoo M'Nissing, and Cedar Creek Provincial Parks), but as of July 2015, it had not yet publicly initiated planning processes for any of these parks.

Public Participation & *EBR* Process

The ministry posted proposal notices for the planning manual and the guidelines on the Environmental Registry for public comment periods of 44 and 46 days respectively, and received a total of seven comments.

Commenters were generally supportive, although some questioned the adequacy of the 20-year review cycle, or were critical of the MNRF for the lack of up-to-date management direction for many parks. For example, one commenter stated that many of the current interim management statements "are generic in nature and do not properly recognize the values that are contained on each specific landscape."

Several commenters suggested that there should be further clarification or specificity respecting issues including: other planning processes; key stakeholders; and the determination and prioritization of values. The ministry made several changes to the draft documents in response to these comments, including: new references to appropriate stakeholders; consideration of other planning processes; and revisions to the list of values of conservation interest.

Other commenters made suggestions regarding specific issues or activities in particular protected areas, including: hunting and fishing; the lethal management of wildlife; canoe route maintenance; the integration of servicing systems to existing municipal systems; and activities covered by Class Environmental Assessments. The MNRF stated that these concerns were outside the scope of the documents but would be retained for future reference.

Statement of Environmental Values

The MNRF considered its Statement of Environmental Values (SEV) in developing the guidelines and amending the Planning Manual. In its SEV consideration documents, the ministry explained how each principle was applied in making the decisions, including, for example: a sound understanding of natural and ecological systems; exercising caution and special concern for natural values in the face of uncertainty; participation in resource management; the application of an ecosystem approach; adaptive management; and environmental protection. In particular, the ministry emphasized that the Planning Manual and guidelines: recognize the importance of gathering information to support the protected areas management planning process, support public involvement, and address the principle of maintaining ecological integrity.

In summary, the ministry stated that the decisions focus "on protected area management planning through balancing the sustainable use of natural resources with the protection and enhancement of natural ecosystems. This is set within [the MNRF's] vision of a healthy environment through sustainable development and the mission of ecological sustainability."

ECO Comment

Ecological integrity is at the core of Ontario's protected areas system – it is the diversity and abundance of native species, together with unimpeded natural processes, that make these areas so distinct. The MNRF must safeguard Ontario's protected areas for future generations and ensure that the wildness of these special places is unimpaired. The *PPCRA*'s requirement to prioritize ecological integrity above all else is a significant advance in conserving our provincial parks and conservation reserves for their own sake, free from undue and inappropriate human impacts. However, applying this new direction will be a challenge; it will require both resources and a cultural shift within the MNRF.

Nearly seven years after the *PPCRA* came into force, the ministry has finally publicly articulated how it will manage for ecological integrity in protected areas. The ECO commends the MNRF for taking this important step. The updated Planning Manual and supplementary guidelines provide the detailed guidance that was lacking in the 2009 Planning Manual and collectively establish a solid foundation for ecosystem-based management. Moreover, these documents appear to envision an open and transparent planning process with ongoing public involvement. The ECO is hopeful that this planning framework will enable the MNRF to protect the ecological communities and processes that are characteristic of Ontario's protected areas.

Now that the necessary groundwork has been completed, this planning framework will have to be implemented throughout the province. The ECO has been urging the MNRF to bring protected areas' management direction up to date for over a decade. This is no small task, and the ministry needs adequate resources to undertake the management direction planning process, particularly for the many protected areas with outdated management plans and statements. It is imperative that there be sufficient internal expertise, such as park planners and ecologists, to undertake the necessary work to put the ministry's policies into practice and, most importantly, safeguard the future of Ontario's protected areas.

Further, although the *PPCRA* directs the MNRF to maintain and *restore* ecological integrity, in practice, ecological restoration projects in protected areas have not been a priority for the ministry. Few provincial parks and conservation reserves are pristine, intact ecosystems – many areas have legacy impacts from prior land uses, in addition to ongoing degradation of ecosystem functions from various internal and external pressures. As such, the ECO encourages the government to establish a dedicated internal fund for ecological restoration projects in Ontario's protected areas. Protected area managers should not exclusively focus on mitigating impacts or managing for 'sustainability' in a particular park; rather, they should aim to improve ecological integrity and seek new opportunities for net gains in biodiversity.

The new Planning Manual and guidelines describe how the MNRF will manage for ecological integrity in individual protected areas, but are not intended to provide strategic direction for where and when the ministry will direct its efforts and resources within the protected areas system as a whole. The ECO urges the MNRF to develop a strategic plan for protecting and restoring ecological integrity throughout the entire protected areas system. Such a strategy could: set overarching priorities for the maintenance and restoration of ecological integrity; establish achievable operational objectives; and provide a plan for reviewing management direction for specific protected areas, replacing the ministry's current *ad hoc* review process. Without strategic direction for protected areas management planning, the

ecological integrity of many of Ontario's provincial parks and conservation reserves remains vulnerable to the multitude of pressures that exist throughout the province.

Review of Posted Decision:

1.3.4 Presqu'ile Provincial Park Management Plan Amendment

Decision Information

Registry Number: 012-0486
Proposal Posted: November 29, 2013
Decision Posted: November 7, 2014
Comment Period: 56 days
Number of Comments: 16
Decision Implemented: August 29, 2014

Description

Background

Presqu'ile Provincial Park ("Presqu'ile") encompasses 982 hectares of unique natural features spread over the Presqu'ile Peninsula and two small islands. The park is located on the north shore of Lake Ontario in the Municipality of Brighton. Presqu'ile includes a remarkable diversity of landforms and habitats including sand dunes, pannes (seasonally wet flats between the dunes), marshes, fields and forests.

The park takes its French name, which means "almost an island," from the Presqu'ile Peninsula, the foot of which was once a limestone island. Over hundreds of years, sand spits stretching from the island and mainland grew towards each other, eventually joining to form a tombolo (a barrier beach linking a former island with the mainland). Popular in part for its migratory bird populations and long sandy beach, Presqu'ile is also distinguished by having the second-oldest operating lighthouse in Ontario. The park area was first protected in 1922 under the *Presqu'ile Park Act*, and became regulated as a provincial park in 1954.

Presqu'ile Provincial Park is a globally significant Important Bird Area for shorebird, waterfowl, colonial waterbirds and migratory landbird concentrations. It contains breeding and nesting habitat for colonial waterbirds and shorebirds, and provides suitable habitat for a number of at-risk bird species including the black tern (a species of special concern), the endangered king rail and piping plover, and the threatened least bittern. The park also encompasses a provincially significant wetland that contains habitat for at-risk Blanding's and musk turtles, and Presqu'ile's pannes contain an internationally significant vegetation community. The park is on the monarch butterfly migration route, and over 20,000 monarch butterflies have been tagged in Presqu'ile to date.

Presqu'ile's extensive sand beach is highly valued not only by shorebirds but by human visitors as well. Presqu'ile is the second-most visited provincial park in southeastern Ontario (after Sandbanks Provincial Park), recording approximately 80,000 day-use visitors and 35,000 campers in 2010.

According to a background report produced in 1995, commercial and recreational fishing have historically taken place in Presqu'ile Bay and the open waters of Lake Ontario to the south of the peninsula. Waterfowl hunting is allowed in some parts of the park four days a week between late September and late December.

Historical Management of Presqu'ile Provincial Park:
Presqu'ile was first established as a protected park in 1922. The Ministry of Natural Resources and Forestry (MNRF) began a management planning process for Presqu'ile in the 1990s that culminated in the completion of the *Presqu'ile Provincial Park Management Plan* in 2000 (the "Presqu'ile Management Plan"). (For the ECO's review of this policy decision see pages 140-145 of the Supplement to our 2000/2001 Annual Report.)

Presqu'ile is classified as a Natural Environment park. The objectives of Natural Environment parks are to protect recreational landscapes with representative natural features and cultural heritage values in order to provide recreational and educational experiences.

The 2000 Presqu'ile Management Plan zoned the lands and waters within the park based on their ecological and/or cultural significance, and potential for recreation or development. Four zoning designations were applied: nature reserve, natural environment, historical and development. Each designation permits different resource and recreational uses and types of development. For example, campgrounds and main roads are restricted to development zones, while walking, cycling and swimming can take place in nature reserve, historical and natural environment zones.

The 2000 Presqu'ile Management Plan committed the MNRF to prepare resource management plans for individual zones to guide landform, vegetation and wildlife habitat management and restoration, as well as recreational management where applicable. In subsequent years, the MNRF developed and implemented resource management implementation plans for specific areas of the park including the beach and dunes, mainland, and Gull and High Bluff Islands. These plans were approved under the *Class Environmental Assessment for Provincial Parks and Conservation Reserves* (the "Class EA"). (For the ECO's comments on the MNRF's decision not to post the resource management implementation plans as policy proposals on the Environmental Registry, see pages 9-10 of the Supplement to our 2008/2009 Annual Report.)

The resource management implementation plan for the park's mainland directs the ministry to "control hyper-abundant/nuisance/invasive species if they are negatively impacting sensitive species or communities in the park." It also states that mute swans may have contributed to the decline of other marsh-nesting bird species, though no management actions are identified. The ministry prepared and implemented a management strategy for double-crested cormorants from 2003 to 2007. From 2008 to 2010, no cormorant management took place, and as of 2012 all cormorant management, monitoring and assessment activities were incorporated into the resource management implementation plan for High Bluff and Gull Islands. (For the ECO's review of the cormorant strategy for Presqu'ile, see pages 138-144 of the Supplement to our 2002/03 Annual Report.)

Maintaining Ecological Integrity is the First Priority in Protected Areas Management:
In 2006, the Ontario government passed the *Provincial Parks and Conservation Reserves Act, 2006* (*PPCRA*), which requires the maintenance of ecological integrity to be the first priority in the planning and management of Ontario's protected areas, and states that the restoration of ecological integrity shall be considered. Under the *PPCRA*, protected areas have ecological integrity when "biotic and abiotic components of ecosystems and the composition and abundance of native species and biological communities are characteristic of their natural regions and rates of change and ecosystem processes are unimpeded." One critical element of ecological integrity is the maintenance of habitat that supports viable populations of native species.

The management plan for a protected area describes how the area's ecological integrity is maintained and restored. It provides a framework for addressing complex issues and proposals for infrastructure and resource management projects, including when, where and to what extent these activities should take place. The management plan provides assurance that these activities are compatible with environmental protection, and are responsive to the public interest.

Updated management plans should include the most recent scientific information about the status of a protected area's ecological integrity. Based on that information, the MNRF can define the internal and external threats to a park's ecological integrity and identify the actions it will take to address them in the park's management plan.

In our 2012/13 Annual Report, the ECO reported that most protected areas had outdated management direction (plans or statements) and a significant number of plans were developed without any public consultation. For example, only 89 out of 629 protected areas had management direction that had been approved or amended since the *PPCRA* came into force in 2006, and 145 provincial parks had management direction that was over 20 years old. Yet, the ministry considered all existing plans to be "current."

Management plans like Presqu'ile's that were already approved when the *PPCRA* was passed are grandfathered, and therefore not required to conform to the new legislation. As a result, plans prepared prior to 2006 are not legally required to ensure that the maintenance of ecological integrity is the first priority of planning and management. The ECO reported that less than 15 per cent of management direction explicitly addressed the new mandate of the *PPCRA*.

In the 2013 Report of the Auditor General of Ontario, similar concerns were raised about how ecological integrity was being addressed by the MNRF in management planning for protected areas. The expert ecologist retained by the Auditor General reviewed a sample of management plans and directions provided by the MNRF and concluded that none of them contained a clear statement indicating that ecological integrity was the first priority in managing the park it pertained to. The ecologist also found that "every management direction reviewed noted significant damage to environmental conditions, but none put forward any meaningful strategies or had been updated to address them."

The MNRF completed an "administrative update" to the Presqu'ile Management Plan in 2013 to: edit dated terminology; update sections to include management actions implemented since 2000; and revise direction to reflect the *PPCRA*. The administrative update also added information on management direction contained in the resource management implementation plans.

2014 Amendment to the Presqu'ile Provincial Park Management Plan

More than ten years after the 2000 Presqu'ile Management Plan was approved, the MNRF began an examination of the Plan. The ministry stated that the examination found that most of the policy direction in the Plan remained current, relevant and effective, but the ministry also recognized the need for some revisions. The MNRF stated that the resulting amendment was developed under the direction of the ministry's *Protected Areas Planning Manual* (2009) and associated guidelines. (For the ECO's review of the 2014 *Protected Areas Planning Manual* and guidelines, see Section 1.3.3 of this Supplement.)

Among other actions, the amendment to the Presqu'ile Management Plan:

- revises the park's protection objective to reflect the priority placed on the maintenance of ecological integrity, as mandated by the *PPCRA*;
- changes the park's recreation objective to include nature appreciation in the list of activities engaged in by park visitors;
- adds scientific research to its park objectives to "encourage research that furthers knowledge of the park's ecological communities, and contributes to understanding and maintaining landscape-level function;"
- provides for the enhancement, rehabilitation and restoration of wildlife habitat; and
- adds a summary of public consultation regarding waterfowl hunting in the park, and updates the wildlife management section to reflect a 2001 decision to continue the hunt (see below).

The amendment also lays the foundation for new development and infrastructure in the park by:

- creating access zones (which encompass an emergency exit route, beach and trail access routes and parking areas) by rezoning some lands that were previously zoned nature reserve, natural environment and historical;
- allowing for the disposition of park land for public purposes (e.g., the construction of municipal water and drainage systems);
- enabling development of a new campground office, park store, addition to the park office, and a new visitor centre in place of an existing cottage;
- enabling construction of roofed overnight accommodations and the reconfiguration and expansion of the park's camping trailer dumping station; and
- enabling development of a cycling trail and improved road shoulders for bike lanes on the main park road.

The amended Presqu'ile Management Plan includes information on the consultation process the MNRF undertook in 2001 to determine if a recommended nearby site, Sawguin Creek Marsh, was suitable to replace Presqu'ile as a hunting ground. The amended Plan states that after the marsh was determined to be unacceptable, the MNRF concluded that no suitable alternative hunting site was available, and therefore waterfowl hunting and the associated use of boats and blinds would be permitted to continue within the protected area.

Implications of the Decision

Despite the *PPCRA*'s directive that the maintenance of ecological integrity be the first priority in park planning and management, the overarching goal statement for Presqu'ile Provincial Park fails to even mention the concept. The amended Presqu'ile Management Plan does not contain any information on the current state of the park's ecological integrity. With the exception of the protection and scientific research objectives and brief statements enabling vegetation management and wildlife habitat rehabilitation and restoration, there is no new content in the amended Plan that explains how the MNRF will maintain and restore the ecological integrity of this protected area. This is in contrast to recently approved management plans for Sioux Narrows and Holland Landing Prairie Provincial Parks that explicitly address ecological integrity when explaining planning and management decisions.

Most of the changes to the Presqu'ile Management Plan enable new and expanded infrastructure including a new park store and new visitor centre, an expanded camping trailer dumping station, public services and new roofed accommodations, all of which enhance and add to visitor services. The rezoning necessary to allow for the infrastructure development did not result in a significant decrease in the extent of park land zoned historical, nature reserve or natural environment. However, the new and expanded infrastructure could put added pressure on the ecological integrity of the park by attracting a larger number of day-use visitors and campers. Indeed, the park's recreation objective specifies that the MNRF will try to increase day use and camping outside of the summer months.

Public Participation & *EBR* Process

The proposed amendments to the Presqu'ile Management Plan were posted to the Environmental Registry for a public comment period of 56 days from November 29, 2013 to January 24, 2014. The MNRF received 16 comments on the proposal. The ministry provided ample information on the proposed plan amendment and a list of links to relevant documents, ensuring respondents had sufficient information to inform their comments.

The majority of commenters expressed opposition to or concern with continuing the waterfowl hunt in the park. A hunting and angling association was the sole commenter to express support for continuing the hunt at Presqu'ile. The same organization also requested that licensed hunters be allowed to hunt deer within the park as part of ongoing deer management (park staff currently conduct deer culls). In the decision notice for the amendment, the MNRF stated that it had made no changes to the Presqu'ile Management Plan as a result of comments received about the waterfowl hunt. Instead, the language in the Plan was updated to reflect the 2001 decision to allow waterfowl hunting in the park to continue. The amended Presqu'ile Management Plan also states that changes to the waterfowl hunting policy were outside the scope of the 2014 amendment, to the Plan.

A non-profit organization stated that the MNRF was prioritizing improving park infrastructure and campground services (e.g., expanding the trailer dumping station, enabling new roofed accommodations and building a new park store) above maintaining the ecological integrity of the park. The organization questioned whether proposed infrastructure developments and expansions had been individually examined to evaluate their impacts on ecological integrity. It argued that Presqu'ile's relatively small size (compared to other provincial parks) cannot necessarily support expanding buildings and services. The organization recommended that the MNRF acknowledge and set a limit to the number and extent of services offered, and spend more financial and human resources reducing visitor impacts and decreasing habitat fragmentation.

Other commenters questioned whether the MNRF should be spending money on expanding services and managing a waterfowl hunt in the park while other resource management needs, such as invasive plant control, go unfulfilled.

Some commenters expressed concern about the impacts of some management actions on species habitat. For example, one commenter, citing a decade-long decline in migrant shorebirds in the park, requested that the MNRF consider creating more shorebird habitat by leaving a larger section of the beach unraked. Another commenter was concerned that vehicle and human traffic on Gull and High Bluff Islands, which the commenter attributed to ongoing cormorant management and vegetation restoration, might result in negative cumulative effects on the islands. The same commenter was also

concerned that snake mortality within the park could increase if the main park road was repaved with black asphalt, because snakes in need of somewhere to bask might be attracted to the sun-warmed surface.

Some commenters raised concerns about specific wildlife and habitat management that the MNRF has not addressed in the Presqu'ile Management Plan (e.g., cormorant control, the timing, location and frequency of beach raking, vegetation restoration on Gull and High Bluff Islands). These issues are instead covered by resource management implementation plans, which were subject to separate public consultation requirements of the Class EA.

Several commenters expressed concern about the number of mute swans in the park, which they reported had increased over the past few years. The MNRF stated that although no changes were required to the Presqu'ile Management Plan as a result of comments about mute swans, the ministry continues to discuss concerns regarding mute swan management with the Canadian Wildlife Service. Mute swans are currently protected under the *Migratory Birds Convention Act, 1994*, and the Canadian Wildlife Service is responsible for issuing permits to control them.

After considering comments on the proposed amendment to the Presqu'ile Management Plan, the ministry re-worded the park protection objective to more strongly reflect the prioritization of ecological integrity. It also made several minor changes including:

- revising wording to allow the disposition of certain rights to park land;
- adding nature appreciation as an activity under the park's recreation objective;
- clarifying that no forests or undisturbed areas would be cleared to enlarge parking areas;
- adding a provision to allow the parking area near the existing park store to remain in operation after the store's demolition; and
- modifying language regarding plan implementation to reflect that the Presqu'ile Forum (a group of stakeholders and park staff that previously consulted on park management) is not currently active.

Statement of Environmental Values

The MNRF considered its Statement of Environmental Values in approving the amendments to the Presqu'ile Management Plan. The MNRF stated that management direction focuses on the preservation of ecological integrity, and changes to the Management Plan focus on balancing sustainable recreation, education and resource utilization with the protection and enhancement of natural ecosystems. The ministry also noted that, although waterfowl hunting and mute swan management are contentious issues, neither was pertinent to the management plan amendment process. The ministry stated that public consultation requirements prescribed by the 2009 *Protected Areas Planning Manual* and the Class EA were fulfilled during the amendment process and a concurrent process under the Class EA for development proposals contained in the amendment.

ECO Comment

The *PPCRA* directs that the maintenance of ecological integrity be the first priority in park management and planning. However, the updated Presqu'ile Management Plan does not include a discussion of the current state of the park's ecological integrity, nor does it identify threats to ecological

integrity or provide a framework within which to mitigate them. Changes to the plan are aimed primarily at enabling activities that provide little, if any, benefit for the park's ecological integrity, such as the construction of new roads and buildings to accommodate more visitors.

The MNRF needs to assess all the issues that affect a protected area as part of its management plan examination process. A thorough review of a management plan should allow for a public discussion of how all issues will (or will not) be addressed in the years ahead by the ministry. However, the MNRF did not reopen the discussion about waterfowl hunting in its examination of the Presqu'ile Management Plan, despite strong concerns voiced by many public commenters. Instead the ministry simply stated that waterfowl hunting was "out of scope for the amendment," and that the Plan was updated "to reflect a 2001 decision which supports waterfowl hunting in the park." While the ministry may decide to let this activity continue, excluding it from public review undermines the public's confidence in the management planning process.

Hunting in protected areas should be permitted only when the MNRF can publicly demonstrate that it is not detrimental to the species hunted or the ecological integrity of the park as a whole. For example, the MNRF hunts deer in Presqu'ile in order to maintain the population at "a level that is within the carrying capacity of the park's deer habitat and sustainable in the context of the park environment." The purpose of the deer hunt is to help maintain ecological integrity by managing a hyper-abundant species, and the hunt's effects and purpose are explained in the Presqu'ile Management Plan.

When the MNRF excludes potentially controversial topics (like waterfowl hunting) from a management plan review, it fails to comprehensively address all issues affecting the protected area. It is the ministry's responsibility to examine the impacts of all activities in protected areas and articulate why they are (or are not) compatible with ecological integrity.

Review of Posted Decision:

1.3.5 Government Response Statements for Species at Risk

Decision Information

Registry Number: 012-0606
Proposal Posted: January 20, 2014
Decision Posted: April 11, 2014

Comment Period: 45 days
Number of Comments: 0
Decision Implemented: March 7, 2014

Registry Number: 012-0405
Proposal Posted: August 13, 2014
Decision Posted: December 15, 2014

Comment Period: 4 days
Number of Comments: 154
Decision Implemented: December 15, 2014

Description

Overview

One of the most important components of the *Endangered Species Act, 2007* (*ESA*) framework is the government response statement to a recovery strategy or management plan for species at risk. A response statement outlines the actions and priorities that the government as a whole will take to protect and recover a species at risk. The law intends for the Ministry of Natural Resources and Forestry (MNRF) to define the specific actions that the government will undertake to protect a species based on feasibility and socio-economic factors. The actions contained in a response statement can directly influence whether a species population will remain as is, improve, or become further imperilled in the future.

In April 2014, the MNRF finalized response statements for six species of special concern: beluga (*Delphinapterus leucas*); black tern (*Chlidonias niger*); broad beech fern (*Phegopteris hexagonoptera*); green dragon (*Arisaema dracontium*); Shumard oak (*Quercus shumardii*); and West Virginia white (*Pieris virginiensis*).

In December 2014, the MNRF completed response statements for six endangered species: American columbo (*Frasera caroliniensis*); bird's-foot violet (*Viola pedata*); Virginia's goats rue (*Tephrosia virginiana*); Northern madtom (*Noturus stigmosus*); slender bush-clover (*Lespedeza virginica*); and willowleaf aster (*Symphyotrichum praealtum*). The ministry also finalized a response statement for pugnose shiner (*Notropis anogenus*), a threatened species. The ministry stated that it required more time to prepare response statements for American eel (*Anguilla rostrata*) and wolverine (*Gulo gulo*), classified as endangered and threatened respectively.

The *ESA* defines a species of special concern as a plant or animal that lives in the wild in Ontario that may become threatened or endangered, because of a combination of biological characteristics and identified threats. A threatened species is defined as a species that lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation. A species is classified as endangered if it lives in the wild in Ontario but is facing imminent extinction or extirpation. The government's decision about which measures it chooses to undertake is a critical one: response statements present an important opportunity to

commit to taking targeted measures to improve the status of a species, before they become more imperilled and require substantial conservation efforts.

In our 2009 Special Report, *The Last Line of Defence: A Review of Ontario's New Protections for Species at Risk*, the ECO urged the MNRF to ensure that its response statements are "robust, effective and defensible" and that "its commitments are fully implemented in a timely fashion." In our subsequent 2013 Special Report, *Laying Siege to the Last Line of Defence: A Review of Ontario's Weakened Protections for Species at Risk*, the ECO reported that the government had "failed to address these and other concerns in its production of more recent response statements."

Background

The *ESA* has three central purposes: to identify species at risk; to protect species that are at risk and their habitats, and to promote the recovery of these species; and to promote stewardship activities to assist in species protection and recovery. There are multiple steps in the *ESA* process that are intended to ultimately lead to specific actions being taken to aid in the protection and recovery of a species.

An independent committee of experts, the Committee on the Status of Species at Risk in Ontario (COSSARO), assesses and classifies species at risk using scientific information, community knowledge and Aboriginal traditional knowledge. Species may be classified under the Act as: extinct; extirpated; endangered; threatened; or special concern. Once COSSARO classifies or reclassifies a species, the Minister must then amend the Species at Risk in Ontario List (O. Reg. 230/08) accordingly.

The *ESA* process differs somewhat depending on whether the species is classified as special concern, endangered or threatened. For example, the Act's prohibitions on harming and harassing species at risk (section 9) or damaging or destroying their habitat (section 10) do not apply to species of special concern.

In addition, experts chosen by the government develop "management plans" for species of special concern within five years of listing under the *ESA*; whereas they develop "recovery strategies" for threatened and endangered species within one or two years after listing. The *ESA* does not prescribe the contents of the management plan; in contrast, the *ESA* specifies that recovery strategies must: identify the habitat needs of a species; describe threats; and provide recommendations to the Minister. In both cases, however, these documents provide impartial advice to the government on how to protect and recover a species at risk.

Within nine months, the Minister must publish a statement that summarizes the government's actions and priorities in response to a management plan or recovery strategy. The Minister must then implement the response statement actions that are feasible and within the responsibilities of the Minister, allowing for the consideration of social and economic factors. Five years after the MNRF publishes a response statement for a threatened or endangered species, the Minister is required to review the progress towards the protection and recovery of that species. There is no such requirement for a species of special concern.

Overview of Some Species at Risk

Beluga Whale:
The beluga is a medium-sized, white whale that migrates annually between open water near the Hudson Strait in the winter and river estuaries along the coasts of Hudson and James bays in the summer for moulting, feeding and calving. Most of Ontario's belugas belong to the Western Hudson Bay population, Canada's largest population. In 2004, the Committee on the Status of Endangered Wildlife in Canada estimated that the population is 50,000 whales, but the estimate is based on aerial surveys that were conducted between 1978 and 1987.[1] The beluga is considered a species of special concern because the whale is under threat from: predation by killer whales and polar bears; habitat loss and alteration (e.g., from shipping traffic and hydro-electric development); climate change; contaminants; and hunting in parts of its range. Since belugas return to the same river estuaries each spring, alteration and destruction of these important habitats is another threat. The total catch for the Western Hudson Bay population in 2003 was 764 whales, which is an increase from previous annual catches of about 500 whales.[2] Not many whales are hunted within Ontario; most belugas are killed southeast of Baffin Island and in the Hudson Strait.

Bird's Foot Violet:
The bird's foot violet is an herbaceous perennial with purple petals and leaves that resemble the toes of a bird. It favours dry, open, sandy sites, including oak savannas and prairies. This plant only occurs in North America, from southern Ontario to Texas. Five populations remain in southwestern Ontario and the largest population, with a total of 6,500 plants, is located within Turkey Point Provincial Park and St. Williams Conservation Reserve. The four other populations are located on private lands, and three of those populations have fewer than 10 plants. The species is listed as endangered in Ontario. Threats to its survival are: fire suppression; habitat loss; trampling and recreational pressure; erosion; and invasive species.

Pugnose Shiner:
The pugnose shiner is a small, slender minnow with a blunt snout and small, upturned mouth. The minnow is considered globally rare and has a limited distribution in North America, including the upper Mississippi River, Red River of the North and the Great Lakes basins. In Canada, it can be found in the southern drainage of Lake Huron, Lake St. Clair, Lake Erie, Lake Ontario and the St. Lawrence River. The minnow requires shallow, densely vegetated waters for spawning because its embryos are sensitive to light. Adults are typically found in clear waters of streams, lakes and bays with slow currents and vegetation. The species is listed as threatened in Ontario. Threats to its survival include: habitat modifications; aquatic vegetation removal; sediment loading and turbidity; nutrient loading; invasive species; baitfish harvesting; changes in the fish community; and climate change.

West Virginia White:
The West Virginia white is a forest-dwelling butterfly that is listed as a species of special concern in Ontario. This butterfly occurs in eastern North America, from Quebec to northwestern Alabama. In Ontario, observations since 2002 are clustered in Halton region, Manitoulin Island, Leeds and Grenville and Frontenac counties, central Peterborough County, and southeastern shoreline of Lake Superior/St.

[1] Committee on the Status of Endangered Wildlife in Canada (2004). *COSEWIC Assessment and Update Status Report on the Beluga Whale* Delphinapterus leucas *in Canada*, pages 29-35.
[2] Committee on the Status of Endangered Wildlife in Canada (2004). *COSEWIC Assessment and Update Status Report on the Beluga Whale* Delphinapterus leucas *in Canada*, page 33.

Joseph Island. There is no population estimate for the West Virginia white in Ontario. Major threats to the species' survival include the loss and fragmentation of woodlands in Ontario and the spread of garlic mustard (*Alliaria petiolata*), which is mistakenly eaten by newly hatched caterpillars causing death. Other threats include urban development and climate change.

Government Response Statements

The ministry response statements share a similar layout, which includes a recovery or management goal, objectives, and actions. The recovery or management goal within each response statement generally aims to maintain, and in some cases improve, the current population.

Actions are divided into "government-led" and "government-supported" actions. Government-led actions are those activities that the government will undertake directly. The MNRF defines government-supported actions as "endorsed by the government as being necessary for the protection and management of the species." These actions do not identify who is responsible for implementation. The MNRF assigned high, medium or low priority to all government-supported actions for the species of special concern, but did not prioritize the government-led actions. The ministry only identified government-supported actions that are high priority in the threatened and endangered species' response statements.

The MNRF states in each response statement that it "considered what actions are feasible for the government to lead directly and what actions are feasible for the government to support its conservation partners to undertake." The MNRF noted in each response statement that it will provide support for conservation agencies, municipalities, industry partners and Aboriginal communities to undertake government-supported actions "where appropriate through funding, and advisory services." The ministry added that funding may be available through the Species at Risk Stewardship Fund and the Species at Risk Research Fund for Ontario.

The response statements also specified that "implementation of the actions may be subject to changing priorities across the multitude of species at risk, available resources and the capacity of partners to undertake recovery activities." In addition, "where appropriate, the implementation of actions for multiple species will be co-ordinated across government response statements."

Government-led Actions:
All of the response statements included a government-led action to encourage the submission of data to the ministry's central repository at the Natural Heritage Information Centre (NHIC). The Centre manages data about the location of species of conservation concern, plant communities, wildlife concentration areas, and natural areas in Ontario. The centre reviews all submitted occurrence reports before entering them into the provincial database.

The government committed to the following actions for all the species, except Beluga: to undertake communication and outreach to increase public awareness of species at risk in Ontario; and to continue to implement the Ontario Invasive Species Strategic Plan to address the invasive species that threaten the species at risk.

Response statements for the species listed as endangered or threatened (i.e., willowleaf aster, pugnose shiner, slender bush-clover, American columbo, bird's foot violet, Virginia goat's-rue, and northern madtom) included the following government-led action:

- educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the *ESA*;
- protect the species and its habitat through the *ESA*;
- support conservation, agency, municipal and industry partners and Aboriginal communities and organizations to undertake activities to protect and recover the species. Support will be provided where appropriate through funding agreements, permits with appropriate conditions, and/or advisory services; and
- encourage collaboration and establish and communicate annual priority actions for government support in order to reduce duplication of efforts.

Response statement for the species of special concern, except beluga (i.e., black tern, broad beech fern, green dragon, Shumard oak, and West Virginia white), included the following government-led actions:

- continue to implement protection for species of special concern and their habitat through management planning processes, including forest management on crown land and/or planning for provincial parks;
- encourage municipalities to identify habitat of the species as significant woodland and/or significant wildlife habitat under the Provincial Policy Statement; and
- encourage planning and environmental authorities to consider the conservation of the species in management planning and decision making.

The MNRF included the following government-led actions for beluga:

- continue to work jointly with First Nations to develop community based land use plans in the Far North of Ontario. Working together, First Nations and Ontario will "identify community and broad-scale interests that reflect the complex nature of the ecology, culture and economics of the Far North," and will consider cumulative impacts and conservation of important beluga summer estuarine habitat in Ontario in the planning process;
- work co-operatively with other governments and agencies regarding the protection of portions of important estuarine summer habitat outside of Ontario's jurisdictions;
- collaborate with the federal Department of Fisheries and Oceans, and other management agencies regarding monitoring, research and management of beluga;
- encourage planning and environmental authorities to consider the conservation of beluga in management planning and decision making; and
- ensure that potential implications to beluga habitat are considered during the review of natural resource development and industrial projects.

The response statement for pugnose shiner included government-led actions to develop a population and distribution monitoring protocol and to investigate the effectiveness of coastal wetland habitat restoration activities to recover populations. The MNRF committed to continue forest pest monitoring programs in Southern Ontario within the black tern, Shumard Oak and West Virginia white response statements. In addition, the ministry included the following actions for the bird's foot violet and Virginia goat's-rue:

- continue to undertake periodic monitoring of populations, habitat conditions, and threats to the species and their habitat within Turkey Point Provincial Park;
- continue to undertake ecosystem enhancement activities such as prescribed burning and invasive species control within Turkey Point Provincial Point, as resources permit; and
- continue to work with partners to undertake monitoring, habitat management, research to address significant knowledge gaps, and to increase awareness and promote stewardship of species at risk in St. Williams Conservation reserve.

Government-supported Actions:
Most of the response statements included government-supported actions to: implement a standardized population and habitat monitoring program; implement best management practices; conduct habitat rehabilitation; conduct research on threats to species and on viable population sizes of the species; and promote awareness among landowners about the species. In general, these actions align with actions recommended in the response statements and management plans. For example, the West Virginia white response statement and management plan both contain an action to secure habitat of key sites through land acquisitions. And the slender bush-clover, bird's foot violet, and Virginia goat's rue response statements and recovery strategies contain actions to explore opportunities to establish or re-establish populations in existing sites through plant cultivation.

However, there are a number of protection and management actions that were recommended in management plans or recovery strategies that the ministry did not address in response statements. For example, the black tern management plan and bird's-foot violet recovery strategy both recommended action to secure habitat on key sites through for land acquisition, but this action is not contained in the response statements. In addition, the beluga management plan states that it is critically necessary to protect the whale's significant estuarine summer habitat within Ontario, but this was not included in the response statement.

Implications of the Decision

Weak, Status Quo *Protection and Management*

The new response statements suggest that the MNRF will do little more than what it was previously doing to protect and manage these species at risk. Indeed, most of the government-led protection and management actions are already required in law or already committed to in existing policies or programs. For instance, statements that the government will "continu[e] to implement the *Ontario Invasive Species Strategic Plan*" will not provide any new protection for, or management of, these species.

Similarly, most of the government-led actions for beluga merely reiterate what the ministry is already required to do – such as the ministry's commitment to protect beluga and its habitat through the provincial park management planning process – or is already doing, for instance working with other jurisdiction on management or research. While the response statement includes actions to "consider" the conservation of important beluga summer estuarine habitat in Ontario through the Far North planning process, and to work with other jurisdictions to protect summer habitat outside of Ontario, it does not include any action to specifically identify and protect this habitat within Ontario.

In addition, government-led actions are vague. For example, it is unclear how the government will further "encourage" municipalities to "consider" the habitat of West Virginia white or broad beech fern as significant wildlife habitat and/or significant woodland under the *Provincial Policy Statement, 2014*. Under the province's one-window planning service, the MNRF no longer reviews land use planning documents or applications. Instead, the ministry provides advice to the Ministry of Municipal Affairs and Housing when asked, and creates guidance documents for municipalities and planning authorities. Municipalities and planning authorities identify and/or approve the designation of significant wildlife habitat and significant woodlands in local planning policies. The MNRF's existing guidance documents, the *Significant Wildlife Habitat Technical Guide* (2000) and the *Natural Heritage Reference Manual* (2010), already advise municipalities and planning authorities that habitat of these species of special concern could be considered significant wildlife habitat and/or significant woodlands. While planning authorities can seek advice from the MNRF, it is ultimately the planning authorities' discretion whether or not to ask.

Little Ministry Involvement in Inventorying, Monitoring and Research

In general, the government did not commit to any new involvement in inventorying, monitoring and research for these species at risk. Nearly all of the government-led actions included in the response statements simply reiterate the ministry's existing obligations or recovery actions already underway, such as continuing forest pest monitoring programs in southern Ontario or continuing to undertake periodic monitoring of bird's foot violet in a provincial park. The only government-led action that may be considered new is the commitment to develop a pugnose shiner population and distribution monitoring protocol.

Actions that "encourage" the submission of data to the NHIC might not result in any new or updated information on the population or distribution of these species, since the ministry itself did not commit to inventory or monitor populations of these species. Moreover, even if third parties obtain new data on these species (see subsection below), it may not be entered into the NHIC database in a timely fashion. In our 2010/2011 Annual Report, the ECO reported a backlog of data to be entered into the NHIC. It appears the ministry has made little progress since then, as management plans released in 2013 noted that the NHIC had unprocessed records for beluga, green dragon and Shumard oak.

Reliance on Unidentified Third Parties for Management Actions

The many government-supported actions that attempt to address specific threats to the species at risk will only be implemented if unspecified third parties step up. For example, response statements include many government-supported actions to address data gaps and monitoring protocol deficiencies, but these actions rely on third parties for implementation. And the implementation of these important actions may be *ad hoc* and inconsistent with the priorities identified in the response statements. In our 2010/2011 Annual Report, the ECO raised this concern regarding the reliance of third parties to undertake on-the-ground protection and recovery efforts. However, the government stated that it would support third parties to undertake protection and recovery activities through funding, agreements, permits and advisory services, where appropriate, and that it would encourage collaboration and communicate annual priority actions for government support in order to reduce duplication of efforts.

Difficult to Measure Success

The *ESA* does not require a five-year progress review for species of special concern (as it does for endangered, threatened and extirpated species). It is therefore unknown if the ministry will ever review its progress towards the protection and recovery of species of special concern. Even if the ministry does review its progress, the response statements do not include any population targets or specific deadlines for completion of the actions against which to measure the success of the actions. In our 2010/11 Annual Report, the ECO raised this concern and encouraged the government to set measurable targets for species recovery whenever possible.

Government-led Actions are not Prioritized

Additionally, the ministry failed to prioritize government-led actions, as required under the *ESA,* in these response statements. The ministry did, however, assign priority to government-supported actions for species of special concern, but not for threatened or endangered species.

Delayed Protection

The ministry published the response statements for the species of special concern within the legislative deadline. The ministry did not meet its legislative deadline in preparing recovery strategies and response statements for the endangered and threatened species by approximately four and five months, respectively. Such delays have the practical effect of stalling protection and recovery efforts; for some species at risk, such delays in taking action can have significant consequences. The ECO raised a similar concern in our 2013 Special Report, noting that nearly half of the recovery strategies had been delayed, which in turn held up the creation of response statements.

In December 2014, the MNRF again delayed its preparation of a response statement for the American eel and wolverine, which were due in August 2014. A glaring delay, however, is the ministry's ongoing failure to prepare response statements for the polar bear (*Ursus maritimus*) and three populations of lake sturgeon (*Acipenser fulvescens*), which it was required to have completed by September 2012 (see Parts 4.3 and 4.4 of our 2012/2013 Annual Report).

Public Participation & *EBR* Process

The MNRF posted a proposal for the species of special concern response statements on the Environmental Registry for a 45-day public review and comment period. In its decision notice, the ministry stated that it did not receive any comments on the proposal and as a result, made no substantive changes to the draft response statements.

The ministry posted a proposal for the threatened and endangered species response statements on the Environmental Registry for a 47-day public review and comment period. In its decision notice, the ministry stated that it received 153 public submissions during the first stage of consultation (November 22 – December 23, 2013). The majority of these comments related to the recovery strategy for the American eel, which the ministry stated it would consider in developing the draft response statement.

The ministry stated that during the second consultation stage, it received one comment related to the pugnose shiner response statement. The commenter, an environmental organization, was generally

supportive of the response statement and highlighted opportunities where it could assist in implementing actions (i.e., monitoring and research). The commenter also requested information on how to access the Species at Risk Stewardship Fund to facilitate research on the effectiveness of coastal wetland restoration activities for species at risk recovery.

The MNRF also stated that it made some modifications (e.g., to improve clarity) to the response statements for American columbo, bird's-foot violet and Virginia goat's-rue, slender bush-clover, and willowleaf aster as a result of comments received from ministry staff. Additionally, the ministry updated the response statement for pugnose shiner to reflect a recent status change from endangered to threatened under the *ESA*.

Statement of Environmental Values

The ministry provided a summary of how it considered its Statement of Environmental Values (SEV) in the development of the response statements. For the six species of special concern, the MNRF stated that it considered six principles of resource stewardship (as outlined in its SEV) relevant to this decision and provided a brief description of how these principles were applied. For example, the ministry explained how its principle of participation in resource management was applied. The MNRF stated that the response statements recognize that the protection and recovery of species at risk is a shared responsibility and that no single agency or organization has the knowledge, authority or financial resources to protect and recover all of Ontario's species at risk. The ministry also described how it considered its principle that applied research and sharing of scientific and technological knowledge and innovative technologies must be fostered to support the sustainable development of natural resources. It stated that the response statements clearly acknowledge the need to address key knowledge gaps (e.g., inventory and monitor populations) and increase awareness of the conservation status and needs of species of special concern.

For the threatened and endangered species response statements, the ministry stated that it considered all its principles of resource stewardship. For example the ministry described how it considered its principle of understanding natural and ecological systems was applied. It stated that the response statements are based on consideration of the best available scientific information that was provided in the respective recovery strategies.

ECO Comment

One of the most critical steps in the *ESA* process is the preparation and publication of the government response statement: it should articulate what actions the Ontario government will (and, ideally, will not) take for the protection and recovery of species at risk. It is at this stage that the government considers social and economic factors in deciding what actions are feasible, as well as clearly identifying the help needed by others outside of government. It should be a frank and honest plan that ideally works toward making the species (and its habitat) secure enough so that it is no longer in peril.

Again, the ECO is disappointed to report that the government response statements for species at risk are inadequate. The government committed to little, if anything, beyond what would have been done irrespective of the *ESA*. As a result, the conditions that contributed to the species being listed as special concern, threatened or endangered in the first place are unlikely to improve as a result of the actions set out in the government response statements. The ECO's past concerns persist: government

response statements for species at risk continue to be vague and weak, and simply reiterate existing responsibilities under government policies and programs. Although some of the response statements' overall recovery and management goals aim to improve the species' population levels, it is unclear how this will be achieved without taking any new concerted action.

Protecting imperilled species is a shared responsibility. However, the MNRF is the lead government ministry responsible for species at risk and it must demonstrate some on-the-ground leadership. Instead, the ministry is reinforcing the impression that it is largely a passive bystander when it comes to taking some measure of substantive action for species at risk. The MNRF is missing an important opportunity to implement practical and innovative actions to address specific threats to these species. For example, the response statement could have included committments to secure key habitat of species at risk through land acquisition. For beluga, the government could have pledged to identify and protect key summer habitat (estuaries) within Ontario. Instead, these actions are left to unspecified third parties to undertake (or not), or left unaddressed altogether. The government's ultimate goal should be to take actions to improve a species' at-risk status and, therefore, no longer require the attention of the *ESA*.

The legislative framework of the *ESA* is sound in principle: first, independent assessment and classification of species; then science-based recovery strategies and management plans; the government then responds with response statements that outline protection and recovery actions that consider social and economic factors; and finally, implementation of the actions in the response statement that are feasible and within the responsibility of the Minister. Each of these steps is dependent on its preceding step. If one step is weak or broken, the whole system fails. Response statements are one of the important final steps in the framework for protecting and recovering species under the *ESA*. The ministry's continued failure to prepare meaningful response statements threatens the entire process and, in turn, all species at risk in Ontario.

Review of Posted Decision:

1.3.6 Expansion of Wild Turkey Hunting Opportunities

Decision Information

Registry Number: 012-0672
Proposal Posted: February 5, 2014
Decision Posted: April 9, 2014
Comment Period: 47 days
Number of Comments: 83
Decision Implemented: March 27, 2014

Description

Overview

The eastern wild turkey (*Meleagris gallopavo silvestris*; "wild turkey") disappeared from Ontario's landscape in the early 1900s as a result of uncontrolled hunting and rapid deforestation. In 1984, the Ministry of Natural Resources and Forestry (MNRF) started a program to reintroduce the species into Ontario and, once established, began to manage recreational hunting of the bird. The ministry has gradually opened spring and fall wild turkey hunting seasons across southern Ontario as the population increases and its range expands. Today, the wild turkey population has rebounded to the point that they can be found in parts of the province where they were not historically located.

In April 2014, the MNRF opened new spring hunting seasons in areas around Parry Sound, Huntsville and Sudbury, and a fall hunting season in the Pembroke area. The ministry stated that this decision will "provide additional recreational hunting opportunities and increased economic benefits from wild turkey hunting."

Range and Abundance of Wild Turkeys in Ontario

The wild turkey is a large, ground-nesting bird native to North America. It can adapt to many habitats, but it prefers an equal mix of forest and open areas, such as large forest tracts in agricultural areas. Trees are important to wild turkeys because they provide an area to build nests as well as protection from weather and predators. The bird is an opportunistic omnivore that eats: insects; seeds; grasses; berries; nuts; and plants.

Prior to European settlement, the wild turkey was common in the mixed and temperate forests, as well as savannas, of the eastern United States and southern Ontario. Its historic range in Ontario spanned from Lake Erie to Georgian Bay (see Figure 1). This area is within Ontario's Mixedwood Plains Ecozone.

During the 1800s, the landscape of southern Ontario underwent major changes. Extensive patches of forests were logged, often to create farmland. Simultaneously, the government did not regulate wild turkey hunting. As a result, the wild turkey population declined and eventually became extirpated from Ontario by 1909. Wild turkey populations in most of North America also suffered declines.

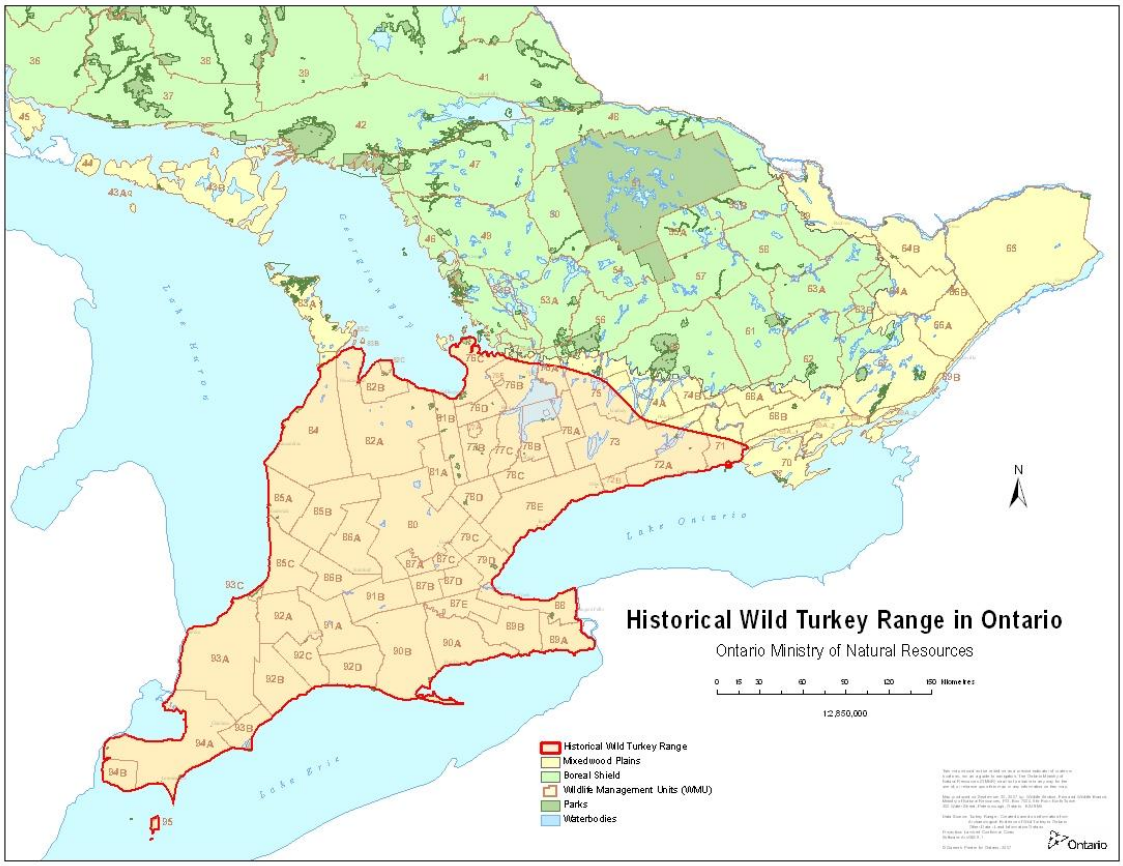


Figure 1. Historic range of eastern wild turkey in Ontario. (Source: Ontario Ministry of Natural Resources, *Wild Turkey Management Plan for Ontario*, 2007).

In 1984, the MNRF began to reintroduce the species in Ontario. The MNRF has released 4,400 turkeys at 275 sites across the province, including birds from the U.S. and birds that were trapped and transferred from within Ontario.[1] Most of the release sites were located within the wild turkey's historic range; however, there were some birds released outside of their historic range, including on St. Joseph Island (in northwestern Lake Huron) and around Sudbury.[2] The last wild turkey releases were made by the MNRF in the winter of 2004/2005.

Ontario's wild turkey population is now self-sustaining and its distribution is larger than its historic range (see Figure 2). In 2007, the ministry reported that the population was about 70,000 birds.[3] Since 2007, the turkey's range has expanded northward, up to Parry Sound and Sudbury. These northern birds have naturally migrated, escaped from farms, or have been released illegally. Wild turkeys can survive north of their historic range, but conditions such as snow depth, colder temperatures, and limited food availability make these areas less favourable habitat.

[1] Bellamy, K. and Pollard, J.B. (2005). Development of an Ecological, Risk-Based Decision Framework for Releasing and Managing Wild Turkeys in Ontario. In: Stewart, C.A. and Frawley, V.R., editors. *Proceedings of the Ninth National Wild Turkey Symposium* (December 10-14, 2005), Grand Rapids, Michigan, pages 289-294.
[2] Ontario Ministry of Natural Resources (2007). *Wild Turkey Management Plan for Ontario*, page 25.
[3] Ontario Ministry of Natural Resources (2007). *Wild Turkey Management Plan for Ontario*, page iii.

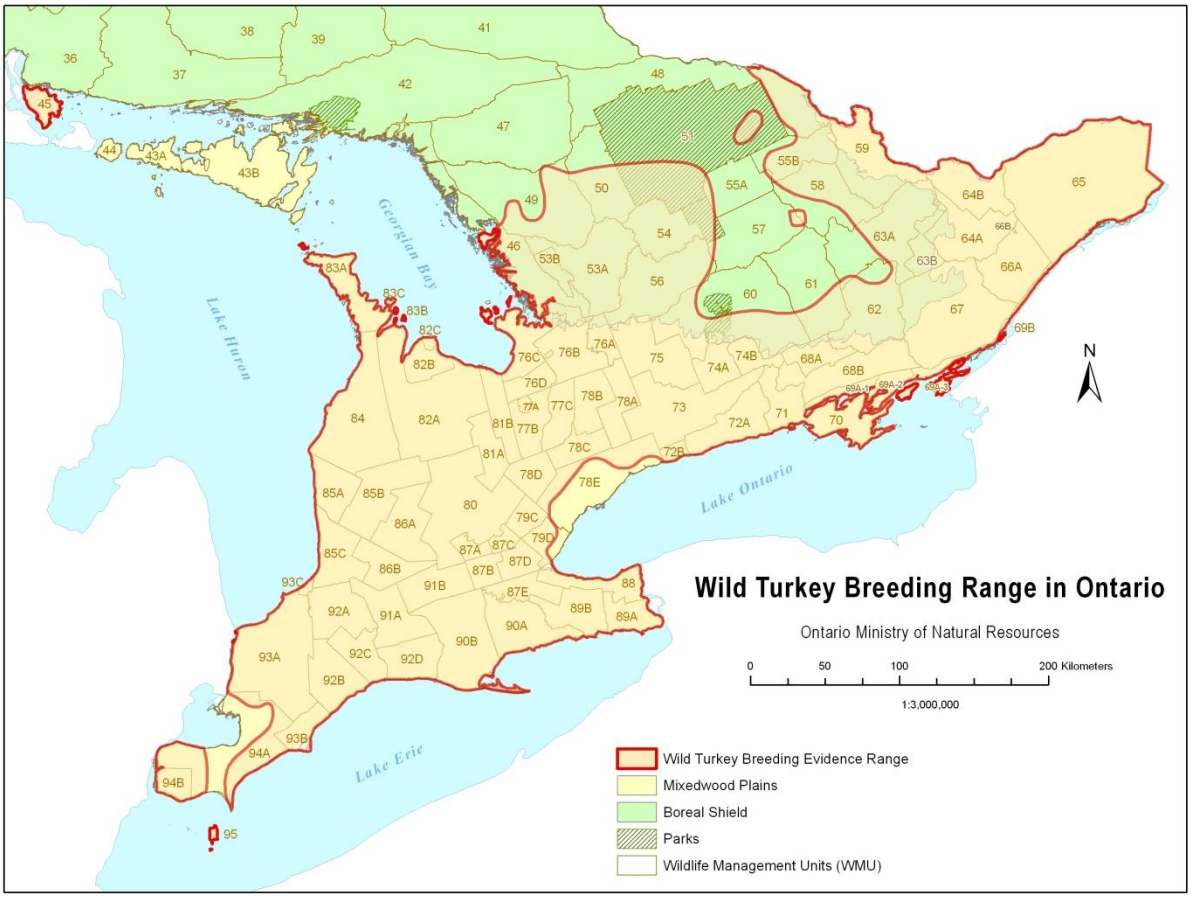


Figure 2. Approximate breeding range of eastern wild turkeys in Ontario (2007). (Source: Ontario Ministry of Natural Resources, *Wild Turkey Management Plan for Ontario*, 2007).

Managing Ontario's Wild Turkey Hunt

In 1987, the ministry opened the first wild turkey hunting season in a small area of eastern Ontario. The hunt was restricted, with a limited number of hunters and a short season. As the wild turkey population increased and its range expanded, the ministry increased hunting opportunities. The MNRF's primary objective for population management within the *Wild Turkey Management Plan for Ontario* (the "Management Plan") is to "manage wild turkey populations based on landscape level goals which are managing for sustainability in the Mixedwood Plains Ecozone and providing hunting opportunities where they exist in the Boreal Shield Ecozone."

The MNRF uses an ecological land classification system to delineate natural regions based on ecological factors such as: bedrock; climate; soils; and vegetation. The Mixedwood Plains Ecozone is situated south of the Precambrian Shield, with primarily limestone, sandstone and shale bedrock. The vegetation in this ecozone is diverse, including: mixed deciduous-evergreen forests; tolerant hardwood forests; wetlands; alvars; and tall-grass prairies. The Boreal or Ontario Shield Ecozone is just north of the Mixedwood Plains Ecozone. It occupies more than half of Ontario and contains all of the Precambrian Bedrock in the province. Vegetation in this ecoregion is also diverse, with conifer-dominant forests, mixed and deciduous forests, and wetlands.

The Management Plan includes criteria for opening spring and fall wild turkey hunting seasons in a wildlife management unit (WMU). The Management Plan states that, as wild turkeys expand their range into units where releases were never made, the primary criteria for opening spring hunting will be: a minimum population of 200 birds; and an increasing trend in abundance, based on deer hunter observations. The criteria to add a unit to the fall hunting season is: that the annual spring wild turkey harvest is at least 200 birds in each of the preceding three consecutive years, or three out of four years; or the harvest density is greater than 0.4 turkeys per square kilometre of turkey habitat for three consecutive years.

Nearly all of southern Ontario is now open for wild turkey hunting in the spring season, and parts of southern Ontario are open during the fall hunting season. During the spring season (April 25 to May 31), a hunter can kill up to two bearded wild turkeys, which are typically males. During the fall season (for 13 days after Thanksgiving) a hunter can take either one male or one female bird. Hunters must report wild turkey harvest information to the MNRF by noon the day after the bird was killed. In 2014, the MNRF reported that 6,912 wild turkeys were killed in that spring season and 262 birds in the fall season.[4]

Expansion of Wild Turkey Hunting in New Areas

The ministry manages game wildlife, including wild turkey, under the *Fish and Wildlife Conservation Act, 1997* (*FWCA*) and its regulations. Hunting seasons and areas are defined in the Open Seasons – Wildlife regulation (O. Reg. 670/98) made under the *FWCA*.

In March 2014, the MNRF amended this regulation to add Wildlife Management Units, or WMUs, 42, 47, 49 and 50 (areas around Parry Sound, Huntsville and Sudbury) to the spring hunting season. These areas are north of the wild turkey's historic breeding range and mostly north of its 2007 breeding range. In addition, the ministry added WMU 59, in the Pembroke area, to the fall hunting season. This area is within the wild turkey's current breeding range, but north of its historic range.

The MNRF stated in its Environmental Registry proposal notice that the turkey populations in these areas met the criteria in the Management Plan for opening the spring and fall turkey season. In response to an inquiry from the ECO for additional information about the application of the criteria to these units, the MNRF stated that "the index of reported turkey sightings by deer hunters suggests turkey numbers in WMUs 42, 47, 49 and 50 have exceeded 200 birds in each area since 2005." With regard to the fall hunt, the ministry responded that "WMU 59 meets the first of the two criteria as spring turkey harvest exceeds 200 birds/year from 2008-2013".

The ministry also told the ECO that the "MNRF district staff in Parry Sound and Sudbury Districts indicated public interest in spring turkey hunting seasons in these areas," and the "MNRF staff in Pembroke District indicated public interest in a fall turkey hunting season in WMU 59." In addition, the ministry also stated that opening the hunting seasons is consistent with the management objectives to provide hunting opportunities in the Boreal Shield Ecozone.

[4] Ontario Ministry of Natural Resources and Forestry (2015). *2015 Hunting Regulations Summary*, page 31.

Implications of the Decision

Wild turkeys are prolific breeders and have a high rate of reproduction. Because of these traits, the MNRF stated that hunting adult male wild turkeys in the spring after the breeding season has "no direct influence on observed population fluctuations or sustainability."[5] Given that hunters are allowed to kill only bearded turkeys, which are primarily males, in the spring season, and that the provincial population of wild turkeys appears to be increasing, the addition of four WMUs to the spring hunting season should have little impact on wild turkey abundance in Ontario.

The expanded areas, however, are north of the wild turkey's historic breeding range; as such, the climate and habitat may not be as suitable for long-term survival as the more southern locales. It is possible that the addition of a spring hunt could deplete local wild turkey populations, particularly in years with severe winter weather. This raises broader questions about how to manage species outside of their historical range. Scientists predict that climate change will alter the ranges of many species. For example, the Audubon Society hypothesized that the wild turkey climatic range will move into northern Ontario by 2050.

The MNRF stated that a conservative fall turkey harvest will not cause a fluctuation in wild turkey populations; changes in population are primarily based on overall annual hen (adult female) survival and reproductive success. Furthermore, the ministry stated that its criteria for opening wild turkey fall hunting is based on overall population management objectives. As previous spring harvests in the Pembroke area met the MNRF's criteria, it is unlikely that fall hunting of wild turkeys in this area will deplete the local or provincial populations.

Public Participation & *EBR* Process

On February 5, 2014, the MNRF posted a proposal on the Environmental Registry to open spring wild turkey hunting seasons in areas near Parry Sound, Huntsville and Sudbury and to open a fall turkey hunting season in an area near Pembroke. The public review period was 47 days and the MNRF received 83 comments.

Many of the commenters supported the proposal notice to expand the wild turkey hunting seasons. A hunting group stated that it "has continually expressed interest and support for the creation of additional wild turkey hunting opportunities, which we believe will provide substantial benefits (e.g., social, economic, etc.) consistent with the Management Plan for Ontario (i.e., managing for sustainability and providing hunting opportunities)." Some commenters welcomed the proposed changes because they wanted opportunities to hunt turkeys nearby, rather than having to travel south. Many commenters observed a growing turkey population in the affected areas and suggested that the northern turkey population would be able to sustain hunting.

Some commenters, conversely, stated that there does not appear to be enough wild turkeys in these areas to warrant hunting. They suggested that opening hunting seasons in more northern areas, coupled with harsh winters, could destroy the current population.

[5] Ontario Ministry of Natural Resources (2007). *Wild Turkey Management Plan for Ontario*, pages 3-4.

Other commenters supported the proposal to control turkey populations and reduce damage to farm crops and lawns from the birds. For example, an agricultural group commented that farmers across southern Ontario are reporting increased numbers of wild turkeys on their farms, and increased damages to standing crops and stored grain by wild turkeys.

In response to the comments received, the MNRF stated that it will continue to manage "for sustainability within the Mixedwood Plains landscape and to provide turkey hunting opportunities where they exist with the Boreal Shield landscape." The ministry made a commitment to "continue to monitor the outcome of turkey seasons and turkey populations and consider future management actions in accordance with policy in the turkey management plan."

Statement of Environmental Values

The MNRF considered its Statement of Environmental Values (SEV) in expanding wild turkey hunting to additional WMUs. The ministry explained in its SEV consideration document how it applied each resource stewardship principle for this decision. For example, this included: understanding natural and ecological systems; exercising caution and special concern for natural values in the face of uncertainty; recognizing the finite capacity of natural systems in planning and allocation decisions; participating in resource management; applying an ecosystem approach; and implementing adaptive management. In summary, the MNRF stated that the decision is consistent with the objectives and criteria within the Management Plan. The ministry also stated that "Ontario's approach ensures sustainable management of wild turkeys within the Mixedwood Plains landscape and therefore the province as a whole."

ECO Comment

Wild turkeys were hunted out of the province at the beginning of the 20th century. Logging and land clearing also drastically changed southern Ontario's natural environment, altering the habitat of many species. Forests, wetlands, savannas and prairies were lost as settlements and agriculture expanded. Since then, efforts have been made to conserve and restore natural areas, as well as to reintroduce a handful of lost species like wild turkeys. The reintroduction of wild turkeys and their dramatic range expansion is a wildlife management success in Ontario.

As a result of reintroduction efforts, it is now common to see flocks of wild turkeys roaming fields in southern Ontario. Turkey populations across the region are currently self-sustaining and spreading northward. As this species has proliferated, the ministry has gradually expanded recreational hunting opportunities for wild turkeys. The MNRF's most recent expansion of wild turkey spring hunting into areas near Parry Sound, Huntsville and Sudbury and fall hunting near Pembroke is consistent with the ministry's management objectives.

The management of Ontario's wild turkeys raises interesting broader issues about the migration of different species into previously unoccupied habitat. The natural environment is dynamic, changing over time through the influence of various forces. Shifting temperatures and weather patterns, for example, are major drivers of ecosystem changes. Species that were not present historically in Ontario, like opossums, have adapted to these changes and can now be found in the province. Similarly, evolving environmental conditions in Ontario mean that wild turkeys, which are naturally limited in their range by temperature and snow depth, can now be found in more northern parts of the province.

The northern range expansion of the wild turkey is indicative of changing environmental conditions in Ontario and the adaptability of the wild turkey. This trend is expected to continue. In 2010, the MNRF scientists modelled projected shifts in climatic conditions as they relate to Ontario's ecoregions and ecozones. For example, they showed that what were common climatic conditions in the past in the area around Barrie will soon become common in the area around Sudbury (Figure 3). In effect, they were accurately predicting the northward shift of some species, like wild turkeys, that is now occurring. The MNRF scientists recommended the development of integrated monitoring programs to help detect and verify change as it occurs, in order to guide strategic decision making by the ministry.

Figure 3. Predicted migration of the climatic conditions of the Lake Simcoe-Rideau Ecoregion 6E (within the Mixedwood Plains Ecozone) based on emission projections. (source: Ontario Ministry of Natural Resources and Forestry, *Current and Projected Future Climatic Conditions for Ecoregions and Selected Natural Heritage Areas in Ontario*, Climate Change Research Report CCRR-16, 2010).

Wild turkeys are an adaptable species that can readily respond to changing environmental conditions by naturally expanding their range. However, many other species may have more difficulty adapting to follow changing climate patterns, especially species that occupy a very specific ecological climatic niche. In addition, natural and human barriers (e.g., lakes and highways), as well as different geologic and soil conditions, restrict the movement of a variety of species. Shifts in species ranges will also have significant socio-economic implications, especially for commercial activities (e.g., forestry, trapping and fishing) or recreational activities (e.g., hunting) that depend on predictable patterns of biodiversity. Given that we are already in a changing environment, the MNRF should prioritize ecological connectivity in its planning and management of all Crown lands in Ontario, with particular priority on linkages between protected areas.

Review of Posted Decision:

1.3.7 Black Bear Management Pilot Project

Decision Information

Registry Number: 012-0981
Proposal Posted: February 5, 2014
Decision Posted: April 30, 2014
Comment Period: 30 days
Number of Comments: 13,479
Decision Implemented: April 17, 2014

Description

In April 2014, the Ministry of Natural Resources and Forestry (MNRF) amended two regulations under the *Fish and Wildlife Conservation Act, 1997* (*FWCA*) to enable a two-year Black Bear Management Pilot Project. This pilot project introduced a spring (May 1–June 15) black bear hunting season in eight wildlife management units (WMUs) as part of a provincial management program to more effectively deal with human-bear conflicts in northern Ontario. In the participating WMUs, this decision had the effect of temporarily reviving the spring bear hunt that was cancelled by the Ontario government in 1999.

Background

Black bears (*Ursus americanus*) are an icon of Ontario's wilderness heritage, an Aboriginal cultural symbol, a recreational and economic resource, and an important component of Ontario's ecosystems. Indeed, black bears are a keystone and indicator species, predators of juvenile deer and moose, and competitors with other species.

According to the MNRF, Ontario is home to a healthy and sustainable black bear population of about 85,000 to 105,000 animals. Black bears, which are not considered at-risk, are distributed across the province from near Lake Ontario to the Hudson Bay coast. The large overlap in human settlement and black bear ranges, and the need for black bears to consume large quantities of food before hibernating in winter, can lead to interactions between humans and bears, particularly near potential food sources. Human-bear interactions range from bear sightings, to cases of bears feeding from garbage piles, dirty barbecues and fruit trees, to incidents of property damage and human injury or death. Most black bears, however, avoid people, and thousands of interactions between bears and humans occur each year in Ontario without conflict.

Black Bear Hunting in Ontario:
Prior to 1961, Ontario had a year-round open season for black bear hunting that allowed hunters to kill an unlimited number of bears at any time of year. But when Ontario's *Game and Fish Act* was passed in 1961, Ontario established a September 1–June 30 bear hunting season, which was later divided into spring and fall hunts. In 1997, the *Game and Fish Act* was replaced by the *FWCA*, with a central goal of providing "a better basis for protection and management of a broader range of wildlife species in Ontario."

The MNRF cancelled the spring bear hunt in 1999. This was done to ensure that mother black bears with young cubs were not mistakenly shot, leaving behind orphaned cubs with increased risk of

mortality. The Minister of Natural Resources at the time stated, "we have reviewed current practices and considered modifications; but none provide assurance that young bears and their mothers would be protected as they emerge from their dens in the spring. Stopping the hunt is the only protection for the animals."[1] This controversial decision led to the submission of over 35,000 public comments via the Environmental Registry (see the ECO's review of this decision on page 70 of our 1999/2000 Annual Report). Shortly after ending the spring black bear hunt, the MNRF expanded the fall hunt by opening the season earlier in most areas of Ontario.

Two regulations under the *FWCA* lay out the rules for hunting black bears in Ontario. Ontario Regulation 679/98 (Open Seasons) specifies what time of year black bears can be hunted in each WMU (WMUs are geographic units of land within which the MNRF sets specific parameters for hunting seasons, harvest limits and the sustainable management of species). Ontario Regulation 665/98 (Hunting) provides the conditions under which black bear hunting is allowed. The latter regulation specifies that a hunter with a bear hunting licence tag is allowed to kill only one bear per year – unless issued a second game seal to kill one additional bear. These second seals are WMU-specific, and each year the MNRF advertises the WMUs where second game seals are available. Ontario Regulation 665/98 also requires licensed black bear hunters to complete and return to the MNRF a questionnaire relating to their hunting activities under that licence. As of March 31, 2015, black bear licence tags and second game seals cost about $50 each.

In addition to recreational hunting, the *FWCA* also allows a person to kill a black bear that they believe is damaging, or is about to damage, their property.

Nuisance Bear Review Committee:
After the cancellation of the spring hunt, the MNRF received an increase in the number of complaints about "nuisance bears" (i.e., individual bears involved in problematic interactions with people). This led the ministry to establish an independent Nuisance Bear Review Committee in 2002 to review the nuisance bear issue and prepare a report with recommendations on how to address the problem. The committee reviewed scientific information, mitigation activities in other jurisdictions, and submissions from members of the public, organizations and municipalities.

In 2003, the Nuisance Bear Review Committee released its report, concluding that "the Committee did not find any connection between cancellation of the spring bear hunt and recent increases in nuisance bear activity. Instead, there was a clear connection between fluctuations in natural food abundance and nuisance activity."[2] The committee also found that over 50 per cent of the nuisance bear complaints it reviewed involved the presence of garbage, barbecues or grease – attractants the committee considered easy to remove. Based on these findings, the committee made several recommendations to the MNRF about how to reduce human-bear conflicts, including: requiring additional information from hunters through mandatory reporting; researching nuisance bear activity further; taking a lead role in nuisance bear management, and stressing the removal of attractants as a first step to reducing human-bear conflicts.

[1] Ontario Ministry of Natural Resources and Forestry (Janurary 15, 1999). News Release, *Government to End Spring Bear Hunt*.
[2] Poulin, R. et al. (2003). *Nuisance Bear Review Committee Report and Recommendations*. Prepared for the Ontario Ministry of Natural Resources, page 37.

Moreover, the committee's report concluded that "there was no evidence that spring harvest reduced nuisance bear activity." Nonetheless, it recommended that a limited spring bear hunt be reinstated – under strict conditions – for socio-economic reasons. To ensure that Ontario's black bear population is managed sustainably, and to minimize the chances of orphaning cubs, the committee suggested limiting a spring bear hunt in several ways, including:

- restricting a spring hunt to the harvest of male bears, in order to protect the "critical adult female component of the black bear population;"
- requiring that hunters use suspended baits, thereby providing the best opportunity to correctly identify the sex of a bear before shooting;
- requiring hunters and outfitters to attend mandatory training that provides the tools to readily distinguish between male and female bears;
- prohibiting the use of dogs, which could chase and disrupt family groups of black bears;
- requiring hunters to report their harvest of bears during the hunt, and to submit the teeth (in order to estimate age) and proof of sex (DNA sample or penis bone) of all harvested bears in order to monitor the sex-age composition of the harvest;
- restricting the timing of a spring hunt north of the French River to May 1–31, to account for when black bears emerge from their dens, and minimize the chance that adult females will be vulnerable to hunting;
- differing the timing of hunts north and south of the French River to avoid the emergence of mother black bears from their dens after hibernation;
- returning the start of the fall hunt to pre-1999 dates (i.e., after August 31) to minimize potential conflicts with other users and reduce the vulnerability of adult female bears to harvest; and
- requesting the highest penalties available under the *FWCA* for hunters who kill females in the spring.

Ontario's Bear Wise Program:
In response to the Nuisance Bear Review Committee's report, the MNRF launched the Bear Wise program in 2004 to reduce human-bear conflicts. The cornerstones of the Bear Wise program were: a reporting system (e.g., a toll-free phone number) for citizens and police to report problem bear incidents; a response program for managing human-bear conflict (including trapping, transferring, relocating, chemically immobilizing and killing problem bears); an education and awareness program to encourage people to take steps to avoid attracting bears; and a prevention program to assist and support communities in efforts to reduce human-bear conflicts by reducing and managing bear attractants and managing greenspaces. For a more complete history of black bear management in Ontario, see Section 4.17 of the Supplement to our 2009/2010 Annual Report.

In 2006, the MNRF developed a toolkit to assist municipalities in drafting and passing by-laws to reduce human-bear conflicts (see box, "Garbage Placement By-Laws of Pilot Project Municipalities"). The guidance document states that "Bear Wise by-laws are an important element in the overall efforts to reduce human-bear conflicts but need to be coupled with other prevention initiatives and importantly, education and awareness."[3] The toolkit suggests several ways that municipal by-laws can reduce the availability of bear attractants, including: limiting the placement of garbage to the day of pickup; requiring that all garbage containers be bear-proof; eliminating curb-side garbage collection;

[3] Ontario Ministry of Natural Resources (2006). *Reduction of Human – Bear Conflicts Through Effective Management of Attractants in Communities: A Toolkit for Municipal By-laws.*

prohibiting the feeding of undomesticated and unconfined wildlife on any communal property; and restricting the use of birdfeeders.

Over the years, the MNRF has substantially reduced Bear Wise's funding for education programs and community outreach projects, including funding for the purchase of bear-resistant garbage containers. In spring 2012, as part of a ministry-wide transformation initiative, the MNRF reduced the number of staff working on the Bear Wise program. The ministry also stopped trapping and relocating problem bears, and assisting in site-specific conflicts with bears, except in support of police services in responding to emergency situations involving bears that pose an immediate threat to public safety. By default, the Ontario Provincial Police and local police departments are often now responsible for dealing with bears that wander into urban and suburban areas.

The Black Bear Management Pilot Project

In response to mounting concerns over human-bear conflicts in northern Ontario, in November 2013, the MNRF proposed a two-year pilot project that would open a limited spring bear hunt to resident hunters in eight WMUs in and around several northern Ontario communities, including Timmins, Thunder Bay, Sudbury, Sault Ste. Marie, North Bay and Cochrane (see Figure 1). When the MNRF proposed the pilot project, it pointed out that every other Canadian province and territory with black bears – except Nova Scotia – has both a spring and fall bear hunt.

The ministry's stated purpose for piloting this spring hunt was to reduce human-bear conflicts and improve public safety, presumably by reducing the adult bear population at the start of the summer season. The ministry stated that, in order to participate, municipal councils would have to pass a resolution agreeing to opt into the program. According to the Minister at the time, about 50 of the 57 municipalities included in the pilot project areas had passed resolutions requesting they be allowed to opt into the bear pilot project.

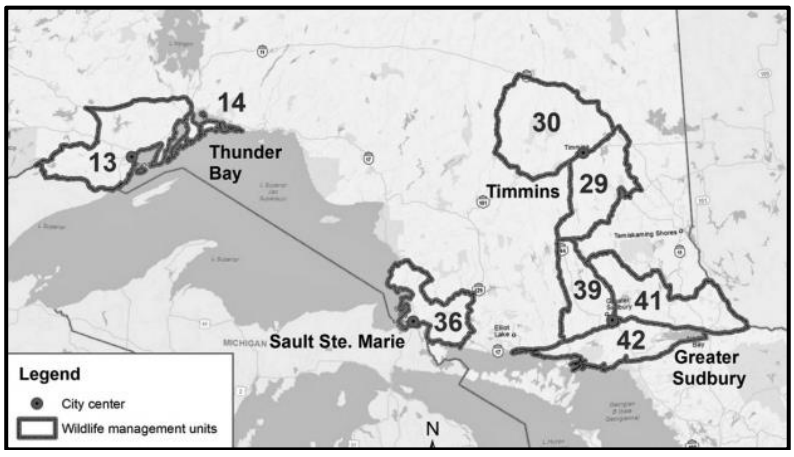


Figure 1. The eight Wildlife Management Units (WMUs) where licensed Ontario residents were permitted to hunt black bears from May 1 to June 15 in 2014 and 2015. (Source: Ontario Ministry of Natural Resources and Forestry).

After consulting the public via the Environmental Registry, in April 2014 the MNRF decided to move forward with its plan to pilot a limited spring bear hunt in the eight specified WMUs. The Minister at the

time explained that "public safety is paramount and Ontarians should feel safe in their communities. We have heard increasingly from some northern Ontario municipalities that they are concerned about public safety and human-bear conflicts. In response, we are taking action in a strategic way to address the areas of highest incidence."[4]

To enable the implementation of the Black Bear Management Pilot Project, the MNRF amended the two relevant regulations under the *FWCA*:

- Ontario Regulation 670/98 (Open Seasons – Wildlife) was amended to create an open season for Ontario residents with a bear hunting licence tag to hunt black bears in WMUs 13, 14, 29, 30, 36, 39, 41 and 42 from May 1 to June 15 in 2014 and 2015.
- Ontario Regulation 665/98 (Hunting) was amended to prohibit shooting, or attempting to shoot, a cub (i.e., a bear born in the year of the hunt) or a female bear accompanied by a cub during May or June. The amended regulation also required resident hunters who were issued a bear hunting licence tag on or before June 15 to complete and return to the MNRF by August 1 of that year a questionnaire relating to the hunting activities carried out under that licence.

Both regulations specify that these amendments will be revoked on January 1, 2016.

The Environmental Registry proposal notice for the pilot project stated that the merits of a spring hunt in reducing human-bear conflicts and increasing public safety in northern communities would be assessed with participating municipalities by:

- tracking the number and types of calls to the Bear Wise reporting line from the pilot area and other communities;
- monitoring the number of bear hunters and number of bears harvested;
- identifying changing trends in human-bear encounters; and
- exploring ways to limit human-bear interactions (e.g., by tracking the number of municipal by-laws to discourage the feeding of bears).

Implications of the Decision

Increased Hunting Opportunities

The pilot project's revival of the spring hunt increased the number of days in 2014 and 2015 when licensed resident hunters could go hunting for bears. This in turn increased a hunter's chances of making a kill. Moreover, together with the MNRF's offering of second game seals, the pilot's spring hunt increased some hunters' opportunities to kill more than one bear in a year.

Conditions Suggested by the Nuisance Bear Review Committee Ignored

To "ensure that the black bear population is managed in a sustainable manner and to minimize chances of the orphaning of cubs of the year," the Nuisance Bear Review Committee suggested limiting a

[4] Ontario Ministry of Natural Resources and Forestry (November 14, 2013). News Release, *Ontario Proposing a Black Bear Management Pilot in North*.

partially re-instated spring bear hunt in several ways. The pilot project, however, imposed only one of the committee's suggested conditions (see Table 1).

Table 1. Conditions Suggested by the Nuisance Bear Review Committee for a Partially Re-instated the Spring Black Bear Hunt. (Source: Poulin et al., *Nuisance Bear Review Committee Report and Recommendations*, 2003).

Suggested Condition	Included as part of the 2014–2015 Black Bear Management Pilot Project?
Mandatory training for hunters and outfitters	No
Male-only harvest	No
Mandatory hunting over baits and the use of suspended baits	No
Use of dogs prohibited	No
Mandatory reporting and submission of teeth and proof of sex	Partially; reporting of harvest is mandatory, but submission of teeth and proof of sex is not
May 1–31 season north of the French River	No
April 15–May 15 season south of the French River	Not applicable; all WMUs in the pilot project are north of the French River
Returning the fall season to pre-1999 dates	No
High penalties for the harvesting of females in spring	Not applicable; the pilot did not prohibit the harvest of females

The MNRF did not adopt the committee's suggestion to require hunters to submit the teeth and proof of sex of harvested bears. Consequently, hunters submitted teeth from less than 10 per cent of the bears harvested in spring 2014. Historically, Ontario hunters have voluntarily submitted premolar teeth for only about 40 per cent of the bears that are harvested annually, limiting the MNRF's capacity to monitor the sex-age composition of the annual bear harvest.

Mandatory Reporting, but Low Response Rates

In addition to completing a fall questionnaire, Ontario residents who were issued a bear hunting licence tag in spring 2014 or 2015 (i.e., before June 16th) were also required to complete and return to the MNRF a mandatory questionnaire about their spring hunting activities by August 1 of the year. The purpose of the spring questionnaire was to gather information on:

- the number of resident hunters that hunted bears during the spring;
- the number of male and female bears shot during the spring hunt;
- when, where (i.e., in which WMU) and with what type of firearm bears were shot; and
- the number of live bears seen in each WMU.

Despite the spring questionnaire being mandatory, only 1,474 (45 per cent) of 3,288 hunters who were issued a bear tag in spring 2014 returned a completed questionnaire by the August 1, 2014 deadline.[5] Similarly, as of January 20, 2015, only 7,128 (41 per cent) of 17,482 resident hunters had completed and returned the mandatory fall 2014 questionnaire.

[5] Ontario Ministry of Natural Resources and Forestry (August 12, 2014 and January 5, 2015), information provided to the ECO in response to ECO inquiry.

These poor response rates are perhaps unsurprising; hunters' response rate to mandatory black bear surveys has historically been quite low (60–70 per cent of hunters) – even though failing to return a completed bear hunt questionnaire is an offence subject to a fine under the *Provincial Offences Act*. Unfortunately, the tendency for many hunters to delay, and even abstain from, completing mandatory questionnaires compromises the ministry's ability to evaluate the impacts of bear hunting. As the Auditor General of Ontario reported in 2007, "while some areas of the province have an abundance of black bears … the ministry had incomplete information regarding black bear harvests, which could lead to decisions that do not support sustainability in all areas of the province."[6]

Impact on Black Bear Harvest Rates

One might expect that the expanded hunting opportunities created by the pilot project would increase the number of black bears killed in Ontario in a given year. But, because harvest rates are dependent on a number of factors (including hunting effort, bear vulnerability and the number of licence tags and second game seals issued by the MNRF), adding another hunting season may not necessarily increase the number of bears killed.

To assess the pilot project's impact on the annual harvest rate, the ECO asked the MNRF for data on the number of bears harvested in spring 2014 and fall 2014. In March 2015, the MNRF informed the ECO that 193 bears were reported to have been harvested in spring 2014. (For comparison, from 2006–2012, hunters killed an average of 1,034 bears per year in the pilot project's eight WMUs.) As discussed above, however, the ministry's knowledge of hunting effort and harvesting rates is routinely hampered by the delayed and poor return rate of hunters' mandatory questionnaires. As of July 2015, the ministry had not provided the ECO with data on the number of bears killed in fall 2014, preventing the ECO from assessing the impact of the spring hunt on the annual harvest.

Ecological Impact

A spring harvest of just 193 bears (0.18–0.23 per cent of Ontario's black bear population of about 85,000 to 105,000 animals) would likely have little impact on the provincial population. It must be noted, however, that, given the poor return rate of hunters' questionnaires, this reported number of killed bears is most certainly an underestimate of the actual harvest. Without better information on the sex-age composition of the annual harvest, it is difficult to assess the pilot project's potential effect on the population.

Further, a 2008 study by MNRF scientists observed that, "American black bear (*Ursus americanus*) population dynamics are most sensitive to survival of adult females. To ensure that harvest is sustainable, harvest should be skewed to males. In addition, in jurisdictions with a spring harvest, lactating females should not be harvested." But the pilot project only prohibited the killing of females accompanied by cubs, creating the potential for hunters to still kill females without cubs, and even mothers without visible cubs in the area. Indeed, the MNRF informed the ECO that at least 32 female bears had been killed in the 2014 spring hunt.

[6] Auditor General of Ontario (2007). *Annual Report, Office of the Auditor General of Ontario*, page 144.

Potential for Cubs to be Orphaned

To minimize the number of cubs orphaned by a spring hunt, the Nuisance Bear Review Committee suggested: prohibiting the killing of female bears; requiring hunter training for distinguishing males from females; prohibiting the use of dogs; and timing a spring hunt to prevent hunting when mother bears are most vulnerable. The pilot project, however, imposed none of these limitations.
Rather, amendments to O. Reg. 665/98 simply prohibited hunters from shooting a female bear accompanied by a cub. Because mother bears sometimes leave their cubs in trees while foraging, some spring hunters may have unknowingly killed females with dependent young. As a result, the pilot project created the potential for cubs to be orphaned. Indeed, MNRF staff noted in a 2008 research study that in jurisdictions where there is a spring hunt, nursing females frequently appear in the harvest despite legislation to protect females accompanied by cubs-of-the-year.

Pilot Project is Unlikely to Reduce Human-Bear Conflicts

Even if the pilot project were to increase the total number of bears killed annually, there is little evidence that killing more bears would achieve the goal of reducing human-bear conflicts; recent research by the ministry's own scientists and staff on hunting and human-bear conflicts in Ontario found that killing more bears did not reduce subsequent human-bear conflicts. In fact, in 2014 ministry staff noted that "although it may be intuitive to assume that harvesting more bears should reduce [human-bear conflicts], empirical support for this assumption is lacking despite considerable research."[7] The MNRF researchers also pointed to studies in Wisconsin, Minnesota, and Japan as evidence that hunting does not reduce human-bear conflicts.

One reason increased bear hunting may not reduce human-bear conflicts is that it targets non-nuisance bears at the interior of bear habitat (away from human populations) rather than nuisance bears that live on the periphery of their habitat where they encounter and interact with humans. Similarly, hunting may not target the age, gender or size of bears that are typically involved in human-bear conflicts. Moreover, although MNRF scientists found no evidence that increased hunting reduces human-bear conflicts, they did find that when natural food (e.g., fruit) is scarce, human-bear conflicts increase, perhaps because hungry bears seek out alternative foods, such as garbage and agricultural crops.

While it may be easy to assume that a simple way to reduce human-bear conflicts is to encourage the killing of more bears, the MNRF science does not support this approach. Instead, ministry scientists and staff have asserted that:

> reducing the associated risk of [human-bear conflicts] through harvest would require high harvest levels that reduce populations to very low densities. This might be at odds with the objectives of maintaining viable populations and providing sustainable sport-harvest opportunities over the long term. A better strategy for management agencies would be to develop a thorough understanding of causes of [human-bear conflicts] in their jurisdiction …, promote programs that focus on practical solutions that deny bears access to the many kinds of

[7] Obbard, M.E. et al. (2014). Relationships among Food Availability, Harvest, and Human-Bear Conflict at Landscape Scales in Ontario, Canada. *Ursus* 25(2): 98-110, page106.

anthropogenic attractants, and develop educational programs that encourage the public to accept responsibility for their role in the human–bear conflict dyad.[8]

Questionable Evaluation of the Pilot Project's Success

In the Environmental Registry proposal notice (#012-0981), the MNRF proposed several methods for evaluating the pilot project's effectiveness at reducing human-bear conflicts and increasing public safety. These included: exploring ways to limit human-bear interactions; and monitoring the number of hunters, harvested bears, human-bear conflicts, and calls to the Bear Wise reporting line.

It should be noted, however, that MNRF scientists have found no relationship between the number of complaints made to the ministry's Bear Wise hotline and the actual frequency or severity of human-bear conflicts.[9] While the reasons for fluctuations in complaints are not entirely understood, ministry scientists have suggested that an increase in calls after the spring bear hunt was cancelled may have been due to increased awareness and perception of risk from bears, or to the public's reduced tolerance for bears. Along a similar vein, ministry scientists have recently argued that liberal hunting regimes (like a spring bear hunt) may not actually reduce the number of conflicts between humans and bears, but merely encourage greater acceptance of bears, resulting in fewer complaints.

Given the influence that natural food availability has on both human-bear conflicts and bear harvest levels, any useful evaluation of the success of the pilot project on reducing human-bear conflicts must measure and control for this factor. Likewise, other variables, such as garbage availability, human behaviour, and changes to the MNRF's management regime (e.g., no longer providing assistance in site-specific human-bear conflicts) could also affect the reporting rate for human-bear conflicts and the perceived success of the pilot project.

Public Participation & *EBR* Process

The ministry received 13,479 comments on the Environmental Registry proposal notice for the pilot project. Not surprisingly, this controversial decision elicited many comments both for and against the resumption of a spring bear hunt.

Opponents of the pilot project argued that a spring bear hunt is inhumane, as adult bears would be killed and cubs would be orphaned and starve to death. Many argued that merely prohibiting the hunting of females with cubs would not prevent hunters from killing nursing mothers, as mothers often leave their cubs while searching for food, and it is extremely difficult to distinguish a female bear from a male. One animal welfare organization asserted that the loss of adult females combined with the loss of young cubs would have negative environmental consequences.

Other commenters argued that the pilot project would not achieve its goal of improving public safety, as research by the ministry's own scientists shows that the number of human-bear conflicts is affected not by hunting but by natural food abundance and garbage availability. Pointing out that the Nuisance Bear Review Committee concluded that the spring hunt had little to no impact on nuisance bear

[8] Obbard, M.E. et al. (2014). Relationships among Food Availability, Harvest, and Human-Bear Conflict at Landscape Scales in Ontario, Canada. *Ursus* 25(2): 98-110, page 96.
[9] Howe E.J. et al. (2010). Do Public Complaints Reflect Trends in Human-Bear Conflict?. *Ursus* 21(2): 131-142.

activity, one animal welfare organization found it "inexplicable that the Government of Ontario would now suggest that a renewed spring bear hunt would have this effect."

Several commenters suggested that putting money into awareness and education programs, and improving waste management practices, would be more effective at reducing human-bear conflicts. One commenter argued that the MNRF's proposed program for monitoring the pilot project's effectiveness ignores critical factors, including "the availability of natural food sources, which has already been identified by [the ministry] as the most important component of any study about human-bear conflict." The same commenter asserted that "without information on abundance of natural foods in the wild it will be impossible to understand whether human-bear conflict levels have been affected by this proposed spring harvest."

Hunters and tourist operators were generally supportive of the pilot project but:

- recommended that the pilot project be extended beyond two years;
- recommended that non-resident hunters be included to increase the harvest of bears in the spring, and contribute to northern economies;
- questioned the need to limit most hunters to one bear per year, as hunters would be forced to choose between the spring and fall seasons, and would not be as effective at reducing bear densities immediately prior to the nuisance period; and
- suggested that the spring bear hunt should be expanded to include all WMUs within black bear range (or at least north of the French and Mattawa rivers), as limiting the pilot project to just eight WMUs marginalizes the bear problems experienced by the rest of the province, draws hunting tourism away from other WMUs, and restricts the pilot project's ability to reduce nuisance bear populations.

Like opponents of the spring hunt, supporters also questioned how the ministry intends to measure the pilot project's success; one argued that, given the many factors that influence the number of complaints reported to the Bear Wise Reporting Line, simply examining reporting rates would be an inadequate metric of the project's effectiveness.

Several of the comments submitted online were made by people who appear to live outside Ontario.

Other Public Consultation Opportunities

In the proposal notice, the ministry indicated that it had requested that each of the 57 municipalities in the pilot areas express their interest in the proposed pilot project by submitting a resolution to such effect. The MNRF indicated to the ECO that it also solicited input from other stakeholder and advisory groups (e.g., the ministry's Fish and Wildlife Heritage Commission and Human-Wildlife Conflict Advisory Group), and undertook Aboriginal engagement by: sending letters to First Nation and Métis communities with a known interest in the pilot areas; and discussing the pilot project at existing round-table dialogues, including with the Union of Ontario Indians at the Resource Management Table.

Statement of Environmental Values

The MNRF documented consideration of its Statement of Environmental Values (SEV) for this decision by discussing how the relevant principles of resource stewardship were applied. The ministry considered the following four SEV principles relevant to the proposal:

- A sound understanding of natural and ecological systems and how actions affect them is key to achieving sustainability;
- The planning for and management of natural resources should strive for continuous improvement and effectiveness through adaptive management of natural resources;
- Ministry staff should exercise caution and special concern for natural values in the face of uncertainty and an incomplete understanding of the way the natural world works and how actions affect it; and
- Participation in resource management by all those who share an interest is a necessary ingredient, particularly in support of communities who must balance economic diversity with other needs. Those affected by proposed changes must have access to information and opportunities to provide input to decisions that affect their lives.

The SEV consideration document was signed by the Director of the MNRF's Biodiversity Branch on February 24, 2014 – more than a week before the proposal's Registry comment period ended. The signed document contains several placeholder notations, such as "a total of XXXX comments were provided on the proposal" and "I have taken into consideration the aforementioned in my decision to approve [proposal title]."

Garbage Placement By-laws of Pilot Project Municipalities

Since 2006, the MNRF's Bear Wise by-law toolkit has outlined ways that municipal by-laws can reduce the availability of bear attractants and the occurrence of human-bear conflicts.[10] However, municipalities' implementation of this guidance has been inconsistent.

Elliott Lake, which was not included in the pilot project but is located nearby, was reportedly the first municipality in Ontario to pass Bear Wise by-laws that reflect the toolkit's guidance on garbage placement and containers (see Table 2). By contrast, municipalities located in pilot project WMUs have waste collection by-laws that are generally less restrictive than those suggested by the ministry to minimize human-bear conflicts. For example, most of the large municipalities in pilot project WMUs allow residents to place bagged garbage at the curb the night before collection (see Table 2).

Table 2. Garbage Placement and Container Requirements, as Suggested in the Ministry of Natural Resources and Forestry's Toolkit for Municipal By-laws and Found in Select Northern Ontario By-Laws.

Source	By-Law Requirements	
	Timing of Garbage Placement on the Curb	Acceptable Garbage Containers
Reduction of Human – Bear Conflicts Through Effective	Placement of garbage limited to the day of pickup (e.g., 6	All containers required to be bear-proof (no open containers

[10] Ontario Ministry of Natural Resources (2006). *Reduction of Human – Bear Conflicts Through Effective Management of Attractants in Communities: A Toolkit for Municipal By-laws*.

Source	By-Law Requirements	
	Timing of Garbage Placement on the Curb	**Acceptable Garbage Containers**
Management of Attractants in Communities: A Toolkit for Municipal By-laws (Ministry of Natural Resources and Forestry, 2006).	a.m. to 7 p.m.).	containing bear attractants).
Elliot Lake By-law No. 05-74	Prohibited before 6 a.m. on the day of collection, unless in a garbage can. Empty cans and uncollected garbage must be removed by 8 p.m. the same day.	Garbage must be in plastic bags and contained in metal or plastic garbage cans with secure water-tight lids.
North Bay By-law No. 2006-24	Prohibited before 6 p.m. the night before collection. Empty cans and uncollected garbage must be removed by midnight.	Solid waste left at curbside for collection must be in an opaque bag at least 1.5-millimetres thick, or in an opaque receptacle or container.
Sault Ste. Marie By-law No. 2004-68	Prohibited before 7 p.m. the night before collection. No requirement as to when empty cans and uncollected garbage must be removed.	All waste must be kept in plastic bags with a minimum 1.5-millimetre thickness or a water-tight metallic or plastic waste container with tightly fitting cover.
Sudbury By-law No. 2006-280	Prohibited before 8 p.m. the night before collection (5 p.m. for properties in the Central Business District). Empty cans and uncollected garbage must be removed by 7 p.m. the day of collection (9 a.m. the day after for properties in the Central Business District).	Garbage bags and rigid containers are acceptable.
Thunder Bay By-law 130-90	Prohibited before 4 p.m. the day before collection. Empty receptacles and uncollected garbage must be removed by midnight.	Acceptable containers include plastic bags with a minimum of 1.5-millimetre thickness and metal or plastic containers with a tight-fitting lid.
Timmins By-law 1986-2575	Generally prohibited before 6 a.m. the day of collection. Solid waste in containers with latches may be placed at the curb after 8 p.m. the day before collection. No requirement as to when empty cans and	Garbage bags (with a minimum thickness of 1.5 millimetres) are acceptable, except that garbage put out after 8 p.m. the night before collection must be in containers with latches.

Source	By-Law Requirements	
	Timing of Garbage Placement on the Curb	Acceptable Garbage Containers
	uncollected garbage must be removed.	

Other Information

In April 2014, two animal protection organizations applied for a judicial review of the government's decision to allow the pilot project's spring bear hunt. In May 2014, the Ontario Divisional Court dismissed the application.

ECO Comment

Given the large size of Ontario's black bear population, the few WMUs included, and the relatively few bears reportedly killed in the pilot project's first year, the project may not have a significant ecological impact on the province's overall population of black bears.

Nevertheless, incomplete information on the number, age, sex and location of the bears harvested each year prevents the MNRF from effectively evaluating hunting's ecological impact and making informed management decisions. The consequences of an error in bear management can be significant; black bear populations are vulnerable to overharvest, particularly of adult females, as they reach sexual maturity late in life and have few offspring. As a result, once a bear population is overharvested, it may take a decade or more to recover. Moreover, where black bears are a keystone species, overharvesting could have negative effects on other species and even the entire local ecosystem. To improve the MNRF's ability to assess the impacts of hunting on the population and make informed management decisions, the ECO encourages the ministry to: require hunters to submit the teeth and proof of sex of all harvested bears; and impose stiff penalties for not returning mandatory bear hunting questionnaires.

Similarly, the ECO is concerned how the MNRF will determine the pilot project's success, especially as a basis for either expanding the project or permanently reviving a spring bear hunt. To effectively evaluate the project's role in reducing human-bear conflicts, the ministry must not only monitor and report on the number and types of human-bear conflicts, but also measure and control for natural food abundance, garbage availability, human behaviour and other factors that might affect the frequency of human-bear conflicts.

The ECO finds it disturbing that the ministry would ignore almost all the conditions suggested by its own Nuisance Bear Review Committee for a reinstated spring hunt. Furthermore, the ECO is troubled that the MNRF's reported reasons for implementing the pilot project seem to be undermined by recent research by its own scientists and staff.

First, the MNRF said it implemented the pilot project in response to hearing increasingly from some northern Ontario communities that were concerned about public safety. However, research by MNRF staff has shown that the frequency of complaints is not related to the frequency and severity of human-bear conflicts. Moreover, ministry data fail to show an increase in human-bear conflict activity in the pilot project's major municipalities.

Second, the ministry's stated purpose for the pilot project was to reduce human-bear conflicts. But research by MNRF scientists indicates that increased hunting does not reduce human-bear conflicts, and that variations in natural food availability play a greater role in such conflicts. In short, research by the ministry's own staff suggests that the pilot project would not achieve its objective of reducing human-bear conflicts.

Easy access to garbage and other bear attractants seems to be a key factor in human-bear interactions. The 2003 Nuisance Bear Review Committee observed that the majority of complaints it reviewed involved garbage, barbecues or grease. Although the ministry encourages municipalities to develop by-laws to reduce human-bear conflicts, it seems that several municipalities in the pilot project's WMUs have not incorporated the suggested measures into their by-laws. Moreover, the ministry has reduced its public education work through the Bear Wise program. Echoing the advice of the Nuisance Bear Review Committee and the ministry's scientists, the ECO encourages the MNRF to assess the causes of human-bear conflicts within communities, and to implement educational and promotional programs to reduce identified sources of conflict.

In summary, in implementing the pilot project, the MNRF: made a bear management decision with incomplete information on the annual harvest; ignored ministry research that calls into question the utility of the pilot project; and disregarded the advice of the committee the ministry struck to review the nuisance bear issue. The ministry has also cut back its public education Bear Wise program, even though communities and residents still have much to do in eliminating or reducing attractants for bears. The ECO urges the MNRF to listen to informed experts, review relevant research and implement human-bear conflict solutions that are actually supported by evidence, science and experience.

Review of Posted Decision:

1.3.8 New Regulation Prescribing Habitat for Five Species at Risk

Decision Information

Registry Number: 012-1549
Proposal Posted: May 1, 2014
Decision Posted: December 1, 2014

Comment Period: 46 days
Number of Comments: 36
Decision Implemented: January 1, 2015

Description

Overview

Habitat loss is one of the biggest threats to species at risk in Ontario and around the world. Accordingly, one of the key protections offered by the *Endangered Species Act, 2007* (*ESA*) is the prohibition on damaging or destroying the habitat of endangered and threatened species. Although the Act provides a generic definition of habitat, the Ministry of Natural Resources and Forestry (MNRF) may, and is sometimes required to, set out in regulation the specific areas and types of habitat that are protected for each species.

On January 1, 2015, the MNRF amended O. Reg. 242/08 (General) to define the specific habitat of the following species:

- eastern sand darter (*Ammocrypta pellucida*), an endangered fish;
- Hine's emerald (*Somatochlora hineana*), an endangered insect (dragonfly);
- Hungerford's crawling water beetle (*Brychius hungerfordi*), an endangered insect;
- Pitcher's thistle (*Cirsium pitcheri*), a threatened plant; and
- wavy-rayed lampmussel (*Lampsilis fasciola*), a threatened mollusc.

All areas defined as habitat in the amended regulation are now protected under the *ESA*, meaning they cannot be damaged or destroyed unless authorized under the Act (e.g., through the issuance of a permit).

Background

The Endangered Species Act, 2007*:*
The *ESA* has three purposes: 1) to identify species at risk; 2) to protect species at risk and their habitats and promote species recovery; and 3) to promote stewardship activities to assist in the protection and recovery of species at risk.

An independent group of scientific experts, the Committee on the Status of Species at Risk in Ontario, assesses and classifies species based on the degree of risk they face. Based on these assessments, species determined to be at risk must be added to the Species at Risk in Ontario List set out in O. Reg. 230/08 (Species at Risk in Ontario List) and classified as: special concern, threatened, endangered or

extirpated. The level of protection afforded to a listed species under the *ESA* depends on this classification.[1]

The *ESA* includes two key prohibitions:

- Section 9 prohibits killing, harming, harassing, capturing or taking a live member of an extirpated, endangered or threatened species, as well as activities such as possessing, transporting, collecting, buying and selling those species; and
- Section 10 prohibits damaging or destroying the habitat of an endangered or threatened species.

However, these prohibitions are not absolute. Under the Act, permits and agreements can be obtained to authorize, with conditions, activities that would otherwise result in violations of sections 9 and 10 of the *ESA*. Furthermore, O. Reg. 242/08 provides exemptions for a broad range of activities such as forestry and aggregate operations. Proponents of activities subject to these regulatory exemptions are required to follow rules set out in a regulation, rather than obtain an individual permit or agreement.[2]

You can find a more thorough overview of the *ESA* in the ECO's special reports about the Act, *The Last Line of Defence* (February 2009) and *Laying Siege to the Last Line of Defence* (November 2013).

Habitat Protection under the ESA*:*
The *ESA* provides two definitions of "habitat." First, the habitat of a particular species may be defined in regulation (often referred to as a regulated habitat definition). Second, for endangered and threatened species without a regulated habitat definition, habitat is defined as "an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding" (often referred to as the general habitat definition).

The general habitat definition is limited to areas that are currently occupied by an endangered or threatened species – it does not include areas that were formerly or could potentially be occupied by a species. Under the Act, however, a regulated habitat definition can generally encompass (or exclude) whatever areas the government considers appropriate, subject to the condition that the Minister may not make a regulation if, having consulted with an expert, he or she is of the opinion that the regulation would result in the species becoming extirpated.[3] The regulated habitat definition can include areas that the species previously occupied or where it could potentially become established.

Prescribing species-specific habitat definitions in regulation can offer many advantages over the general habitat description, including greater specificity about the geographic areas where habitat can

[1] For example, the *ESA* prohibition on harming or harassing a member of a protected species only applies to species classified as extirpated, endangered or threatened. Similarly, recovery strategies are required for endangered and threatened species, while only management plans are required for species of special concern.
[2] For example, proponents may be required to prepare a mitigation plan setting out how they intend to minimize the negative effects of the activity on species at risk.
[3] Specifically, subsection 57(1) of the *ESA* requires the Minister of Natural Resources and Forestry to consult with a species-specific expert when making regulations relating to endangered or threatened species if the Minister is of the opinion that the regulation is likely to: (1) jeopardize the survival of the species in Ontario or to have any other significant adverse effect on the species; or (2) result in a significant reduction in the number of members of the species that live in the wild in Ontario. Subection 57(2) of the *ESA* then prohibits any regulation from being made unless the Minister, having consulted a species-specific expert, is of the opinion that the regulation will not result in the species' extirpation from Ontario, among other requirements.

be found. Such specificity makes it easier for the MNRF, private landowners, and those undertaking activities that may affect species at risk to determine if a particular location is likely to be protected habitat. It also helps the MNRF enforce the *ESA* provisions relating to habitat because the regulations are generally more specific than the general habitat definition about the types of places that constitute habitat, making it easier to determine whether or not a specific location is protected.

The ministry may, but is not required to, prescribe habitat for those species listed as endangered or threatened when the *ESA* came into force in 2008. For species listed since then, however, the ministry must prepare habitat regulations within two years of listing an endangered species, and within three years of listing a threatened species.[4] Currently, the habitats of 33 species or populations are set out in O. Reg. 242/08 (including the five species discussed here). Nineteen more species are awaiting legislatively mandated habitat regulations.

Research Needs Ignored, Regulations Delayed

For species-specific regulations to be truly useful, they must be grounded in scientific information about the location of current, historic and potential future populations. Information about key habitat features must also be known. For example, knowing that a species prefers shallow water will not narrow the list of potential habitat areas as much as knowing that it requires a sandy bottom clear of vegetation.

Recently, the ECO has observed that some habitat regulations have been delayed because the MNRF does not have the information necessary to develop a regulated habitat definition. For example, in an August 2014 Environmental Registry notice (#012-2320), the ministry explained that the recovery strategy for the pygmy snaketail (an endangered dragonfly) "identifies significant knowledge gaps and recommends that it would be premature to apply a habitat regulation for this species until more data is available." Accordingly, the MNRF decided to delay proposing a habitat regulation until such information is compiled (i.e., indefinitely).[5]

Of greater concern than this initial delay, however, is that there was no announcement of a corresponding effort by the ministry to collect the information necessary to prepare a habitat regulation for the pygmy snaketail. Rather, it seems that the MNRF is content to wait indefinitely for new information to become available from some unidentified source.[6] This is unacceptable. In order to fulfil its *ESA* obligation to develop habitat regulations, the ministry must be willing to ensure that the needed habitat research is carried out in a timely manner.

Habitat Regulations and Recovery Strategies:

The *ESA* states that before regulating species-specific habitat, the MNRF must consider any recovery strategy and government response statement that have been prepared for the species.

[4] Alternatively, under subsection 56(1)(b) of the *ESA* the Minister of Natural Resources and Forestry can advise the public that additional time is required before proposing a habitat regulation, or the Minister can decide that no regulation is needed for reasons set out in subsection 56(1)(c)(i) of the *ESA*, but he or she must advise the public via the Environmental Registry of this decision and the rationale within the same two and three year time periods for otherwise proposing habitat regulations.

[5] The August 2014 Registry notice does not comply with the ESA requirement that any notice advising of the need for additional time provide an estimate of when the regulation will be proposed (see subsection 56(1)(b)(iii) of the *ESA*).

[6] Although inventory and monitoring of pygmy snaketail is included among the 35 species-specific priorities identified in the *Species at Risk Stewardship Fund for Ontario: 2015/16 Guidelines*, this approach depends on a third party coming forward to undertake the work; there is no system for ensuring that the information gaps identified in the pygmy snaketail recovery strategy are ever filled. See: Government of Ontario (2015). *Species at Risk Stewardship Fund for Ontario: 2015/16 Guidelines*, pages 2-3.

Under the *ESA*, recovery strategies must: identify the habitat needs of the species; describe threats to its survival and recovery; and make recommendations to the Minister on the area that should be considered in developing a habitat regulation as well as objectives for the protection and recovery of the species. Recovery strategies must be prepared within one year of a species being listed as endangered and within two years of a species being listed as threatened.[7]

Once a recovery strategy is developed, the Minister must issue a government response statement, within nine months, that describes the government's intended course of action in response to the recovery strategy. The Minister is required to ensure that all measures contained within the government response statement that the Minister considers feasible are implemented.

In addition to the recovery strategy and government response statement, MNRF policy[8] states that when identifying and describing habitat, the government will also consider:

- the area protected under the general definition of habitat;
- the best available scientific information on the species; and
- the social and economic implications of habitat regulation.

New Habitat Regulations for Five Species

As of January 1, 2015, the habitats of eastern sand darter, Hine's emerald, Pitcher's thistle, Hungerford's crawling water beetle and the wavy-rayed lampmussel are now defined by species-specific provisions set out in O. Reg. 242/08. The Ministry has also produced habitat protection summaries for each of these species, which are available on the MNRF's website. The summaries provide brief descriptions of the types of areas protected by the regulation, and offer basic guidance on what types of activities may damage or destroy the habitat. This material may assist ministry staff and others in interpreting and applying the regulation. The new habitat definitions set out in the regulation are briefly described below.

Eastern Sand Darter:
The Eastern sand darter is a very small translucent fish belonging to the perch family that spends much of its time burrowed into the sandy bottoms of the lakes and rivers where it lives. Its habitat is defined as any part of a watercourse or body of water that is currently used or has been used within the past four years by the species, within specified geographic areas.[9] The geographic areas encompass all locations identified as current habitat in the species' recovery strategy, as well as one newly discovered location and most of the species' historic range. The habitat definition also includes aquatic and riparian buffer zones along most watercourses. However, in the Detroit River and lakes and ponds, only aquatic areas dominated by sand or fine gravel substrate (the habitat features believed to be required for spawning) are protected as buffer zones.

[7] For species listed as endangered or threatened at the time the *ESA* came into force (i.e., on June 30, 2008), the Minister had five years (i.e., until June 30, 2013) to prepare recovery strategies (see subsection 11(4)(c) of the *ESA*).
[8] Ontario Ministry of Natural Resources and Forestry (2008). *SAR Policy 4.1: Habitat Protection for Endangered, Threatened and Extirpated Species under the Endangered Species Act, 2007*, pages 10-11.
[9] The geographic areas set out in regulation for eastern sand darter habitat are: Brant; Chatham-Kent; Essex; Elgin; Haldimand; Middlesex; Norfolk; and Prince Edward, including the water bodies of Lake Erie, Lake St. Clair and the Detroit River that are adjacent to those geographic areas; and the parts of the geographic area of Lambton composed of Brooke-Alvinston and Dawn-Euphemia.

Hine's Emerald:
Hine's emerald is a green and brown dragonfly that favours wetlands with grassy vegetation where its larvae use crayfish burrows for protection. The regulation defines Hine's emerald habitat as any part of a fen, marsh, seepage area, pond or other body of water[10] that is or has been used by the species for egg laying or larval development and is within specified geographic areas.[11] This definition encompasses the only area in the province known to be inhabited by the species – the Minesing Wetlands. The regulation also protects aquatic environments within 1,600 metres of the primary use area, and any area within 500 metres of the aquatic buffer zone that does not have an impervious surface.[12]

Hungerford's Crawling Water Beetle:
Hungerford's crawling water beetle grows to be only four millimetres long and is found in small to medium-sized streams, most often downstream from dams, culverts or other barriers. Its habitat is defined as any part of a watercourse that is currently used or has been used within the past five years by the species and is within specified geographic areas.[13] The definition also includes adjacent watercourse areas and vegetated riparian areas nearby to primary use areas. The geographic areas included in this definition encompass all locations where the species is known to occur in Ontario.[14]

Pitcher's Thistle:
Pitcher's thistle can grow to be up to one metre tall and has grey-green leaves covered in white fuzz. It has the largest seeds of any thistle in eastern North America. The regulation defines Pitcher's thistle habitat as sand dunes with less than 25 per cent tree cover where the species exists or has existed within the previous five years in areas along the southern shores of Lake Huron and Manitoulin Island.[15] Areas of natural vegetation with more than 25 per cent tree cover that are within 15 metres of such population sites are also considered habitat. The geographic areas set out in this definition exclude the Pitcher's thistle population in Pukaskwa National Park, which is on Lake Superior. The *ESA* does not apply within national parks.

[10] This includes vernal or other temporary pools.
[11] The geographic areas set out in regulation for Hine's emerald habitat are the municipality of Barrie and the following municipalities within Simcoe County: Adjala-Tosorontio; Clearview; Essa; Innisfil; Springwater; and Wasaga Beach.
[12] An "impervious surface" is one that does not permit the infiltration of water from the surface down to the soil, such as a paved area.
[13] The geographic areas set out in regulation for Hungerford's crawling water beetle habitat are: the municipalities of Arran-Elderslie, Brockton, South Bruce and South Bruce Peninsula in Bruce County; and the municipalities Chatsworth, Hanover and West Grey in Grey County.
[14] The Hungerford's crawling water beetle is known to occur on the Rankin, Saugeen and North Saugeen Rivers. The *Hungerford's Crawling Water Beetle Habitat Protection Summary* explains that "if the species was last observed more than five years ago [as is the case for the North Saugeen River population of this species], the MNRF considers the species to still be present at the site unless one of the following occurs: five consecutive years of MNRF-approved surveys have been conducted and indicate that the species no longer exists at the site, or the species has been formally designated as extirpated at the specific site." This means that, once identified at a given location, a species is considered to be currently using that site until either of the above conditions are met (i.e., five consecutive years of MNRF-approved surveys confirm no presence, or a formal extirpation designation). See: Ontario Ministry of Natural Resources and Forestry (undated). *Habitat Protection Summary for Hungerford's Crawling Water Beetle*, page 2.
[15] Specifically, the geographic areas set out in regulation for Pitcher's thistle habitat are: the municipalities of Kincardine; Lambton Shores; Burpee and Mills; Central Manitoulin; Cockburn Island; Northeast Manitoulin and the Islands; Tehkummah; and the geographic townships of Dawson and Robinson within the geographic area of Manitoulin.

Wavy-rayed Lampmussel:
The wavy-rayed lampmussel is a freshwater mussel that can reach ten centimetres in length and live up to 20 years. Under the regulation, its habitat is defined as any watercourse[16] within certain areas of southwestern Ontario that is or has been used by the species.[17] Also included are certain nearby aquatic areas and, in most cases, adjacent vegetated riparian zones. In addition, parts of Lake St. Clair that have a water depth of two metres or less and are or have been used by the species are defined as habitat. Areas that are within five kilometres of such locations and also have a water depth of two metres or less are also included in the definition. These areas appear to include all areas identified as "Currently Occupied Habitat" in the species' recovery strategy.[18]

Implications of the Decision

Some Gains and Some Losses in Scope of Protection

Prior to the regulatory amendments, the habitats of each of the affected species were determined according to the general habitat definition, which defines habitat as any area upon which the species currently depends for carrying out its life processes. Relative to this general definition, the areas protected under the regulation are broader in some respects (i.e., some historical habitat and buffer zones are now included), but narrower in others (i.e., restricted geographic ranges and specific requirements for certain habitat features and uses).

The potential implications of the shift to regulated habitat definitions are set out below. However, it can be difficult to predict the impacts of these changes on species at risk because of knowledge gaps regarding species' distribution, habitat needs and other ecological requirements.

New Protection for Known Historical Habitat:
Unlike the general habitat definition, each of the new regulated habitat definitions includes areas that were occupied by the species in the past but are not currently occupied. In some cases this includes habitat occupied at any time in the past (i.e., Hine's emerald and wavy-rayed lampmussel), and in other cases, it includes only habitat occupied within the last few years (i.e., eastern sand darter, Hungerford's crawling water beetle and Pitcher's thistle). This allowance could provide species the space to re-establish themselves within ideal habitat environments.

New Protection for Buffer Zones:
All of the new regulated habitat definitions include buffer zones around areas that are or have been used by the species, unlike the general habitat definition. For example, for eastern sand darter, Hungerford's crawling water beetle and wavy-rayed lampmussel, most aquatic areas nearby current or previously inhabited parts of watercourses, as well as adjacent naturally vegetated riparian areas, are also considered habitat. Protecting buffer zones could allow existing populations room to grow and increase their range, as well as ensure that primary use areas are not damaged by nearby activities.

[16] With a stream order greater than two.
[17] The areas of southwestern Ontario set out in regulation for wavy-rayed lampmussel habitat are: the geographic areas of Brant; Chatham-Kent; Huron; Lambton; Middlesex; Oxford; Perth; Waterloo; and Wellington; as well as the St. Clair River.
[18] It is not entirely clear whether the regulated wavy-rayed lampmussel habitat encompasses all areas identified as Currently Occupied Habitat in the recovery strategy because the description of Currently Occupied Habitat does not say whether there are any known occurrences in water deeper than two metres. That said, the recovery strategy does note that the species prefers shallow water. See: Morris, T.J. (2011). *Recovery Strategy for the Wavy-rayed Lampmussel* (*Lampsilis fasciola) in Ontario*. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Appendix pages 10-11.

Narrowed Protection Based on Geographic Area:
All of the new regulatory provisions limit the defined habitat to specific geographic areas; accordingly, other areas are necessarily (and sometimes explicitly) excluded. Generally, these geographic restrictions do not exclude any areas in which the subject species is known to occur. However, these regulatory definitions offer no habitat protection for any undiscovered populations occurring outside the listed areas.

Existing information about both the eastern sand darter and Hine's emerald suggest that undocumented populations may occur outside of the geographic areas identified in the regulation. Specifically, the government response statement for eastern sand darter notes that a new population of the species was identified in 2013 in Prince Edward County – far away from the known populations in southwestern Ontario.

Although Prince Edward County is included among the geographic areas identified in the eastern sand darter habitat regulation, this discovery suggests it is entirely possible that there are other parts of the province where this species may exist unknown to the MNRF. In the case of Hine's emerald, the recovery strategy notes that "experts suggest there is a *high likelihood* of extant Hine's emerald populations at least at some of 28 locations identified [by the Committee on the Status of Endangered Wildlife in Canada] as having appropriate habitat" (emphasis added). Many of these 28 locations are outside of the geographic areas listed in the habitat regulation.[19]

In the event that new occurrences of either of these species (or any other species with regulated habitat confined to a specified geographic area) are discovered outside of the geographic areas listed in the regulation, amendments will be required before that habitat is protected. In contrast, under the general habitat definition, any area used by an endangered or threatened species for a life process is afforded immediate protection.

Narrowed Protection Based on Habitat Features and Uses:
The new regulatory habitat definitions all define habitat in reference to certain environmental features and/or particular uses by the species. In some cases, these clauses merely restrict habitat to the type of environment the species tends to inhabit. For example, wavy-rayed lampmussel habitat in Lake St. Clair is limited, in part, to areas where the water depth is two metres or less. This depth limitation is consistent with the species' known preference for shallow water and is thus unlikely to exclude any areas where the species occurs. In other cases, however, environmental feature- or use-based restrictions may exclude areas that would have previously been considered habitat under the general habitat definition. For example, Pitcher's thistle habitat is restricted in part to sand dunes with less than 25 per cent tree cover (and associated buffer areas). Although the recovery strategy says that Pitcher's thistle prefers open dune habitat, there is no mention of the 25 per cent threshold. The ministry offered no explanation for why it decided to restrict the habitat definition in this way.

Consideration of Recovery Strategy Recommendations

The recommendations set out in each species' recovery strategy vary widely. In some cases, the recommendation is only that the Minister consider the approach used in the recovery strategy to

[19] These locations are listed in: Committee on the Status of Endangered Wildlife in Canada (2011). *COSEWIC Assessment and Status Report on the Hine's Emerald* Somatochlora hineana *in Canada*, pages 11-20.

identify critical habitat. In other cases, the recovery strategy sets out a detailed description of what geographic areas and habitat features should be considered when developing the regulation. The Minister is not required or expected to follow all habitat recommendations set out in a recovery strategy when making the habitat regulation, because he or she must also consider a wide variety of other factors including social and economic implications. However, the recovery strategy habitat recommendations offer important insight from the best available scientific information about a species' habitat protection needs.

The eastern sand darter and wavy-rayed lampmussel regulated habitat definitions generally incorporate the areas referenced in their respective recovery strategy habitat recommendations. However, the Hungerford's crawling water beetle habitat definition does not incorporate the species' recovery strategy recommendation to protect potential habitat and historical habitat last used more than five years ago to allow for dispersal and re-establishment.

There are also several significant recommendations in the recovery strategy for Hine's emerald that are not incorporated into the species' habitat definition. First, the regulation only includes areas currently or previously used by a Hine's emerald for egg laying or larval development (and associated buffer areas), rather than including all known habitat as recommended in the recovery strategy. While some adult habitat that differs from that of larval stage individuals is likely protected as part of the buffer zone, this definition is more restrictive that recommended in the species' recovery strategy.

Furthermore, the regulation does not incorporate the recommendation that the "Snow Valley Uplands" areas be prescribed as part of Hine's emerald habitat.[20] The recovery strategy explains this recommendation as reflecting the importance of groundwater recharge to the wetland, describing this area as "where the current regional groundwater infiltration regime is maintained for the entire Minesing Wetlands." The recovery strategy also notes that this area is under threat from residential development. Despite the importance of this area, the regulatory definition only includes recharge areas within 500 metres of the aquatic buffer zone around primary use areas – a condition that incorporates only a small portion of the Snow Valley Uplands areas.

In addition, although buffer zones have been protected, the regulation does not incorporate travel corridors between habitat patches, which the recovery strategy described as "essential to the recovery of Hine's Emerald, particularly to enable their movement and dispersal."

The Pitcher's thistle recovery strategy recommended that those areas identified as "critical habitat" be considered in preparing the habitat regulation. Although this recommendation does not require that all areas identified as critical habitat be protected, it is noteworthy that the regulation's final habitat definition departs sharply from the critical habitat description with respect to vegetated buffer zones. The regulation only protects a buffer zone of 15 metres from occupied dunes with less than 25 per cent tree cover despite the critical habitat definition in the recovery strategy, which includes all treed areas for 15 metres from the point where tree coverage is 60 per cent or more – a much larger range.

[20] The recovery strategy refers readers to the definition of Snow Valley Uplands provided in: Beckers, J. and Frind, E.O. (2001). Simulating Groundwater Flow and Runoff for the Oro Moraine Aquifer System. Part II. Automated Calibration and Mass Balance calculations. *Journal of Hydrology* 243: 73-90. Generally speaking, this is an area located approximately one kilometre east of the Minesing Wetland, which extends east for several square kilometres to the outer edges of Barrie in the southwest and Snow Valley Road in the North.

Defined Habitat Can Still be put to Other Uses

Prescribing an area as habitat in regulation does not mean the area cannot ever be used by humans. Activities that do not damage or destroy habitat are not prohibited by the *ESA*;[21] accordingly, many property owners may continue to use their land as they always have after it has been designated as species at risk habitat. In addition, any activities authorized by permit or agreement, or that follow the rules in regulation for the O. Reg. 242/08 sector-specific exemptions, will be allowed to continue even if they damage or destroy habitat.

Public Participation & *EBR* Process

The proposal notice for the regulatory amendments introducing these new habitat provisions was posted on the Environmental Registry (#012-1549) in May 2014 for a 46-day comment period. The ministry reported that it received 36 comments. The MNRF provided an overview of the proposed content of the regulatory amendments in the form of species-specific regulation summaries (similar to the habitat regulation summaries now available on the MNRF website), as well as hyperlinks to other materials. However, the ministry did not explain the relationship between recovery strategies, government response statements and habitat regulations – important contextual information for potential commenters to understand.

In addition to the Registry notice, the MNRF placed notices in local papers and alerted local governments and organizations to the proposal. The ministry also sent letters to landowners identified as possibly having species at risk habitat on their properties and advised them of this likelihood and of the proposed regulatory amendments. Approximately half of all comments were submitted by individuals who had received such a letter. Some commenters raised concerns with the consultation process associated with Hine's emerald in particular, stating that the MNRF's notice letters had not been properly addressed or delivered to all potentially affected parties. They also said that the timeline for commenting did not allow sufficient time to provide meaningful comment following receipt of the letters, and that the proposal was unclear.

With respect to the proposal itself, a handful of commenters encouraged the ministry to broaden the proposed habitat definitions for Hine's emerald and Pitcher's thistle. Some commenters felt the Hine's emerald regulation did not adequately protect groundwater recharge and discharge areas and support potential recovery efforts. Regarding Pitcher's thistle, a conservation organization commented that beach and nearshore environments occurring near sand dunes also needed protection.

Several commenters expressed general support for the proposal, and many requested further information about how they could be better stewards of the habitat on their properties. Some commenters also expressed concern that activities on neighbouring properties might be negatively affecting species at risk.

[21] "Damage" and "destroy" are not defined in the *ESA*; the MNRF policy document *Categorizing and Protecting Habitat under the Endangered Species Act* sets out the ministry's approach to determining whether a proposed activity is likely to damage or destroy habitat. This policy was reviewed in Chapter 2.4 of the ECO's 2011/2012 Annual Report, Part 2. Furthermore, the species-specific habitat protection summaries help gauge whether an activity is likely to damage or destroy habitat by using a colour coded system as per *Categorizing and Protecting Habitat under the Endangered Species Act*.

Conversely, a similar number of commenters advised the MNRF that they did not believe any species at risk used their properties, or, in any event, that their property should not be subject to the habitat regulation. Many of these commenters expressed concern about how the regulation might restrict their ability to use and, in particular, develop their properties in the future. A number of comments focused on the issue of what types of activities would be considered to damage or destroy regulated habitat, rather than the parameters of the habitat definitions themselves. For example, some farmers and a farm organization expressed concern that farm practices would be restricted even when carried out in an environmentally responsible manner.

A drainage-related industry association commented that *ESA* permitting, review and monitoring requirements add costs to municipal drain construction and maintenance. Furthermore, it expressed concern that mitigation or avoidance measures associated with *ESA* permits may "contradict" work required on municipal drains. In this respect, the commenter stated that "the regulations must address the legal implications to the municipality and the landowners associated with the municipal drains impacted by those species." They further encouraged the use of the *Drainage Act* as a tool "to correct deficiencies or improve the conditions that may exist."

Other comments included suggestions that the MNRF meet with affected landowners to explain the regulation and encourage stewardship activities, and that the ministry update geographic references in the proposal to reflect current municipal titles. Several commenters also used the proposal notice as an opportunity to voice their concerns about the province's general approach to environmental management, or other matters not directly related to the proposed regulation.

The MNRF reported that it made a number of adjustments to the proposals for eastern sand darter, Hine's emerald, Hungerford's crawling water beetle and the wavy-rayed lampmussel as a result of these comments. These changes include:

- revising the list of geographic areas set out in the Hungerford's crawling water beetle and Hine's emerald provisions to refer to lower-tier municipalities instead of townships;
- altering the Hine's emerald habitat definition as it pertains to vegetation and groundwater recharge and discharge zones – instead of setting different buffer zone distances for areas of natural vegetation and groundwater recharge or discharge, the regulation creates one zone for any permeable surface area;
- extending the Hine's emerald and wavy-rayed lampmussel habitat definitions to areas used at any time in the past;[22]
- expressly excluding the Sydenham River downstream of Dresden from the wavy-rayed lampmussel and eastern sand darter habitat definitions, and excluding unoccupied tributaries from the eastern sand darter habitat definition and small tributaries from the wavy-rayed lampmussel habitat definition;
- simplifying the requirements for certain environmental features in the definition of eastern sand darter lake habitat; and
- adding a riparian buffer zone to the eastern sand darter habitat definition.

[22] In the case of Hine's emerald, areas must have been used for egg laying or larval development.

Additional refinements were also made to ministry materials to improve clarity. For example, the habitat protection summaries for some species now expressly note that cropland and lawns are not considered habitat under the regulatory habitat definition.

Statement of Environmental Values

The MNRF provided the ECO with a copy of its Statement of Environmental Values (SEV) consideration document. This document details several principles of resource stewardship from the MNRF's SEV that the ministry considered when making this decision. For example, the principle that planning and allocation decisions should recognize the finite capacity of natural systems was reflected in the decision because "regulating the habitat of species at risk is based on the understanding that our resources and environment have limits and are not inexhaustible. The finite capacity of the environment is acknowledged in the decision to protect the habitat of these five species at risk through regulation." In reference to the principle calling for caution and special concern for natural values in the face of uncertainty, the ministry stated that "the proposed habitat regulation represents a precautionary approach that takes into account the level of uncertainty in the species' needs and the impacts that surrounding activities might have on them."

ECO Comment

Overall, the areas inhabited by known populations of eastern sand darter, Hine's emerald, Hungerford's crawling water beetle, Pitcher's thistle and wavy-rayed lampmussel are now better protected by their regulatory habitat definitions than they were by the general habitat definition.

One advantage of regulated habitat definitions is that the geographic area restrictions offer specificity about where species at risk might be present in the province. This provides some certainty to the MNRF, landowners and proponents that if an activity is taking place outside the prescribed areas, they likely do not have to worry about whether a particular species might be present. However, when there is good reason to believe that populations exist outside of the geographic area defined in regulation – as is the case with eastern sand darter and the Hine's emerald – this specificity can work against the best interests of the species by leaving such populations without protection, and by potentially misleading stakeholders into believing the species could not possibly be present in the area. While it is the MNRF's stated practice to amend habitat regulations as needed to address newly discovered habitat, amending a regulation can be a long process and in the meantime habitat could be lost. Fortunately, this shortcoming could be easily overcome for species believed to have undocumented populations outside of the regulated habitat area by adding a basket clause protecting areas relied upon for life processes by all existing populations, wherever they might occur.

In the case of Hine's emerald, the failure to protect the Snow Valley Uplands areas is troubling. The importance of such protection was explained and expressly recommended in the species' recovery strategy. The MNRF's decision to reject this recommendation is particularly disconcerting because the Snow Valley Uplands are under pressure from development, as noted in the recovery strategy. This makes protecting the area all the more important, but also, possibly, more controversial. Given the specificity of this recommendation in the recovery strategy, and with no explanation from the ministry as to why it was not followed, the ECO concludes that in this case the MNRF opted to favour development, rather than to prioritize the protection of this species at risk habitat.

The ECO is pleased with the efforts the MNRF made to identify potential stakeholders in this decision and to directly engage with them. Despite this effort, however, many of the comments indicated serious misunderstandings about how habitat regulations operate and what types of activities are prohibited in regulated habitat. For example, many property owners seemed to assume that their land could not be regulated habitat if a species at risk had not been observed on the property; this suggests that the existence and purpose of buffer zones as well as how activity on one property could damage habitat on another (e.g., removing vegetation leading to soil erosion or increased water runoff) needs to be better explained. Several commenters also expressed concern that having species at risk habitat on their properties would mean that they were no longer allowed to carry out any of their usual activities. In reality, if a species is already using a location as habitat, it is a strong indication that any pre-existing nearby activities are not "damaging or destroying" that habitat and property owners can likely continue many, if not all, of their activities as usual.

These, and other misconceptions, could be partially addressed through a more comprehensive Environmental Registry proposal notice – one that includes information about the purposes of the *ESA* and the role of recovery strategies and government response statements in determining appropriate species-specific habitat definitions. Providing an overview of how the habitat regulation interacts with the section 10 prohibition on damaging or destroying habitat would also be helpful. Similarly, links to applicable policy guidance documents – such as *SAR Policy 4.1: Habitat protection for endangered, threatened and extirpated species under the Endangered Species Act, 2007* – would also add value to the Registry notice. Finally, hosting meetings in communities where there is significant interest (in this case, in the area affected by the Hine's emerald habitat regulation), would likely improve public understanding of the proposal and also present an opportunity to engage community members in the protection of species at risk.

SECTION 2

REVIEWS OF APPLICATIONS FOR REVIEW

2.1 Ministry of Agriculture, Food and Rural Affairs

Review of Application: R2014002

2.1.1 Soil Management in Agricultural Operations
(Review Undertaken by the OMAFRA; Review Denied by the MOECC and the MMAH)

Background/Summary of Issues

In January 2015, the ECO received an application from two Ontario residents requesting a review of the need for a new act to declare the Ontario government's support for sustainable and careful use of soil. The applicants stated that current legislation and incentives are insufficient to encourage responsible soil management on agricultural land.

The ECO forwarded the application to the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA), the Ministry of the Environment and Climate Change (MOECC), and the Ministry of Municipal Affairs and Housing (MMAH).

Ministry Response

While the MMAH and the MOECC informed the applicants that they had decided to deny their application for review on March 31, 2015, and April 2, 2015, respectively, the OMAFRA advised the applicants on March 31, 2015, that it would undertake their requested review. The OMAFRA did not provide an expected date of completion.

ECO Comment

The ECO will review the handling of this application in a future reporting year, once the OMAFRA has completed its review.

2.2 Ministry of the Environment and Climate Change

Review of Application R0334:

2.2.1 Classification of Chromium-Containing Waste as Hazardous (Review Undertaken by the MOECC)

Background

Overview

In November 1995, two Ontarians submitted an application under the *Environmental Bill of Rights, 1993* requesting a review of Regulation 347 (General – Waste Management), made under the *Environmental Protection Act*. The applicants suggested that different forms of chromium should be distinguished from each other for the purposes of classifying hazardous waste under the regulation. The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC). The ministry agreed to undertake a review in 1996. On July 31, 2014, the ministry delivered notice of its decision to maintain its existing approach to chromium regulation.

Chromium and the Regulation of Hazardous Waste

Chromium is a metal used for a variety of purposes, including in the production of stainless steel, chrome plating, and as a catalyst in the dyeing and tanning of leather. The two most common types of chromium compounds are hexavalent and trivalent chromium. Exposure to hexavalent chromium is known to cause health effects such as respiratory problems, gastrointestinal and neurological effects, kidney and liver problems, and skin burns. It is also classified as carcinogenic to humans. Trivalent chromium, however, is generally considered less toxic, and is in fact an essential nutrient in very small quantities.[1]

Hazardous wastes are waste materials that, in sufficient quantities or concentrations, can pose a threat to human health or the environment. Generally, hazardous wastes require special handling to ensure that they are properly stored, transported, treated and disposed of in order to protect human health and the environment. In Ontario, Regulation 347 defines what waste materials are considered "hazardous waste," and dictates how they are to be collected, stored, transported, treated, recovered and disposed. Under the regulation, if a leachate test shows that a waste has total chromium levels that meet or exceed five milligrams per litre (as set out in Schedule 4 of the regulation), that waste is considered hazardous.[2] The regulation does not distinguish between hexavalent and trivalent chromium.

Under the *Canadian Environmental Protection Act, 1999*, the same five milligram per litre leachate test is used to define chromium hazardous waste under the Export and Import of Hazardous Waste and

[1] For more background information about chromium, see: United States Environmental Protection Agency website (accessed December 9, 2014). *Chromium Compounds – Hazard Summary*. http://www.epa.gov/ttnatw01/hlthef/chromium.html.

[2] In addition, certain products containing chromium are automatically considered "hazardous" under Regulation 347, General – Waste Management, made uder the *EPA* regardless of the chromium form, the total amount of chromium or chromium leachate. These are generally compounds specific to a particular operation, such as "spent cyanide plating bath solutions from electroplating operations" (F007 under schedule 2 of Regulation 347) or "spent cyanide solutions from salt bath pot cleaning from metal heat treating operations" (F011 under schedule 2 of Regulation 347).

Hazardous Recyclable Material Regulations. These regulations similarly do not distinguish between hexavalent and trivalent chromium. However, only hexavalent – and not trivalent – chromium compounds are included on the List of Toxic Substances recognized under the *Canadian Environmental Protection Act, 1999*.

Summary of Issues

The applicants requested a review of the chromium criterion in Schedule 4 of Regulation 347, which establishes the leachate test threshold used in defining chromium hazardous waste. The applicants argued that leather tanning uses only the trivalent form of chromium, and that less than five per cent of the chromium in tannery waste is typically available for leaching. However, under the leachate test set out in Regulation 347, tannery waste is usually designated as hazardous, and must be transported and disposed of at a higher cost than non-hazardous waste.

The applicants argued that continuing to classify trivalent chromium as hazardous places an unnecessary economic burden on industries that manage chromium-contaminated waste, and diverts resources away from other environmental concerns. The applicants asserted that other jurisdictions, including the United States, differentiate between toxic and non-toxic forms of chromium.

Ministry Response

In 1996, the MOECC agreed to undertake the review, advising the applicants that the ministry intended to co-ordinate its work with a concurrent federal review of the national hazardous waste definition. In June 2005, the MOECC advised the ECO that recently published draft federal regulations dealing with hazardous waste did not contain an exemption for blue leather tanning waste (i.e., tanning waste containing chromium).[3] The MOECC said that it would continue to work with Environment Canada to determine whether it intended to pursue such an exemption in the final version of the federal regulations. The ministry stated that once the federal regulations were finalized, it would complete the review. The federal regulation defining chromium hazardous waste came into force in November 2005. It contains no exception for tanning waste containing chromium.[4]

On July 31, 2014, the MOECC advised the applicants of its decision to continue with its existing approach of not differentiating between trivalent and hexavalent chromium in its regulation of hazardous chromium waste. The ministry asserted that while hexavalent chromium is a known carcinogen, trivalent chromium also exhibits harmful effects and that new science continues to indicate its toxicity. Furthermore, the MOECC reported that a literature review "provided no new evidence to suggest that total chromium should not be considered as a parameter for defining the hazards of a waste." The ministry also stated that in certain circumstances trivalent chromium can convert into hexavalent chromium.

The ministry reported that it evaluated alternatives to the current hazardous waste management regime, such as disposing of chromium through municipal wastewater treatment or through thermal

[3] Although the MOECC did not specify, the ECO believes the ministry was referring to the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*, which were posted publicly in draft in May 2004. See: Government of Canada (2004). Proposed Regulatory Text – Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations, *Canada Gazette* 138(12): 701.

[4] Environment Canada website (accessed December 10, 2014). *Management of Hazardous Wastes and Hazardous Recyclable Materials in Canada*. http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=4379B169-1.

treatment. The MOECC concluded that these methods all risked introducing chromium into the natural environment and facilitating the conversion of trivalent chromium into hexavalent chromium.

The MOECC also noted that "Ontario's existing framework for defining hazardous wastes is generally consistent with other North American jurisdictions." With one exception, all other Canadian provinces use the same leachate concentration threshold as Ontario for defining chromium hazardous waste. Environment Canada also uses this standard to define hazardous chromium waste under the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations under the *Canadian Environmental Protection Act, 1999*.

In concluding that the regulation should not be changed at this time, the ministry explained that the existing approach avoids risks and proactively manages environmental and human health hazards from chromium. Furthermore, the ministry considers it "desirable to remain aligned with the national hazardous waste definition."

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The ECO agrees with the ministry's decision to maintain the existing approach to defining chromium waste as hazardous. Although there may be differing opinions and approaches to managing trivalent chromium from leather tanning as a hazardous waste, maintaining the current definition is consistent with the precautionary principle and with standard practice throughout most of Canada.

The ministry states that its decision is supported by "new science" that continues to indicate that trivalent chromium poses some environmental risk (even if it may be somewhat less toxic than hexavalent chromium). However, the ministry provided no detailed analysis, research summaries nor a source list for the literature review referenced in the ministry decision. It would have been helpful for the MOECC to provide some indication of what research findings it was referring to and relying upon.

That it took nearly 20 years for the MOECC to reach a decision on this review is entirely unreasonable and inexcusable. While the ECO appreciates the challenges that may come from earnest attempts to co-ordinate provincial and federal reviews, the federal definition of chromium hazardous waste has not changed since 2005. Furthermore, recently, when the ECO requested updates from the MOECC on this matter, the ministry refused to provide any information or a timeline for completion. The ministry's delay in completing this review simply cannot be explained away by the effort to co-ordinate with the federal government.

Review of Application R2008014:

2.2.2 Air Pollution Hot Spots Regulatory Reform (Review Undertaken by the MOECC)

Background/Summary of Issues

In January 2009, two applicants requested a review of the need for a new regulatory framework to fill gaps in Ontario's air pollution laws related to cumulative impacts of pollution, particularly air pollution "hot spots." Hot spots are described by the applicants as "multi-pollutant, multi-facility areas with significant background levels of pollutants or pollutant levels from local sources that exceed toxic air pollutant standards and areas impacted by persistent, bioaccumulative, toxic air pollutants from industrial sources."

The applicants are concerned that air pollution hot spots in Ontario threaten the physical and psychological health of people living in those areas, and compromise their right to live in a healthful environment. As evidence of significant deficiencies in Ontario's air pollution regulatory regime, the applicants cited the environmental health crisis in the community of Aamjiwnaang First Nation near Sarnia, Ontario – an air pollution hot spot area known as "Chemical Valley." The applicants asserted that Ontario's regulatory framework is "unable to adequately protect the environment or human health from the dangers associated with air pollution."

The applicants asked the Ministry of the Environment and Climate Change (MOECC) to:

- identify pollution hot spot areas in Ontario that require pollution reduction plans;
- regulate air pollution in hot spot areas using a cumulative effects approach;
- require that any assessment, report or estimate of emissions and/or pollutant concentrations include background levels of pollution;
- require the MOECC standards to be ratcheted down over regulated, enforceable timelines;
- make reducting emissions of persistent and bioaccumulative pollutants a priority;
- require that "maximum achievable control technologies" and "lowest achievable emission rates" be used to reduce overall emissions;
- require ongoing monitoring of emission sources at industrial facilities;
- engage community members and industry in the development of pollution reduction plans;
- prohibit the issuance of new or amended Certificates of Approval (now called Environmental Compliance Approvals) while pollution reduction plans are being developed, unless the approvals would result in reduced emissions; and
- ensure that pollution reduction plans set out maximum limits on pollution that can be approved by the MOECC under the approval process.

The ECO forwarded the application to the MOECC.

Ministry Response

In May 2009, the MOECC notified the applicants that it would undertake the requested review. The MOECC stated that it is "committed to developing the long-term tools, including science, policies and guidelines to support the application of an ecosystem approach, including consideration of cumulative

effects. As such, the ministry is currently reviewing how it applies the principles of its Statement of Environmental Values (SEV), including cumulative effects assessment and the ecosystem approach, in its environmentally significant decision making."

The ministry advised the applicants that, as part of its review of the environmental decision-making process, it would review the matters raised in the application. The ministry noted that if the review concludes that the current framework warrants revision, the ministry "will actively engage the regulated community, local residents, and other stakeholders."

In May 2010, the ECO requested an update from the MOECC on the status of its review. The MOECC informed the ECO that the ministry was working on its SEV Values Guiding Principles Review, which included considering "how to best operationalize the SEV principles, including consideration of cumulative effects." The MOECC stated that as part of the SEV project, the ministry was looking at new approaches, examining experiences in other jurisdictions, and actively considering the proposal presented in the application for review.

A year later, when the MOECC had still not completed its review, the ECO requested another update from the ministry. The MOECC responded that it was continuing to consider the issues raised in the application as the ministry determines how best to incorporate cumulative effects assessment in its decision-making processes. The MOECC also responded that "the ministry is working on a number of initiatives that are expected to incorporate a cumulative approach, including its work with [the Canadian Council of Ministers of the Environment (CCME)] regarding proceeding with an Air Quality Management System, participation in a research consortium on aquatic cumulative effects and requiring proponents to undertake formal cumulative effects assessments on a case by case basis."

In May 2012, the MOECC informed the ECO that it still had not completed its review of the application because it is tied to initiatives related to the assessment of cumulative effects and the Air Quality Management System.

In February 2013, when asked again about the status of this review, the MOECC told the ECO that the review was still in progress. In May 2013, the applicants sent a letter to the MOECC also requesting a progress update on the review. The Minister at the time responded that the review was still ongoing, and that the ministry would provide a notice of the results of the review within 30 days of its completion.

In March 2014, the ECO again asked the MOECC for an update on this review. In May 2014, the MOECC responded that there was no update at that time.

In March 2015, the MOECC informed the ECO that the ministry has various work underway on this issue. As of July 2015, however, the ministry had still not completed its review.

Other Information

In October 2010, the CCME announced that federal, provincial and territorial Ministers of the Environment were "moving forward with a new collaborative air management approach to better

protect human health and the environment."[1] The CCME stated that the proposed new air quality management system would: include more ambitious Canadian air quality standards and consistent industrial emissions standards across the country; and establish regionally co-ordinated airsheds and air zones within individual provinces and territories.

In October 2012, Canadian jurisdictions, with the exception of Quebec, agreed to begin implementing the CCME-developed Air Quality Management System to improve air quality in Canada. This comprehensive approach, which is the product of collaboration between the federal, provincial and territorial governments and stakeholders, includes:

- a framework for a place-based air zones approach to managing air quality that enables action tailored to specific sources of air emissions in a given area;
- the establishment of six regional airsheds, collectively covering all of Canada, to co-ordinate efforts to reduce transboundary air pollution and report on regional air quality;
- new Canadian Ambient Air Quality Standards (CAAQS) to set the bar for outdoor air quality management across Canada;
- base-level industrial emissions requirements to ensure that all significant industrial sources in Canada meet a good base-level of performance; and
- a framework for addressing air pollutant emissions from mobile sources (i.e., the transportation sector).

In 2012, the CCME released a document that provides guidance on air zone management under the Air Quality Management System.[2] In September 2013, the MOECC indicated that, through air zone management, Ontario will collaborate on a toolkit to support local actions to improve air quality. At the same time, the MOECC also indicated that a discussion document would be posted on the Environmental Registry for public comment about Ontario's proposed approach to implementing air zone management.[3] In April 2015, the ministry released the *Air Quality in Ontario 2013 Report*, which states that ambient air quality will be measured against the new air quality standards (CAAQS) for the first time in 2015 to determine management levels for air zones. As of June 2015, however, the ministry had not yet posted a discussion document on the Registry about Ontario's proposed approach to air zone management.

ECO Comment

The MOECC has taken over six years to conduct this review. Worse still, several years have gone by since the MOECC last updated the applicants on the review's progress. While the ECO is pleased that the MOECC agreed to undertake this review, these delays are entirely unreasonable. The ECO strongly urges the MOECC to complete the review. The ECO will report on the ministry's handling of this application and the outcome of the review once it is completed.

[1] Canadian Council of Ministers of the Environment (October 20, 2010). News Release, *Ministers Move Forward with New Approach on Air Quality*.
[2] Canadian Council of Ministers of the Environment (2012). *Guidance Document on Air Zone Management*.
[3] Hussain, L. and Newdick, J. (September 27, 2013). *Air Quality Management System.* Presentation at Greater Toronto Area – Clean Air Council.

Review of Application R2009016:

2.2.3 Providing for Stays Pending Decisions on Leave to Appeal Applications under the *EBR* (Review Undertaken by the MOECC)

Background/Summary of Issues

The applicants filed a request for a new regulation under the *Environmental Bill of Rights, 1993* (*EBR*) that would provide jurisdiction to stay a decision subject to a leave to appeal (LTA) application made under the *EBR*. A "stay" would suspend any activities permitted by an instrument while an LTA application challenging the decision to issue the instrument is being considered. If leave is granted, the *EBR* already provides for an automatic stay pending the outcome of the appeal.

LTA applications under the *EBR* are adjudicated by administrative tribunals such as the Environmental Review Tribunal (the "Tribunal"). Although the Tribunal attempts to render decisions on LTA applications within 30 days of receiving an application, many factors can prolong deliberation on whether to grant leave.

Delays in the LTA process are problematic because there is currently no way for the Tribunal to stay the government's decision pending a determination on whether leave should be granted. The applicants contend that this lack of jurisdiction leads to uncertainty, and can give rise to "a situation where significant harm can be inflicted on the environment pending a decision on leave to appeal." The applicants cited an example in which a Permit to Take Water (PTTW) for an area near a provincially significant wetland was completely acted upon before residents had an opportunity to challenge the merits of the permit in a formal hearing before the Tribunal.

The applicants noted that Cabinet has the power under subsection 121(1)(s) of the *EBR* to make regulations "providing for stays pending decisions on applications for leave to appeal." However, to date no regulation has been made. The applicants argued that a new regulation providing for stays pending LTA decisions would be in the public interest and would support the purposes of the *EBR* to protect and restore the environment and to enhance public participation.

Ministry Response

Under the *EBR*, the Ministry of the Environment and Climate Change (MOECC) was required to make a decision on whether to undertake the requested review by March 19, 2010 (i.e., 60 days after receipt of the application). On March 22, 2010, the responsible Assistant Deputy Minister in the ministry's Integrated Environmental Policy Division wrote to the applicants and explained that the MOECC was unable to make a decision by March 19, 2010, and that a decision would be provided to the applicants and the ECO by May 14, 2010. On May 14, 2010, the Assistant Deputy Minister notified the applicants that the MOECC had still not made a decision but would be in a position to render a decision by July 30, 2010.

On August 23, 2010, the MOECC finally provided the applicants with its preliminary decision on the application. The ministry informed the applicants that it would undertake the requested review, but only as it relates to PTTWs. The ministry explained that it would be limiting the review to PTTWs because they are instruments that may potentially be implemented or expire before an LTA request is

heard by the Tribunal, and because PTTWs were not affected by the ministry-wide Modernization of Approvals program underway at the time.

The MOECC initially indicated that it would need 12 months to complete the review. However, on August 16, 2011 (just days short of the 12-month mark), the ministry informed the applicants that it was aligning the review with another more comprehensive review of the *EBR* and its regulations that the ministry had agreed to undertake in March 2011 (for more information on that application, refer to R2010009 in Section 2.1.3 of this Supplement to the Annual Report). The ministry stated that "the issues contemplated in a review of the need for any new regulation providing for stays pending leave to appeal decisions would be within the scope of a review of the *EBR* itself." The ministry stated that it would begin its review immediately, and that it anticipated requiring 12 – 16 months to complete the review.

The ministry did not complete the review within 12 – 16 months. In February 2013 – 19 months after the MOECC agreed to undertake this review in conjunction with the more comprehensive review of the *EBR* – the MOECC reported to the ECO that it was "currently finalizing the scope and approach for its review of the *EBR*." However, in May 2014 – over two and a half years after the MOECC combined the applications and over three years after the MOECC originally agreed to undertake the review – the ministry advised the ECO that it was unable to provide any estimated timeframe for completion of the review. As of April 2015, the ECO has received no further communication from the MOECC on this application.

ECO Comment

The MOECC is long overdue in completing this review.

The ECO will review the handling of this application once the ministry has completed and provided a decision on its review.

Review of Application: R2010009

2.2.4 Review of the *Environmental Bill of Rights, 1993* (Review Undertaken by the MOECC)

Background/Summary of Issues

In December 2010, the ECO received an application from two staff members of the Canadian Environmental Law Association requesting a review of the *Environmental Bill of Rights, 1993* (*EBR*) and its regulations.

Since the *EBR* came into force in 1994, it has never undergone any formal review. Despite the identification of shortcomings in the legislation over the years and changes to societal values and environmental priorities, the statute has remained largely unchanged. The applicants urged the Ministry of the Environment and Climate Change (MOECC) to undertake a formal public review of the *EBR* to solicit input on key changes to the current *EBR* regime and better achieve the broad purposes of the legislation.

The applicants identified ten key issues, listed below, that should be formally reviewed by the MOECC in an open and public review of the *EBR*:

1. updating the purposes of the *EBR;*
2. the lack of environmental rights in the *EBR;*
3. complying with meaningful Statements of Environmental Values;
4. use, misuse and avoidance of the Environmental Registry;
5. fixing the "EA Exception" under section 32 of the *EBR;*
6. revisiting the leave test and funding for third-party appeals;
7. enhancing the powers of the ECO;
8. prescribing additional ministries and statutes under the *EBR;*
9. improving responses to applications for reviews and investigations; and
10. facilitating access to environmental justice.

The applicants stressed that this list is not exhaustive, but merely the "Top 10" issues that are "illustrative of the types of systemic problems which require consideration within the requested review." For each issue, the applicants described their concerns and suggested potential reforms to address them.

The ECO forwarded the application to the MOECC.

Ministry Response

On March 1, 2011, the MOECC advised the applicants that it had concluded that the requested review was warranted. The MOECC agreed with the applicants that "the *EBR* is generally sound and it would not be appropriate to conduct a wholesale reconsideration of the Act in its entirety," and stated that "the Ministry's review will examine certain components of the *EBR*, as determined necessary by the Ministry after further deliberation and references to some of the matters raised in your application."

In its preliminary decision letter, the MOECC did not provide an estimated time for completion of its review. However, in August 2011, the MOECC advised a different set of applicants who had submitted an application regarding *EBR* leave to appeal rights that the ministry would be incorporating its review of *EBR* leave to appeal rights into the ministry's broader review of the *EBR.* The MOECC stated that it anticipated that the review would take 12 – 16 months to complete from that date. For more information on the related review, see R2009016 in Section 2.1.2 of this Supplement to the Annual Report.

The ministry did not complete the review within 12–16 months. In February 2013 – 19 months after the MOECC combined the applications and 23 months after the ministry originally agreed to undertake the review, the MOECC reported to the ECO that it had met with the applicants in December 2012 to "determine [the] applicants' review priorities," and was "currently finalizing the scope and approach for its review of the *EBR*." However, in May 2014 – over two and a half years after the MOECC combined the applications and over three years after it originally agreed to undertake the review – the ministry advised the ECO that it was unable to provide an estimated timeframe for completion of the review.

In September, 2014, the applicants wrote to the Minister of the Environment and Climate Change to bring his attention to the MOECC's lack of progress on the review. The applicants remarked that "the approximate four year timeframe taken so far by the Ministry just to get the focused *EBR* review underway greatly exceeds the amount of time (ten months) taken by the *EBR* Task Force to originally draft the *EBR* in its entirety," and asked the Minister to direct ministry staff "to take all necessary steps to expedite the *EBR* review." The applicants also urged the Minister to direct ministry staff to provide options for early public engagement on various aspects of *EBR* reform. To the ECO's knowledge, the Minister did not respond to the applicants' letter.

As of July 2015, the ECO has received no further communication from the MOECC on this application.

ECO Comment

The MOECC is long overdue in completing this review.

The ECO will review the handling of this application in a future Annual Report, once the ministry has completed its review.

Review of Application: R2012005

2.2.5 Regulations Related to Hydraulic Fracturing (Review Undertaken by the MOECC and the MNRF)

This application was reviewed in conjunction with R2012006 (Ministry of Natural Resources and Foresty). Please see Section 2.4.1 of this Supplement for the full review.

Review of Application: R2012013

2.2.6 IC&I Source Separation Programs (Review Undertaken by the MOECC)

Background/Summary of Issues

On August 29, 2012, an application was submitted requesting a review of O. Reg. 103/94 (Industrial, Commercial and Institutional Source Separation Programs) made under the *Environmental Protection Act* (*EPA*). The ECO forwarded this application to the Ministry of the Environment and Climate Change (MOECC).

The applicants argued that the regulation is too lenient on small businesses. They pointed out that this regulation does not require those retail establishments, retail shopping complexes, or office buildings that occupy premises of less than 10,000 square metres to operate a source separation program for their wastes nor to ensure that such a program is implemented, nor are these small businesses covered by any other Ontario regulation pertaining to source separation and recycling. The applicants stated that waste diversion has become a high priority in the province for several good reasons and that, in their opinion, businesses of all sizes should do their part in diverting waste.

Ministry Response

On February 18, 2013, the ministry informed the applicants that it had concluded that a review is warranted and will be conducted. The MOECC stated that the review is consistent with the ministry's waste action plan, announced on February 9, 2012, and with the ministry's goal to consider all available options for maximizing diversion.

In response to a request from the ECO on November 26, 2013, for an update on the status of this review, the ministry replied that any decisions on how to proceed with the *EBR* review would be made after consultation with the stakeholders and the public on the draft Waste Reduction Strategy and the proposed new Waste Reduction Act (Bill 91).

ECO Comment

Because the ministry's review was not complete at the end of our reporting year, the ECO will review the MOECC's handling of this application in a future report.

Review of Application: R2013002

2.2.7 Amendments to Waste Disposal Site Provisions under the *EPA* (Review Undertaken by the MOECC)

Background/Summary of Issues

In July 2013, two applicants requested a review of section 27 of the *Environmental Protection Act* (*EPA*), which sets out the approval requirements for waste management systems and waste disposal sites.

The applicants, who are representatives of the Canadian Environmental Law Association, the Concerned Citizens' Committee/Tyendinaga & Environs, and the Mohawks of the Bay of Quinte, asserted that section 27 of the *EPA*, as currently drafted, "is incomplete, outdated and inadequate to protect the environment and public health and safety." They argued that it should be amended by adding two provisions that:

- prohibit the establishment, use, operation, enlargement, alteration or expansion of a waste disposal site at locations that are hydrogeologically unsuitable; and
- prohibit proponents from re-applying for approval of a new or expanded waste disposal site under Part V of the *EPA* where the facility or a substantially similar facility was previously proposed at the same or adjoining location, and was refused approval under the *Environmental Assessment Act* or the *EPA* due to hydrogeological unsuitability.

The applicants argued that "the existing statutory framework and current regulatory standards do not necessarily prevent proponents from proposing landfills at hydrogeologically unsuitable sites across Ontario." The applicants claimed that building landfills on such unsuitable sites can lead to groundwater contamination. As additional context for their application, they included a case study of the Richmond Landfill, located in the town of Greater Napanee, asserting that the site demonstrates the need to review and revise section 27 of the *EPA*.

The ECO forwarded this application to the Ministry of the Environment and Climate Change (MOECC).

Ministry Response

In September 2013, the ministry informed the applicants that it required more time to decide whether to undertake the review. In October 2013, the ministry advised the applicants that it would not be undertaking the requested statutory review, but that it would instead "conduct a review of guidance materials related to the ministry's landfill approvals processes, to determine if changes could be made to further enhance the level of protection to human health and the environment." The ministry indicated that it would notify the applicants of the results of the review within 30 days of its completion.

ECO Comment

As of July 2015, the MOECC had not yet completed its review. The ECO will report on the ministry's handling of this application and the outcome of the review once it is completed.

Review of Application: R2013005

2.2.8 Regulation of Compromised Soil
(Review Undertaken by the MOECC; Review Denied by the MMAH)

Background/Summary of Issues

In November 2013, the ECO received an application from two Ontario residents requesting a review of the need for a new province-wide policy to address the problem of "compromised soil" and to properly regulate the disposal of fill. The applicants asserted that there is currently a patchwork of regulatory oversight by provincial and municipal authorities, and that the failure to ensure the appropriate disposal of compromised soil creates significant environmental and health concerns.

The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC) and the Ministry of Municipal Affairs and Housing (MMAH).

Ministry Response

The MOECC and the MMAH responded to the applicants on January 21, 2014. The MMAH informed the applicants that it had decided to deny the application for review. However, the MOECC advised the applicants that it would undertake the review, and that it anticipated the review would be completed within 12 to 18 months.

ECO Comment

The ECO will review the handling of this application in a future reporting year, once the MOECC has completed its review.

Review of Application: R2013009

2.2.9 Amendments to the *OWRA* and its Wells Regulation (Review Undertaken by the MOECC)

Background/Summary of Issues

On January 2, 2014, an application was received by the ECO requesting a review under the *Environmental Bill of Rights, 1993* (*EBR*) of the *Ontario Water Resources Act* (*OWRA*) and Ontario Regulation 903 (Wells). The ECO forwarded this application to the Ministry of the Environment and Climate Change (MOECC).

The applicants, representatives of the Canadian Environmental Law Association, note that this application is an updated and expanded version of a similar *EBR* application for review denied by the MOECC in 2003 (see pages 223-233 of the Supplement to the ECO's 2003/2004 Annual Report). The applicants argue that the ministry has taken no meaningful steps in the intervening years to address the problems with the *OWRA* and Regulation 903 identified in the earlier application.

The applicants assert that the current legislative and regulatory regime governing wells suffers from a variety of "serious interpretive problems, unacceptable loopholes, substantive shortcomings, and enforcement difficulties" that place groundwater resources and Ontario well users at risk. According to the applicants, these issues include ambiguity resulting from a failure to define key terms, blanket exemptions from certain requirements, and unacceptably low standards for certain construction, repair or decommissioning work. They also argue that the best management practices set out in the draft *Test Holes/Dewatering Wells Manual* (finalized after the application was submitted; see Environmental Registry #011-5722) and in the *Manual for Water Supply Wells* should be legally mandated via direct incorporation into Regulation 903. Similarly, the applicants also assert that the well construction standards for brownfield sites that are currently set out in an *Environmental Protection Act* regulation should be incorporated into Regulation 903 such that all well-related requirements are set out in one place.

Ministry Response

On March 7, 2014 – the statutory deadline for the MOECC to respond to the application – the ministry informed the applicants that it required more time to make a decision whether to undertake the review. The ministry committed to advising the applicants of its decision by no later than May 7, 2014, but on May 9, 2014, the MOECC advised that yet more time was required. On December 5, 2014 – nine months after the statutory decision deadline – the ministry advised that it would undertake the proposed review. No estimated timeline for completion of the review was provided by the ministry.

ECO Comment

As of July 2015, the MOECC had not yet completed its review. The ECO will report on the ministry's handling of this application and the outcome of the review once it is completed.

Review of Application: R2014001

2.2.10 Notifying the Public of Sewage Bypasses at Wastewater Treatment Plants (Review Undertaken by the MOECC)

Background/Summary of Issues

In July 2014, two Ontarians requested a review of approvals for the Ashbridges Bay Wastewater Treatment Plant (Environmental Compliance Approval #2251-8Y8KRT) and the Humber Wastewater Treatment Plant (Certificate of Approval #8477-8C6JZN), both located in Toronto.

The applicants argued that swimmers, boaters, fishermen, and residents are kept in the dark when combined sewer overflows and treatment plant bypasses pollute recreational waters with sewage and bacteria levels that can affect human and aquatic health. To protect public health and the environment, the applicants recommended that the Ministry of the Environment and Climate Change (MOECC) amend the above approvals to require the treatment plant operators to:

- ensure that bypasses are communicated to the public after they are reported to the ministry; and
- add a procedure to their operations manuals for ensuring that bypasses are reported to the public.

In making their case for why the public interest merits the requested review, the applicants argued that: it would be consistent with the MOECC's Statement of Environmental Values; there is likelihood of environmental harm if the review is not undertaken; this matter is not otherwise subject to review; and few resources are required to conduct the review.

The ECO forwarded this application to the MOECC.

Ministry Response

In September 2014, the MOECC agreed to undertake the review. However, rather than focus on the approvals for the wastewater treatment facilities identified in the application, the ministry noted that its review would consider the applicants' concerns about public reporting of water quality issues during severe weather events. The MOECC expected that it would complete the review by March 9, 2015.

On March 6, 2015, the ministry wrote to the applicants, informing them that the review was still ongoing and was anticipated to be completed by June 30, 2015.

ECO Comment

Because the ministry's review was not completed by the end of our reporting year, the ECO will review the MOECC's handling of this application in a future report.

Review of Application: R2014003

2.2.11 Soil Management in Agricultural Operations
(Review Undertaken by the OMAFRA; Review Denied by the MOECC and the MMAH)

This application was reviewed in conjunction with R2014002 (Ministry of Agriculutre, Food and Rural Affairs) and R2014004 (Ministry of Municipal Affairs and Housing). Please see Section 2.1.1 of this Supplement for the full review.

2.3 Ministry of Municipal Affairs and Housing

Review of Application: R2013006

2.3.1 Regulation of Compromised Soil
(Review Denied by the MMAH; Review Undertaken by the MOECC)

Background/Summary of Issues

In November 2013, the ECO received an application from two Ontario residents, requesting a review of the need for a new province-wide policy to address the problem of "compromised soil" and to properly regulate the disposal of fill. The applicants asserted that there is currently a patchwork of regulatory oversight by provincial and municipal authorities, and that the failure to ensure the appropriate disposal of compromised soil creates significant environmental and health concerns.

The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC) and the Ministry of Municipal Affairs and Housing (MMAH).

Ministry Response

The MOECC and the MMAH responded to the applicants on January 21, 2014. The MMAH informed the applicants that it had decided to deny the application for review. However, the MOECC advised the applicants that it would undertake the review, and that it anticipated the review would be completed within 12 to 18 months.

ECO Comment

The ECO will review the handling of this application in a future reporting year, once the MOECC has completed its review.

Review of Application: R2014004

2.3.2 Soil Management in Agricultural Operations
(Review Undertaken by the OMAFRA; Review Denied by the MOECC and the MMAH)

This application was reviewed in conjunction with R2014002 (Ministry of Agriculture, Food and Rural Affairs) and R2014003 (Ministry of the Environment and Climate Change). Please see Section 2.1.1 of this Supplement for the full review.

2.4 Ministry of Natural Resources and Forestry

Review of Application: R20120006

2.4.1 Regulations Related to Hydraulic Fracturing (Review Undertaken by the MOECC and the MNRF)

Background/Summary of Issues

In October 2012, the ECO received an application requesting a review of the need to improve current laws and adopt new laws to protect Ontarians and the environment from the potential adverse effects of hydraulic fracturing ("fracking"). The applicants requested a review to ensure the development of a complete regulatory approach that is organized around the "cradle to grave" principle of waste management. The ECO forwarded this application to the Ministry of Natural Resources and Forestry (MNRF) and the Ministry of the Environment and Climate Change (MOECC).

The applicants specifically requested a review of:

- the definition of "oil field brine" and sections 2 and 3 of R.R.O. 1990, Regulation 341 (Deep Well Disposal) made under the *Environmental Protection Act* (*EPA*);
- the definition of "liquid industrial waste" in section 1 of R.R.O. 1990, Regulation 347 (General – Waste Management) made under the *EPA*; and
- the definition of "oil field fluid" under the *Oil, Gas and Salt Resources Act*.

The applicants argued that these regulations pre-date modern fracking practices and are thus ill-equipped to manage the potential adverse effects from fracking operations.

The applicants also noted that the current regulations make fracking-produced waters exempt from regimes for "hazardous waste" and/or "liquid industrial waste" under the *EPA* and its associated regulations. The applicants proposed several changes that could be made to the regulations in order to eliminate these exemptions.

Ministry Response

In January 2013, in a joint response, the MNRF and the MOECC agreed to undertake this review. The ministries concluded that the public interest warrants the requested review of the above-mentioned sections of Regulation 341, Regulation 347, and the *Oil, Gas and Salt Resources Act.*

Initially, neither ministry provided the applicants with a timeline for the expected completion of the review. However, upon follow-up by the applicants, both ministries indicated that "the review involves complex matters that will require significant consideration and analysis, therefore we expect it will take a number of months." As of July 2015, the completed review remained outstanding.

ECO Comment

The ECO will review the handling of this application once the ministries have completed their review.

SECTION 3

REVIEWS OF APPLICATIONS FOR INVESTIGATION

3.1 Ministry of the Environment and Climate Change

Review of Application: I2013004

3.1.1 Abandoned Wood Disposal Site
(Investigation Denied by the MOECC; Investigation Undertaken by the TSSA)

This application was reviewed in conjunction with I2013005 (Technical Standards and Safety Authority). Please see Section 3.2.1 of this Supplement for the full review.

Review of Application: I2013006

3.1.2 Facility Operating without Environmental Compliance Approval (Investigation Denied by the MOECC)

Background

On February 27, 2014, two individuals submitted an application under the *Environmental Bill of Rights, 1993* (*EBR*) requesting an investigation into alleged contraventions of the *Environmental Protection Act* (*EPA*) and the *Ontario Water Resources Act* (*OWRA*) at a concrete facility in Hamilton, Ontario. The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC).

The applicants alleged that the facility was operating without an Environmental Compliance Approval (ECA) for air emissions, as required by subsection 9(1) of the *EPA*. They also alleged that the operator may not have been abiding by the annual reporting requirements set out in subsection 6(1) of O. Reg. 127/01 (Airborne Contaminant Discharge Monitoring and Reporting), made under the *EPA*. Furthermore, the applicants alleged that the facility may have been discharging more than 10,000 litres of water per day, in violation of the requirement for an industrial sewage works approval under section 53 of the *OWRA*.

History of the Facility

On June 16, 2006, the MOECC conducted a site inspection and confirmed that the then-owner of the facility, Ontario Redimix Ltd., did not have the required approvals for air and noise, or for industrial sewage works. The MOECC also determined that the company was not reporting its air emissions as required under O. Reg. 127/01.

In 2007, Ontario Redimix Ltd. submitted an application for an ECA (then called a Certificate of Approval) for air and noise to the MOECC. Notice of this proposed approval was posted on the Environmental Registry (#010-0774) on June 8, 2007. However, Ontario Redimix Ltd. ultimately withdrew its application and the approval was never issued.

The facility was sold in 2007 and again in 2009. Today it is operated by Inter County Concrete Products Limited ("Inter County"). On March 15, 2011, the MOECC inspected the facility a second time and again found that the facility was operating without the required approval for air and noise; furthermore, the company had not completed an Emissions Summary and Dispersion Model report as required under O. Reg. 419/05 (Air Pollution – Local Air Quality), made under the *EPA*.

Inter County applied for an ECA for air and noise in 2013. Notice of the proposed approval was posted on the Environmental Registry (#012-0352) on October 31, 2013. The ECA for air and noise was issued on April 29, 2014.

Summary of Issues

The applicants asserted that despite two inspections by the MOECC confirming that the facility did not have the required approvals and that the operator was not meeting reporting obligations, the facility was in active operation, at least periodically, between 2006 and 2014. Specifically, they alleged that the facility did not have the required ECA for air emissions, and it may also have lacked an approval for industrial sewage works. In addition, the applicants alleged that the operator may not have been meeting *EPA* reporting requirements.

The applicants asserted a number of negative consequences resulting from the unapproved operation of the facility. First, they reported that individuals had observed "drag-out" (i.e., dirt and debris tracked out of the site onto the public road). The applicants noted that, in their December 2013 comments regarding Inter County's ECA application (Registry #012-0352), they reiterated concerns that drag-out was creating "clouds of particulate pollution."

The applicants also asserted that the operator's failure to prepare and submit Emission Summary and Dispersion Modelling reports denied the public access to information regarding pollution emissions from the facility. They also argued that there is "no way to assess whether there are any environmental impacts due to the lack of an industrial sewage works permit."

The applicants expressed concern that allowing the facility to operate without the required approvals "sets a bad example and creates an 'unlevel playing field' where compliance approvals are concerned." They further argued that the administrative delay in the approvals process "is not an acceptable reason for a facility to continue with operations that require an approval under the *Environmental Protection Act* and possibly the *Ontario Water Resources Act*."

The applicants stated that the ongoing, unapproved operation of the facility also circumvented the *EBR* process. They noted that they had submitted comments to the ministry on two previous applications for approvals at the facility, and although no ECA had been issued, the facility continued to operate and community members were denied their right to review and/or appeal any final ECA decision. Furthermore, they argued that allowing the facility to continue to operate even after they raised the approvals issue with the MOECC may undermine the integrity of the approvals process.

The applicants also reported that they had difficulty confirming basic information from the MOECC regarding the operation of the facility and the issuance of any approvals. In December 2013 and January 2014, one of the applicants communicated with the MOECC to obtain information about the facility. The applicants reported that there was some confusion within the MOECC as to whether ECAs that the MOECC had issued to an unrelated nearby property might also apply to Inter County. Furthermore, the MOECC reportedly advised the applicant that the facility was non-operational in the wintertime, making the status of any approvals a moot issue for the time being. However, the applicants stated that members of the community had observed concrete trucks operating and steam discharging from the facility in February 2014, suggesting that the facility was in fact operational.

In support of their application, the applicants submitted a number of documents including a copy of a March 15, 2011 MOECC inspection report, copies of Environmental Registry comments submitted in respect of past approval applications for the facility, and photographs of the facility taken on February 26, 2014.

Ministry Response

The ministry issued its decision denying this application for investigation on May 6, 2014.

The MOECC outlined the steps it had taken over the past eight years in its attempt to bring the facility into compliance. In March 2007, the ministry sent a warning letter to the then-owner regarding the failure to submit an annual report for the facility (presumably regarding air emissions, as required under O. Reg. 127/01). In September 2008, the ministry directed the new owner to submit an ECA application, but was advised by the company that it was considering potential site alterations before submitting its application. The ministry followed up in November 2008 requesting that the company set a deadline by which it intended to submit the ECA application. The ministry reports that, in response, the company advised that it had decided to shut down the facility, and the facility was then sold in February 2009. Most recently, following a dust complaint in June 2012, the ministry followed up with the facility and in response, Inter County sprayed down the site with water to reduce dust.

The ministry confirmed that, in addition to the above referenced complaint in June 2012, it received complaints about dust and drag-out in September 2008, and on two occasions in July 2013. Furthermore, in October 2008, the then-owner reported a spill of a small amount of diesel fuel onto the ground and into a storm sewer. Ministry staff attended the site and the spill was cleaned up.

The MOECC provided several reasons for concluding that an investigation was not warranted. First, the ministry noted that it has taken action to bring the facility into compliance and that an *EBR* investigation would duplicate actions being undertaken by the ministry. To this end, an ECA was issued to the company on April 29, 2014. The ministry also noted that it has received only four dust- and drag-out-related complaints in the past seven years, and that the facility intends to pave the driveway and front portion of the site for dust control. Further, the ministry noted that the ECA includes conditions intended to address dust and drag-out issues, as well as noise abatement measures and documentation obligations. The MOECC also noted that the truck wash facility that required an industrial sewage works approval has not operated in a number of years and has been decommissioned. Overall, the ministry stated that the alleged contraventions have been addressed and are not likely to cause harm to the environment.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The ECO has serious concerns about the MOECC's response to the issues raised in this application for investigation. While the ministry's response acknowledged the immediate issue of the facility's need for an ECA, it failed to address any of the valid concerns of the applicants respecting accessing ECA information and the history of non-compliance at the facility.

The applicants stated that they had difficulty obtaining information about whether the necessary approvals had been issued, and that both the ministry and the company appeared to be confused as to whether an ECA issued to a different property somehow applied to the facility. These allegations are disconcerting. Members of the public should be able to access accurate information about ministry

approvals. At an even more basic level, proponents and ministry staff should be clear about which ministry approvals apply to a given operation.

Of even greater concern is the MOECC's long-term failure to enforce the requirement for an ECA. For over eight years, the facility operated (at least periodically) to the knowledge of the ministry without an approval. This violation could and should have been addressed following the 2006 and 2011 inspections; instead the ministry made only a handful of requests over several years that the operators voluntarily comply with the law. In its decision, the ministry explained its inaction by stating that "apart from the lack of an ECA, the facility was well managed and not in any obvious contravention of any regulations." It is difficult to think of another scenario where such an explanation would excuse a failure to enforce the law. For example, a person cannot drive without a licence, regardless of whether or not they are a competent driver. In any event, one cannot judge regulatory compliance without the missing emissions reports, and the dust complaints received by the ministry indicate that the operations were not, in fact, without negative consequences for the surrounding community.

The ECO has previously criticized the MOECC's sometimes lax enforcement of the requirement to have an ECA in place before a business begins operations (see Part 4.1 of our 2013/2014 Annual Report). The MOECC has a number of compliance tools at its disposal in cases where the *EPA* is being contravened, including issuing Orders requiring that the offending action cease. In this case, however, the ministry never took any enforcement action (such as issuing Orders, administering fines or laying charges) against the operator. The requirement that parties obtain an ECA for certain activities is a foundation of our environmental regulation system. By tolerating these types of violations, the ministry creates a dangerous incentive for companies to ignore the law. As the ECO has stated before, the MOECC should have zero tolerance for such glaring violations of one of the *EPA*'s fundamental provisions. When facilities knowingly operate without the necessary approvals, the ministry should consider laying charges.

Review of Applications: I2013007

3.1.3 Bird Injury and Death Caused by Reflected Light (Investigation Denied by the MOECC)

In March 2014, two applicants submitted an application under the *Environmental Bill of Rights, 1993* (*EBR*) for an investigation into allegations that six corporate property owners/managers (the "corporations") were violating subsection 9(1)(a) of the *Environmental Protection Act* (*EPA*). Specifically, the applicants alleged that the corporations were using or operating commercial buildings or structures that may be discharging a contaminant – radiation (reflected light) that may kill or injure birds – without an Environmental Compliance Approval (ECA).

Background

Bird Collisions with Buildings

Many birds in eastern North America migrate each spring from their wintering grounds in the south to their breeding grounds in the north, and then back each fall. Situated next to Lake Ontario and between the wintering and breeding grounds of many species, the City of Toronto is an annual stopover location for hundreds of thousands of migrating birds.

Unfortunately, as these birds migrate through the city they risk colliding with Toronto's office buildings, condominiums, houses and other structures. Collisions with buildings, particularly windows, are a major threat to both migratory and non-migratory birds, killing roughly 25 million birds in Canada each year. These deaths can have serious ecological consequences. Birds play important roles as pollinators, seed dispersers, predators, prey and controllers of pests.

Since 1993, a non-profit organization, the Fatal Light Awareness Program (FLAP), has collected data on bird collisions and rescued injured birds in downtown Toronto. An assessment of FLAP data collected between 1993 and 2007 suggested that significant numbers of migratory birds were affected by building collisions in Toronto's downtown core.[1] These data included injured and killed birds of at least 15 endangered, threatened and other at-risk species.

Reducing Bird Collisions with Buildings

Bird collisions or "strikes" with buildings result from a variety of causes. At night, birds that rely on the light of the moon and stars for navigation may be attracted and confused by brightly lit buildings, leading them to fly into windows and other glass surfaces (for more information on the ecological consequences of nighttime light pollution, see Part 4.3 of this Annual Report). During the day, glass that reflects the sky and nearby vegetation can cause birds to perceive it as open space or habitat and fly into it. Indeed, daytime bird strikes are most prevalent on buildings with highly reflective windows and nearby trees and ground cover. Bird mortality rates due to daytime building collisions have been found to increase with: the percentage and surface area of buildings covered by glass; the presence and height of nearby trees and shrubs; and the amount of light emitted from windows.

[1] Konze, K., Mainguy S. and Ursic, M. (2009). *Migratory Birds in the City of Toronto: A Literature Review and Data Assessment Final Report*. Prepared for the City of Toronto.

There are a number of things building owners and property managers can do to minimize bird collisions. These include:

- turning off interior lighting at night, or minimizing the light that escapes through windows;
- shielding outside lighting to minimize attraction to night-migrating birds;
- applying window films, decals, and other visual markers on existing glass;
- installing awnings, sunshades, facades, netting, grilles, shutters, artwork, and internal screens, shades, blinds or curtains;
- using patterned, angled, opaque or translucent glass instead of highly reflective and transparent glass; and
- moving indoor greenery away from clear glass.[2]

Toronto's Bird-Friendly Development Guidelines and Standards:
In 2007, the City of Toronto developed *Bird-Friendly Development Guidelines* with the participation of FLAP, the Canadian Wildlife Service, architects and developers. These voluntary guidelines offer a comprehensive list of site design strategies and recommendations to make new and existing buildings less dangerous to migratory birds.

Since January 31, 2010, new planning applications for non-residential and multi-residential buildings in the City of Toronto have been required to document compliance with certain environmental performance measures. These required measures, which are specified in the *Toronto Green Standard*, include design features (e.g., bird-friendly glazing) to reduce bird collisions and mortalities.[3] Developers can also comply with a higher, voluntary level of performance (e.g., enhanced bird-friendly glazing) to be eligible for a financial incentive.

Federal Guidance on Reducing Bird Collisions:
Environment Canada's *Guide for Developing Beneficial Management Practices for Migratory Bird Conservation* (the "Guide") supports the conservation of birds by encouraging the development of Beneficial Management Practices (BMPs) by industries or stakeholders whose activities may affect migratory birds in a number of different ways. The Guide outlines a process for preparing a BMP, provides guidance on the key points a BMP should include, and explains the roles and responsibilities of Environment Canada, different stakeholders, and other interested parties in the BMP-development process. Environment Canada encourages stakeholders to consult the department's *Avoidance Guidelines* when developing BMPs, because they provide advice to help reduce the risk of inadvertently harming, killing, disturbing or destroying migratory birds, nests and eggs.[4] The Guide also suggests that stakeholders review the Environment Canada Bird Conservation Region Strategies relevant to their operations.

[2] For detailed examples of strategies to minimize the risk of bird collisions, see: American Bird Conservancy (2011). *Bird-Friendly Development Guidelines*; American Bird Conservancy (2011). *Bird-Friendly Building Design*; and North-South Environmental Inc. (2014). *Bird Friendly Guidelines*. Prepared for the City of Markham.
[3] City of Toronto (2014). *Toronto Green Standard for Mid to High-Rise Residential and Non-Residential Development* (Version 2.0); and City of Toronto (2014). *Toronto Green Standard for New Low-Rise Residential Development* (Version 2.0).
[4] Environment Canada website (accessed January 8, 2015). *Avoidance Guidelines, Technical Information*. http://ec.gc.ca/paom-itmb/default.asp?lang=En&n=8D910CAC-1#_01.

Ecojustice v. Cadillac Fairview Corporation[5]

In April 2012, the non-profit organization Ecojustice filed charges against the Cadillac Fairview Corporation and related companies, alleging that as the owners and managers of the Yonge Corporate Centre in Toronto they were guilty of offences under the *EPA*, the *Ontario Society for the Prevention of Cruelty to Animals Act*, and the federal *Species at Risk Act*.[6]

With respect to the *EPA* charges, Ecojustice alleged that the defendants violated section 14 of the *EPA*, which states that "a person shall not discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect." Under the *EPA*:

- "'contaminant' means any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse effect;"
- "'discharge', when used as a verb, includes add, deposit, leak or emit and, when used as a noun, includes addition, deposit, emission or leak;" and
- "adverse effect" includes injury or damage to animal life.

Ecojustice argued that the companies violated section 14 of the *EPA* by discharging (or permitting the discharge of) radiation (light) contamination from reflective glass, and that this discharge caused the adverse effect of killing and injuring birds.

The court agreed with this analysis and found that the companies had breached the *EPA*. Although the companies were ultimately found not guilty of the charges based on the defence of due diligence, the case set an important precedent: reflections of light from buildings that are responsible for bird deaths contravene the *EPA*.

Summary of Issues

The applicants requested an investigation into six corporate property owners or managers located in Toronto "with a documented history of bird strikes at their commercial buildings." According to the applicants, these corporations were selected to be named in the application based on documentation and monitoring performed by FLAP. One of the corporations and properties alleged by the applicants to be contravening the *EPA* was the Cadillac Fairview Corporation and the Yonge Corporate Centre – the complex of office buildings that were the subject of the Ecojustice court case (see above).

The applicants alleged that these six corporations violated subsection 9(1)(a) of the *EPA*. Among other things, this subsection prohibits a person from operating or constructing any structure that may discharge, or from which may be discharged, a contaminant into the natural environment (other than water), except under and in accordance with an Environmental Compliance Approval (ECA). Given the finding in the Ecojustice case that reflected light that causes injury or death to birds constitutes the discharge of a contaminant under the *EPA*, the applicants argued that owners or managers of buildings

[5] *Podolsky* v. *Cadillac Fairview Corp*., 2013 ONCJ 65 (CanLII).
[6] These charges were brought as a private prosecution, meaning they were laid by a private citizen (on behalf of Ecojustice, in this case) instead of the police or a peace officer.

that may discharge reflected light that cause the death or injury of birds from window collisions are contravening subsection 9(1)(a) of the *EPA* if they fail to obtain an ECA.

As evidence that the corporations were responsible for the discharge of a contaminant (reflected light) causing an adverse effect, the applicants provided FLAP data on the number of collisions observed at 18 buildings owned by the 6 corporations over a 10-year period (2000–2010). According to the application, each building was responsible for several hundred bird collisions during this time. As evidence that the corporations were operating without ECAs, the applicants reported that correspondence with the corporations and searches on the Environmental Registry and the website of the Ministry of the Environment and Climate Change (MOECC) uncovered no relevant ECAs.

The applicants noted that established building design standards, like Toronto's *Bird-Friendly Development Guidelines*, could mitigate the majority of bird collisions. For example, they reported that following a private prosecution undertaken by Ecojustice and Ontario Nature against another property owner (Menkes Developments), the application of window films to Consilium Place in Toronto resulted in at least a 70 per cent reduction in bird strikes.

The ECO forwarded this application for investigation to the MOECC.

Ministry Response

After twice extending the timeline for completing the ministry's preliminary review of the application, the MOECC denied the request for an investigation in November 2014 – five months past the statutory deadline required by the *EBR*. The ministry concluded that an investigation "is not warranted as non-regulatory tools (e.g., promotion/guidance) are a more proportionate response to the adverse effects caused by reflected light."

The ministry's decision summary elaborated that: "given the guidance provided by the federal government and some municipalities to make property managers more aware of how they can address the issue of bird strikes through voluntary practices; the ministry is satisfied that not proceeding with compliance activities for the emission of reflected light is appropriate."

With respect to the municipal guidance available, the ministry referred to Toronto's *Bird-Friendly Development Guidelines*, which outline site design strategies and recommendations to lessen the number of bird strikes and mortalities in new and existing buildings. With respect to the federal government guidance, the ministry clarified in a response to an inquiry from the ECO that it was referring to Environment Canada's *Guide for Developing Beneficial Management Practices for Migratory Bird Conservation*. The MOECC expressed an interest in working with the applicants and other stakeholders on potential opportunities to create guidance and promote best practices to prevent bird strikes.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

Other Information

In January 2015, the applicants informed the ministry and the ECO that the building owners and managers identified in the application had still not taken voluntary action to reduce bird strikes with available remedial measures.

ECO Comment

The ECO has several major concerns with the MOECC's handling of this application for investigation.

First, the MOECC denied this application five months past the statutory deadline required by the *EBR*. Nothing in the *EBR* allows the ministry to arbitrarily delay a decision to deny an application for investigation.[7] The ECO has flagged the ministry's poor compliance with the *EBR*'s mandatory application timelines several times before (for example, see Part 1 of our 2011/2012 Annual Report and Part 1.5 of our 2012/2013 Annual Report). Such repeated disregard for the *EBR*'s deadlines is inexcusable.

Second, the ministry denied this application on the basis that "non-regulatory tools (e.g., promotion/guidance) are a more proportionate response to the adverse effects caused by reflected light." This implies that the ministry does not consider the adverse effects caused by reflected light (both in general and in the specific alleged contravention) to be serious enough to warrant an *EBR* investigation. The ECO disagrees with such a position; the death and injury of thousands of birds, particularly endangered and threatened species, is a serious issue. The significance of this threat was established in the Ecojustice case decision, where the court noted: "to be clear, I do not view the death and injury of hundreds if not thousands of migrating birds as a matter of merely 'trivial or minimal' import."

Third, the ministry's response seems to suggest that, because property owners and managers can follow federal and municipal guidance to minimize bird collisions, the alleged contravention (operating without an ECA) is not likely to cause environmental harm. But information provided by the applicants suggests that the alleged contraveners have not actually implemented available guidance. If this is true, and the corporations are not voluntarily taking actions to reduce bird strikes, the alleged contravention may in fact be causing harm to the environment.

The bigger, underlying problem, however, is that the Ontario court decision created a regulatory gap that the MOECC has failed to address. The court ruled that reflected light that causes injury or death to birds constitutes a discharge of a contaminant under the *EPA*. It follows then, as per section 9 of the *EPA*, that any structure that reflects light that may cause injury or death to birds should require an ECA. However, the underlying message of the MOECC's decision to deny this application is that the ministry will not actively regulate the impacts of reflective buildings on birds by requiring an ECA or by some other means. Instead, it appears that the ministry's preferred approach is to ignore its regulatory responsibility and leave it up to property owners and managers to voluntarily follow guidelines and suggested strategies.

[7] Note, under subsection 78(2) of the *EBR*, the minister may delay providing notice of a decision not to undertake an *EBR* investigation if "an investigation in relation to the contravention alleged in the application is ongoing apart from the application."

If the MOECC had undertaken an investigation, it could have thoughtfully worked through the most appropriate and effective means (e.g., approvals, charges, voluntary compliance, etc.) to address any adverse effects caused by reflections from the buildings named in the application. More importantly, the ministry could have determined the best ways to regulate the impacts of reflected light, such as: requiring reflective buildings to obtain ECAs; regulating reflective buildings through a permit-by-rule approach; or some other approach. It is noteworthy that the ministry already regulates other sources of bird mortality in approvals that it issues. Given the scale of bird mortalities caused by building collisions, the MOECC unequivocally has a role to play in addressing this serious problem. The ECO urges the ministry to clarify how it will address the regulatory gap created by the court decision.

Review of Applications: I2014001

3.1.4 Compliance of Richmond Landfill Site with its Public Notification Plan (Investigation Undertaken by the MOECC)

On April 8, 2014, two individuals representing Ontario organizations submitted an application under the *Environmental Bill of Rights, 1993* (*EBR*) requesting an investigation of an alleged contravention of the *Environmental Protection Act* (*EPA*). Specifically, the applicants alleged that Waste Management of Canada Corporation (WMCC) failed to comply with conditions of its Environmental Compliance Approval (ECA) for the Richmond Landfill Site, which is an offence under subsection 186(3) of the *EPA*. The ECO forwarded this application to the Ministry of the Environment and Climate Change (MOECC), which informed the applicants on June 18, 2014, that it would undertake the requested investigation. On September 17, 2014, the ministry released the results of its investigation.

Background

WMCC first received approval in 1988 to accept domestic, commercial, non-hazardous industrial and institutional waste at the Richmond Landfill Site. This site occupies 138 hectares in the Town of Greater Napanee. The waste deposition area occupies 16.2 hectares of the site, and is divided into five areas that were filled during five different phases. Phase 1 is the original area and is unlined. Phases 2 and 3 have a clay liner and Phases 4 and 5 have a composite clay/synthetic liner. Leachate from the lined areas (i.e., the Phase 2-5 areas) is collected and taken away for treatment.

The landfill stopped receiving waste in 2011; however, it is still subject to a number of conditions set out in the site's ECA. The company's most recent ECA, which was amended in 2012, includes an interim Environmental Monitoring Plan, contingency plans for leachate and landfill gas collection systems, and updated financial assurance. Monitoring work by WMCC subsequent to this ECA amendment found off-site contamination in an area south of the landfill that exceeded ministry guidelines. The MOECC stated that in response it "followed up to ensure that WMCC undertook further actions to assess and address the off-site contamination."

In 2012, the Environmental Review Tribunal (ERT) granted leave to appeal the amended ECA to one of the applicants (the other applicant is a party to the appeal hearing). At the time this *EBR* application was submitted the appeal was still on-going.

During the ERT appeal proceedings, the parties came to an agreement on public notification requirements respecting the site, resolving a portion of the appeal. This agreement included a new detailed Public Notification Plan (the "Plan") and a revised condition in the ECA that establishes a requirement for providing notice to interested persons when certain conditions set out in the Plan are triggered. The ERT accepted this revised notification condition and the new Plan and issued an order with consent of the parties on April 26, 2013. On May 3, 2013 the MOECC Director amended the ECA to give legal effect to the Plan.

Conditions in New Public Notification Plan:
Section 1.2 of the Plan specifies the "occurrences" that will trigger WMCC's notice requirements. The occurrences listed are:

- a "spill of a pollutant" at the landfill site;
- monitoring results onsite or offsite that "may indicate new exceedances of any provincial regulatory standards or guidelines regarding groundwater or surface water quality;"
- a fire or explosion at the site;
- the "triggering of any contingency plans" as specifically set out in the ECA; and
- "any other upset condition, mechanical breakdown, maintenance activity or other operational event resulting in the discharge of a contaminant into the natural environment which causes or may cause an adverse effect as defined in the *EPA*."

Section 2.1 of the Plan states that if there is a triggering occurrence, WMCC must provide "timely and adequate" notification to select persons and entities identified in the Plan. These include: property owners and residents within three kilometres of the landfill site; three municipalities; the organizations that are the applicants of this *EBR* investigation; Quinte Conservation; and the local MOECC district manager.

Section 2.2 of the Plan requires WMCC to email all of the above parties and post notification on its website "as soon as reasonably practicable," and to provide additional notification within 36 hours via other means including: door-to-door or telephone contact; personally delivered notices; advertisements in local papers; and announcements on TV or radio. As per Section 2.3 of the Plan, minimum content includes: a description of the reason for the notice; an estimate of the likely extent and duration of the occurrence and of potential environmental or human health effects; if available, follow-up or further monitoring measures taken by WMCC; and the contact information of the WMCC representative responsible for notifying and responding to the public. Furthermore, WMCC is obliged to keep the MOECC informed and to provide updates where there is a "material change in status, remedial plans or progress" with respect to the occurrence.

Section 2.4 of the Plan (the "Presumption in Favour of Public Notification") sets out a general provision based on the precautionary principle: "In the event that there is a disagreement or uncertainty regarding the commencement of an occurrence or its potential effects upon the environment or human health, WMCC shall take a precautionary approach by providing the notification required under this plan."

Summary of Issues

The applicants assert that since May 2013, when the agreement described above came into effect, there have been a number of events that triggered the public notification requirements, but for which WMCC provided no notification. For example, WMCC was required to monitor leachate within the landfill site and report the results. Monitoring after May 3, 2013, revealed that there was N-Nitrosodimethylamine (NDMA) in the landfill leachate. This toxic substance had not previously been detected or even tested for, yet no notification was provided.

WMCC was also required to test all groundwater monitoring wells in which leachate impacts might be expected for the presence of a suspected carcinogen called 1,4-dioxane. Post-May 2013 testing showed the presence of this chemical (which had not been tested for previously) in exceedance of the "Reasonable Use" limits under the MOECC's Guideline B-7 in off-site monitoring wells south of the landfill, and in off-site private domestic wells in the vicinity. Again, no notification was provided.

The applicants state that the company triggered a contingency measure under the ECA when it offered whole house replacement water supplies for the six residences closest to the site (as required by the ERT order), but that the company did not disclose this occurrence to the full list of persons and officials entitled to such notice under the Plan.

WMCC issued a report in July 2013 outlining all recent fieldwork and sampling, as required by the ERT order. The report contained data that showed that the leachate plume had moved off-site. This finding was subsequently confirmed or accepted by hydrogeologists working on behalf of the applicants and the MOECC. Although this information was provided to the applicants during the ERT hearing, the applicants maintain that it has not been disclosed to all those who are entitled to the information under the Plan.

The applicants note that the ERT order required the company to submit an application to the MOECC for approval to establish a Contaminant Attenuation Zone (CAZ), a contingency measure for addressing leachate contaminants that have migrated off-site in concentrations that exceed Reasonable Use limits. In addition, a further ERT order dated August 28, 2013, explicitly requires that WMCC provide public notification of the draft application for the CAZ and its supporting documentation. The applicants state that a draft CAZ was filed and provided to the parties at the ERT hearing in the fall of 2013, but notice was not provided to all those entitled to such notice under the Plan.

The applicants stated that they were aware of a WMCC "manager's letter," dated November 2013, which purportedly addresses some developments regarding the site and which the company had posted on its website and circulated to some community members. They stated that due to its inadequate form, sparse content and limited distribution, it failed to meet the prescriptive requirements of the Plan.

Regarding the seriousness of the alleged contraventions, the applicants submit that this apparent non-compliance with the Plan "…is serious, significant and warrants investigation and/or abatement action" by the ministry, as soon as possible. In support of this statement, the applicants pointed out that the public-interest rationale for the Plan is "to ensure that persons interested in, or potentially affected by, the Richmond Landfill Site receive full and timely notification of significant developments, new information, or potential adverse effects, particularly in relation to off-site movement of leachate contaminants from the WMCC property."

The applicants further stated that receiving notice under the Plan will allow neighbours to take the necessary precautions to safeguard themselves, their families and their proprietary interests. Notification to the residents, communities, municipalities, public health officials and other agencies listed in the Plan will help ensure accountability for addressing environmental and public safety concerns and will facilitate meaningful public participation in the development of potential contingency measures or remedial actions. Accordingly, the applicants argued that the alleged contraventions are "not trivial, inconsequential or irrelevant" and are both environmentally significant and put residents at risk.

Ministry Response

The MOECC stated that it reviewed all of the alleged violations, considered the application for investigation in its entirety, reviewed all the relevant ministry files, and consulted with WMCC. As a result of this investigation, the ministry concluded that there had been "no violations of subsection 186(3) of the *Environmental Protection Act* with respect to the public notification requirements of [the ECA]".
With respect to the discovery of NDMA in the landfill leachate, the ministry noted that the Plan requires notification if monitoring reveals any new exceedances of provincial standards or guidelines regarding groundwater or surface water quality". Since the NDMA was detected in landfill leachate and not in ground or surface water, the ministry did not consider it to be a violation of the notification condition of the ECA.

With respect to the presence of 1,4-dioxane in off-site groundwater monitoring and private domestic wells, the ministry pointed out that since no provincial regulatory standard currently exists for this contaminant, no exceedance could have occurred. Accordingly, the ministry does not consider this to be a violation of the notification condition.

The ministry also stated that the requirement to provide whole-house water supply to six houses was a direct condition of the ERT Interim Order and not a contingency plan triggered by the ECA. Since it is the latter that requires notification, the ministry did not consider this to be a violation.

Regarding the movement of groundwater contamination off-site to the south and south-east of the landfill, the ministry stated that although the information about the off-site movement of contaminants was included in a report that was produced pursuant to the ERT order, the movement of the contaminants off-site had been identified in 2012 and early 2013, prior to the amended ECA. The ministry stated that events that occurred prior to the amendment are not considered to be triggers under the Plan.

With respect to the draft CAZ application by WMCC, the ministry noted that the approved groundwater contingency plan, of which the draft CAZ is a component, was initiated in 2012, prior to the issuance of the amended ECA, and that the CAZ is therefore "a development in the on-going implementation of the contingency plan." Accordingly, the requirement to submit the CAZ was not considered to be a triggering occurrence under the Plan.

Lastly, the MOECC stated that the presumption in favour of public notification under Section 2.4 of the Plan did not apply in these instances. The ministry's rationale was that the information in these cases was known prior to the implementation of the new Plan, and accordingly there was "no disagreement or uncertainty" involved. Moreover, the ministry stated that it does not consider Section 2.4 of the Plan as providing a basis for ministry staff to develop a new standard or guideline for 1,4-dioxane in the absence of a provincial standard for this substance.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

An implicit purpose of the government issuing any environmental approval is to give Ontarians the assurance that their environment is safeguarded. Approvals are meant to give confidence that a proponent will adhere to set rules and, for its part, that the government will hold the proponent accountable to those rules. Approvals also have the effect of giving proponents the social licence to operate within and near communities. This *EBR* application illustrates what happens when that system is not working as it should.

The approval in this case contains specific measures intended to assuage the long-standing concerns of the local community about environmental and health impacts from the landfill, including important provisions regarding public notification. The ministry has concluded that the company is in compliance with its approval. Yet, members of the public clearly do not believe that the notification conditions have been satisfied, demonstrating at a minimum that the spirit of the mutually agreed-upon public notification provisions has not been met.

As of July 28, 2015, the appeal of the Richmond landfill's ECA was still before the Environmental Review Tribunal (case #12-033), which is considering related issues with respect to the landfill operation. Regardless of the outcome of the appeal, what is clear is that the MOECC, as the approval body and the overseer, has a duty to not only ensure that its approval processes are working, but also that the public can have confidence in them. In keeping with this responsibility, the MOECC should ensure that the spirit of the public notification agreement, and particularly the "Presumption in Favour of Public Notification" provision in the Plan, is embraced when interpreting the company's obligations to the community.

Review of Applications: I2014002

3.1.5 Groundwater Contamination from a Landfill (Investigation Denied by the MOECC)

In May 2014, two residents of Ontario submitted an application for investigation of a landfill that is owned and operated by their local municipality. The applicants alleged that contaminated groundwater is flowing from the landfill site onto their property, threatening their groundwater, surface water and private water well. The applicants alleged that the municipality, as owner of the landfill, is contravening several provisions of the *Environmental Protection Act* (*EPA*) and its regulations, the *Ontario Water Resources Act* (*OWRA*), and monitoring and reporting conditions of the landfill's regulatory approval. The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC).

Background

The eight-hectare landfill, located in the Peterborough area, has operated since 1972. The landfill itself receives solid, non-hazardous municipal waste. The wider landfill site, with a total area of 21.3 hectares, also includes a household hazardous waste and waste electronics depot. It also hosts a re-use centre, receives leaf and yard waste in its outdoor composting facility, and is operating a pilot program for composting source-separated organics. The landfill site is bordered to the south by a creek and abuts a Provincially Significant Wetland.

Like almost all older landfills, which were built before today's more protective landfill design and operation requirements were enacted, the landfill has no liner or collection system for its leachate – the liquid that percolates through landfilled waste and can potentially contain contaminants leached from the waste. Rather, the landfill operates as a "natural attenuation site." In a natural attenuation site, instead of using engineered controls, the contaminants in the leachate are reduced through natural processes as the leachate migrates in groundwater through the soil; the goal is to create a buffer area around the landfill large enough to ensure that the concentrations of contaminants are reduced to acceptable levels by the time the leachate reaches the end of the "contaminant attenuation zone."

The landfill at issue in this application has a 60.7-hectare contaminant attenuation zone to the south and southeast (i.e., downgradient) for this purpose. The municipality also had "groundwater rights" to additional lands to the south and southeast for this purpose, but the MOECC advised the municipality in 2011 that merely owning the groundwater rights was not sufficient to have these lands considered as part of the contaminant attenuation zone. In 2012, the municipality acquired an additional 23.8 hectares of land to legally expand the buffer zone.

The landfill operates under an Environmental Compliance Approval (the "Approval") issued by the MOECC. The municipality (as owner and operator of the landfill) must adhere to conditions in the Approval, including requirements to comply with:

- Ontario's *Reasonable Use Guideline B-7* (for protecting off-site groundwater quality); and
- *Provincial Water Quality Objectives* (for protecting surface water quality on- and off-site).

The Approval requires the municipality to submit an annual report to the MOECC on the development, operation and monitoring of the landfill site. Following an amendment to the approval in 2012, the municipality was also required to submit a Trigger Mechanisms and Contingency Plans report to the ministry by December 2013. This report establishes site-specific contaminant concentration thresholds which, if exceeded, would trigger contingency actions such as the installation of a low permeability landfill capping system (i.e., a landfill cover that would prevent further water from seeping into the waste) and/or the acquisition of additional land to extend the contaminant attenuation zone.

Monitoring wells installed at and around the landfill site enable the municipality to measure the levels of contaminants in groundwater in accordance with the monitoring program required by the Approval.

Summary of Issues

The applicants live on a 200-acre property that they purchased in 1985, located adjacent to the southeast portion of the landfill site. The applicants' land includes a portion of the Provincially Significant Wetland. The creek that borders the landfill site to the south runs across the northern portion of the applicants' property.

The applicants alleged that exceedances of certain contaminants (including benzene, toluene and vinyl chloride) have been found in groundwater on or near their property and are caused by leachate migrating from the landfill site. Central to the applicants' concerns is the effect of the landfill leachate on surface water, groundwater and wetlands, as well as the applicants' private water well, which supplies their drinking water, and their own health and property value. The applicants singled out the presence of vinyl chloride in groundwater, a known human and animal carcinogen, as a particular concern. Vinyl chloride is a degradation product of tetrachloroethylene and trichloroethylene, which according to the applicants' environmental consultant were once stored at the landfill site and have been detected along with their breakdown products in monitoring wells in the vicinity of the creek.

According to the applicants, the municipality bought out the applicants' neighbours when it extended the attenuation zone. Yet, the municipality has allegedly refused to buy out the applicants. The applicants also asserted that the municipality has failed to fulfil a commitment to study the potential impact of the landfill on their property. In particular, the applicants alleged that the municipality reneged on a commitment to install a bedrock monitoring well on the applicants' property to help delineate the leachate plume. The applicants therefore hired their own environmental consultant to assess the potential impacts of the landfill on their property. The applicants' consultant concluded that landfill leachate containing elevated concentrations of contaminants is migrating toward, and is the source of impacts on, the applicants' property.

The applicants alleged that the municipality is relying on an inaccurate groundwater flow model to deny responsibility for impacts on the applicants' property. According to the applicants and materials supporting their application, the municipality's model assumes that once landfill leachate flows into the creek at the northern end of the applicants' property (southeast of the landfill site), the creek acts as a barrier to the leachate entering the wetland area of the property. In contrast, the applicants contend, based on data collected by their environmental consultant, that the creek water seeps into the creek bed and recharges groundwater in the area, including on their property.

Alleged Contraventions of Acts and Regulations

The applicants specifically alleged that the municipality, as owner of the landfill, is contravening several provisions of the *EPA* and regulations made thereunder, as well as a provision of the *OWRA*. These provisions and regulations include, among others:

- *EPA* subsection 6(1), which prohibits the discharge of any contaminant into the natural environment in an amount or concentration in excess of that prescribed by the regulations;
- *EPA* subsection 14(1), which prohibits the discharge of a contaminant into the environment that causes or may cause an adverse effect;
- certain sections of O. Reg. 232/98 (Landfilling Sites) made under the *EPA*, which establishes criteria for the design of groundwater protection features of a landfill;
- certain sections of Regulation 347 (General – Waste Management), the general waste management regulation made under the *EPA*; and
- *OWRA* subsection 30(1), which prohibits the discharge of anything into any water that may impair the quality of the water.

The applicants claimed that the alleged contraventions are causing an adverse effect by disturbing their use and enjoyment of their property.

Alleged Contraventions of the Landfill Approval

The applicants alleged that the landfill does not comply with Ontario's *Reasonable Use Guideline B-7* or the *Provincial Water Quality Objectives*, as required under the landfill's Approval. The *Reasonable Use Guideline B-7* establishes procedures for determining what constitutes "reasonable use" of groundwater on property adjacent to contaminant sources, and for determining acceptable levels of contaminants at a site boundary. It only applies to groundwater. The *Provincial Water Quality Objectives* establish surface water quality criteria that are considered satisfactory to protect aquatic life and recreational use.

The applicants also alleged that the municipality was in non-compliance with certain monitoring and reporting requirements under the landfill's Approval and in some cases requested that the MOECC confirm whether the municipality was in compliance. These requirements included:

- surface water and groundwater monitoring requirements;
- requirements associated with preparing the annual report for the landfill, including the requirement to provide a summary of all complaints received about the landfill and the municipality's response to those complaints; and
- the requirement to submit to the MOECC a contingency plan to be implemented in the event that surface water and groundwater quality trigger a requirement for action.

Requested Ministry Action

The applicants asked the Ontario government to exercise its powers to stop the alleged migration of contaminants to their property, and to remedy the existing contamination. In relation to the municipality's monitoring and reporting obligations under the landfill Approval, they also asked the

MOECC to investigate their complaints to the municipality since 2009, as well as the municipality's failure to install a groundwater monitoring well on their property.

In support of their application, the applicants provided correspondence, maps, photographs, an MOECC memorandum, an environmental consultant's technical report including data regarding the environmental condition at and around the landfill site and the applicants' property, and other materials.

Ministry Response

In August 2014, the MOECC informed the applicants that it would not undertake the requested investigation. The ministry based its decision on subsection 77(3) of the *Environmental Bill of Rights, 1993* (*EBR*), which excuses a minister from conducting an investigation if it would duplicate an ongoing or completed investigation. The ministry noted that it is aware of the environmental issues associated with the landfill, and stated that appropriate abatement and compliance actions are already being undertaken by the municipality to ensure the applicants' concerns are addressed and that the natural environment is protected. Consequently, the ministry stated that the requested investigation "would be duplicative of an ongoing investigation (i.e., efforts already completed and underway related to the environmental performance and compliance of the approved facility)."

The MOECC stated that, in considering the applicants' allegations, the ministry reviewed technical and compliance information regarding the landfill site. It also "considered the various actions that have been taken and that are being taken by the [municipality] to ensure the site is being operated in compliance with its approval."

The ministry noted that, through its past and ongoing regulatory involvement with the landfill, "the ministry has in essence been 'investigating' the alleged contraventions and, irrespective of the request will continue to do so." The ministry assured the applicants that it "will continue to take appropriate actions to ensure that the [municipality] operates the site in a state of compliance and properly addresses environmental concerns."

Alleged Exceedances of Regulatory Standards and Environmental Impacts from the Landfill

The MOECC confirmed that the landfill site is in compliance with the groundwater quality requirements of the *Reasonable Use Guideline B-7*. In other words, concentrations of contaminants in groundwater at the site boundary meet acceptable levels. The ministry noted that the monitoring data that the applicants submitted in support of their application was three years old. According to the MOECC, "there have been three subsequent years of monitoring information, assessments and developments that have transpired and provide further information in regards to the alleged environmental impacts, and general understanding of the environmental conditions associated with the site."

Regarding surface water and wetlands, which must meet *Provincial Water Quality Objectives* on- and off-site, the MOECC stated that its technical review indicated no significant impact in the creek. However, the MOECC stated that there have been some water quality impacts within the wetland onsite near the existing waste disposal area. The MOECC stated that the municipality, in response:

(1) has taken actions to mitigate potential leachate impacts by installing a barrier around part of the existing waste area, and repairing leachate seeps; and
(2) was undertaking assessments during 2014 to refine contingency trigger mechanisms for surface water impacts.

The MOECC stated that it is ensuring the municipality takes appropriate actions to protect the wetland. In particular, the ministry noted that it made recommendations in its review of the landfill's 2013 annual report that the municipality undertake additional remedial measures to mitigate potential impacts to the wetland.

To address the applicants' specific concerns about potential impacts to their drinking water, the MOECC relied on information from the municipality's established groundwater monitoring program for the landfill, which is used to determine potential and actual leachate impacts. The MOECC stated that its technical review "indicates that the Applicants' water well has not been impacted by landfill leachate and is not susceptible to being impacted by the landfill due to its location relative to groundwater flow and the location of [the creek]." The MOECC further noted that staff from the ministry's District Office collected samples from the applicants' private well in 2008 and 2009, and that "the results indicated no impacts from landfill leachate."

The ministry stated that "the available monitoring information does not indicate any adverse environmental impacts to the Applicants' property or water well from the landfill. The ongoing monitoring program and associated trigger mechanisms and contingency plans (once finalized) will ensure potential adverse environmental impacts are identified and managed."

Despite an otherwise thorough, detailed response, the ministry did not respond to the applicants' allegation that the municipality relied on a flawed groundwater flow model to conclude incorrectly that their property is not susceptible to being impacted, nor did it specifically explain why the ministry accepts the municipality's model.

The MOECC noted that the applicants had apparently stopped granting access to the municipality to monitor the applicants' private well in 2012. The MOECC reiterated that it does not consider the applicants' well to be susceptible to contamination from the landfill, but suggested that the applicants may wish to allow the municipality to resume monitoring their well as a "precautionary measure."

Alleged Non-Compliance with Monitoring and Reporting Requirements

The MOECC responded to each of the applicants' concerns about the municipality's compliance with the landfill Approval. Regarding reporting obligations, the MOECC advised that the municipality included the required reporting information in its latest annual report (2013). However, the ministry noted that it had to remind the municipality of the need to report even when no complaints about the landfill are received (the municipality provided an addendum to the annual report in June 2014 confirming that no complaints were received in 2013). The ministry also asked the municipality to provide an addendum to the 2013 report regarding the decommissioning of, or repairs to, monitoring wells that occurred during the reporting period.

Regarding monitoring obligations under the Approval, the MOECC stated that "ministry technical staff are satisfied that the scope of the current monitoring program is effective (subject to further modifications)."

The MOECC also confirmed that the municipality submitted the required report on trigger mechanisms and contingency plans in December 2013, and that the ministry reviewed the report and provided comments and recommendations to the municipality. The ministry confirmed that in 2014 the municipality was undertaking additional monitoring and investigations to refine the trigger mechanisms.

The MOECC noted that it would be beyond the scope of the ministry's jurisdiction to investigate the applicants' allegation that the municipality has failed to honour a commitment to install a bedrock monitoring well on the applicants' property. The ministry confirmed that it has not required the municipality to install a monitoring well on the applicants' property.

Finally, in reference to the applicants' request that the ministry investigate their complaints to the municipality since 2009, the MOECC stated that it does not have any details of complaints made prior to December 2012 (when the Approval was amended to require that a summary of complaints and responses be included in annual reports). However, the ministry invited the applicants to bring any other specific concerns about the landfill directly to the ministry.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The MOECC's decision to not undertake an investigation is fair; the *EBR* does not require a ministry to duplicate a past or ongoing investigation. The MOECC was already working with the municipality to ensure that abatement measures are in place to protect the environment surrounding the landfill, including the applicants' property, and to respond with appropriate action in the event that problems are encountered. Further, although the MOECC formally denied this application, it appears to have undertaken a detailed technical review of available information about the landfill site and its impacts, including monitoring data from the applicants' well, before reaching its decision.

Nevertheless, the applicants' concerns are understandable. They live downstream of a landfill that lacks engineering controls, and they have been informed by their environmental consultant that there are landfill-derived contaminants in groundwater flowing towards their property. The mere presence of vinyl chloride alone in groundwater near their property boundary would understandably evoke concern about the future safety of their well water.

A key factor in determining the applicants' actual level of risk of contamination is whether or not the groundwater flows from the landfill site to the applicants' property. The applicants believe that it does (based on the work of their environmental consultant) and that leachate from the landfill site threatens the safety of the creek, the wetland and their drinking water. The MOECC maintains that it does not, and that the applicants' property and drinking water are not in jeopardy. While the MOECC's response was generally very thorough, the ministry failed to address this critical point by explaining in its decision notice the technical basis for accepting the municipality's groundwater flow model, and

discounting the applicants' concerns that the groundwater flow model is incorrect. As it stands, the ministry's response to this application likely resolves little in the eyes of the applicants.

It is promising that the MOECC seems to be actively engaged on this case, not only in ensuring that the Approval for the landfill is up-to-date and includes appropriate conditions to protect the environment, but also in confirming that the municipality is complying with the Approval. The ECO has long been concerned about the environmental impacts and challenges of Ontario's older landfills; see, for example, an article about the MOECC's handling of small and aging landfills in Part 6.1 our 2009/2010 Annual Report. Ministry oversight is critical to ensure that landfilled waste does not pollute local water sources.

Review of Application: I2014003

3.1.6 Discharge of Contaminated Water from a Municipal Drain (Investigation Denied by the the MOECC)

On June 4, 2014, two individuals submitted an application under the *Environmental Bill of Rights, 1993* (*EBR*) requesting an investigation of an alleged contravention of section 14 of the *Environmental Protection Act* (*EPA*). This section prohibits the discharge of a contaminant into the natural environment where it may cause an adverse effect. The applicants allege that stormwater that is being discharged from a newly constructed municipal drain onto their property contains turbidity and deleterious substances, rendering the water in their pond unfit for use. The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC).

Background

Owners of farmland sometimes wish to drain excess surface water from their lands to improve agricultural productivity. Problems may arise, however, where a property owner wants to increase drainage, but does not have a direct drainage path to a natural waterway. In these cases, the owner of the property may require a drainage route that crosses through other properties to reach an outlet.

The *Drainage Act* sets out processes to address these drainage challenges. Where neighbours are able to agree on the construction and maintenance of a drain and the sharing of the costs, the Act sets out a framework for "Mutual Agreement Drains." This process gives the drains formal status and makes the agreement binding on future owners of the land. The Act also sets out a process for "Petition Drains," by which property owners, unable to reach an agreement with their neighbours, can petition for a municipal drain to service the properties within the watershed. The Act also provides direction on other drainage matters, such as engineers' reports, assessments, allowances and compensation, appeals, and maintenance and repairs.

In December 2011, the owners of 56.8 hectares of land in the Municipality of Central Huron petitioned the municipality to have a municipal drain built to provide drainage of surface water from their land as well as other neighbouring properties. The drainage petition process involved all of the landowners either serviced by the drain, and/or through whose properties the drain would flow. The process also involved municipal council and staff, the Ausable Bayfield Conservation Authority, and the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA). The petition was successful and the municipality hired an engineering firm to plan, design, and set specifications for the municipal drain. The engineer's report was adopted by the municipal council in March 2012.

The applicants' property is directly downstream of the drain petitioner's property, separated by a road. The project engineer selected a pond on the applicants' farm to receive the output of the municipal drain. This pond had been built in the 1970s by the applicants' family and has been functioning as a settling basin for the waters that drain from the applicants' own tiled agricultural land, as well as for stormwater from the roadside ditch. The pond has also been used as a water source for the applicants' cattle. It drains into a small creek, which is a tributary of a larger creek that eventually drains into Lake Huron.

In a letter to the municipal council dated March 15, 2012, one of the applicants indicated that he opposed the selection of his pond as the receiving water body of the municipal drain. He stated that he saw no benefit to him, only detriment, to having the municipal drain empty into his pond. Nevertheless, on March 29, 2012, council introduced a by-law creating the drain as designed by the engineer and authorized the necessary budget. As is set out in the *Drainage Act*, the cost of the municipal drain is divided between the landowners according to a specific formula and added to their tax assessments, so that the municipality eventually recovers that cost. Since the applicants' property is considered part of the municipal drain, they were assessed a proportionate part of the total cost.

The applicant appealed this decision to the Ontario Agriculture, Food and Rural Affairs Tribunal and a hearing was held on October 17, 2012, at which the appellant (the current *EBR* applicant) argued the following: his land did not require additional drainage; the benefits that he would derive from the drain were not commensurate with the assessed cost; the drain would interfere with his farming system; and that the outlet of the drain should not be on his land. He also stated several related concerns: that the additional silt deposited in his pond would result in its eventual loss; that the chemicals in the discharged water would affect his pursuit of organic status for his livestock; and that the increased water level would create a risk to his animals and farm workers. He also asked that the trees near the pond not be removed as they provide shade for the cattle.

The engineer for the municipality stated that he had selected the applicants' pond as the receiving end of the new municipal drain because it is the only available sufficient outlet for the drain and the only way that the water can get to the necessary natural watercourses. The engineer also asserted that the drain would be located adjacent to the existing tile drain and pond, which were already serving that same general purpose for the applicants' land, and thus it should have little impact on the applicants' farming activities.

The appellant countered that the surface water currently draining into their pond was either from his own land, which was free of chemicals, or from the roadside ditches, which he argued was cleaned by passing through a marsh and grassy waterway on its way to the pond. The appellant asserted that the water from the municipal drain would, by contrast, be discharged directly into the pond without being filtered or buffered in any way.

On November 30, 2012, the Tribunal denied the appeal. In its decision, the Tribunal found that the appellant had failed to provide a workable alternative to the use of his pond as a sufficient outlet for the drain. It also found that he had failed to provide sufficient evidence to support his argument that the upstream marsh and grassy pathway (to be bypassed by the municipal drain) improved the quality of the surface water that ran into his pond. Despite denying the appeal, the Tribunal concluded that the construction of a new, second pond on the appellant's property could resolve the appellant's concerns. The Tribunal therefore encouraged the parties to meet to discuss the possibility of creating a new pond.

The MOECC stated that after the Tribunal appeal was denied, the municipality, the conservation authority, and the applicants did hold a meeting, as suggested by the Tribunal. The MOECC also stated that the municipality and conservation authority had offered grant money to the applicants for the purpose of creating an alternative livestock watering source for the property, but the applicants did not respond to the offer.

Municipal council passed the municipal drain by-law on February 5, 2013. According to the MOECC, in August 2013, the applicants appealed to the Normal Farm Practices Protection Board to resolve the disputes around the municipal drain; however, the applicants abandoned this appeal a week before the hearing.
As of June 2014, the drain was discharging into the applicants' pond; however, according to the MOECC, the project remained incomplete at that time as upland structures designed to moderate the flow had not yet been built.

Summary of Issues

The applicants allege that stormwater from the municipal drain is harming the water in their pond, making it unsuitable as a water source for their cattle. They claim that pesticides and other chemical residues from upstream farms will impair their ability to be organically certified. They also claim that increased turbidity and nutrients will promote algal blooms, potentially contaminating the water. They state that since the water from the drain began entering their pond, algae have started growing in both the pond and the downstream creek.

The applicants also claim that the high-volume discharge from the drain is eroding and scouring the natural watercourse that flows across their property, making it wider and deeper. They state that this increase in water volume could flood their marsh and affect their downstream well. They are also concerned that it may have an impact on an endangered species of fish, the redside dace, which is known to live in the downstream watercourse. They claim that all of the above are adverse effects due to the discharge from the drain and that the municipal drain therefore contravenes section 14 of the *EPA*.

The applicants took water samples from their pond both before and after the installation of the drain and had them tested by a lab. In summary, the results show: an increase in turbidity and a decrease in total dissolved solids; increases in the major plant nutrients; the presence of some micronutrients, such as manganese, iron, aluminum, zinc, and boron, in the post-drain samples, which were all below detectable limits in the pre-drain samples; and a more than three-fold increase in sodium. The applicants also attached more than 50 photographs, showing pre- and post-drain differences in water flow, increased turbidity in the drain discharge waters, erosion of the banks of the downstream creek and flooding of the downstream land.

Ministry Response

On August 14, 2014, the MOECC informed the applicants that it had denied the application for an investigation. Prior to the submission of this *EBR* application, the MOECC had received numerous complaints from the applicants. In response to those complaints and to this *EBR* application, the ministry stated that it had reviewed the various reports, the Tribunal decision, and the applicants' water chemistry data. Further, the ministry had conducted site inspections and held repeated consultations with municipal staff, the project engineer, the conservation authority and the applicants to review and discuss the applicants' allegations in detail. As such, the ministry stated that the requested investigation would duplicate an already completed investigation, which is a permissible ground for denying an application for investigation under the *EBR*. Moreover, the ministry stated that the drain is not causing, nor is likely to cause, harm to the environment. Finally, the MOECC stated that it "does not

regulate non-point source overland storm water flows managed by municipal drains" and therefore it "will continue to direct such complaints or concerns to appropriate regulatory authorities."

The ministry noted that the establishment of the municipal drain, as a petitioned drain under the *Drainage Act*, followed the required process. The MOECC also stated that, from its detailed review of the file, "there were no identifiable concerns with water or sediment quality in respect of the property's pond that required [the] MOECC's attention." Therefore, the MOECC concluded that "the issues raised were drainage related and outside of [the] MOECC's mandate." The ministry reiterated that it had previously advised the applicants that their complaints should be directed to the municipality and/or the conservation authority, which have regulatory authority relating to drainage issues. The MOECC did note, however, that "in the event any issues develop with respect to point source discharges to the municipal drain or natural watercourses those issues will be addressed by [the] MOECC."

The MOECC also explained that the applicants' pond, as part of the drain, is designed as a sediment control basin and therefore will, by design, be high in turbidity and sediment. In addition, the ministry stated that the conservation authority was actively engaged in the project and supports the drain as a means of reducing existing erosion and sediment problems and ultimately improving the quality of the drainage water that enters the creek. The MOECC stated that the various upstream berms and erosion control structures, however, were still under construction, and therefore the applicants would not yet have realized the project's positive impacts on water quality and quantity.

The ministry also noted that the applicants' pond, which is a dugout surface water pond that receives surface run-off from agricultural fields, was never a secure watering source for his cattle, even prior to the new drain. The MOECC had therefore previously advised the applicants that it would be in their best interest to accept the funding offered for a new pond.

Finally, the MOECC stated that ministry staff had reviewed the applicants' sampling data from the property's pond, but that the water sampling protocol followed by the applicants was uninformative and could not provide a representative profile of turbidity, sediment and erosion issues related to the pond.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The MOECC appears to have undertaken a very detailed review of the application and to have gone to some effort to discuss the issues with the applicants; however, it should have gone one step further and run its own water sampling tests. This additional step could have more definitively addressed the applicants' concerns regarding adverse water quality and their allegations that the drainage water is causing, or is likely to cause, harm to the environment. It would also have strengthened the ministry's rationale that it had already completed an investigation of the matter.

From a broader perspective, this case raises questions about how the *Drainage Act* deals – or does not deal – with potential environmental impacts arising from drainage waters. For example, the *Drainage Act* does not take land and soil management issues sufficiently into account. Well-managed, healthy soils have good levels of organic matter, which allow better infiltration by water and increased water-holding capacity, minimizing run-off. Poorly managed soils tend to be compacted and thus resistant to

infiltration by water, resulting in greater run-off, more flooding and downstream sedimentation, and concomitant contamination of ground and surface waters by nutrient and pesticide residues. Under the current Act, there is little incentive to improve upstream conditions, while downstream property owners may be unfairly forced to accept the contaminated run-off from upstream properties that are not well managed.

The ECO has on two previous occasions called for a review of drainage policies and the *Drainage Act.* In our 2004/2005 Annual Report, the ECO recommended that the MOECC review current policies related to drainage and stormwater management to ensure that ecosystem functions are safeguarded. In our 2009/2010 Annual Report, the ECO recommended that the OMAFRA amend the *Drainage Act* and its policies to ensure that provincially significant wetlands are protected from being drained. This *EBR* application provides yet more support for the ECO position that the outdated *Drainage Act* requires a thorough review and upgrading to reflect a more modern understanding of how drainage projects affect the natural environment.

Finally, this case raises questions about what role the MOECC has, or should have, in the regulation of drainage waters. Agricultural drainage is already regulated via the *Drainage Act*: the OMAFRA, municipalities and the conservation authorities have all been assigned some regulatory authority over drainage issues. Given these defined roles by other agencies, the MOECC appears to take the position that regular surface waters managed by municipal drains are beyond its jurisdiction; only an out-of-the-ordinary, point source discharge to the municipal drain that causes an adverse effect would fall within the MOECC's authority. While it makes good sense to avoid regulatory duplication by multiple authorities, there may still be a legitimate role for the MOECC in regard to ordinary drainage water, especially absent a review of drainage policies to address environmental issues as recommended above. Drainage waters duly approved under the *Drainage Act* may still discharge contaminants into the environment causing adverse effects, even without a point-source contaminant. The cumulative effects of poor quality surface water running off multiple farm lands could result in the discharge of contaminated drainage water causing an adverse effect.

Review of Application: I2014004

3.1.7 Violation of a Landfill's Environmental Compliance Approval (Investigation Denied by the MOECC)

In August 2014, two Ontario residents submitted an application for investigation of a landfill owned and operated by their neighbouring municipality (the "operator"). The applicants alleged that the operator had failed to comply with its Environmental Compliance Approval, which requires the operator to develop and operate the site in accordance with its Site Development and Operation Plan (the "Development Plan"). Specifically, the applicants alleged that the operator has failed to implement measures to screen landfill operations from view, control nuisance seagulls, and prevent and/or clean up litter within the landfill and on surrounding properties. The applicants also alleged that the operator is contravening several provisions of the *Environmental Protection Act* (*EPA*) through these failures.

Background/Summary of Issues

The landfill site is located in Bruce County and has operated since 1972. It accepts residential and commercial non-hazardous waste, compost, brush and recyclables. In 2007, the operator proposed to expand the landfill's capacity by 347,000 cubic metres to enable it to accept waste for an additional 25 years. The Ministry of the Environment and Climate Change (MOECC) approved the environmental assessment for the landfill expansion in March 2011, and issued the operator its Environmental Compliance Approval (the "Approval") in October 2012. The expansion was completed in 2013 and the site began receiving waste in January 2014.

The operator must comply with the conditions of the Approval including following the Development Plan, which describes the development and continued use of the landfill site.

Alleged Contraventions of the Landfill Approval

The applicants alleged that the operator failed to adequately implement select mitigation measures included in the Development Plan, thereby violating section 4.1 of the Approval, which requires the landfill site to operate in accordance with the Development Plan.

The mitigation measures to which the applicants referred include: constructing a berm along each cell perimeter to block the view of waste disposal operations from a nearby road; planting vegetation to screen the operations from view; erecting a litter fence if necessary; and cleaning up litter from the landfill that might accumulate against the fence and on surrounding properties. The Development Plan also committed the operator to prepare and implement a wildlife management program. Finally, the applicants also referred to a commitment in the operator's 2013 Annual Compliance Report to construct berms to block the view of landfill operations.

The applicants listed several complaints indicating that these measures had not been adequately implemented. They stated that birds had become a nuisance and were polluting nearby lakes, and that residents with dwellings located on those lakes could see the landfill operation from their properties. The applicants also alleged that litter was escaping into farmers' fields near the site and becoming tangled in farm equipment.

The applicants also wrote that there had been an increase in the level of noise pollution from landfill operations as a result of the expansion, and that nearby residents had complained they could hear machinery running throughout the day. The Development Plan includes a commitment to minimize noise impacts where possible, though the applicants did not refer to this commitment in their application.

Alleged Contraventions of the EPA

The applicants alleged that by violating the terms of the Approval to expand the landfill, the operator had contravened subsection 27(1) of the *EPA*, which prohibits the operation or expansion of a waste disposal site except in accordance with an Approval. The applicants also alleged the operator violated *EPA* subsection 6(1), which prohibits the release of contaminants into the natural environment, and section 86, which prohibits littering.

Requested Ministry Action

The applicants argued that residents living near the landfill would not have agreed to the expansion if they had known they would see and hear the operations from their homes. They also stated that the alleged non-compliance of the operator and the MOECC's failure to act have eroded public trust.

One of the applicants telephoned an MOECC Senior Environment Officer in the spring of 2014 to express his concerns about the visibility of the landfill operations, seagulls in the vicinity, and litter in farm fields near the site. According to the applicant, in July 2014 the officer indicated no further screening would be constructed by the operator. The applicant was unsatisfied with this response and subsequently contacted the MOECC District Supervisor on August 8, 2014. The applicant stated he drew the supervisor's attention to section 8.7 of the Development Plan, which lists proposals to screen landfill operations from the view of a nearby road and residences. The applicant stated the supervisor responded on August 11 indicating that she could not find the relevant document.

This same applicant sits on his municipality's town council. At its meeting on August 11, 2014, the council passed a motion to request that the MOECC order the operator to comply with the Development Plan. The Mayor informed the MOECC District Supervisor of the council motion by letter, and provided her with the Development Plan.

Ministry Response

In November 2014 the MOECC informed the applicants that it would not be undertaking an investigation of the landfill operation. The ministry said it had already reviewed the environmental assessment, Approval documents and supporting documentation in response to earlier complaints, and had also spoken with officials and consultants involved in the preparation of the documents. The ministry stated the operator had implemented mitigation measures included in the Development Plan, and there were no ongoing compliance issues with the landfill operation. The MOECC also stated that its own inspections confirmed that the mitigation measures currently in place are adequate. With regard to the alleged failure of the operator to implement screening measures listed in the Development Plan, the MOECC stated that "all reasonable steps to implement the options to the extent necessary to 'mitigate' visual impacts have been taken," including constructing berms.

The MOECC stated that "perimeter berms are required as one of the plan's mitigation measures, but are not expected to eliminate all the [landfill's] visual impacts." The ministry also stated that consultants who prepared the Development Plan had informed the ministry that waste containment was the primary purpose of the perimeter berms, and that visual screening was considered a secondary benefit. The MOECC stated that landfill officials confirmed that vegetation had been planted for screening, and that although the plants were new and young, they will "grow and provide better screening as the landfill ages." The ministry also stated there was no discussion about how high the perimeter berms should be, nor any deadlines for implementing any of the mitigating measures for visual screening in either the Approval or the Development Plan.

In response to the applicants' complaints about litter from the landfill ending up in neighbouring farm fields, the MOECC stated that a litter fence had been installed in spring 2014 on the north side of the site. The ministry also stated that it conducted inspections in August and September 2014 that confirmed bird numbers and off-site litter were not a concern, stating that "municipal officials have indicated that the average numbers since the opening of the new expansion area have been low."

The MOECC did not acknowledge the assertion that nearby residents had complained they could hear the landfill compactor running throughout the day. However, the applicants only briefly mentioned the issue and did not cite any specific contravention of the Approval or Development Plan related to noise mitigation.

The ministry said it would continue to monitor the site to ensure operations comply with its approvals and applicable legislation.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The MOECC declined this request for investigation on the basis that it had already investigated the applicants' main concerns, including mitigation measures to screen landscape operations from view, management of nuisance wildlife, and litter prevention and clean-up.

However, the ministry and applicants differ in what they perceive as the berms' primary purpose – waste containment or visual barrier. The MOECC stated the berms are primarily for waste containment, and are not expected to eliminate all of the landfill's visual impacts. While this may be true, the ministry is being disingenuous by not at least acknowledging that the berms' stated purposes, in both the Development Plan and the 2013 Annual Compliance Report, included screening the landfill operations from view of the nearby road.

The ministry and the applicants also disagree over what constitutes adequate mitigation of the visual effects of the landfill. The MOECC says that planting young vegetation and constructing berms of any height, when taken together, constitute acceptable mitigation. The applicants believe the mitigation efforts are inadequate because operations are still visible from the nearby road and residences. The disagreement between these two interpretations cannot be resolved by looking at the Approval, annual compliance report, or Development Plan for clarity.

The MOECC listed and adequately explained the actions it took in response to the applicants' initial complaints regarding the landfill site, as well as its reasons for denying the request for investigation. However, the ministry could have provided documents and details that supported its assertion that the operator was in compliance with its Approval. It would have been useful for the ministry to provide the data collected by both the operator and the ministry itself on seagull numbers since the landfill expansion, along with data on off-site litter quantities. It also would have been beneficial for the ministry to provide the applicants with the operator's wildlife management program and its 2014 Annual Compliance Report. Without these documents and details, the applicants cannot gauge changes in bird or litter quantities, and do not know what the landfill operator has in place as a plan to manage these effects.

Review of Application: I2014005

3.1.8 Clarington Transformer Station Environmental Assessment (Investigation Denied by the MOECC)

Background

On December 5, 2014, the ECO received an application requesting an investigation into alleged contraventions of the *Environmental Assessment Act* by Hydro One relating to a transformer station in Clarington, east of Oshawa (the "project"). The applicants alleged that Hydro One did not reasonably consider and evaluate any alternative sites for the Clarington Transformer Station, as required by the *Class Environmental Assessment for Minor Transmission Facilities* (*1992*). The applicants also contended that Hydro One did not comply with conditions that the Minister of the Environment and Climate Change had previously imposed on the project. They also alleged that the project will harm the environment because operation of the transformer station will produce lead, cadmium and mercury; and, if the transformer station should fail, it could spill transformer fluid into the surrounding soil and groundwater. The ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC).

The applicants had also asserted that Hydro One had contravened the *Oak Ridges Moraine Conservation Act, 2001*. However, this statute is not prescribed under the *Environmental Bill of Rights, 1993* (*EBR*) for the purposes of an application for investigation; as such, there is no *EBR* right to request an investigation under this Act.

Environmental Assessments

An environmental assessment (EA) is required under the *Environmental Assessment Act* for "undertakings" (i.e., enterprises, activities, plans and programs) of the provincial government, municipalities, and public bodies, unless exempt by order or regulation. The intent of an EA is to openly determine and analyze the risks, impacts, and alternatives of an undertaking before it begins.

There are two types of EA planning and approval processes used in Ontario: an individual EA and a streamlined EA. Large and complex projects with the potential for significant environmental effects must undergo an individual EA process. The process includes: developing a Terms of Reference; preparing an EA document (e.g., an Environmental Study Report) that describes the project, its purpose, rationale, possible alternatives, potential environmental effects and mitigation actions; and submitting these documents for mandatory public and government review. The Minister of the Environment and Climate Change must approve these undertakings.

A proponent can use a similar, streamlined EA process for certain types of projects that have predictable and manageable environmental effects. Projects falling under one type of streamlined process – Class EAs – do not require approval by the Minister provided that the proponent follows a self-assessment and decision-making process identified in the ministry-approved Class EA document. There are 11 approved Class EAs in Ontario, which cover a number of activities including infrastructure projects and transmission lines. If a person believes that a proponent did not address significant outstanding issues in the Class EA process for an undertaking, they can ask the Minister – through a

Part II Order or "bump-up" request – to require the proponent to prepare an individual EA. The Minister can also impose conditions on an undertaking in addition to those of an approved Class EA.
Over the last decade, the ECO has raised numerous concerns about the existing EA and Class EA processes, including the failure of EAs to consider the need for a project, alternatives to it, and the lack of mechanisms by which projects can be rejected under Class EA processes. For more information on the EA process, see Part 5.1 of our 2013/2014 Annual Report.

The Clarington Transformer Station

The Clarington Transformer Station will be built on Hydro One property in the Municipality of Clarington, east of Oshawa (Figure 1). The project area is located within the Oak Ridges Moraine. The moraine is an ecologically and hydrologically important ridge of land formed from glacial sands and gravel. It acts as a rain barrel by recharging groundwater aquifers and discharging filtered water to over 65 watercourses. The moraine is protected by the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act, 2001*. Some of the project is located within an Oak Ridges Moraine Plan natural linkage area (central corridors connecting core areas and river valleys) – only existing uses, restricted new resource management, agricultural, low intensity recreational, home business, transportation, and utility uses, and some aggregate operations are allowed in these areas.

Hydro One's transmission network conveys electricity throughout Ontario at high voltages. There are approximately 300 transmission stations in Ontario to change high transmission voltages to lower distribution voltages. Hydro One stated that the Clarington Transformer Station will offset power lost from the Pickering Nuclear Generating Station, which will be retired by 2020.[1] The Clarington Transformer Station will transform electricity voltages from 500 kilovolt (kV) to 230 kV by connecting to existing circuits located on or adjacent to the project site. The station will have two 500/230 kV transformers, a 500 kV switchyard, a 230 kV switchyard, buildings, and connection facilities and equipment. The station transformers will be equipped with spill containment systems designed to prevent the loss of transformer insulating oil from entering the surrounding environment. Hydro One will also clear a transmission corridor, grade the site, and construct an access road.

The project is subject to the *Class Environmental Assessment for Minor Transmission Facilities* process under the *Environmental Assessment Act*. This Class EA requires a proponent to, among other things, identify and evaluate alternatives to the undertaking.

In November 2012, Hydro One completed its draft Environmental Study Report for the Clarington Transformer Station as part of the Class EA process. During the consultation period for the draft report, the ministry received 56 "bump-up" requests to elevate the project to an individual EA based on a number of issues and concerns.[2] Amongst other issues, members of the public raised concerns that Hydro One did not fully consider alternative sites, and that the project will cause soil and water contamination if transformer oil spills into the environment.

[1] Hydro One Networks Inc. (2014). *Clarington Transformer Station, Class Environmental Assessment Environmental Study Report*, page ES-2.
[2] Hydro One Networks Inc. (2014). *Clarington Transformer Station, Class Environmental Assessment Environmental Study Report*, pages 155-180.

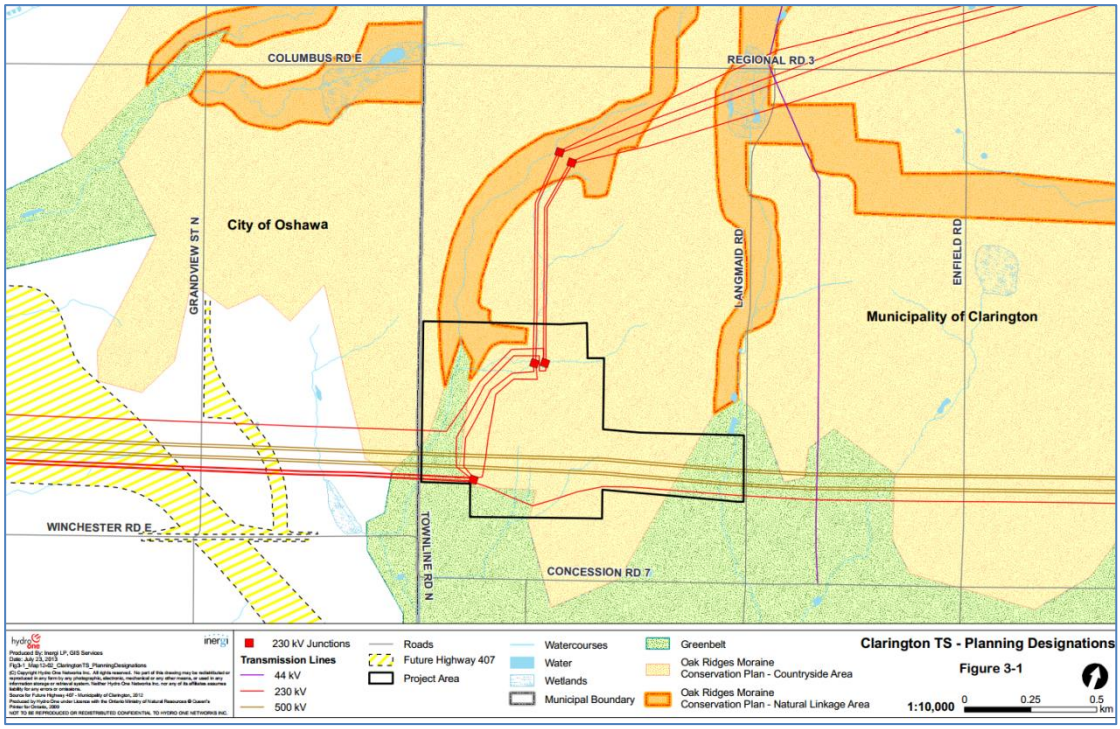


Figure 1. Clarington Transformer Station project area. (Source: Hydro One, ***Clarington Transformer Station, Class Environmental Assessment Environmental Study Report***, Report Number: 590-CLEA-12-11, January 2014: 25).

On January 2, 2014, the Minister denied all the "bump-up" requests, but imposed six conditions on Hydro One to:

- prepare and submit a groundwater monitoring plan, including baseline water level and quality sampling results, to the MOECC prior to construction;
- prepare and submit a contingency and pollution prevention plan to the MOECC;
- prepare and submit a detailed acoustic assessment report to the MOECC;
- post the acoustic assessment report and contingency and pollution prevention plan on its website;
- form a community liaison committee within six months of the Part II Order decision and invite the Enniskillen Environmental Association and members of the public that expressed an interest in the project to sit on the committee; and
- notify the MOECC once all the conditions are fulfilled.[3]

Hydro One completed the final Environmental Study Report in January 2014. Within this document, Hydro One stated that, "consideration was given to the expansion of existing transmission stations, addition of new stations at existing generation sites and at new locations." Hydro One stated that it had considered a number of alternatives but rejected all other options because they were neither technically nor economically feasible. The null hypothesis (i.e., the "do nothing" scenario) was rejected due to "the consequences to regional power supply and reliability that would result from the retirement of [the Pickering Nuclear Generating Station]." Hydro One concluded that installing the proposed

[3] Hydro One Networks Inc. (2014). *Clarington Transformer Station, Class Environmental Assessment Environmental Study Report,* Appendix B pages 488-490.

transformer station on the proposed site is the only feasible option to address the retirement of the Pickering station.

Summary of Issues

The applicants alleged that Hydro One did not follow the *Class Environmental Assessment for Minor Transmission Facilities*, which requires the proponent to consider and assess alternative sites. This would be a contravention of subsection 13(3)(a) of the *Environmental Assessment Act;* that no person shall proceed with an undertaking subject to a Class EA unless it is done in accordance with the Class EA. The applicants asserted that Hydro One purchased the site's property over 30 years ago and selected the site for building the Clarington Transformer Station without a comparative assessment of off-moraine alternative sites simply because it already owned the land. The applicants also stated that Hydro One did not present any alternate site plans at the public information centres.

The applicants further alleged that Hydro One did not comply with the conditions in the Minister's order following the "bump-up" requests. This would be a contravention of section 38 of the *Environmental Assessment Act*; that any person who contravenes an order, term or condition of an approval issued or given under the Act is guilty of an offence. The applicants claimed that Hydro One did not submit an adequate groundwater monitoring plan before it began construction of the project, as required by the Minister, because it conducted poor groundwater baseline monitoring. Furthermore, the applicants alleged that without proper baseline data, it will be difficult to identify any impacts from this project in the future.

The applicants asserted that the daily operation of transformer stations produce lead, cadmium, and mercury that can be introduced into the surrounding local environment. The applicants alleged that the project has the potential to harm private ground water wells if a transformer failure occurs and the spill containment system is compromised. The applicants stated that transformer failures and subsequent spills of transformer fluid into the surrounding soil and water environments occur rather frequently and are not always preventable. They also claimed that since the site is situated on a part of the Oak Ridges Moraine with a high surface water table, it could potentially contaminate shallow and intermediate water tables.

Ministry Response

In February 2015, the MOECC denied the application because it was "satisfied that [Hydro One] has considered and evaluated a range of alternative sites through the Class Environmental Assessment process and the project is not likely to cause harm to the environment."

Consideration of Alternatives:
The ministry stated that in 2013, when it received a number of "bump-up" requests, the MOECC reviewed Hydro One's compliance with the Class EA's requirements. As part of that review, the ministry determined that "Hydro One did not adequately present its assessment of potential alternative solutions and options in a manner that was easily communicated." The MOECC therefore requested that Hydro One submit revised documentation that more clearly explained how it considered other options before selecting the Clarington Transformer Station option. According to the ministry, Hydro One's revised documentation (i.e., the final Environmental Study Report) confirmed that several other

alternative locations were examined, including alternative sites proposed by the public, before deciding that the Clarington site was the preferred location.
Moreover, the ministry affirmed that the Minister denied the "bump-up" requests because Hydro One had met the requirements of the Class EA (including the requirement to assess a reasonable range of alternative locations to the project site) and therefore, the *Environmental Assessment Act*.

Compliance with Conditions of Minister's Decision on "Bump-Up" Requests:
The ministry reported that Hydro One had completed four of the six required conditions and was in the process of complying with the other two. The ministry stated that it was satisfied with Hydro One's groundwater monitoring plan and the contingency and pollution prevention plan. The ministry also stated that the baseline water quality and quantity monitoring results are adequate to provide sufficient information to assess pre- and post-construction conditions in the project area.

The ministry committed to "monitor EA compliance and determine whether Hydro One is meeting its requirements through measures such as tracking compliance due dates. Should non-compliance with an EA condition arise, steps will be taken to determine the appropriate response."

Harm to the Environment:
The ministry advised the applicants that, as part of the ministry's review of the "bump-up" requests, ministry hydrogeologists reviewed Hydro One's hydrogeological analysis, the Environmental Study Report, and an independent analysis commissioned by community representatives. From this review, the ministry determined that "the ground where the proposed transformer station is located (including the containment tank for transformer fuel) has a relatively thick, low-permeability layer separating the proposed works from the groundwater aquifer." In response to concerns raised by the "bump-up" requests, the ministry said that it required Hydro One to submit a groundwater monitoring plan and a contingency and pollution prevention plan in case of a spill and to monitor groundwater conditions on a regular basis. The ministry also stated that the transformer station will have a spill containment system and an oil/water separation facility for each transformer.

The MOECC advised the applicants that other ministry approvals are required for air and noise emissions, the spill containment system, and construction dewatering activities for this project. And that it is ministry practice to impose conditions in these types of approvals to prevent or mitigate potential risks to the environment.

The MOECC committed to monitoring compliance with these approvals, assessing potential environmental effects and taking appropriate action should non-compliance occur. Additionally, the ministry said that, if there is significant non-compliance, the matter may be referred to its Investigations and Enforcement Branch for further action, which could potentially include prosecution.

As a result, it is the ministry's opinion that the project is not likely to cause environmental harm.

For the full text of the ministry decision, please see our website at www.eco.on.ca.

ECO Comment

The ECO agrees with the ministry's decision not to conduct an investigation. The ministry assessed the applicants' concerns that Hydro One did not comply with the *Class Environmental Assessment for Minor*

Transmission Facilities' requirement to consider and assess alternative sites for the project. The ministry concluded that Hydro One's revisions to the Environmental Study Report indicate that it did consider and evaluate a range of alternative sites for the transformer station through the Class EA process. The MOECC stated that it was satisfied with Hydro One's groundwater monitoring plan for the project and its baseline water quality and quantity monitoring results. Furthermore, the ministry considered the applicants' concerns that the project poses a potential threat to groundwater and deemed that preventative measures at the site, such as a spill prevention system and monitoring wells, are adequate.

While the ECO has previously identified problems with the EA process, including that it does not require proponents to sufficiently consider a project's "need" and "alternatives"; however, in this particular case, the process worked. Through "bump-up" requests, the public identified many concerns and issues with the proposed project and, although the ministry denied the requests in the end, the MOECC imposed additional conditions on Hydro One to address the public's concerns.

Review of Application: I2014006

3.1.9 Illegal Waste Disposal (Investigation Undertaken by the MOECC)

Background/Summary of Issues

On March 23, 2015, the ECO received an application requesting an investigation of a property owner for alleged non-compliance with an order issued under section 43 of the *Environmental Protection Act* (*EPA*) to remove waste from a site that was not an approved waste disposal site under the Act. The applicants also alleged the property owner is in contravention of section 27 of the *EPA*, which prohibits the operation of a waste disposal site except under and in accordance with an Environmental Compliance Approval.

The ECO forwarded this application to the Ministry of the Environment and Climate Change (MOECC).

Ministry Response

The ministry acknowledged its receipt of the application on March 27, 2015. On May 26, 2015, the ministry advised the applicants that it would undertake the requested investigation. The MOECC stated that the investigation should be completed by July 27, 2015, and that notice regarding the results of this *EBR* investigation would be provided to the applicants by August 26, 2015.

ECO Comment

The ECO will review the MOECC's handling of this application in a future report once the investigation has been completed.

3.2 Technical Standards & Safety Authority

Review of Application: I2013005

3.2.1 Abandoned Wood Disposal Site
(Investigation Denied by the MOECC; Investigation Undertaken by the TSSA)

On January 22, 2014, two individuals submitted an application under the *Environmental Bill of Rights, 1993* (*EBR*) requesting an investigation of alleged contraventions at an abandoned planing mill and sawmill in Hearst, Ontario (the "site"). The applicants asserted that the site contains a wood waste disposal pile and leaking fuel storage tanks that contravene the *Technical Standards and Safety Act, 2000*, the *Ontario Water Resources Act* (*OWRA*), and Regulation 347 (General – Waste Management) under the *Environmental Protection Act* (*EPA*). The applicants also asserted that the wood waste on the site is a fire hazard. On January 27, 2014, the ECO forwarded the application to the Ministry of the Environment and Climate Change (MOECC), and the Technical Standards & Safety Authority (TSSA), under the Ministry of Government and Consumer Services for consideration.

Background

The sawmill and planing mill began operating in 1965. In the 1970s, the MOECC issued a Certificate of Approval under the *EPA* for a wood waste disposal site. In 1989, the MOECC amended the approval to include additional conditions requiring the site owner to submit: a closure plan; an estimate of the associated costs; and financial assurance for these costs. However, the site owner never submitted the closure plan or financial assurance before it filed for bankruptcy in 1992. The MOECC reports that it did receive limited funds during the bankruptcy, with which it undertook some remedial work at the site in 1995. The site was ultimately forfeited to the Province of Ontario in 2002.

Under the *Technical Standards and Safety Act, 2000*, the TSSA regulates environmental matters at fuel handling sites that are considered operational (i.e., sites with fuel handling equipment, even if the equipment is not in use). The MOECC regulates environmental matters on sites that are considered permanently closed. Sites are permanently closed when all the fuel handling equipment has been removed and closure requirements set out in the Liquid Fuel Handling Code or Fuel Oil Code have been satisfied (e.g., notification of the TSSA and the MOECC that fuel tanks have been removed and submission of a site closure report to the TSSA).

In the event of a spill, leak or escape of a petroleum product into the environment, the Liquid Fuels Handling Code and Fuel Oil Code require that the incident be reported and that efforts be made to recover the escaped product. Where spilled, leaked or escaped oil may cause negative environmental effects off-site or adversely affect drinking water, the regulatory lead is the MOECC, regardless of whether the site is operational or not.

The MOECC regulates activities that may impair the environment through a number of environmental statutes, including the *OWRA* and the *EPA*. For example, section 30 of the *OWRA* prohibits the discharge of polluting material that may impair the quality of water. Wood waste can pose a serious threat to surface and groundwater. Although its composition is variable, wood waste leachate can be acidic, have a very high oxygen demand, and be toxic to aquatic organisms. In addition, a spill or leak of fuel could contaminate water sources and cause damage to the natural environment.

The MOECC regulates waste management, including wood waste disposal sites, under Regulation 347 of the *EPA*. Subsection 8(7)(b) of this regulation states that an Environmental Compliance Approval (formally called a Certificate of Approval) for a waste disposal site is not required if wood waste is stored at a site for less than 18 months. Section 11 of Regulation 347 contains prescribed standards for the location, maintenance and operation of a waste management site.

Summary of Issues

The applicants allege that, given the bankruptcy of the previous site owner, the contravener is the Province of Ontario because it now controls the site (through the Public Guardian and Trustee).

The applicants allege that there are aboveground fuel storage tanks on the property and that the site is in contravention of the *Technical Standards and Safety Act, 2000*. They claim that leaked oil from the fuel storage tanks and other fuel storage equipment that was previously held on the site has contaminated the soil. To support this assertion, the applicants provided an Environmental Site Assessment completed in 1991 that indicated that several fuel storage tanks had been located and used on the site at that time.

The applicants further allege that the Province of Ontario has contravened section 30 of the *OWRA*. The applicants estimate that the site contains approximately 1,400,000 tons of wood waste material such as shavings, sawdust and bark residuals. The applicants claim that runoff from the wood waste and leaked fuel on the site is polluting an adjacent river.

In addition, the applicants assert that the wood waste disposal site contravenes Regulation 347 under the *EPA*. Specifically, the applicants allege that both the previous site owner and now the Province of Ontario have contravened subsection 7(b) and section 11, the prescribed standards for a waste disposal site, of the regulation.

Finally, the applicants claim that the property is a fire hazard. They state that wood waste fires are difficult to extinguish and that a fire would release heavy smoke, particulate matter and toxins into the air. The applicants state that the Town of Hearst does not have the firefighting resources necessary to properly extinguish a wood waste fire at the site, should it occur.

Ministry Responses

The TSSA

On February 13, 2014, the TSSA sent an acknowledgement letter to the applicants. In this letter, the TSSA suggested that it would conduct a site inspection in May 2014, after the snow had melted, to determine if an investigation was warranted. However, on March 4, 2014, the TSSA informed the applicants that it would in fact conduct an *EBR* investigation.

On July 2, 2014, the TSSA provided the applicants with a summary of its investigation. The TSSA stated that on June 3, 2014, a Fuels Safety Program Inspector examined the site from three separate locations, as well as walked around the site to look for fuel storage tanks. The inspector did not find any indication of underground or aboveground fuel storage tanks on the site, but did note that the site was covered by wood chips and scrap wood. The TSSA provided the applicants with pictures that were taken during

the site visit. The TSSA concluded that the site is not considered a fuel handling property under the *Technical Standards and Safety Act, 2000* and, as such, the TSSA has no jurisdiction over the site. The TSSA informed the applicants that, as a result, it would not take any further action at the site.

The MOECC

On March 31, 2014, the MOECC notified the applicants that it would not conduct an investigation. The MOECC stated that, through the sale of assets by the trustee during bankruptcy proceedings, the ministry received limited funds to undertake some remedial work at the site. This work was completed in 1995 and included removing waste polychlorinated biphenyls (PCBs) from the site, grading and contouring the wood waste disposal site, and capping and covering approximately 10 per cent of the site. The MOECC also informed the applicants that in 2010, Infrastructure Ontario estimated that there are approximately 800,000 cubic metres of wood waste on the site.

The MOECC noted that while the applicants alleged a contravention of subsection 7(b) of Regulation 347, the section does not exist and the ministry proceeded on the assumption that the applicants intended to cite subsection 8(7)(b). The MOECC concluded that, while this provision does require an approval for the site since wood waste was stored at the property for more than 18 months, there is no violation of this requirement because a Certificate of Approval was issued by the ministry.

Respecting section 11 of Regulation 347, which sets out requirements for the location, maintenance and operation of a landfill, the MOECC concluded that there is no violation of some paragraphs (3, 8, 9, 10, 11, 12 and 19), and that non-compliance with other paragraphs (1, 2, 14, 15, 16 and 17) is not likely to cause harm to the environment, largely because the site is inactive.

The MOECC concluded that an *EBR* investigation into potential violations of the remaining paragraphs (4, 5, 6, 7, 13 and 18) of section 11 of Regulation 347 that address water-related issues and section 30 of the *OWRA* would duplicate an ongoing investigation. The ministry stated that in August 2013, it inspected the property under its Properties of Environmental Concern program and collected surface water samples. The ministry found that the site had "greatly improved" in comparison to water samples collected in 1998, but determined that additional water sampling would be undertaken in 2014 to determine if runoff from the site is impairing water quality. In addition, the MOECC stated that it did not observe any fuel storage equipment on the site or staining of soil that would indicate possible petroleum spills to the ground. It also did not see any signs of petroleum products (e.g., fuel film) on surface water or near the property. The ministry further stated that it would provide the applicants with a summary of its findings once the water quality assessment is completed.

The MOECC advised the applicants that while it did not identify any violations of ministry legislation with respect to potential fire hazards, ministry staff contacted the Town of Hearst regarding this concern. The Town reportedly informed the MOECC that should a fire occur, it would obtain necessary equipment to extinguish the fire in order to protect private property and ensure public safety. Additionally, the MOECC reported that the Town advised the ministry that it does not believe the site is a fire hazard because the wood waste has high levels of moisture.

For the full text of the ministry decisions, please see our website at www.eco.on.ca.

ECO Comment

The ECO is pleased with how the TSSA handled this application for investigation and the authority conducted an appropriate investigation into the issues raised by the applicants. The ECO believes that the TSSA's conclusion is reasonable; the authority confirmed during a site visit that there are no fuel storage tanks at the site and, therefore, no further action is required by it because the site is not subject to the *Technical Standards and Safety Act, 2000* or its regulations.

The ECO agrees with the MOECC's decision not to conduct an *EBR* investigation into alleged contraventions of the *OWRA* and Regulation 347 under the *EPA*. The ministry's decision is reasonable given that it had previously inspected the site and is currently monitoring water quality at the site. The *EBR* does not require a ministry to duplicate an ongoing investigation. The applicants provided evidence that, in 1991, there were fuel storage tanks on the site and claimed that they remained at the site at the time the application was submitted. Both the TSSA and the MOECC reported that there are no fuel storage tanks at the site, based on site visits in 2013 and 2014. It appears that the fuel storage tanks were removed sometime after 1991, when the environmental site assessment was completed. If the fuel tanks were removed after 2001, when the Fuel Oil Code came into effect, the removal should have been reported to the MOECC and the TSSA.

This application highlights the ongoing issue of fiscal responsibility for remediation of abandoned contaminated sites. In 2013, the ECO received an application for review requesting reforms to the provincial government's approach to contaminated site liability management (see Section 2.1.13 of the Supplement to our 2013/2014 Annual Report). Those applicants identified that while the polluter pays principle is embodied in the *EPA*, polluters can still avoid liability for remediation costs by declaring bankruptcy. The ECO suggested that the MOECC "should consider how it can best address situations where the polluter is unable to pay." In this particular case, the previous site owner's failure to provide the MOECC with a closure plan and financial assurance to complete the plan resulted in limited remediation of the site. It provides a clear example of the high environmental and societal costs for failing to take a proactive approach to contaminated site liability. For additional information on financial assurance for environmental rehabilitation, refer to Part 2.1 of this Annual Report.

SECTION 4

SELECT SIGNIFICANT ISSUES

4.1 Making Polluters Pay: Collecting Adequate Financial Assurance for Environmental Rehabilitation

The Hagersville tire fire – thick, black towers of toxic smoke billowed from a raging inferno for more than two weeks – still sparks many people's memories as one of the biggest environmental nightmares in Ontario's history. The fire was started by arsonists in the early morning of February 12, 1990 at a recycling facility holding a stockpile of millions of used tires. Although the Ministry of the Environment and Climate Change (MOECC) had ordered the facility's owner to undertake fire-prevention measures years earlier, the owner balked at the costs and dragged his feet in complying. The resulting blaze took firefighters 17 days to extinguish, consumed 14 million tires, and contaminated air, soil and surface water. Worse still, the over $10 million cost of extinguishing the fire and cleaning up the site fell to the government – and taxpayers – of Ontario.

Ontario is covered with thousands of sites that, like the notorious Hagersville tire pile, could pose an environmental threat if improperly managed or, worse, abandoned; for example, there are more than 1,500 closed small landfills and thousands of former industrial and other potentially contaminated sites scattered across Ontario. If not adequately maintained, some industrial sites could pollute soil and water with highly toxic substances, like mercury, volatile organic compounds, and polychlorinated biphenyls (PCBs), negatively affecting wildlife and human health. While not every site poses significant environmental risks, when polluted land and water is not remediated, the environmental and financial burdens often fall to the province and public – and the costs can be huge.

The Polluter Pays Principle

The internationally recognized "polluter pays principle" holds that the costs of pollution should be borne by those who cause or allow it to occur. In recognition of this important principle, the MOECC's Statement of Environmental Values affirms that the ministry "endeavours to have the perpetrator of pollution pay for the cost of clean up and rehabilitation consistent with the polluter pays principle."

Applying this principle has several benefits. First, requiring polluters to pay their own clean-up costs encourages polluters to modify their behaviour to lessen potential environmental impacts. Second, it transfers the financial risk of cleaning up environmental hazards from the government – and taxpayers – to the polluter, relieving the government and the public of unwanted and unwarranted environmental and fiscal burdens.

In 2011, the Drummond Commission[1] recommended that the government revise Ontario's legislative framework to focus more on the polluter pays principle to better protect the province against the costs of environmental clean-up.[2] Subsequently, in September 2014, the Premier mandated that the Minister of the Environment and Climate Change review Ontario's legislative framework to ensure a comprehensive approach to holding polluters responsible for their environment impacts, including putting greater emphasis on the polluter pays principle.

[1] The Ontario government tasked the Commission on the Reform of Ontario's Public Services with determining how to deliver more efficient and effective public services.
[2] The Commission on the Reform of Ontario's Public Services (2012). *Public Services for Ontarians: A Path to Sustainability and Excellence*, page 343.

While the government can apply this principle retroactively by ordering polluters to pay for environmental rehabilitation after the damage occurs, securing full compensation can prove difficult when the owner of a contaminated site has gone bankrupt, cannot be located, lacks sufficient funds or otherwise refuses to pay for the clean-up. In addition, a 2012 Supreme Court of Canada decision determined that environmental protection orders usually will be subject to the normal claims process that governs bankruptcy and corporate restructuring.[3] As a result, ministry remediation orders generally have no priority during bankruptcy proceedings, and will be treated as a regular, unsecured claim among all the other financial claims on the insolvent company's limited remaining funds.

Ontario's Financial Assurance Framework

The requirement that proponents provide upfront assurance that they can, and will, cover the costs of preventing and/or addressing future environmental damage helps ensure that adequate funds will be reliably and readily available if needed. As a result, financial assurance, such as cash, letters of credit, securities, etc., provides an important safeguard that future environmental liabilities will be addressed and paid for by the polluter.

With a few exceptions (e.g., mineral exploration and production under the *Mining Act*, and oil and gas well operations under the *Oil, Gas and Salt Resources Act*), environmental financial assurance is generally administered by the MOECC under the *Environmental Protection Act* (*EPA*).[4]

Environmental financial assurance is mandatory under the *EPA* only from the owners, operators and proponents of the following types of sites and activities:

- certain private-sector landfills created or expanded after August 1, 1998;
- mobile facilities that destroy PCBs; and
- certain types of anaerobic digestion and thermal treatment (e.g., waste incineration) facilities.

The *EPA* also gives the MOECC the discretion and general authority to require financial assurance in a number of situations through an order or as a condition in an approval. The specific amount required is determined on a case-by-case basis. The MOECC's *Financial Assurance Guideline* (Guideline F-15) provides guidance to help ministry staff administer financial assurance and help regulated parties comply with requirements.

Despite these requirements and guidance, several problems have been identified with the MOECC's implementation of the *EPA*'s financial assurance framework over the years.

Financial Assurance is not Required for Many Activities

As mentioned above, financial assurance is mandatory under the *EPA* for only a few types of sites and industrial sectors. The Drummond Commission observed that this subset of activities represents "a small portion of the overall risk exposure" and that "the existing legislation does not provide an effective policy framework for a robust [financial assurance] program covering all relevant industrial

[3] *Newfoundland and Labrador v. AbitibiBowater Inc.*, 2012 SCC 67 (CanLII).
[4] Although Ontario's aggregate and forestry sectors must pay into trusts to help cover the costs of rehabilitating abandoned sites in the province, aggregate and forestry companies do not provide financial assurance to cover the direct costs of rehabilitating their own sites.

sectors."[5] For many activities regulated under the *EPA*, financial assurance is only required if requested by an MOECC Director.[6]

For several sites and activities, Directors seem to rarely use their discretion to require financial assurance. For example: waste management systems, which include systems that collect and transport hazardous waste, asbestos waste, and liquid industrial waste, have the potential to contaminate soil and water through accidental spills. Of the 270 Environmental Compliance Approvals the MOECC issued for waste management systems between November 2011[7] and April 2015, only 14 of them (5 per cent) included a requirement to submit financial assurance.

Likewise, industrial and private sewage works, which include sewage and stormwater treatment systems for industrial facilities, quarries, campgrounds and other businesses, have the potential to release sewage or contaminated water into the environment if abandoned or operated inadequately. Of 133 approvals issued for industrial and private sewage works that the MOECC posted on the Environmental Registry during the past 6 years[8], none required financial assurance (although, the MOECC amended 3 approvals during this time to subsequently require financial assurance).

Furthermore, brownfield properties are abandoned, idle or underused lands that are difficult to develop because of real or perceived environmental contamination. For brownfields that fail to meet the *EPA*'s soil contamination standards, the MOECC can issue a Certificate of Property Use (CPU), which may require risk management measures, monitoring, reporting and restrictions on property use to prevent environmental harm. Of the 200 CPUs found on the Environmental Registry at the time of writing, only 40 of them (20 per cent) required financial assurance to cover the costs of specified measures.

Renewable energy projects (e.g., wind, solar and biogas facilities), and their associated equipment (e.g., transformers, spill-containment systems, underground cabling and access roads), can also have lasting environmental impacts if abandoned at the end of their useful life. Accordingly, proponents of these projects are required to prepare a Decommissioning Plan Report that describes: procedures for dismantling or demolishing the facility; restoration activities; and measures for managing excess materials and waste. Of the 171 renewable energy approvals the MOECC issued between November 2010 and February 2015, discretion was used to require financial assurance for only 4 projects. Even then, the financial assurance requirement was included in the approval not to ensure adequate site decommissioning and remediation, but to ensure that nearby weather radar stations continue to provide accurate and reliable forecasts.[9]

The Auditor General of Ontario reviewed the MOECC's hazardous waste management program in 2007; of the approvals reviewed, only 60 per cent of hazardous waste management receivers and carriers were required to provide financial assurance. In response to this audit, the ministry reported that it had started requiring every hazardous waste receiver to provide financial assurance and every hazardous waste carrier to hold $1 million in liability insurance. The ECO notes, however, that requiring

[5] Commission on the Reform of Ontario's Public Services (2012). *Public Services for Ontarians: A Path to Sustainability and Excellence*, page 342.
[6] Under section 132 of the *Environmental Protection Act*, a Director may include in an order or approval (e.g., Environmental Compliance Approval, renewable energy approval, certificate of property use, Permit to Take Water, etc.) a requirement to provide financial assurance.
[7] Between November 1, 2011 and April 24, 2015.
[8] Between January 1, 2009 and March 12, 2015.
[9] Renewable Energy Approvals #8443-9BMG23, #5855-9HHGQR, #5186-9HBJXR and #0558-9GUJ8T.

a waste carrier to have liability insurance for a vehicle is not the same thing as requiring financial assurance to ensure that the costs of environmental clean-up will be covered.[10]

Required Financial Assurance is not Always Promptly Provided

Even when financial assurance is required of a proponent (either by law, as a condition of an approval, or through a Director's order), it is not always promptly provided.

In 2007, the Auditor General sampled the applications of hazardous waste receivers and carriers who had been required to provide financial assurance to the MOECC. Of these, the Auditor General found that only 30 per cent had provided financial assurance by the required date, while $3.4 million in financial assurance was outstanding for more than 6 months from 24 approval holders. Similarly, in 2010, the Auditor General reported that $20 million in financial assurance was outstanding for non-hazardous waste management sites, facilities and systems.

To address the issue of overdue and uncollected financial assurance, the ministry enhanced its computer system in 2009 to automatically track when financial assurance is overdue. Shortly after, the MOECC also began producing monthly reports on outstanding financial matters to ensure that field staff are following up with approval holders. These measures have reportedly improved the MOECC's ability to monitor and collect outstanding financial assurance; since the introduction of the automated tracker, the ministry's financial assurance balance has reportedly increased from $181 to $418 million.

Despite these improvements, it can still take years for the MOECC to secure requested financial assurance. As of March 31, 2015, 91 companies owed the ministry a total of more than approximately $15 million in overdue financial assurance. For example, the owner of one waste disposal site has owed $1 million in financial assurance for three years, and another has owed approximately $743,000 for nine years – and yet they have continued to operate.

Furthermore, in several instances, despite the ministry *proposing* to require financial assurance, the ministry has failed or been slow to follow through. Over the span of a decade, the MOECC has proposed – but seemingly refrained from – requesting the accumulated total of more than $6.3 million in financial assurance to conduct remedial or preventative work,[11] including financial assurance for: assessing the risk of chlorinated volatile organic compound contamination in soil and groundwater; implementing risk management measures (e.g., groundwater monitoring); and capping mercury- and PCB-contaminated sediments. For an example of the ministry's delay requesting and obtaining financial assurance for an unapproved landfill site, see Section 1.2.1 of this Supplement.

Financial Assurance Doesn't Always Fully Cover Costs

Even when financial assurance is secured, the amount does not always fully cover the costs of rehabilitation. This can occur for several reasons.

First, financial assurance estimates are initially calculated by proponents, and the *EPA* does not require that this calculation cover the entire cost of cleaning up a site and undertaking necessary

[10] See *Detox Environmental Ltd. v. Director, Ministry of the Environment* (Environmental Review Tribunal, Case No. 08-155), pages 9, 15 and 16.
[11] See: Environmental Registry #010-9870, #010-9145, #IA03E0208 and #IA01E1375.

environmental measures. Second, as acknowledged by the MOECC, "because the financial assurance supplied is based on estimates and not every eventuality can be anticipated, the calculated sum may not be adequate to cover the actual cost of a clean-up at the time a facility is closed."[12] By way of example, although the ministry accepted $3.4 million in financial assurance in 2004 to clean up harmful chemical by-products manufactured by General Chemical Canada at its Amherstburg facility, final clean-up costs were as high as $64 million.

In its 2007 audit of the MOECC's hazardous waste management program, the Auditor General found no process for regularly reassessing the amount of financial assurance required from a given proponent. In response, in 2008 and 2009 the ministry: developed guidance for calculating more accurate financial assurance amounts; reviewed the approvals of every hazardous waste receiver to assess the adequacy of financial assurance; required that the financial assurance for all privately owned hazardous waste sites be reassessed annually; and applied its automated financial assurance tracker to non-hazardous waste approvals.

Despite these significant improvements, there are still some gaps in the MOECC's regulatory and policy framework for ensuring that adequate financial assurance is secured. For example, although $100,000 has been repeatedly proven to be insufficient to cover the costs of cleaning up PCB spills,[13] the MOECC continues to require PCB haulers to provide just this amount in financial assurance. What's more, although the ministry proposed changes in 2010 that would have made it easier for the MOECC to hold parent companies responsible for clean-up and costs where financial assurance is absent or inadequate,[14] it has not pursued these proposed changes to date. And despite the ministry's automatic tracker allowing the MOECC to better monitor when financial assurance needs to be re-evaluated, as of January 2015, re-evaluations were overdue for at least 21 approvals – one for over a decade.

ECO Comment

The Drummond Commission recommended that the government emphasize the polluter pays principle and use financial assurance in order to protect the province against financial liabilities. From the ECO's perspective, financial assurance more importantly protects the province against environmental risks, especially since many abandoned sites are not promptly rehabilitated by the government. Obtaining upfront assurance that potential environmental damage will be rehabilitated minimizes threats to wildlife, water, air and human health. In addition, making polluters pay creates an incentive to reduce pollution and minimize environmental harm.

The MOECC has some financial assurance requirements in place, and its financial assurance framework has been strengthened in some ways in recent years. Still, there are many activities and sites for which the government requires no financial assurance. Moreover, even when required, adequate financial assurance is not always promptly collected, putting the government and the public at risk of environmental and financial liabilities.

[12] Ontario Ministry of the Environment (2010). *Modernization of Approvals: Proposed Legislative Framework for Modernizing Environmental Approvals*, page 21.
[13] As testified by an MOECC staff member in *Detox Environmental Ltd. v. Director, Ministry of the Environment*, the financial assurance provided was insufficient in the approximately 15 times that it was needed for clean-up. See: *Detox Environmental Ltd. v. Director, Ministry of the Environment* (Environmental Review Tribunal, Case No. 08-155), page 11.
[14] Ontario Ministry of the Environment (2010). *Modernization of Approvals: Proposed Legislative Framework for Modernizing Environmental Approvals*, page 21.

The MOECC is undertaking an internal, comprehensive review of its financial assurance program in support of its overall objective of minimizing liability and strengthening the polluter pays principle. The MOECC states that the review will examine enhancements to the existing program framework and alternative ways of delivering the financial assurance program. According to the ministry, the first phase of the review has identified recommendations related to: mandatory versus discretionary financial assurance; the methodology for determining the sufficiency of financial assurance; different forms of financial assurance; and the expansion of financial assurance to sites and facilities not currently covered by legislative instruments. The ECO is optimistic about the MOECC's review, and encourages the ministry to consult the public and stakeholders on changes to improve the coverage and effectiveness of its financial assurance program.

4.2 Systemic Insecticides: A Primer

Introduction

Neonicotinoid pesticides, often called "neonics," have received a lot of attention over the past few years. There are concerns that their use has contributed to the greatly increased mortality of honey bees managed by beekeepers, both in Ontario and worldwide. In agriculture, neonicotinoids are used to protect crops against destructive insects, and are applied as a coating on seeds, as a liquid sprayed on plants or soil, or as granules spread on soil. Neonicotinoids also have a range of uses beyond agriculture, including: bait for domestic pests (e.g., roaches and ants); timber injections to control termites; tree injections to protect against herbivorous insects; and topical applications on pets to control parasites.

The ECO reported on neonicotinoids and the threat they pose to pollinators in Part 2.2 of our 2013/14 Annual Report. However, as important as honey bees may be, this issue may have much broader implications. Scientific evidence is mounting that neonicotinoid pesticides, as a group, are affecting many other species in many types of ecosystems.[1]

The Nature of Neonicotinoids

The family of neonicotinoid insecticides share several important characteristics. The key similarity is that once absorbed (usually through the roots), they spread throughout the entire plant, a characteristic that puts them in a technical category known as "systemic pesticides." Other similarities among the neonicotinoids include: moderate to high solubility in water; high levels of invertebrate neurotoxicity; and persistence in soil and in plant tissues. The combination of these four characteristics makes these chemicals extremely effective in controlling insect pests.

The environmental concerns with neonicotinoid pesticides arise from these same characteristics. Their neurotoxicity is not limited to agricultural pests; they affect many invertebrates and, to a lesser degree, some fish and mammals. Moreover, their solubility makes them very mobile in ecosystems and their persistence allows them to accumulate in non-target plants, soils and water. Growing scientific research has shown that these mobile, persistent and toxic chemicals may be affecting ecosystems by reducing populations of many non-target species.

A number of earlier non-systemic pesticides (such as DDT, chlordane, and other organochlorines) were lipophilic (i.e., they are attracted to and dissolve in fats) and tended to accumulate in the bodies of predators, such as birds that ate contaminated insects. The impacts of these bioaccumulations were magnified at the top of the food chain, causing major environmental problems that led to bans and restrictions on their use. Because neonicotinoid pesticides are hydrophilic (i.e., they are attracted to and dissolve in water), they have low potential for bioaccumulation. Until recently, the hydrophilic trait has been considered one of their major advantages.

[1] For a good summary of the scientific literature on this subject, see the reports published in 2014 by the Task Force on Systemic Pesticides, which are compiled in: Bijleveld van Lexmond, M. et al. (editors), (2015). *Environmental Science and Pollution Research: Worldwide Integrated Assessment of the Impacts of Systemic Pesticides on Biodiversity and Ecosystems* 22(1). The Task Force's reports provide much of the supporting documentation for this article.

The first classes of insecticides that included systemic products, organophosphates and carbamates, were introduced in the 1950s and 1960s, respectively. Although these chemicals are still used worldwide, they have increasingly been supplanted by neonicotinoids. Imidacloprid, the first neonicotinoid, was introduced to the marketplace in the early 1990s. Seven neonicotinoid compounds are currently available on the global market and most, but not all, are registered in Canada.[2] Registered products of environmental concern include thiamethoxam and clothianidin. The wide range of uses for these products, combined with their reduced toxicity to mammals and the developing resistance of insect pests to the earlier systemic insecticides, resulted in the neonicotinoids' rapid growth in market share; they are now the most widely used insecticides in the world.

Exposure Routes

There are four common environmental pathways travelled by neonicotinoid pesticides (see Figure 1).

Air: Dust from Planting Equipment

The dust generated during the planting of neonicotinoid-treated seeds may contain high concentrations of pesticides, enough to kill some insects directly via contact during flight. To date, this exposure route has received the most attention, specifically in relation to its potential impact on bees. For example, one study showed that honeybees can collect up to 60 times the lethal dose of pesticide residues on their bodies from foraging flights during seed-planting.[3] In addition, the contaminated dust eventually settles out on various surfaces and is then washed into soil or surface water. The significance of the planting dust exposure route to other pollinators and non-target invertebrates has not yet been adequately studied.

Soil: High Inputs, Slow Degradation

The bulk of neonicotinoid insecticide applied to seeds is not taken up by the crop and remains in the soil (80 to 98 per cent). Eventually these residues degrade into less harmful constituents, but studies show that this process can take years.[4] During this time, soil organisms, such as microbes, micro-arthropods and worms, may be exposed to levels that can have negative impacts.

Water: Groundwater and Surface Water

Although neonicotinoids may bind to some extent to soil particles, the combination of their solubility and persistence means that that the majority of soil residues eventually leach into surface water or groundwater. Residues can also reach water via accidental spillage, overspray, spray drift and run-off

[2] Of the seven neonicotinoid insecticides, five are included in products registered in Canada (imidacloprid, thiamethoxam, acetamiprid, clothianidin and thiacloprid), one is in various products with federal registration pending as of July 2015 (dinotefuran), and one is not in any currently registered products (nitenpyram). Two systemic pesticides with different chemical bases but similar modes of action are also available in the international marketplace: fipronil was introduced in 1993, but is not included in any products currently registered for use in Canada; alternatively, several products containing sulfoxaflor were registered in Canada in July, 2014. See: Health Canada website (accessed April 28, 2015). *Pesticide Product Information Database*, http://pr-rp.hc-sc.gc.ca/pi-ip/index-eng.php; and Ontario Ministry of the Environment and Climate Change website (accessed April 28, 2015). *Pesticides Classification Database*. https://www.lrcsde.lrc.gov.on.ca/PCDWeb/home.action.

[3] Tapparo, A. et al. (2012). Assessment of the Environmental Exposure of Honeybees to Particulate Matter Containing Neonicotinoid Insecticides Coming from Corn Coated Seeds. *Environmental Science and Technology* 46(5): 2592-2599.

[4] Bonmatin, J.M. et al. (2005). Behaviour of Imidacloprid in Fields. Toxicity for Honeybees, in *Green Chemistry and Pollutants in Ecosystems*. Edited by E. Lichtfouse et al. (Germany: Springer-Verlag Berlin Heidelberg), pages 483-494.

from lawns and golf courses. A study of 136 Saskatchewan wetlands, conducted from 2012 to 2013, showed measureable concentrations of neonicotinoids in the majority of water samples,[5] suggesting that these chemicals are both persistent and mobile in ecosystems.

Plants: Target and Non-Target Vegetation

Once taken up by a target plant (the crop), the desired protection from pests is achieved. The plant retains the pesticide in its sap, usually in concentrations of about 5 to 10 parts per billion (ppb), as well as in its leaves, flowers, pollen and nectar. These small concentrations are sufficient to protect crops from agricultural pests; however, the crop is also an exposure route for any other organism that ingests any part of a treated plant.

Because these pesticides are mobile in the environment, (i.e., via dust from planting, leaching from soil into water, etc.), they may also be taken up by local, non-target plants. This could result in further exposure to pollinators, as well as to other insects. One study found that dandelions at the edges of farm fields had levels (9 ppb) similar to those found in treated crops.[6] However, data on uptake by non-target plants is scarce and an assessment of the ongoing impact of this exposure route is not yet available.

[5] Main, A.R. et al. (2014). Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region. *PLOS One* 9(3): e92821.
[6] Krupke, C.H. et al. (2012). Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields. *PLOS One* 7(1): e29268.

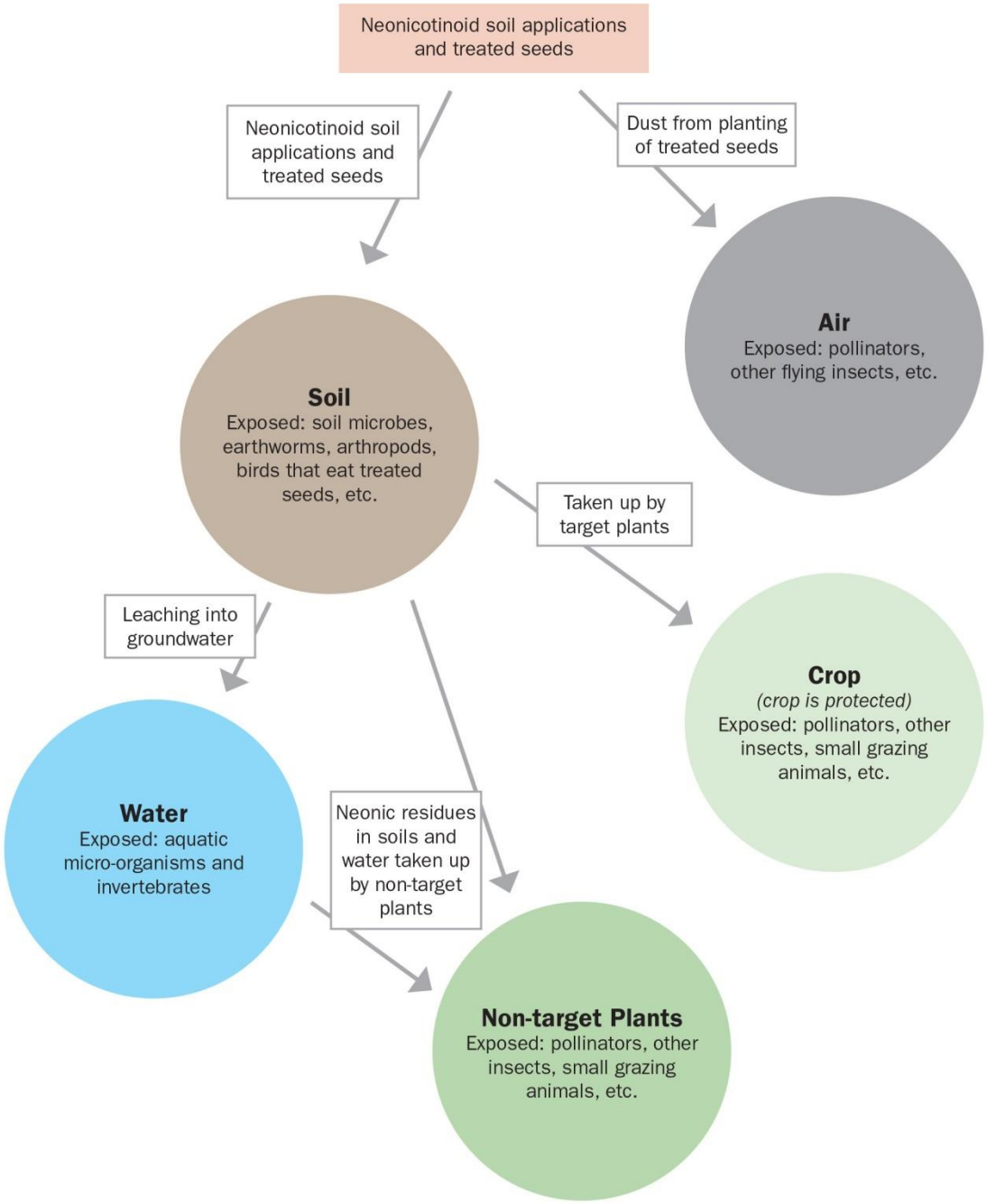


Figure 1. Exposure routes for non-target organisms. The box at the top represents the main sources of neonicotinoids: soil applications and treated seeds. These types of applications comprise 60 per cent of the use of neonicotinoid pesticides worldwide.

Effects on Non-Target Organisms

The effects of neonicotinoid pesticides on life forms can be described as direct or indirect, and the former as either lethal or sub-lethal. Direct effects are a result of exposure to a chemical, and can include death, reproductive effects, behavioural changes (e.g., impaired foraging ability), and compromised immunity. Indirect effects occur through a series of two or more steps; for instance, a pesticide may reduce or eliminate the main food source of an organism, resulting in starvation or weakened survival ability.

Acute lethal effects result in death within a relatively short period of time, such as hours or days. Risk assessments (a common tool for regulatory approval) usually measure the "LD50" of a toxic agent, which is the lethal dose that will kill 50 per cent of the population of a specific organism within a specified time (for example, the time period used for terrestrial vertebrates is 96 hours). Sub-lethal (chronic) effects, which are harder to identify, do not result in death in the short term, but can result in mortality over longer periods by impairing vital functions. These effects include lowered immunity (allowing diseases to increase in both frequency and severity) or altered behaviour (such as when bees lose their ability to navigate).

Toxicity is a measure of the degree to which a substance is harmful to an organism. Neonicotinoids are extremely toxic to invertebrates, with fairly low-level exposures (5 to 10 ppb in plant sap) resulting in quick death. Until recently, however, it was assumed that lower concentrations, typical of those found in the general environment, were not toxic. A growing body of evidence now suggests that neonicotinoids are toxic at very low doses: sub-lethal effects have been identified for a variety of organisms at low, field-realistic levels of exposure.

In addition, some scientists have found that, contrary to expectations, the relationship between the concentration of neonicotinoids and the amount of exposure time required to achieve a lethal dose is not strictly linear; this means that less time is required to produce a lethal dose at very small exposures than would be expected if the relationship were linear. As such, chronic exposure to very low levels of neonicotinoids could be much more dangerous than previously believed.[7] Further, the toxic effects of neonicotinoids, particularly on arthropods (e.g., insects, spiders, crustaceans), are both irreversible and cumulative, amplifying the risk.

Effects on Soil Organisms

Soil organisms, which range from micro-organisms (such as bacteria and fungi) to larger invertebrates (such as arthropods and earthworms), are crucial to a wide range of ecosystem services. The evidence to date shows that neonicotinoids, at the levels commonly found in agricultural soils (e.g., areas of intensive corn and soy bean cultivation), affect many soil organisms. These effects range from reduced feeding behaviour to mortality. Of greatest concern at this time is the potential impact of neonicotinoids on soil invertebrates, including beetles, ants and earthworms. Exposed beetles exhibit abnormal behaviour that increases their vulnerability to predators, while earthworms are highly

[7] Tennekes, H.A. and Sanchez-Bayo, F. (2011). Time-Dependent Toxicity of Neonicotinoids and Other Toxicants: Implications for a New Approach to Risk Assessment. *Journal of Environmental & Analytical Toxicology* S4.

susceptible to a reduction in reproductive success when exposed to low concentrations of neonicotinoids in the soil.[8]

Effects on Aquatic Invertebrates

Aquatic invertebrates, such as freshwater snails, appear to be vulnerable to both low-level long-term and high-level short-term exposures to neonicotinoids. The major sub-lethal impacts identified to date are reduced feeding behaviour[9] and impaired growth and mobility.[10] This may be causing a population decline for these organisms in some ecosystems; a study in the Netherlands found a significant negative relationship between invertebrate abundance and imidacloprid concentrations in surface waters. Another review looked at data from 29 studies and the exposure levels in surface waters in nine countries and concluded that typical neonicotinoid concentrations in surface waters worldwide are "well within the range where both short- and long-term impacts on aquatic invertebrates are possible over broad spatial scales."[11]

Effects on Pollinators

Pollinators are highly vulnerable to neonicotinoid residues. Studies on honey bees, for instance, have shown that exposure to neonicotinoids can have an array of negative effects, including: impaired memory and brain metabolism;[12] weakened immunity;[13] and impaired orientation.[14] The neonicotinoids' impact on wild bees has also been studied, showing similar results. For example, colonies of bumble bees exposed to field-realistic levels of neonicotinoids produced 85 per cent fewer queens than controls.[15] In another study, similar levels of exposure reduced brood production by one-third.[16] Finally, red mason bees exposed to sub-lethal levels of neonicotinoids experienced an almost 50 per cent reduction in offspring and a male-biased offspring sex ratio.[17]

[8] Neonics are more toxic to earthworms than almost all other insecticides. See: Wang, Y. et al. (2012). Comparative Acute Toxicity of Twenty-Four Insecticides to Earthworm, *Eisenia fetida*. *Ecotoxicology and Environmental Safety* 79: 122-128.
[9] Alexander, A.C. et al. (2007). Effects of Insecticide Exposure on Feeding Inhibition in Mayflies and Oligochaetes. *Environmental Toxicology and Chemistry* 26(8): 1726-1732.
[10] For a specific example, see: Sardo, A.M. and Soares, A.M.V.M. (2010). Assessment of the Effects of the Pesticide Imidacloprid on the Behaviour of the Aquatic Oligochaete *Lumbriculus variegatus*. *Archives of Environmental Contamination and Toxicology* 58: 648-656.
[11] Morrissey, C.A. et al. (2015). Neonicotinoid Contamination of Global Surface Waters and Associated Risk to Aquatic Invertebrates: A Review. *Environment International* 74: 291-303.
[12] Yang, E. et al. (2012). Impaired Olfactory Associative Behavior of Honeybee Workers Due to Contamination of Imidacloprid in the Larval Stage. *PLOS One* 7(11): e49472.
[13] Alaux, C. et al. (2010). Interactions Between *Nosema* Microspores and a Neonicotinoid Weaken Honeybees (*Apis mellifera*). *Environmental Microbiology* 12(3): 774-782.
[14] Henry, M. et al. (2012). A Common Pesticide Decreases Foraging Success and Survival in Honey Bees. *Science* 336(6079): 348-350.
[15] Whitehorn, P.R. et al. (2012). Neonicotinoid Pesticide Reduces Bumble Bee Colony Growth and Queen Production. *Science* 336(6079): 351.
[16] Laycock, I. et al. (2012). Effects of Imidacloprid, a Neonicotinoid Pesticide, on Reproduction in Worker Bumble Bees (*Bombus terrestris*). *Ecotoxicology* 21(7): 1937-1945.
[17] Sandrock, C. et al. (2014). Sublethal Neonicotinoid Insecticide Exposure Reduces Solitary Bee Reproductive Success. *Agriculutral and Forest Entomology* 16(2): 119-128.

Effects on Vertebrates

Birds, reptiles, fish, amphibians and mammals are generally less vulnerable to the direct impacts of neonicotinoids than are invertebrates. However, toxicity to vertebrates varies widely between the different pesticides.[18] For instance, imidacloprid has been classified as highly toxic to a particular quail species, while clothianidin is classified as only moderately toxic to that species. Toxicity for the same pesticide also varies between species: imidacloprid is classified as practically non-toxic toxic to the American toad or bluegill sunfish, for instance, but is considered moderately toxic to rainbow trout and highly toxic to the grey partridge.[19]

Imidacloprid is highly toxic to many species of birds and a single treated corn seed can provide a lethal dose; in the case of clothianidin or thiamethoxam, a few seeds are needed to produce a lethal effect. Although the potential also exists for vertebrates to be affected sub-lethally through chronic exposure, this possibility has not yet been sufficiently studied.

Finally, indirect impacts on vertebrate populations may arise, most notably through depletion of food sources. A 2014 study from the Netherlands showed that bird populations in that country vary according to the level of imidacloprid in local surface waters. Insectivorous bird populations drop by 3.5 per cent annually in areas where the concentration of that pesticide in surface waters exceeds 0.02 ppb.[20] Although such studies only show associations and do not prove causation, when combined with current knowledge of the potential mechanisms involved (as described above), they provide strong evidence of significant indirect effects.

ECO Comment

The evidence that neonicotinoids have the potential for disrupting food webs is compelling. Adverse effects have been identified for a wide variety of organisms, all of which play important ecological roles. For instance, micro-arthropods break down organic residues and recycle the nutrients in fresh water ecosystems, ensuring clean water as well as feeding aquatic plants. Earthworms play a vital role in soil ecosystems: they aerate, contribute to good soil structure and stability, and break down organic residuals to release nutrients for plants. Similarly, pollinators are key members of the terrestrial ecosystems that provide us with food, fuel and fibre. All of these creatures are also food sources for fish, birds and other higher-trophic-level organisms. The impacts of neonicotinoids and similar insecticides could have cascading impacts on food webs and ultimately, on their vital ecosystem functions.

A growing body of research shows that neonicotinoids pose a significant risk for pollinators and other invertebrates; they may also pose a direct risk for birds and other vertebrates. In addition, the potential exists for indirect effects resulting from food-chain impacts and possible ecosystem imbalances. Some scientists have raised concerns about possible connections between neonicotinoid use and observed

[18] See Table 5.3 in: Mineau, P. and Palmer, C. (2013). *The Impact of the Nation's Most Widely Used Insecticides on Birds.* Prepared for the American Bird Conservancy, page 31.
[19] See Table 1 in: Gibbons, D. et al. (2014). A Review of the Direct and Indirect Effects of Neonicotinoids and Fipronil on Vertebrate Wildlife. *Environmental Science and Pollution Research* 22(1): 103-118, page 106.
[20] Hallman et al. (2014). Declines in Insectivorous Birds are Associated with High Neonicotinoid Concentrations. *Nature* 511: 341-343, page 341. The study found that bird populations tended to decline at imidacloprid concentrations of more than 20 nanograms per litre, which converts to 0.02 ppb.

decreases in various wildlife populations, suggesting that immune suppression by neonicotinoids may be a significant contributing factor.

The ECO believes that the many gaps in knowledge that still exist on this subject need to be addressed promptly. Ontario has committed to both reduce threats to biodiversity and improve knowledge about biodiversity. Given that commitment, the ECO encourages MOECC to fund independent research examining neonicotinoids, and their effects on food chains and ecosystems from an Ontario perspective.

The ECO is pleased that the Ministry of Environment and Climate Change is beginning a multimedia monitoring study in 2015 to benchmark neonicotinoid concentrations in the environment. The ECO had recommended such monitoring of soil, waterways and wild plants in our 2013/2014 Annual Report. Reporting those monitoring results on an annual basis will be important in keeping the public informed about concentration trends over time and regional exposure patterns.

4.3 A Problem Too Big to Ignore: Microplastics in the Great Lakes

Many of the comforts and advantages of contemporary life are made possible through the use of plastics. Most Ontarians use countless plastic items every day, affecting almost every aspect of their lives. Encompassing a large family of synthetic and semi-synthetic materials, plastic is cheap, malleable and relatively durable. Consequently, it is a popular material choice for not only clothes, electronics, toys, furniture and personal items, but also many intentionally disposable products, such as packaging, drink bottles and take-out containers.

The pervasiveness of plastic has led to an abundance of discarded plastic products throughout the natural world, particularly in aquatic environments. Although it is impossible to reliably estimate the exact amount of plastic in the world's waterways, the problem is extremely widespread with plastic debris reaching the most remote corners of the planet, from the polar regions to the equator.[21]

Much research on plastic pollution in marine environments has explored the environmental effects of microplastics, a term generally applied to particles 5 millimetres or less in diameter.[22] Notable sources of microplastic include:

- microbeads used in personal care products, such as exfoliants in body washes and smoothing agents that give creams and other products a silky texture;
- "scrubbers" in air-blasting formulations (i.e., the hard plastic abrasives blasted against a surface to clean it or remove paint or finish);
- resin pellets used in industrial facilities, where they would be reformed into specific products, such as bottles, bags or toys;
- plastic fibres shed from synthetic (e.g., polyester) fabrics; and
- fragments resulting from the breakdown of larger plastic items (often called "secondary microplastics").

In addition to continuing work on marine environments, scientists have recently started researching the prevalence of microplastics in freshwater ecosystems.

Microplastics in the Great Lakes

Freshwater microplastic research in North America to date has focused almost exclusively on the Great Lakes. Though limited in number, these studies confirm that plastic is commonly found in the lakes and along their shorelines. For example, shoreline surveys conducted by university researchers, which count and categorize plastic found along beaches, identified thousands of plastic particles within a

[21] The difficulty in evaluating the amount of aquatic plastic pollution has not stopped scientists from attempting to provide such an estimate. One recent analysis, for example, estimated that there are 5.25 trillion particles of floating plastic in the world's oceans, weighing a total of 268,940 tons. See: Eriksen, M. et al. (2014). Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea. *PLOS ONE* 9(12): e111913. For more on the issue of marine plastic pollution generally, see: United Nations Environment Program (2005). *Marine Litter: An Analytical Overview*; and National Research Council of the National Academies (2009). *Tackling Marine Debris in the 21st Century*.

[22] There is no universally accepted definition for microplastics, but 5 millimetres is a common threshold used by many including the U.S. National Oceanic and Atmospheric Administration. See, National Oceanic and Atmospheric Administration website (accessed November 28, 2014). *Marine Debris FAQ: What are microplastics?*. http://marinedebris.noaa.gov/learn-basics/types-and-sources.

beach area of only 85 square metres on Lake Huron.[23] Similarly, surface water surveys in Lakes Superior, Huron and Erie found an average abundance of over 43,000 plastic particles per square kilometre of water (particles/km^2).[24] Lake Erie surveys found dramatically higher particle counts than the average, with one sample amounting to 463,423 particles/km^2 – one of the highest counts reported in the world.

Moreover, all of these surveys found that microplastics accounted for a high percentage of all plastic particles collected. At the high end, the Lake Huron shoreline study found that microplastic pellets accounted for 93 per cent of all plastic particles collected. The researchers noted that these pellets resembled the resin pellets used in industrial applications and theorized that nearby industrial operations were the likely source. In the surface water survey, 81 per cent of all particles collected were less than 1 millimetre in diameter. The researchers speculated that many of these particles were likely microbeads used in personal care products. They also found significant numbers of small fragments resulting from the breakdown of larger plastic items.

Moreover, the Ministry of the Environment and Climate Change (MOECC) has reported that its own surface water surveys have revealed that some areas of Lake Ontario have loads up to 6.7 million particles/km^2.[25] Ministry researchers reportedly found a diverse range of plastic sources, but particularly fragments resulting from the breakdown of larger plastic items.

Growing Concern about the Effects of Microplastic in the Natural Environment

Microplastic pollution in aquatic ecosystems poses several environmental hazards. Of greatest concern is the potential for a range of organisms, including the very small organisms at the base of the food web, to ingest microplastics. Although freshwater-specific research is limited, one study has confirmed that microplastics smaller than 55.5 micrometres are "prone to ingestion by a wide range of freshwater invertebrates originating from different habitats and different functional levels."[26] This is consistent with laboratory research showing that microplastics ranging in size from two micrometres to two millimetres are ingested by a wide range of small marine organisms, such as zooplankton and invertebrates.[27]

Larger animals, such as crustaceans, fish and seabirds, are also known to ingest microplastics, either through direct consumption or as a result of eating smaller organisms that have already consumed microplastic particles; one study found that particles in fish were most often between 1 and 2.79 millimetres in diameter. Some researchers have expressed concern that microbeads and pellets, which come in a range of sizes under five millimetres, resemble fish eggs, which are a food source for

[23] Zbyszewski, M. and Corcoran, P.L. (2011). Distribution and Degradation of Fresh Water Plastic Particles Along the Beaches of Lake Huron, Canada. *Water, Air & Soil Pollution* 220(1-4): 365-372. See also: Zbyszewski, M. et al. (2014). Comparison of the Distribution and Degradation of Plastic Debris along Shorelines of the Great Lakes, North America. *Journal of Great Lakes Research* 40(2): 288-299.
[24] Eriksen, M. et al. (2013). Microplastic Pollution in the Surface Waters of the Laurentian Great Lakes. *Marine Pollution Bulletin* 77(1-2): 177-182.
[25] Ontario Ministry of the Environment and Climate Change (July 17, 2015). Information provided to the ECO.
[26] Imhof, H.K. et al. (2013). Contamination of Beach Sediments of a Subalpine Lake with Microplastic Particles. *Current Biology* 23(19): R867–R868, page R867.
[27] For an overview of some of this research, see Table 1 in: Cole, M. et al. (2011). Microplastics as Contaminants in the Marine Environment: A Review. *Marine Pollution Bulletin* 62(12): 2588-2597, page 2595.

numerous organisms. This similarity may lead many animals to intentionally consume plastic believing it to be food.[28]

Plastic ingestion is dangerous because it can block or hinder the passage of food through the digestive system, or reduce feeding by making the organism feel full. In addition, extremely tiny pieces of plastic (less than 150 micrometres) have been shown to move out of the digestive system into other parts of the body through a process called microplastic translocation.[29] Further study is needed to determine and understand any potential negative consequences of such translocation, for both the organism and for any individual that feeds on it.

Consuming plastic may also introduce toxic compounds into both individual organisms and the food web. Although more research is needed to understand precisely how plastic-related contaminants behave in freshwater (as opposed to marine) environments, it is well established that certain toxics, such as phthalates and bisphenol A, can leach from plastic.[30] According to one study, many common plastic additives "may interfere with biologically important processes, potentially resulting in endocrine disruption, which in turn can impact upon mobility, reproduction and development, and carcinogenesis [i.e., the development of cancer]"[31] when consumed. Microplastics may be particularly potent when it comes to leaching out toxic compounds because of their relatively high surface-area-to-volume ratio.

Plastics may also carry toxics in the form of contaminants that have attached (or "sorbed") onto a plastic particle. Again, because of their high surface-area-to-volume ratio, microplastics may be particularly likely to attract a variety of pollutants commonly found in water, such as aqueous metals, endocrine disrupting chemicals and persistent organic pollutants, such as polychlorinated biphenyls (PCBs). These toxics may then be released inside the organism when a plastic particle is ingested, directly exposing the individual to the pollutant.[32] Persistent organic pollutants can be especially toxic, inducing endocrine disruption, genetic mutations and cancer. Persistent organic pollutants, as well as other toxic materials, can also bioaccumulate, meaning they concentrate within an individual over time. As a result, these toxics may then be transferred, and potentially biomagnified, up the food chain as smaller contaminated organisms are consumed by larger animals, including humans.[33]

[28] Corley, C. (May 21, 2014). Why Those Tiny Microbeads in Soap may Pose Problem for Great Lakes. *National Public Radio Morning Edition*. Accessed November 28, 2014. http://www.npr.org/2014/05/21/313157701/why-those-tiny-microbeads-in-soap-may-pose-problem-for-great-lakes.

[29] Browne, M.A. et al. (2008). Ingested Microscopic Plastic Translocates to the Circulatory System of the Mussel, *Mytilus edulis* (L.). *Environmental Science & Technology* 42(13): 5026–5031.

[30] For a general overview on this topic, see: Thompson, R.C. et al. (2009). Plastics, the Environment and Human Health: Current Consensus and Future Trends. *Philosophical Transactions of the Royal Society B* 364(1526): 2153-2166; and Engler, R.E. (2012). The Complex Interaction between Marine Debris and Toxic Chemicals in the Ocean. *Environmental Science & Technology* 46(22): 12302-12315.

[31] Cole, M. et al. (2011). Microplastics as Contaminants in the Marine Environment: A Review. *Marine Pollution Bulletin* 62(12): 2588-2597, page 2595.

[32] Teuten, E.L. et al. (2009). Transport and Release of Chemicals from Plastics to the Environment and to Wildlife. *Philosophical Transactions of the Royal Society B* 364(1526): 2027-2045.

[33] Rochman, C.M. et al. (2013). Ingested Plastic Transfers Hazardous Chemicals to Fish and Induces Hepatic Stress. *Scientific Reports* 3(3263): DOI: 10.1038/srep03263.

Other environmental risks associated with microplastics include the potential to facilitate the spread of invasive species and pathogens; researchers have observed that certain microorganisms can attach to, and be transported by, microplastic particles to extremely remote locations.[34]

Regulatory Challenges

It is a challenge to address microplastic pollution because of the variety of plastic sources. Different types of plastic reach the aquatic environment through various pathways, meaning that a diversity of strategies are needed to stop plastic pollution at the source. For example, researchers have speculated that resin pellets originating at industrial facilities likely enter waterways after spilling into storm drains during transport and off-loading, or by washing down factory floor drains during clean up. Microbeads from personal care products, however, are designed to wash away with the bathwater, after which they pass through wastewater treatment systems and discharge directly into waterways. In the case of microplastic fragments resulting from the breakdown of larger plastic items, the cause may simply be a failure to properly dispose of litter.

Further challenges arise in the provincial context from the current lack of information; freshwater-specific research has only begun to emerge in the past few years and Ontario-specific data is currently limited to a handful of research undertakings. As a result, much remains to be determined about precise sources and the pathways by which microplastics are deposited into lakes (i.e., where specifically does the plastic originate and how does it travel from there to a lake). Additionally, almost nothing is known about the extent to which Ontario lakes other than the Great Lakes are affected by microplastics. Without such information, it is difficult to know where prevention and clean-up efforts should be focused. More broadly, further research is needed to better understand how toxic compounds associated with microplastics bioaccumulate and biomagnify, so as to better evaluate risks to individual organisms (including humans) and ecosystems.

Finally, like many other environmental problems, such as air pollution and climate change, reducing aquatic plastics depends heavily on interjurisdictional co-operation. Because plastics are highly mobile in aquatic environments, particles can easily travel thousands of kilometres across borders. In the case of the Great Lakes, Ontario shares these waters with several U.S. states, meaning that any solution will require action by national and subnational governments in both countries.

Initiatives to Reduce Microplastic Pollution

The wide variety of sources has not stopped efforts to limit one known form of microplastic pollution; in recent years, international campaigns to remove or ban microplastic beads from personal care products have gained strong momentum. As a result, several large companies, such as Unilever, L'Oréal and Johnson & Johnson, have voluntarily agreed to phase out the use of microplastics in their products, with deadline commitments ranging from 2014 to 2017; Canadian grocery retailer Loblaw has also committed to phasing out the use of microbeads in its in-house products (Life Brand and President's Choice) by 2018.

Furthermore, in July 2015, the federal government announced that it would propose adding microbeads to the list of toxic substances under the *Canadian Environmental Protection Act, 1999* and

[34] Zettler, E.R. et al. (2013). Life in the 'Plastisphere': Microbial Communities on Plastic Marine Debris. *Environmental Science & Technology* 47(13): 7137-7146.

that it was developing associated regulations to prohibit the manufacture, import and sale of products containing microbeads. In addition, a private member's bill was introduced in Ontario's legislature in early 2015 that, if passed, would ban the manufacture and addition of microbeads to products in Ontario.[35] Similarly, several U.S. states bordering the Great Lakes have passed or are considering legislation banning the use of microplastic beads in personal care products.[36]

However, other than the handful of jurisdictions that now regulate microbeads, there are few (if any) laws in the world that specifically address land-based sources of microplastic pollution. Rather, most jurisdictions in Canada and around the world rely on broad-scope anti-littering and pollution-control laws to address sources like resin pellets and wayward garbage. In Ontario, for example, section 14 of the *Environmental Protection Act* prohibits the discharging of any contaminants into the natural environment that may cause adverse effects, such as the impairment of the quality of the natural environment. As such, this prohibition would likely apply to at least some incidents of plastics being released into Ontario's lakes and rivers.

There are also a variety of voluntary guidelines aimed at reducing plastic pollution from various sectors. For example, the American Chemistry Council's *Operation Clean Sweep* is a resin pellet product stewardship program seeking to assist companies to implement good housekeeping and containment practices to keep pellets out of the natural environment.

Continuing Research in Ontario and Beyond:

The Government of Ontario, through the MOECC, is involved in ongoing research initiatives, including projects relating to evaluating plastics in Lake Ontario and wastewater treatment plant discharges.[37] Furthermore, many of the academics responsible for the Great Lakes-specific research discussed above are based in Ontario; some of their ongoing work, such as sediment surveys of Lake Ontario, also involves the governments of both Ontario and Canada.[38]

Other U.S.-based research will undoubtedly assist Ontario scientists in government and academia; these ongoing projects include surface water surveys of Lake Ontario and Lake Michigan and an assessment of discharges from wastewater treatment facilities.[39] In addition, researchers at the University of Michigan are working to establish a "long-term multi-disciplinary research platform to assess the impact of microplastics on Laurentian Great Lakes ecosystem health."[40]

---

[35] Bill 75, Microbead Elimination and Monitoring Act, 2015, was introduced on March 9, 2015.

[36] Illinois was the first state to pass legislation banning microplastic bead-containing products, with the passage of Senate Bill SB2727, amending the *Environmental Protection Act* (see, 415 Illinois Compiled Statutes § 5/52.5, *Environmental Protection Act*). New York (Bill A8744A-2013), Ohio (Senate Bill SB 304), Michigan (House Bill 4994 (2013)) and Wisconsin (2015 Senate Bill 18) have also introduced bills that would ban the use of microbeads, although some of these efforts have stalled over the past year.

[37] Helm, P. (November 4, 2014). *Characterizing Microplastics in and entering Nearshore Areas of Lake Ontario*. Presentation at Toronto Regional Conservation Authority Lake Ontario Evenings: Microplastics Edition, Toronto, Ontario.

[38] Norris, T. and Corcoran, P. (April 10, 2014). *Transport Pathways and Accumulation Rates of Plastic Debris near Humber Bay, Lake Ontario*.Presentation at the 11th Annual Earth Day Colloquium, Western University, London, Ontario.

[39] State University of New York at Fredonia website (accessed November 28, 2014). *Chemistry Department Faculty: Sherri Mason Research.* http://www.fredonia.edu/chemistry/Faculty/Mason.asp.

[40] University of Michigan Water Center website (accessed August 12, 2015). *Microplastics in the Great Lakes: Towards Establishing a Long-Term Multi-Disciplinary Research Platform to Assess the Impact of Microplastics on Laurentian Great Lakes Ecosystem Health*. http://graham.umich.edu/media/files/watercenter-tier2-duhaime.pdf.

ECO Comment

Although the environmental consequences of plastic pollution are wide ranging and largely well known, freshwater microplastic pollution is a less-understood – but growing – concern, particularly in the Great Lakes basin. Recent research suggests that areas of Lake Ontario and Lake Erie contain millions of tiny plastic particles/km^2, and that these particles pose risks to both individual organisms and the entire Great Lakes food web, which includes many Ontarians.

When it comes to actions aimed at systematically stopping the escape of microplastics into waterways, most of the media attention and public campaigning on the issue has focused on banning microbeads in personal care products. While the resulting phase-out of these particles is praiseworthy, this strategy only addresses one source of plastics and will take years to fully implement. Such action is part of the solution, but will not solve the problem.

Consequently, Ontario must do more. It is encouraging that the MOECC is already dedicating resources to ongoing research projects aimed at evaluating the volume and sources of microplastics in the Great Lakes. This work is critical to any future efforts to prevent additional microplastics from entering Ontario's waterways, and the ECO commends the province for being on the forefront of research on this issue. This work should be complemented by additional provincial support for research into the ecosystem-level effects of microplastic pollution, including the biomagnification of toxics throughout the food chain.

Additionally, although Ontario's existing environmental laws generally prohibit polluting the natural environment, they are ineffective unless the source of pollution can be identified – something that is particularly tricky in the case of microplastics. As such, the ECO encourages the MOECC, as it identifies new information about plastic pollution, to readily apply its environmental laws and approvals to fight microplastic pollution at the source. For example, many facilities that use resin pellets likely already operate under an Environmental Compliance Approval, and the terms of such approvals could be amended to require protocols to prevent or minimize the release of pellets into water systems.

It must also be acknowledged that much microplastic pollution results from the breakdown of larger plastic items, many of which are likely improperly discarded garbage. Consequently, it is worth considering how littering laws can be strengthened. This issue was addressed in Section 2.2.12 of the Supplement to our 2012/2013 Annual Report, with a particular focus on the potential role for expanded extended producer responsibility programs.[41] Additionally, the province, along with municipalities, should consider how to improve education and outreach efforts near waterways to reduce littering, as well as possible waste infrastructure improvements – for example, increasing the number of garbage and recycling bins along public and provincial park beaches.

Whatever actions Ontario takes in the coming months and years, provincial research and information on government actions must be shared and discussed with other jurisdictions. This will ensure that all governments with an interest in the Great Lakes have the best available information and can learn from best practices implemented elsewhere. Fortunately, there is already a strong history of collaboration

[41] Extended Producer Responsibility programs are an approach that makes the manufacturers and importers of products (e.g., tires, electronics, paint – or, conceivably, plastics) responsible for collecting and responsibly managing those products when they are discarded.

between the U.S. federal and state governments, Canada and Ontario in the area of Great Lakes management.

Finally, solving this problem will also require Ontarians to act individually. The microplastic problem exists because of the pervasiveness of plastics. While plastics have improved the lives of Ontarians, they also impose an environmental cost. The best way to stem microplastic pollution, like all plastic pollution, is to be more thoughtful about where and when plastic is used and discarded. Fortunately, Ontarians can easily work to minimize the amount of plastic that ends up in the Great Lakes by reducing their use of plastic products, such as disposable plastic packaging. Just as individual microplastic pieces add up to a big environmental concern, these individual efforts, along with the efforts of academics, businesses and government, can come together to play an important role in successfully eliminating this environmental threat.

4.4 Implementation of Ontario's Plan to Conserve Biodiversity

The conservation of biological diversity – the variety of life on earth – is one of the great environmental challenges of our time. Biodiversity is the foundation of invaluable ecosystem services, like producing clean air and water, and it increases resilience in the face of environmental change. Despite the immense ecological, cultural, economic and intrinsic value of biodiversity, many natural areas throughout the province have been lost or degraded (particularly in southern Ontario) and numerous species that were once abundant are in decline, and in some cases at risk of extinction. Globally, species are being lost at an alarming pace – an estimated one thousand times the natural extinction rate.[1] Many complex problems are fuelling the biodiversity crisis, including: habitat loss and degradation; climate change; invasive species and disease; pollution; and overexploitation.

Governments around the world have formally acknowledged the need to take swift and decisive action to protect biodiversity. Canada, along with 195 other countries, is a party to the United Nations *Convention on Biological Diversity*. In 2010, Canada committed to the *Aichi Biodiversity Targets* (the "Aichi Targets"), a series of 20 conservation targets under the Convention. Parties are expected to achieve several of these targets by 2015 and the remainder by 2020. Canada's provinces and territories are largely responsible for fulfilling the nation's obligations under the Convention.

Ontario has an important role to play in the global effort to conserve biodiversity. Ontario stretches from the Great Lakes to the subarctic, encompassing more than a million square kilometres – an area larger than many of the countries that are parties to the Convention. Ontario's Far North region is one of the world's largest intact ecosystems and is home to the southernmost population of polar bears in the world. The more than 250,000 lakes in the province contain approximately a fifth of the fresh water in the world. There are more than 3,000 species of plants, 154 species of fish, 477 species of birds, 53 species of amphibians and reptiles, and 81 species of mammals in Ontario.[2] In other words, there is a lot depending on the actions that the Ontario government takes now to preserve this wealth of biodiversity.

In the ECO's 2012 Special Report *Biodiversity: A Nation's Commitment, an Obligation for Ontario*, we explained the nature of the Government of Ontario's obligations with regard to the Aichi Targets, and called on the provincial government to develop a strategic plan of action to conserve, protect and recover biodiversity. Subsequently, in December 2012, the Ontario government released *Biodiversity: It's in Our Nature – Ontario Government Plan to Conserve Biodiversity, 2012-2020* (the "Plan"). For information on the history of the Ontario government's biodiversity conservation efforts refer to Part 4.1 of our 2012/2013 Annual Report.

The Ontario Government Plan to Conserve Biodiversity

The Plan sets out the general role of 16 government ministries in conserving Ontario's biodiversity. It also commits these ministries to 24 broad actions and 115 specific supporting activities under four themes: engaging people; reducing threats; enhancing resilience; and improving knowledge. For example, under the theme of enhancing resilience, Action 20 is to "protect species diversity" and one of

[1] Pimm, S.L. et al. (2014). The Biodiversity of Species and their Rates of Extinction, Distribution and Protection. *Science* 344(6187): 1246752-1-1246752-10.
[2] Ontario Biodiversity Council (2010). *State of Ontario's Biodiversity 2010*, page 73.

the specific supporting activities for this action is to "enhance tools for the management of harvested species and their habitats." Lead and supporting ministries are specified for each activity.

While some of the actions and activities are specific to the Plan (e.g., reviewing biodiversity indicators and identifying gaps), many simply call for the continued implementation of pre-existing programs, policies, laws, etc. that in some way relate to biodiversity conservation (e.g., Action 10 is to "reduce greenhouse gas emissions," with the implementation of the *Green Energy Act, 2009* identified as one activity).

The vast majority of the actions and activities in the Plan are ongoing (e.g., supporting the Invasive Species Centre, promoting social science research that explores the factors that motivate biodiversity conservation). However, the Plan also includes a small number of discrete tasks, such as: "develop a genetic resource management strategy for wild species;" "review Ontario's wetland conservation policy framework;" and "develop an integrated broad-scale monitoring program for all aspects of Ontario's biodiversity."

The government did not set any timelines or targets for the actions under the Plan, nor is there any commitment or mechanism to assess its effectiveness. In our 2012/2013 Annual Report, we expressed concern about the absence of a co-ordinated approach to monitoring the implementation and completion of responsibilities under the Plan. As such, the ECO committed to requesting regular reports from ministries to account for their priorities and achievements under the Plan. The ECO also recommended that each of the ministries develop its own implementation plan for its assigned activities.

Plan Implementation to Date

In September 2014, the ECO asked all ministries for a report on their progress in addressing their responsibilities under the Plan. The ECO also requested that the ministries provide copies of their own implementation plans.

Ministries provided a general summary of their relevant activities to date and, where requested by the ECO, also described their progress respecting several specific activities.

No Accountability for Plan Implementation

No Implementation Plans:
None of the ministries contacted provided an implementation plan for meeting their responsibilities. Instead, most ministries provided a generic response explaining the purpose of the Plan and implying that the Plan itself was sufficient to guide implementation of required actions. A number of ministries also stated that "through government priority setting, ministries will establish timelines and deliverables for actions and activities," or they simply said that they would incorporate aspects of the Plan into annual work processes. No further information was provided respecting what these "timelines and deliverables" might be or whether they would ever be communicated to the public.

Failure to Acknowledge Government-wide and Supporting Responsibilities:
Many of the Plan actions that are the joint responsibility of all of the ministries have not been addressed. For example, not a single ministry discussed how it would:

- "champion *Ontario's Biodiversity Strategy, 2011* throughout the [Ontario Public Service] and broader society;"
- "explore opportunities to establish an enterprise approach to biodiversity conservation within the [Ontario Public Service];" or
- "promote Ontario's Ecological Footprint as a way of communicating the cumulative impacts of humans on biodiversity."

Additionally, few ministries addressed how they planned to "continue to integrate community knowledge from a diversity of sources to further policy development and management action."

This further highlights the need for ministries to articulate timelines and deliverables. Without clarification from ministries as to what they intend to accomplish under such broadly-framed activities, it is not readily apparent that such activities will make a real contribution to conserving biodiversity, bringing into question their inclusion in the Plan.

Moreover, most ministries appear to be paying little attention to their obligations to implement Plan activities where they have been identified as a "supporting" ministry or where multiple ministries have been assigned responsibility as the lead. For example, the ECO requested that the Ministry of the Environment and Climate Change (MOECC) provide details on its efforts to implement a number of specific actions under the Plan. For seven of these activities, including two for which the MOECC is designated as one of the "lead" ministries, the ministry simply responded that these fall under the mandate of the Ministry of Natural Resources and Forestry (MNRF). This includes a government-wide commitment to "integrate site-and landscape-level biodiversity conservation into existing legislation and policy as opportunities arise." This is something the MNRF cannot do on the MOECC's behalf (for example, by amending the *Environmental Assessment Act* to explicitly address biodiversity in the environmental assessment process).

Likewise, the Ministry of Finance is tasked with supporting 14 activities and co-leading 4 ministry-wide activities. Yet its response was a brief statement saying that the ministry would support the MNRF as the lead agency in three activities (i.e., investigating economic instruments, improving tools for valuing biodiversity, and assessing opportunities to develop a biodiversity conservation market). The Ministry of Finance did not provide any further details on how it intended to "support" the MNRF.

Based on the responses we have received, some ministries may be attempting to shift responsibility for their obligations under the Plan to the MNRF. Other ministries, such as the Ministry of Economic Development, Employment and Infrastructure and the Ministry of Northern Development and Mines, have told us that they do not have an explicit mandate to conserve biodiversity or to regulate activities that directly impact biodiversity. Again, they may be attempting to distance themselves from responsibility for implementing the plan. These responses contradict the spirit and purpose of the Plan, which envisioned "an important and unprecedented statement of partnership and commitment across 16 ministries to work together to conserve Ontario's biodiversity."

The exception to these shortcomings is the Ministry of Tourism, Culture and Sport, which provided the most thorough response of all the ministries. It not only explained the activities it is undertaking in both lead and supporting capacities, but also acknowledged its responsibilities regarding the activities that apply to all ministries.

Progress Relates to Government Core Environmental Priorities

The majority of accomplishments reported by the ministries fall within the Plan's "reduce threats" theme. These generally relate to other program areas that are existing priorities for the Ontario government, namely addressing invasive species, mitigating climate change and reducing pollution. Examples of activities reported by ministries include:

Combating Invasive Species:

- The MNRF has introduced legislation to address the control of invasive species.
- The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) made several amendments to the noxious weed schedule under the *Weed Control Act*. The ministry added several new species (primarily invasive) to the list and removed several species that are no longer considered a serious threat to agriculture and may benefit pollinators and other wildlife (see Section 1.1.2 of this Supplement).
- The MNRF established a DNA monitoring program to better detect the presence of invasive Asian carp in the Great Lakes basin.

Climate Change Mitigation and Adaptation:

- The MOECC and the Ministry of Energy have eliminated the use of coal in electricity generation.
- The MNRF has implemented pilot programs to assess species and ecosystem vulnerability to climate change, including in the Lake Simcoe watershed and Ontario's Clay Belt. The ministry also states that it is currently co-ordinating a Great Lakes basin-wide ecosystem vulnerability assessment.

Pollution Reduction:

- The MOECC and the OMAFRA are proceeding with measures to reduce the use of neonicotinoid pesticides on corn and soy crops (Environmental Registry #012-3068; see also Part 2.2 of our 2013/2014 Annual Report).
- The MOECC and the OMAFRA introduced regulatory amendments to enable the recycling of greenhouse nutrient feedwater, thereby reducing discharge into local streams (see Part 1.2.2 of this Supplement).

Little On-The-Ground Conservation Action

Despite the progress being made in some program areas, ministries reported little direct conservation action, particularly for activities under the Plan's "enhance resilience" theme. Actions completed to address other environmental priorities will in many cases, provide some benefit to biodiversity; yet, real progress towards achieving Ontario's biodiversity goals requires strong actions focused on on-the-ground biodiversity conservation that will achieve direct results.

Conservation efforts must target multiple biological and geographic scales, addressing biological diversity at the landscape, ecosystem, species and genetic levels (see Figure 1). This is necessary in order to successfully protect and restore not just individual species, but also their habitats, the patterns and connectivity of these habitats, and key ecological processes, like water, wildfire and nutrient cycles. Unfortunately, conservation efforts are currently inadequate at each of these levels, as discussed below.

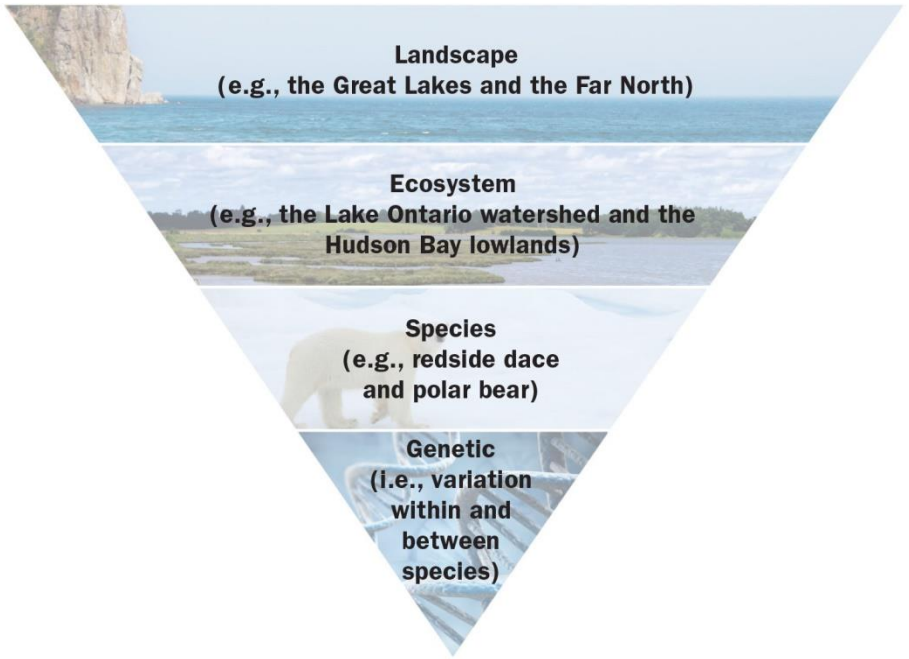


Figure 1. Biological and geographic scales of biodiversity.

Landscape-level Conservation:
Conservation efforts directed at the broader landscape level are important to enable migration and to protect species that are threatened by habitat fragmentation (e.g., species that occur at low densities, have extensive home ranges, are large-bodied, and/or feed at higher levels in the food chain). Protecting natural systems at the landscape level can also support broad-scale ecological patterns and processes. Actions 15 and 16 of the Plan direct ministries to integrate biodiversity into land use and resource management planning, and to promote landscape-level conservation planning.

Provincial land use planning systems (i.e., established under the *Planning Act*, the *Public Lands Act*, the *Far North Act, 2010*, etc.) can be used to conserve biodiversity at the landscape level. They dictate what types of development are appropriate for different areas, and define the areas and natural features that should be protected from development.

As noted by the Ministry of Municipal Affairs and Housing (MMAH) in its response, the newly revised *Provincial Policy Statement, 2014* (PPS) contains several changes that relate to promoting the conservation of biodiversity, as well as a new requirement for municipalities to identify natural heritage systems in southern Ontario. Despite this new language, as discussed in Part 5.2 of our 2013/2014 Annual Report, there is still little actual protection for natural heritage systems and corridors, and "[o]verall, the PPS is wholly inadequate to safeguard natural heritage against the irreparable damage and loss of biodiversity that inevitably accompany development."

The MMAH also states that its 2015 review of the regional land use plans for southern Ontario, including the *Growth Plan for the Greater Golden Horseshoe*, the *Greenbelt Plan*, the *Oak Ridges Moraine Conservation Plan* and the *Niagara Escarpment Plan* "will provide additional opportunities to integrate biodiversity conservation into provincial policy." However, the ministry did not indicate how biodiversity would be considered in its review of those plans.

In its response to the ECO, the MNRF referred to *Taking a Broader Landscape Approach – A Policy Framework for Modernizing Ontario's Approach to Natural Resource Management* as part of its efforts to "integrate site- and landscape-level biodiversity conservation into existing legislation and policy." Applying a landscape approach to natural resources management can have significant benefits for biodiversity, but in the ECO's review of this policy in our 2013/2014 Annual Report (Part 3.1), we stated that "[a]t best, MNR[F]'s Broader Landscape Approach is a meek attempt to re-focus the ministry; at worst, it is a vague and non-committal document that will be used as justification to marginalize the much-needed conservation work that underlies the ministry's core function." It remains to be seen whether the MNRF will implement its new landscape approach in a manner that will tangibly benefit biodiversity.

The MNRF also noted its continued implementation of the Land Stewardship and Habitat Restoration Program in its response. This is a competitive funding program that "supports on-the-ground efforts in habitat enhancement and ecological restoration to advance Ontario's biodiversity conservation objectives at a landscape level" by providing up to $20,000 in matching funds for a project. Many natural areas throughout the province have been degraded by industry, development and pollution, and restoring the ecological health of such areas should play a significant role in conserving biodiversity. However, the program only receives $300,000 per year to fund projects. This is minimal funding given that the costs of ecological restoration are often high; for example, Ducks Unlimited recently estimated the average wetland restoration cost in southern Ontario $27,664 per hectare.[3]

Ecosystem Conservation:
The Plan does not specifically include conserving biodiversity at the ecosystem level as one of its key actions, though it does include several activities that relate to ecosystem and community conservation under Action 14 – expanding the system of protected areas and conservation lands. Action 21 of the Plan also directs ministries to develop and implement tools to maintain and enhance habitats and ecosystem services.

The Ontario government has made an effort to create new protected areas and expand existing areas. For example, in September 2014, the Ministry of Natural Resources and Forestry announced the creation of five new provincial parks (Carden Alvar, Cedar Creek, Clear Creek Forest, Queen Elizabeth The Queen Mother Mnidoo Mnising, and Strawberry Island Provincial Parks) and expansion of three others (Misery Bay, Stoco Fen and Charleston Lake Provincial Parks). However, Aichi Target 11 commits parties to increase protected areas to at least 17 per cent of terrestrial and inland water areas by 2020. Currently, regulated protected areas comprise only 10.2 per cent of the province, and the Ontario government clearly needs to protect more land, more quickly, in order to meet Aichi Target 11.

One of the discrete tasks the MNRF is responsible for under the Plan is to review Ontario's wetland conservation policy framework. Wetland conservation can both enhance habitat and ecosystem

[3] Pattison, J.K. (2011). *A Business Case for Wetland Conservation – The Black River Subwatershed*. Prepared for Ducks Unlimited Canada.

services. However, neither the MNRF, nor the two supporting ministries for this activity (the MMAH and the MOECC) reported any progress on this review; it did note, however, that it was included as a priority in the ministry's 2014 mandate letter from the Premier.

Conservation of Species Diversity:
Action 20 of the Plan addresses species diversity, which is often the primary focus of efforts to conserve biodiversity. To carry out this action, the MNRF commits to "implement the *Endangered Species Act, 2007* while considering ecosystem and multi-species-based plans and stewardship initiatives, where feasible." The OMAFRA, the MOECC, the Ministry of Northern Development and Mines, and the Ministry of Transportation are listed as supporting ministries for this activity. In their responses, several ministries highlighted their specific efforts to comply with the *Endangered Species Act, 2007* (*ESA*) and to undertake related activities to benefit species at risk, for example:

- The Ministry of Northern Development and Mines stated that the rehabilitation of abandoned mines may help protect habitat for endangered species (e.g., bats).
- The MNRF pointed to the continued availability of the Species at Risk Stewardship Fund and the Species at Risk Farm Incentive Program (administered in co-operation with the OMAFRA), which fund practices that are beneficial to species listed under the *ESA*. The MNRF also stated that it is investigating a "market-based exchange to improve species at risk outcomes."
- The Ministry of Transportation stated that it is developing transportation-specific best management practices for the protection of endangered species, and highlighted efforts to mitigate the adverse effects of the Rt. Hon. Herb Gray Parkway project on species at risk. The ministry also noted that it is undertaking measures to reduce wildlife-vehicle collisions, including new mitigation installations (e.g., fencing, crossing structures) and effectiveness monitoring on Highway 69.

These are important actions, but they are tangential to the core protections that the *ESA* is supposed to provide. The ECO has repeatedly warned that the MNRF is failing to implement the *ESA* in a manner that serves to adequately protect and recover species at risk. In 2013, the ECO issued a Special Report titled *Laying Siege to the Last Line of Defence: A Review of Ontario's Weakened Protections for Species at Risk,* after several regulatory amendments were made under the Act. The ECO concluded that "the implementation of this legislation has failed miserably." Part 5 of this Annual Report discusses continuing problems with the implementation of the Act, in the context of recent decisions made by the MNRF respecting government response statements, permitting, and habitat management.

The Plan also directs the MNRF to "continue to enhance tools for the management of harvested species and their habitats." The only relevant activity described by the ministry in this respect was the development of a draft *Ontario Provincial Fish Strategy: Fish for the Future*, the goal of which is to improve the conservation and management of fisheries and the ecosystems that they depend on.

Conservation of Genetic Diversity:
Genetic variation is the foundation of biodiversity; it is critical to a species' reproductive success, resistance to disease and adaptation to environmental change. Accordingly, one of the Plan's key actions is to "promote consideration of genetic diversity in policy development and decision making."

The MNRF is responsible for leading two activities: developing a genetic resource management strategy for wild species; and enhancing partnerships with emerging centres of excellence in the

conservation of genetic diversity. The OMAFRA is responsible for the other activity under this action: continuing to work with the federal government and other partners on issues related to crop and livestock genetic diversity. Neither of these ministries, however, reported progress on these responsibilities.

No Monitoring Program

Collecting baseline information and then ensuring ongoing monitoring for change are essential components of an effective plan to conserve biodiversity. To this end, the Plan commits the MNRF (lead ministry) and the MOECC (supporting ministry) to developing "an integrated, broad-scale monitoring program for all aspects of Ontario's biodiversity." In response to the ECO's request for an update on what the ministry has done in pursuit of this activity, the MNRF stated only that "this activity will require consideration as [the] MNRF continues with its modernization efforts." The MOECC simply said that this activity falls under the MNRF's mandate.

ECO Comment

Biodiversity: It's in Our Nature is the Ontario government's plan for halting the loss of biodiversity in the province. There are now less than five years remaining to implement the Plan and achieve the outstanding Aichi Targets by 2020; however, the Plan's most important actions have yet to be initiated. It appears that the Plan has done little to spur ministries to take effective action to conserve biodiversity and help meet Canada's international commitments. If all government ministries do not fully commit to the goals of the Plan and fulfil their responsibilities, the Plan itself may prove to be little more than a futile exercise in greenwashing.

One of the central challenges in planning to conserve biodiversity is that biodiversity is an inherently broad concept, effectively synonymous with life on earth. Almost any action that benefits the environment will also benefit biodiversity to some degree. But there is a distinction between conservation activities that substantially benefit biodiversity and those that provide mere incidental benefits.

By necessity, the Plan's activities are diverse. For example, ministries have several significant accomplishments, such as introducing invasive species legislation and increasing protected areas. They also reported on a number of more peripheral programs, such as ensuring that farm plastics are recycled, or limiting truck speeds (resulting in modest reductions of greenhouse gas emissions). It is unlikely that the government's focus on peripheral program areas will be sufficient to prevent the loss of biodiversity in Ontario.

On-the-ground conservation action for species and their habitats continues to receive insufficient attention and resources, despite the fact that such action is crucial to safeguarding biodiversity in Ontario. With the 2020 deadline approaching, now is the time to actually do something. The Ontario government must undertake high-impact activities, such as:

- expand Ontario's protected areas system to meet the 17 per cent conservation target;
- require protection of natural heritage systems and corridors;
- provide substantial resources for ecological restoration;
- develop strategies to preserve genetic diversity; and

- undertake broad-scale biodiversity monitoring.

These are complex activities that will require expertise, commitment and adequate financial support; however, the long-term benefits of acting now to avoid the irreversible loss of species in the future will far outweigh the short-term costs.

The development of the Plan was supposed to be a government priority setting exercise, but based on the ministry responses we have received, it was not: the lack of work-planning and transparency demonstrated by ministries is troubling. More than two years into the Plan, ministries across the board have failed to provide implementation plans or establish "timelines and deliverables." Figuring out *who* is taking *what* actions to conserve biodiversity should not be a guessing game for the public.

Ministry responses also revealed that the root problem that the Plan was meant to address remains unresolved: all ministries, not just the MNRF, must play a role in conserving biodiversity. Achieving the Plan's goals (and the Aichi Targets) by 2020 will not happen if the ministries that are responsible for taking action continue to point fingers at one another while doing little or nothing themselves. The Plan, itself, is not overly ambitious, and there is no justification for the apparent reluctance by each ministry to step up and do its assigned part. Given the urgency of biodiversity loss in Ontario, this failure to act brings the government's commitment to this issue into serious question. Halting the loss of biodiversity in Ontario will undoubtedly be difficult, but it can be done – if the Ontario government is willing to move beyond its business as usual approach.

4.5 When Darkness Doesn't Fall: The Ecological Importance of Nighttime Darkness in Ontario

Outdoor nights are often flooded with light – emitted from homes and offices, towers, streetlights, vehicles and myriad other sources. As levels of nighttime illumination continue to grow, the nightscape is gradually being obscured. Stargazers must go to increasingly remote settings to view even a portion of the sky that is not washed out by this "astronomical light pollution."

Artificial light at night does more than just annoy amateur astronomers; it has a powerful effect on the biological world. It can affect animals' physiologies, foraging behaviours and predator-prey relationships, as well as reproduction, communication and navigation. If you have ever watched insects swarming around a street lamp in the evening (making them easy prey for bats and other predators), then you have witnessed one effect of "ecological light pollution" – artificial light that disrupts the natural patterns of light and dark in terrestrial and aquatic ecosystems. Artificial light in the night is believed to have profound and long-term ecological effects, potentially altering the structure and function of ecosystems themselves.

While there has been evidence that artificial night lighting affects individual organisms for decades, the study of the biological and ecological need for periods of natural darkness, known as "scotobiology," is still relatively new. And until fairly recently, the implications of ecological light pollution for conservation have been largely overlooked.

The Disappearing Night: An Ecological Problem

Unlike astronomical light pollution, which refers to light that is directed or reflected towards the sky, ecological light pollution also includes outdoor lighting that is directed downwards or shielded from the sky (in some cases deliberately to reduce astronomical light pollution). Sources can include "sky glow" (see box "Forms of Light Pollution"), as well as lights from buildings and other structures, street lamps, vehicles, boats, lighthouses and even offshore oil platforms and underwater lighting.

Forms of Light Pollution

Glare – The effect of light that shines horizontally (i.e., in the visual field).
Light trespass – Artificial light that spills beyond the area intended to be lit.
Over-illumination – Illumination in excess of what is needed or at times when it is not needed.
Sky glow – Distant light from populated areas reflecting off of particles of water vapour, dust or smog in the atmosphere.

There are many examples that demonstrate the potential biological and ecological effects of artificial night lighting. While not all are specific to Ontario, they raise concerns about the impacts that artificial night lighting may be having on individual species and ecosystems in this province.

Migratory birds can become disoriented by nighttime city lights, resulting in fatal collisions with tall, brightly lit buildings. This is a serious problem that results in the deaths of millions of birds in Canada every year (see Part 2.5 of this Annual Report for more discussion on the effects of illumination on bird mortality). Under natural conditions, sea turtle hatchlings navigate toward the ocean, which is brighter than the landward horizon. However, artificial light from hotels, homes and other structures along the

coastline can cause hatchlings to lose their way to the sea and perish, victims of exhaustion, predation or road collisions. Moths and many other insect species are attracted to artificial light, resulting in high mortality from predation, contact with hot light sources or exhaustion from endlessly orbiting the light.

Among the more subtle impacts, changes in nocturnal lighting have been found to reduce the success of nocturnal tree frogs and beach mice in finding food.[1] [2] While artificial lighting may actually help bats hunt for insects around streetlights, it can also interfere with some species' commuting behaviour (e.g., between roosts and foraging areas)[3] and their ability to navigate. In freshwater environments, artificial nighttime lighting may alter the spatial distribution, daily movement, and over-wintering success of some aquatic organisms, including fish.[4]

Nighttime lighting can also affect reproductive behaviours. Studies have found that street lights influence egg-laying behaviour in some songbirds, as well as mating behaviour in some songbird and frog species.[5] [6] Artificial light is also believed to interfere with the bioluminescent flashes that some insects, such as glow worms and fireflies, produce to communicate and attract mates.[7]

These effects are not insignificant. Changing the timing of egg laying in birds could can hatchlings to go hungry if their natural food sources are not yet available. An organism that alters its foraging behaviour in response to artificial light may affect others competing for the same resources. Such seemingly small behavioural changes could cumulatively affect the health of an entire ecosystem. For example, artificial lighting could result in greater predation of zooplankton grazing at the water's brightly lit surface; in turn, reduced numbers of zooplankton could lead to increased algal growth and a consequent decline in water quality.[8]

The influence of artificial night lighting may alter entire community structures. One study found that the presence of street lighting changed the composition of ground-dwelling invertebrate communities in the area.[9] Moreover, artificial lighting can also influence the development, flowering and dormancy of some plants, and prevent some tree species from adjusting to seasonal variations.

Light Pollution is Bad for People Too

Like other organisms, humans have internal clocks that are based on natural cycles of light and darkness. Exposure to light at night can disrupt human circadian rhythms (the 24-hour day/night

[1] Buchanan, B.W. (1993). Effects of Enhanced Lighting on the Behaviour of Nocturnal Frogs. *Animal Behaviour* 45(5): 893–899.
[2] Bird, B.L. et al. (2004). Effects of Coastal Lighting on Foraging Behavior of Beach Mice. *Conservation Biology* 18(5): 1435–1439.
[3] Stone, E.L. et al. (2009). Street Lighting Disturbs Commuting Bats. *Current Biology* 19(13): 1123-1127.
[4] Moore, M.V. et al. (2006). Artificial Light at Night in Freshwater Habitats and Its Potential Ecological Effects, in *Ecological Consequences of Artificial Night Lighting*. Edited by C. Rich and T. Longcore. (Washington, D.C.: Island Press), page 380.
[5] Kempenaers, B. et al. (2010). Artificial Night Lighting Affects Dawn Song, Extra-Pair Siring Success, and Lay Date in Songbirds. *Current Biology* 20(19): 1735–1739.
[6] Rand, A. S. et al. (1997). Light Levels Influence Female Choice in Túngara Frogs: Predation Risk Assessment?. *Copeia* 1997(2): 447-450.
[7] Longcore, T. and Rich, C. (2004). Ecological Light Pollution, *Frontiers in Ecology and the Environment* 2(4): 191-198, page 195.
[8] Moore, M.V. et al. (2000). Urban Light Pollution Alters the Diel Vertical Migration of *Daphnia. Verhandlungen des Internationalen Verein Limnologie* 27: 1-4.
[9] Davies, T.W. et al. (2012). Street Lighting Changes the Composition of Invertebrate Communities. *Biology Letters* 11(8): 764–767.

cycle), interfering with numerous processes, including hormone production, immune system response and cell regulation. Excessive exposure to artificial light at night has been linked to depression, sleep disorders, cardiovascular disease, and even increased risk of cancer in humans.

Preserving the Darkness

Efforts to decrease the use of artificial lighting at night have been primarily motivated by a desire to maintain favourable conditions for stargazing or to reduce energy consumption. For example, to combat the eroding quality of night sky viewing, the Royal Astronomical Society of Canada (RASC) established a Light Pollution Abatement program in 1991 that promotes and gives advice on better lighting practices within urban and rural areas. In 2003, the City of Toronto adopted a "Lights Out Policy" as part of its larger Energy Management Program for city facilities. Some Ontario municipalities have adopted light pollution by-laws aimed at protecting the night sky and reducing wasteful and inefficient outdoor lighting.[10]

Awareness of the ecological consequences of artificial lighting is growing though, and with it efforts to reduce ecological impacts. Although energy conservation was the primary purpose for Toronto's Lights Out Policy, one of its goals was also to reduce the number of bird deaths in highly lit downtown areas. In 2005, Toronto also launched a public awareness campaign, "Lights Out Toronto!," to promote ways that individuals, businesses, property owners and others can help reduce migratory bird deaths. And in 2007 Toronto developed *Bird-Friendly Development Guidelines*, which include recommendations to make lighting for new and existing buildings less dangerous to migratory birds. The *Toronto Green Standard* now requires certain new building developments to shield exterior light fixtures, and offers reductions in development charges for building owners that follow certain recommendations, such as turning off rooftop lighting overnight during migratory bird seasons.

Other North American cities have initiated similar programs to save migratory birds by turning out the lights. In 2009, the International Union for Conservation of Nature (IUCN) established a Dark Skies Advisory Group in response to the growing body of scientific literature on the ecological impacts of light pollution.

[10] E.g., Town of Richmond Hill; Town of Mississippi Mills; Township of Muskoka Lakes.

Dark Sky Areas

One of the most notable efforts to reduce light pollution has been the creation of "dark sky areas"[11] – areas in which outdoor lighting is restricted to protect the natural darkness of the night sky and the environment. In the last two decades, astronomical and environmental communities have joined forces – recognizing that their interests in preserving nighttime darkness for stargazing and for ecological purposes are aligned – to advocate for the establishment of such dark sky areas. Organizations have been working around the world to promote the preservation of dark skies,[12] but Canada has been at the forefront of the dark sky movement.

Canada's first dark sky area (the first in the world to be recognized by an independent authority) was Ontario's Torrance Barrens Conservation Reserve, near Gravenhurst. The provincial government designated the area a dark sky reserve in 1999, primarily to maintain dark skies for astronomy, with trails and a viewing area for astronomy buffs. In addition, the provincial government's management direction for Torrance Barrens commits to prohibiting unnecessary, undirected light pollution in recognition of "the natural, aesthetic and biological values provided by a pristine night sky."
Following designation of the Torrance Barrens as a dark sky reserve, the concept of preserving the night sky in protected areas – not just focusing on light pollution in urban settings – took root. In 2005, the RASC established a formal program to designate eligible areas as "dark-sky preserves." The goal of the RASC's Dark-Sky Preserve Program is "to promote the reduction in light pollution, demonstrate night-time lighting practices, improve the nocturnal environment of wildlife, protect and expand dark observing sites for astronomy, and provide accessible locations for the general public to experience the naturally dark night sky."[13]

Today, there are 17 RASC-designated dark sky preserves in Canada, 6 of which are in Ontario (see box "Ontario's Dark Sky Preserves"). Eight of Canada's dark sky preserves are in national parks – in fact, Wood Buffalo National Park, which comprises 44,807 square kilometres and spans the Northwest Territories/Alberta boundary, is the largest dark sky preserve in the world.

Ontario's Dark Sky Preserves

Torrance Barrens Conservation Reserve (1999)
Point Pelee National Park (2006)
Gordon's Park, Manitoulin Island (2008)
Bruce Peninsula National Park and Fathom Five National Marine Park (2009)
Bluewater Outdoor Education Centre, Wiarton (2012)
North Frontenac Township (2013)[14]

The RASC's guidelines for outdoor lighting in dark sky preserves provide general guidance, including:

- eliminating any unnecessary outdoor lighting;

[11] Known variably in different locations or by different organizations as Dark Sky Reserves, Dark Sky Preserves, Dark Sky Places, Starlight Reserves, Urban Star Parks, Nocturnal Preserves, etc.
[12] Including, for example: the International Dark-Sky Association; the International Union for Conservation of Nature (IUCN) Dark Skies Advisory Group; and UNESCO's Starlight Initiative.
[13] Dick, R. (2013). *Dark-sky Guidelines (RASC-DSP)*. Prepared for the Royal Astronomical Society of Canada.
[14] The Municipality of North Frontenac is the first municipality to be designated as a Dark Sky Preserve by RASC.

- using only the minimum required level of lighting for safety and navigation;
- keeping the area of illumination as small as practical by using full cut-off (shielded) light fixtures and/or structures or barriers to confine the area of illumination;
- keeping the duration of illumination as short as practical;
- turning off all light sources within two hours of sunset to provide for a "dark time"; and
- ensuring any indoor lighting is not visible from the outside at night.

To minimize disruption to plants and wildlife, the guidelines also specifically mandate that:

- pathway lighting be restricted to paths near buildings, parking lots and campgrounds;
- light fixtures not be located within ten metres of a shoreline, and overhead lights that shine into water be prohibited;
- illumination height and colour be adjusted to minimize impact of lighting on the ecosystem;
- owners of private properties within dark sky preserves be informed of the impact of artificial lighting on wildlife and encouraged to minimize artificial lighting use on their properties; and
- in developed properties within park facilities, lighting products that produce excessive glare or light trespass, or emit short wavelength light that affects wildlife, should not be permitted.

The RASC has also created a Nocturnal Preserve Program which focuses on improving the nighttime environment for wildlife, rather than astronomy. The guidelines for nocturnal preserves are more stringent in terms of reducing outdoor lighting than the guidelines for dark sky preserves (e.g., they aim to eliminate all artificial lighting within the core of the preserve), as the nocturnal preserve designation is intended to apply in areas that do not have an astronomy outreach program. The RASC designated Canada's first nocturnal preserves (the Ann & Sandy Cross Conservation Area in Alberta, and the Old Man on His Back Prairie and Heritage Conservation Area in Saskatchewan) in July 2015.

Considering the Need for Darkness

Whether through the establishment of dark sky areas or other means, there is agreement among many conservationists that greater consideration of the impacts of artificial light at night needs to be incorporated into conservation research and planning. Experts on the ecological impacts of artificial night lighting have warned that "unless we consider protection of the night, our best-laid conservation plans will be inadequate."[15]

To some extent, this consideration is happening already. Parks Canada has adopted best practice guidelines for outdoor lighting in parks, and includes direction to reduce light pollution in its management plans for communities in some national parks. The federal recovery strategy for woodland caribou identifies "light disturbance" as a threat; one that can affect caribous' behavioural and physiological responses and, in cases of sustained or repeated disturbance, cause caribou to avoid areas, thereby reducing their usable habitat. Ontario has incorporated dark sky protection into management direction for a small number of conservation reserves. However, such consideration of the impacts of night lighting in conservation planning has been patchy at best.

[15] Rich, C. and Longcore, T., eds., (2006), *Ecological Consequences of Artificial Night Lighting* (Washington, D.C.: Island Press), page 2.

ECO Comment

Artificial light at night serves some important functions; it allows for safer navigation after dark and extends the hours of the day that people can work and play. Even dark sky preserves need some lighting to allow stargazers to get around safely. But we need to be more thoughtful about how we light up the night; the ecological need for darkness is an important piece of the conservation puzzle that has been overlooked for too long.

Just as some species need fast-flowing water, tall grass or particular soil conditions to thrive, many species need periods of natural darkness. Nighttime darkness should be treated as part of a species' habitat – one that is worthy of the same level of protection as other habitat features upon which organisms rely to carry out their life processes. And it is not just "dark skies" that need protection – terrestrial and aquatic ecosystems need darkness as well.

Ideally, the Ontario government would develop an approach to minimizing light pollution across the province (for example, by requiring outdoor light-reduction measures under the *Ontario Building Code*). Nevertheless, provincial parks and other protected areas – settings that are often rich in biodiversity – are an ideal starting point for preserving darkness for ecological purposes. The Ministry of Natural Resources and Forestry's legislated priority for planning and managing Ontario's parks and conservation reserves is the maintenance of "ecological integrity," a condition in which ecosystem processes are unimpeded. Given the potential impacts of artificial lighting on many species and ecosystems, the ministry should be considering the importance of darkness in maintaining ecological integrity in Ontario's protected areas.

A species at risk's need for periodic darkness could also be specifically addressed in recovery strategies and management plans prepared under the *Endangered Species Act, 2007*, and in the habitat summaries that the ministry prepares for some species at risk. Doing so would assist the government in ensuring that the recovery and management actions it undertakes for those most vulnerable species take into account any potential impacts of artificial lighting.

It is hard to see any downside to eliminating excess outdoor lighting at night. It would protect ecosystems, conserve energy, and safeguard social, cultural and scientific interests in viewing the night sky. The ECO urges Ontario – and the Ministry of Natural Resources and Forestry in particular – to start consistently incorporating consideration of the ecological need for darkness into conservation research, planning and decision making, particularly in the province's protected areas.

4.6 The Ecological Impacts of Waterpower Projects on Fish Passage

Like most animals, fish need to be able to move from place to place in order to successfully complete their life cycles. Many fish species require specific habitats at different life stages in order to feed, reproduce and survive. These habitats include: over-wintering areas, spawning areas, nursery and foraging areas; refuges (e.g., areas where fish can safely avoid droughts and floods); and corridors between these areas. In many cases, the specific habitats needed to fulfil these functions are quite distinct and removed from one another.

Some fish in Ontario migrate great distances over the course of their lives. For example, American eels (*Anguilla rostrata*) are born, spawn and die in the Atlantic Ocean's Sargasso Sea, but migrate as much as 6,000 kilometres to mature in Ontario's rivers and lakes. Other species, like lake sturgeon (*Acipenser fulvescens*), remain in freshwater their entire lives, but also migrate great distances to spawn. And some, like walleye (*Sander vitreus*), northern pike (*Esox lucius*), and white sucker (*Catostomus commersonii*), may not travel as extensively, but they still migrate up Ontario rivers and streams in search of suitable spawning habitat.[1] Migration and movement are clearly important to the life cycle and population health of many Ontario fish species.

Not surprisingly then, dams and other barriers that hamper fish passage can have serious impacts on fish populations and aquatic ecosystems. For example, American eel abundance has declined in the Upper St. Lawrence River and Lake Ontario by about 99 per cent since the 1970s, due, at least in part, to the barriers created by dams on the St. Lawrence River and its tributaries.[2] Likewise, the Committee on the Status of Endangered Wildlife in Canada has reported that "dams may directly impact lake sturgeon by acting as barriers to movement at certain times of the year, especially during spawning. Unless these dams are redesigned to allow fishes to move freely, impacts on migrations will continue to be substantial."[3] Moreover, dams that prevented fish from reaching their native spawning grounds contributed to the complete elimination of some runs of the now extinct Atlantic salmon (Lake Ontario population) (*Salmo salar*).[4]

Dams, of course, can be beneficial in supporting flood management, hydro-electricity (waterpower) production, irrigation, drinking water supply, and marine transportation. But by blocking fish movement, dams can fragment habitat, interfere with spawning and feeding migrations, reduce a population's size and genetic resiliency, and even eliminate local populations.

Fish Passage at Waterpower Dams

Some of the largest and most environmentally significant barriers to fish passage are waterpower facilities. Hydro-electric dams not only prevent upstream fish passage, but can also kill or injure fish as

[1] For more information, see: Bunt, C.M. et al. (2001). Denil Fishway Utilization Patterns and Passage of Several Warmwater Species Relative to Seasonal, Thermal and Hydraulic Dynamics. *Ecology of Freshwater Fish*. 10(4): 212-219.
[2] Committee on the Status of Endangered Wildlife in Canada (2006). *COSEWIC Assessment and Status Report on the American Eel* Anguilla rostrata *in Canada*, page 58.
[3] Committee on the Status of Endangered Wildlife in Canada (2006). *COSEWIC Assessment and Update Status Report on the Lake Sturgeon* Acipenser fulvescens *in Canada*, page 62.
[4] Committee on the Status of Endangered Wildlife in Canada (2006). *COSEWIC Assessment and Status Report on the Atlantic Salmon* Salmo salar *(Lake Ontario Population) in Canada*, page 15-16.

they move downstream and get trapped on water intake screens, pass through turbines or fall over dams.

Fortunately there are ways to improve passage of fish past these obstacles.[5] These include:

- fishways (e.g., diversions, fish ladders and fish elevators), which can create alternate channels for fish to bypass and/or move upstream above a dam;
- trap and transport programs that can move fish to the other side of a dam; and
- new "fish-friendly" turbines that can reduce downstream mortality rates.

Determining the best fish passage measures for a dam requires careful consideration of several factors. For example, one must consider how best to meet the varying passage requirements of different species; the mere presence of a fishway does not guarantee the safe up- and downstream passage for all species that need it. Conversely, it may be necessary to facilitate the passage of native species while preventing the spread of invasive ones, such as sea lamprey (*Petromyzon marinus*) and species of Asian carp.

Moreover, a specific dam's impacts on fish passage should not be considered in isolation, but in combination with those of other dams and obstructions along a waterway. For example, safe passage for the endangered American eel on the Ottawa River has been blocked for decades by more than ten Ontario and Quebec hydro-electric dams (see Figure 1), none of which have an eel ladder to allow upstream passage.[6] And although two large hydro dams on the St. Lawrence River (the Moses-Saunders Power Dam and the Beauharnois Generating Station) are equipped with fish ladders and navigation locks, together these two waterpower facilities reportedly kill about 40 per cent of the eels that pass through their turbines.[7] The combined impacts of Ontario's more than 2,500 dams,[8] most of which are many decades old, have created a substantial and long-standing threat to several fish populations.

[5] For examples, see: Office of Technology Assessment (1995). *Fish Passage Technologies: Protection at Hydropower Facilities*, *OTA-ENV-641* (Washington, D.C.: U.S. Government Printing Office).
[6] See: CanFishPass website (accessed August 12, 2015). *CanFishPass: Inventory of Canadian Fish Passage Facilities*. www3.carleton.ca/fecpl/canfishpass.html; and MacGregor, R. et al. (2013). *Recovery Strategy for the American Eel (*Anguilla rostrata*) in Ontario*. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, page 36. See also: Committee on the Status of Endangered Wildlife in Canada (2006). *COSEWIC Assessment and Status Report on the American Eel* Anguilla rostrata *in Canada*, page 45.
[7] Committee on the Status of Endangered Wildlife in Canada (2006). *COSEWIC Assessment and Status Report on the American Eel* Anguilla rostrata *in Canada*, page 46.
[8] Ontario Ministry of Natural Resources (2011). *State of Ontario's Protected Areas Report*, page 46.

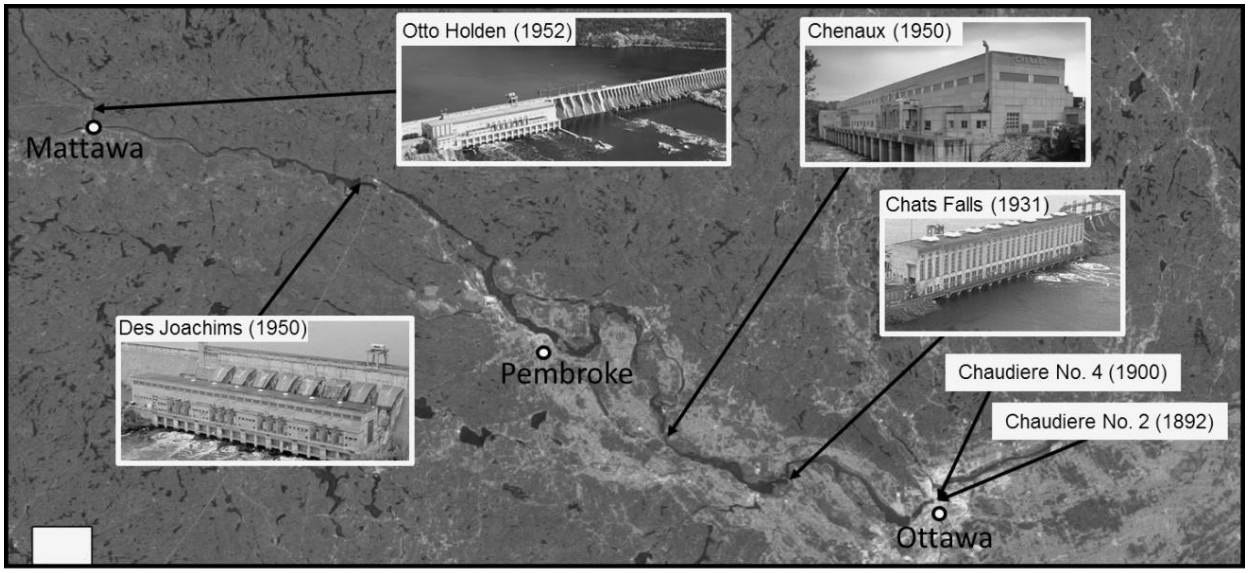


Figure 1. The locations (and dates of construction) of some of the Ontario hydro-electric dams on the Ottawa River. (Source: Ontario Power Generation and the Independent Electricity System Operator).

The government plans to increase the amount of waterpower generated in Ontario from the current capacity of about 8,300 megawatts (MW)[9] to 9,300 MW by 2025[10]. This increase will require expanding the output of existing waterpower facilities and building new ones, which will create even more barriers to fish movement. Given the existing impacts of Ontario's thousands of dams on fish movement, and the province's plans to expand hydro-electric development, the ECO decided to look at how well Ontario's legislative and policy framework for dams, specifically hydro-electric dams, has worked at ensuring fish passage.

Regulatory Framework for Ensuring Fish Passage in Ontario

The Fisheries Act

The federal *Fisheries Act* is the primary legislation for protecting fish and fish habitat in Ontario and across Canada. As a result, Ontario's Ministry of Natural Resources and Forestry (MNRF) essentially defers to the federal Department of Fisheries and Oceans (Fisheries and Oceans Canada) to make decisions related to fish passage.

Under the *Fisheries Act*, the federal Minister of Fisheries and Oceans may put conditions on dams and make orders to prevent harm to fish or to ensure fish passage, including ordering a dam owner to construct a fishway.[11] However, this discretionary power has rarely, if ever, been used to actually require the installation of a fishway in Ontario; of the more than 2,500 dams in Ontario, less than 50 (2

[9] Norris, P. (January 22, 2015). Ontario Waterpower Association. *Official Report of Debates (Hansard), No. F-9*. Standing Committee on Finance and Economic Affairs Pre-Budget Consultations. Legislative Assembly of Ontario, First Session, 41st Parliament, page F-149
[10] Ontario Ministry of Energy (2013). *Achieving Balance: Ontario's Long-Term Energy Plan*, page 6.
[11] Section 20 of the *Fisheries Act*.

per cent) have been identified as having a fishway.[12] Likewise, of the more than 200 waterpower dams in the province, only a couple have a permanent fishway.

The Lakes and Rivers Improvement Act

The construction of most new dams, including hydro-electric dams, requires provincial approval under the *Lakes and Rivers Improvement Act* (*LRIA*). The *LRIA* authorizes the Minister of Natural Resource and Forestry to put conditions on these approvals,[13] and to order owners of existing dams to provide fishways that allow fish passage.[14] However, a search on the Environmental Registry suggests that this type of order has not been issued in the past 20 years. Moreover, the scarcity of fishways in Ontario again suggests that the Minister's discretion has rarely, if ever, been used to require their installation.

Recognizing the importance of fish passage, and the unreliability of discretionary powers, the ECO stated in our 2009/2010 Annual Report that the MNRF:

> should require, through approvals issued under the [*LRIA*], that all new dams facilitate natural passage of fish by installing fish ladders or other similar structures. In addition, [the MNRF] should require all existing dams to be retrofitted with fish ladders or other similarstructures to facilitate safe and natural migration along the course of all Ontario's streams and rivers, through *LRIA* approvals for improvement or repair to dams.[15]

Five years later, the MNRF has not acted on this.[16]

The Environmental Assessment Act

Proponents of waterpower projects with a generating capacity greater than 200 MW must go through an individual environmental assessment (EA) process under the *Environmental Assessment Act* (*EAA*). This involves getting government approval of an EA document that describes: the proposed project; its purpose, rationale, possible alternatives, and potential environmental effects; and actions necessary to prevent, change, mitigate or remedy these impacts. However, many weaknesses have been identified with the *EAA*'s implementation since it was enacted[17] (see Part 5.1 of our 2013/2014 Annual Report). Additionally, many dams and waterpower projects were built before the *EAA* was passed in 1975, and thus were not subject to the Act's requirements to consider environmental factors (such as fish passage) prior to construction.

[12] CanFishPass website (accessed August 12, 2015). *CanFishPass: Inventory of Canadian Fish Passage Facilities*. www3.carleton.ca/fecpl/canfishpass.html. See also: Hatry, C. et al. (2013). The Status of Fishways in Canada: Trends Identified using the National CanFishPass Database. *Reviews in Fish Biology and Fisheries* 23(3): 271-281; and Kerr, S. J. (2010). *Fishways in Ontario*. Prepared forthe Ontario Ministry of Natural Resources, page 34.
[13] Subsection 14(5) of the *Lakes and Rivers Improvement Act.*
[14] Subsection 17(4) of the *Lakes and Rivers Improvement Act.*
[15] Environmental Commissioner of Ontario (2010). *Redefining Conservation: Annual Report 2009/2010*, page 50.
[16] Of the 12 new dams the MNRF approved since January 2010, none were required to install a fishway. (Ontario Ministry of Natural Resources and Forestry (March 9, 2015). Information provided to the ECO in response to ECO inquiry.)
[17] For examples, see: Minister's Environmental Assessment Advisory Panel – Executive Group (2005). *Improving Environmental Assessment in Ontario: A Framework for Reform – Volume 1*; and Lindgren, R.D. and B. Dunn (2010). Environmental Assessment in Ontario: Rhetoric vs. Reality. *Journal of Environmental Law and Practice* 21: 279-303.

The Class EA for Waterpower Projects:
Proponents of new waterpower facilities with a generating capacity less than 200 MW[18] are subject to a streamlined, proponent-driven Class EA process that does not require individual project approval under the *EAA*. The *Class Environmental Assessment for Waterpower Projects* requires waterpower proponents to prepare an Environmental Report that includes: a description of the environmental factors assessed; the potential adverse effects on these factors; details of the effects; and an impact management strategy. The Class EA specifically instructs proponents to assess a project's potential to affect fish migration, injury and mortality.[19]

At the time of writing (March 31, 2015), at least 31 projects had initiated, and 6 had completed, this Class EA process since it came into effect in 2008. The ECO reviewed the Environmental Reports (and supplementary environmental site assessments, natural heritage studies and other documents) that were prepared for the six projects that had completed the Class EA process, noting their consideration of the projects' impacts on fish injury, mortality and migration (see Table 1).

Table 1. Waterpower Class EA Environmental Reports' Consideration of Potential Project Impacts on Fish Migration, Injury and Mortality.

Project	Waterway	Environmental Report's Consideration of the Project's Potential Impacts on Fish Injury, Mortality and Migration
Enerdu Generating Station Expansion and Redevelopment Project	Mississippi River	• Included an inventory of fish species found in the project area • Considered measures to minimize fish injury and morality • Did not include a consideration of the project's impacts on fish migration for species besides the American eel • Did not include measures to enable fish passage besides those that fulfil requirements under the *Endangered Species Act*, 2007 (*ESA*) for the American eel (see information on the *ESA* below) • Did not include a consideration of the cumulative impacts that multiple dams on the waterway might have on fish passage, mortality and injury
Thomas Low Generating Station	Bonnechere River	• Included an inventory of fish species found in the project area • Considered measures to minimize fish injury and morality • Included only a limited consideration of the project's impacts on fish migration, as fish movement into and out of the project area is restricted by waterfalls and existing dams • Did not include measures to enable fish passage besides those that fulfil requirements under the *ESA* for the American eel • Considered cumulative effects only as they related to construction, air quality and noise
Lizard Creek	Lizard Creek	• Included an inventory of fish species found in the project

[18] Or seeking to modify an existing waterpower project that would increase its output by 25 per cent or more.
[19] Ontario Waterpower Association (2014). *Class Environmental Assessment for Waterpower Projects, Fourth Edition*, page 36.

Project	Waterway	Environmental Report's Consideration of the Project's Potential Impacts on Fish Injury, Mortality and Migration
Generating Station Project		area • Did not include a consideration of the project's impacts on fish injury or mortality • Stated that the dam will not inhibit downstream migration, and that natural barriers already limit upstream migration
London Street Generating Station Expansion Project	Otonabee River	• Included an inventory of fish species found in the project area • Considered measures to minimize fish injury and morality • Did not consider fish passage measures because eight other generating stations are located upstream, the area upstream of the project contains little spawning habitat, and because assisting upstream passage could result in more fish entering the intake area coming back downstream, potentially resulting in more fish deaths • Considered the cumulative impacts of eight other generating stations on the waterway as justification for not considering a fishway
Wasdell Falls Hydroelectric Development Project	Severn River	• Included an inventory of fish species found in the project area • Considered measures to minimize fish injury and morality • Did not consider measures to allow fish passage, as "the existing Wasdell Falls dam acts as an impassable barrier to fish migration"
Fletchers Horse Farm Archimedes Screw	Nanticoke Watercours e	• Did not include an inventory of fish species found in the project area • Did not include a consideration of measures to allow upstream fish passage at the existing dam

The Environmental Reports for five of these six Class EA-completed projects included an inventory of the fish species found in the project area. Several of these species are known to use fishways elsewhere in Ontario (see Table 2). If a species is known to use a fishway, movement is likely an important component of its life history, a component that should be considered during the EA process. However, the Environmental Reports generally did not discuss measures to address a project's impacts on the movement of any fish species besides the endangered American eel (see Table 1).

Table 2. Species that use Ontario Fishways and that were identified during the Class EA Process as being in the Area of a Waterpower Project.

Species	Identified during the Class EA Process as Being in the Area of the Waterpower Project[1]					Ontario Fishway(s) used by this Species[7]
	Enerdu[2]	Thomas Low[3]	Lizard Creek[4]	London Street[5]	Wasdell Falls[6]	
American eel (*Anguilla rostrata*)	YES	YES				Moses-Saunders Dam (St. Lawrence

Species	Identified during the Class EA Process as Being in the Area of the Waterpower Project[1]					Ontario Fishway(s) used by this Species[7]
						River)
Black crappie (*Pomoxis nigromaculatus*)				YES	YES	Mannheim weir (Grand River)
Bluegill (*Lepomis macrochirus*)	YES			YES		Mannheim weir
Bluntnose minnow (*Pimephales notatus*)		YES		YES	YES	Mannheim weir
Bowfin (*Amia calva*)					YES	Cootes Paradise Fishway (Desjardins Canal)
Brown bullhead (*Ameiurus nebulosus*)	YES	YES	YES	YES	YES	Mannheim weir
Common shiner (*Luxilus cornutus*)		YES		YES	YES	Big Carp River Fishway
Creek chub (*Semotilus atromaculatus*)		YES	YES	YES		Mannheim weir
Golden shiner (*Notemigonus crysoleucas*)			YES	YES	YES	Mannheim weir
Largemouth bass (*Micropterus salmonides*)	YES			YES	YES	Cootes Paradise Fishway; Mannheim weir
Longnose dace (*Rhinichthys cataratae*)	YES	YES	YES	YES		Mannheim weir
Northern pike (*Esox lucius*)		YES	YES		YES	Pefferlaw Fishway (Pefferlaw Brook); Beaver (Beaverton) River Dam
Pumpkinseed (*Lepomis gibbosus*)	YES	YES	YES	YES	YES	Mannheim weir
Rock bass (*Amblophites rupestris*)	YES	YES	YES	YES	YES	Mannheim weir
Rosyface shiner (*Notropis rubellus*)		YES				Mannheim weir
Shorthead redhorse (*Moxostoma macrolepidotum*)		YES				Mannheim weir
Smallmouth bass	YES	YES	YES	YES	YES	Mannheim weir,

Species	Identified during the Class EA Process as Being in the Area of the Waterpower Project[1]					Ontario Fishway(s) used by this Species[7]
(*Micropterus dolomieu*)						Pefferlaw Fishway; Milne Dam Fishway (Rouge River); New Hamburg Fishway (Nith River)
Walleye (*Sander vitreus*)	YES	YES	YES	YES	YES	Pefferlaw Fishway; Beaver (Beaverton) River Dam; Caledonia Fishway (Grand River); New Hamburg Fishway
White sucker (*Catostomus commersonii*)	YES	YES	YES	YES	YES	Cobourg Creek Barrier; Mannheim weir; Beaver (Beaverton) River Dam
Yellow perch (*Perca flavescens*)	YES			YES	YES	Pefferlaw Fishway; Cootes Paradise Fishway

[1] The Fletchers Horse Farm Archimedes Screw was not included here as its Environmental Report did not contain an inventory of species in the project area.

[2] Bowfin Environmental Consulting (2012). *Mississippi River – Enerdu Proposed Expansion Waterpower Project – Environmental Impact Assessment*, pages 14-34.

[3] Bowfin Environmental Consulting (2012). *Bonnechere River – Proposed Thomas Low Waterpower Project – Environmental Impact Assessment*, pages 36-44.

[4] IBI Group (2011). *Lizard Creek Hydroelectric Generating Station Environmental Screening Report*, page 57.

[5] Oakridge Environmental Ltd. (2011). *Natural Heritage Study Proposed Expansion of London Street Hydro Power Generating Station City of Peterborough*. Prepared for Peterborough Utilities Inc., page 26; and Niblett Environmental Associates, Inc. (2009). *London Street Power Generating Station Walleye Spawning Habitat Survey*. Prepared for Peterborough Utilities Inc., page 4.

[6] OEL-Hydrosys Inc. (2011). *Environmental Report – Wasdell Falls Power Corporation, Severn River, Wasdell Falls – MNR Site #2EC31 Hydroelectric Development Project*. Prepared for Wasdell Falls Power Corporation, page 32.

[7] CanFishPass website (accessed August 12, 2015). *CanFishPass: Inventory of Canadian Fish Passage Facilities*. www3.carleton.ca/fecpl/canfishpass.html. See also: Hatry, C. et al. (2013). The Status of Fishways in Canada: Trends Identified using the National CanFishPass Database. *Reviews in Fish Biology and Fisheries* 23(3): 271-281; and Kerr, S. J. (2010). *Fishways in Ontario*. Prepared forthe Ontario Ministry of Natural Resources, page 34.

Moreover, because the Class EA (and *EAA*) does not require it, the Environmental Reports did not address the cumulative impacts that their project, together with other dams and barriers on the waterway, might have on fish passage, injury and mortality (see Table 1). For example, one Environmental Report did not consider the additive fish passage impacts of a generating station just 125 metres downstream. Another used the abundance of other waterpower facilities on the waterway as justification for not considering the project's impacts on fish passage. An EA that considers a project in isolation likely underestimates the potential environmental threats and the measures needed to address them.

The Endangered Species Act, 2007

There are 5 endangered, 11 threatened and 10 special concern fish species regulated under the *Endangered Species Act, 2007* (*ESA*).

Recovery Strategies and Government Response Statements:
For each endangered and threatened species listed under the *ESA*, the Minister of Natural Resources and Forestry must ensure that a recovery strategy is prepared that, amongst other things, describes threats to the species' survival and recovery, and recommends how to achieve protection and recovery objectives.[20] Once a recovery strategy is finalized, the Minister must ensure that a government response statement is prepared within nine months that summarizes the prioritized actions the government intends to take in response.

However, as of July 2015, recovery strategies and government response statements were overdue for more than half of Ontario's endangered and threatened fish species – some by almost two years (see Table 3). And even though almost all the completed recovery strategies specify that barriers to passage potentially threaten species' recovery, the corresponding government response statements lack specific actions to address this threat (see Table 3). (For the ECO's review of recently released government response statements, see Part 5.1 of this Annual Report.)

Table 3. Fish Passage Threats and Actions Identified in the Recovery Strategies and Government Response Statements for Threatened and Endangered Fish.

Species	Status	Does the Recovery Strategy Identify Impacts of Dams/Barriers on Fish Passage as a Potential Threat for this Species?	Does the Response Statement Commit the Government to Specific Actions to Ensure that this Threat is Addressed?
American eel	Endangered	Yes. The strategy identifies several "critical" approaches to recovering the American eel, including: • ensuring existing facilities provide upstream passage for the American eel and mitigate downstream passage mortalities; • where appropriate, and consistent with the strategic approach of the recovery strategy, using existing regulatory tools (Ontario's *ESA*, the *Fisheries Act* and the *LRIA*) to mandate upstream and downstream passage at existing facilities; • ensuring all new facilities on	Response statement was due August 22, 2014

[20] Although the Minister must also ensure that management plans are prepared for species of special concern, of the ten special concern fish species in Ontario: 8 are exempt from this requirement (because they require a management plan under the federal *Species at Risk Act*); the management plan for the silver lamprey is not due until January 2018; and the recovery strategy for the lake sturgeon (see Table 3) covers threatened and special concern populations.

Species	Status	Does the Recovery Strategy Identify Impacts of Dams/Barriers on Fish Passage as a Potential Threat for this Species?	Does the Response Statement Commit the Government to Specific Actions to Ensure that this Threat is Addressed?
		watersheds within the native range are designed to allow upstream passage and provide safe downstream passage; • developing and implementing strategic passage plans for eels in key watersheds; and • providing policy and procedure tools to evaluate and address the cumulative impact of numerous water control structures on upstream passage.	
Eastern sand darter	Endangered	Yes. The strategy states that: • "dams are the most obvious, but not the only, barrier to movement for eastern sand darter. Improperly designed and installed culverts could create a physical barrier or may preclude the eastern sand darter from being able to move upstream due to high velocities or shallow water depth in the culvert;" and • "barriers to movement could lead to the fragmentation of eastern sand darter populations. Small, increasingly isolated populations may suffer inbreeding effects and a loss of genetic diversity that could impair their ability to respond to changing environmental conditions."	No
Northern madtom	Endangered	Yes. The strategy identifies that "dams/barriers can result in direct loss of habitat or fragmentation."	No
Redside dace	Endangered	Yes. The strategy states that: • in-stream barriers and weirs may affect redside dace access to spawning areas and could be detrimental if metapopulation dynamics are important to redside dace; and • removal of barriers should be	No

Species	Status	Does the Recovery Strategy Identify Impacts of Dams/Barriers on Fish Passage as a Potential Threat for this Species?	Does the Response Statement Commit the Government to Specific Actions to Ensure that this Threat is Addressed?
		encouraged in areas where redside dace populations have been fragmented and the removal of the barrier will not result in the upstream introduction of new species.	
Shortnose cisco	Endangered	Strategy was due June 30, 2013	N/A
Black redhorse	Threatened	Strategy was due June 30, 2013	N/A
Channel darter	Threatened	Strategy was due June 30, 2013	N/A
Cutlip minnow	Threatened	Yes. The strategy states that: • the impacts of dams on different populations of cutlip minnow should also be evaluated. Currently there is a dam on the St. Lawrence River at Cornwall and one at Martintown on the Raisin River. The effects of the dams on the cutlip minnow distribution are unknown, although the species is found above each of the dams.	No, only that the government will investigate seasonal migration, movements and habitat use of all life stages in healthy populations
Lake chubsucker	Threatened	Yes, however the strategy reports that the benefit to existing populations created by barriers outweighs potential negative impacts.	No
Lake sturgeon (Great Lakes – Upper St. Lawrence River, Northwestern Ontario and Southern Hudson Bay-James Bay populations)	Threatened	Yes. The strategy states that: • habitat alteration due to existing dams, future dam construction and operating regimes associated with these facilities represent significant risks to lake sturgeon recovery in Ontario; • where dam construction has created artificial barriers to upstream migration and disrupted formerly continuous habitat, lake sturgeon sub-populations have become fragmented; • the historical loss of habitat through impoundment and fragmentation	Response statement was due September 7, 2012

Species	Status	Does the Recovery Strategy Identify Impacts of Dams/Barriers on Fish Passage as a Potential Threat for this Species?	Does the Response Statement Commit the Government to Specific Actions to Ensure that this Threat is Addressed?
		and the failure to mitigate these losses is likely the greatest ongoing impediment slowing the recovery of sub-populations of lake sturgeon inhabiting highly developed systems such as the Ottawa River; and • downstream passage through hydroelectric facilities and dams can cause injury or direct mortality to all life history stages of lake sturgeon from exposure to extreme changes in water pressure, cavitation, shear, turbulence or mechanical injuries, entrainment and impingement. The recovery strategy contains a critical priority to "assess impediments to lake sturgeon recovery on a local scale and implement appropriate actions. Where feasible, remove existing threats (e.g., low head barriers)."	
Pugnose minnow	Threatened	Strategy was due January 24, 2015	N/A
Pugnose shiner	Threatened	No	No
Shortjaw cisco	Threatened	Strategy was due June 30, 2013	N/A
Silver chub	Threatened	Strategy was due January 24, 2015	N/A
Silver shiner	Threatened	Strategy was due January 13, 2014	N/A
Spotted gar	Threatened	Strategy was due June 30, 2013	N/A

ESA *Agreements and Mitigation Plans for Hydro-Electric Generating Stations:*
The *ESA* generally prohibits killing threatened and endangered species, and harming their habitats.[21] However, O. Reg. 242/08 under the Act exempts hydro-electric generating stations from these prohibitions if the operator entered into an agreement with the Minister of Natural Resources and Forestry before June 30, 2013 that: describes "reasonable steps to minimize adverse effects on the species;" and confirms, in the Minister's opinion, that compliance with the agreement will not jeopardize the survival or recovery of the species in Ontario.[22]

[21] Subsections 9(1) and 10(1) of the *ESA*.
[22] Section 11 of Ontario Regulation 242/08 (General) made under the *ESA*.

In 2012, the MNRF posted 23 proposed *ESA* agreements for public comment on the Environmental Registry. However, the ministry only ever finalized four such agreements[23] as the government amended O. Reg. 242/08 in July 2013, allowing waterpower operators to prepare and comply with a "mitigation plan" instead of signing and implementing an *ESA* agreement.[24]

Unlike *ESA* agreements, which require ministry review or approval, operators must only provide the MNRF a copy of a mitigation plan if requested. The ECO asked the ministry for copies of all of the completed mitigation plans in January 2015, but the ministry was unable to provide any. The MNRF responded that it had not yet requested these documents from waterpower operators, but "intend[s] to do so in the near future as part of [its] regular program evaluation and compliance work."

To their credit, the MNRF and Ontario Power Generation have undertaken projects to stock young eels in the upper St. Lawrence River and Lake Ontario, and to study the trap and transport of mature eels around generating stations. Still, in 2013 the recovery strategy for the American eel reported that: "with the exception of recent trap and transport and stocking (translocation) efforts at [the Moses-Saunders Power Dam] … mortalities due to turbines at Ontario's hydroelectric facilities continue with no attempt to mitigate them (e.g., Ottawa River, Trent River, Mississippi River)."

ECO Comment

Ontario's at-risk fish species, because of: delayed recovery strategies; overdue and ineffective government response statements; and weakened oversight of waterpower operators' mitigation measures.

Determining how to best ensure fish passage at a waterpower dam is an important and complex decision – one that should be made transparently with public participation and government accountability. Sadly, decisions about dam design and fish passage requirements are not made in a transparent and accountable manner; although the Class EA process invites public consultation on a project's possible environmental impacts and mitigation options, detailed decisions about specific design and operational elements are not made until the approvals stage, where they are shielded from public scrutiny and appeal. Unlike *LRIA* orders to construct fishways, approvals of new dams are not prescribed under Ontario's *Environmental Bill of Rights, 1993* (*EBR*), exempting them from the *EBR*'s public notice, consultation and appeal requirements. Further, because section 32 of the *EBR* exempts decisions made under the *EAA* from these provisions, even if *LRIA* dam approvals were prescribed, the public likely would still be denied the right to comment on or appeal them. (For more information about how section 32 of the *EBR* obstructs public participation rights, see Part 1.3 of the ECO's 2012/2013 Annual Report.)

The ECO recognizes that ensuring fish passage, particularly at historic dams, can be complicated and imposes added costs on waterpower proponents. But ignoring the necessity for fish passage can create ecological costs for Ontario's fish species and river ecosystems. The ECO urges the MNRF to fix this long-standing and significant ecological problem for existing and future projects.

[23] *ESA* Agreements were signed for the Heywood Generating Station, the Gananoque Generating Station, the R. H. Saunders Generating Station and an undisclosed generating station.
[24] Note that this option does not apply to the operators of the R.H. Saunders Hydro-electric Station, who must continue to comply with an *ESA* agreement. See: subsection 23.12(10) of Ontario Regulation 242/08 (General) made under the *ESA*.

www.eco.on.ca

Environmental
Commissioner
of Ontario

1075 Bay Street, Suite 605
Toronto, ON M5S 2B1, Canada
Tel: (416) 325-3377 | Fax: (416) 325-3370
1-800-701-6454 | Email: commissioner@eco.on.ca

ISSN: 1205-6928 (Print)
ISSN: 1927-0747 (Online)