



GUIDANCE for Invasive Species Assessments Under the Invasive Species Act, 2015

MINISTRY OF NATURAL RESOURCES AND FORESTRY

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PURPOSE

The purpose of this paper is to describe the process Ontario will use to inform decisions to recommend species for regulation under the *Invasive Species Act, 2015* (ISA). This process will be applied to assess the risk that species pose to Ontario's natural environment, to understand social and economic impacts of these species and to prioritize species for regulatory consideration.

The information collected through this process may also be used to inform the application of various additional management actions in Ontario such as:

- Education and outreach programs
- Developing research programs
- Designing monitoring programs
- Assessing needs for on-the-ground management and control measures
- Developing government policy
- The establishing of enforcement priorities.





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BACKGROUND

Invasive Species pose an urgent and growing threat to the environment, society and economy in most parts of the world, including Ontario. The increasingly global economy and internationally mobile populations have created many pathways through which species can accidentally or intentionally move long distances.

Once established, invasive species can be extremely difficult and costly to control and eradicate. Therefore, preventing the introduction and spread of invasive species has been identified as a primary management objective for invasive species in Ontario and internationally. Ontario is also host to many alien species that are generally not considered invasive as they do not adversely impact the natural environment or they provide ecological, social and economic benefits to Ontario.

Conversely, species that are native to parts of Ontario may be considered invasive in other parts of Ontario where they may adversely impact the natural environment. For example, Smallmouth Bass, which are native to parts of Ontario, have been introduced to waters beyond their native range where native fish populations have been negatively impacted.





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POLICY AND LEGISLATIVE CONTEXT

In Ontario, the Ministry of Natural Resources and Forestry (MNRF) is the provincial lead Ministry responsible for managing the impacts of invasive species on the natural environment. This responsibility is shared with various federal Ministries/Agencies and other provincial Ministries such as the Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Ministry of Environment and Climate Change (MOECC) and the Ministry of Transportation (MTO), depending on jurisdiction and the threats posed by the species.

Ontario Invasive Species Strategic Plan, 2012

In 2012, MNRF, in collaboration with MOECC, OMAFRA, and MTO released the Ontario Invasive Species Strategic Plan (OISSP). OISSP identified three goals:

1. To prevent new invaders from arriving and surviving in Ontario.
2. To slow, and where possible, reverse the spread of existing invasive species.
3. To reduce the harmful impacts of existing invasive species.

The OISSP also identified existing policy and legislative gaps and recommended key actions that should be taken to address these gaps.



Invasive Species Act, 2015

The *Ontario Invasive Species Act, 2015* (ISA) received Royal Assent on November 3, 2015 and comes into force on November 3, 2016.

The ISA provides an enabling legislative framework that is applicable to invasive species that are present in Ontario as well as those that are not. Provisions in the ISA have been included to support the prevention, detection, control, and eradication of invasive species in Ontario.

Invasive species may be listed in regulations as either prohibited or restricted invasive species, and consequently, prohibitions may apply in respect to their introduction, possession, transportation, etc. The ISA also includes provisions that provide authority for the government to undertake control actions to reduce or eliminate the negative impacts of regulated invasive species.

For the purposes of the ISA, an invasive species is defined as:

A species that is not native to Ontario, or to a part of Ontario, and,

a) *is harming the natural environment of Ontario or of the part of Ontario in which it is present, or*

b) *is likely to harm the natural environment of Ontario or of a part of Ontario, regardless of whether it is present in Ontario or in a part of Ontario*

In Ontario, existing legislative and regulatory tools have also been used to regulate or manage invasive species.

Examples include:

- Several species of invasive fish have been regulated provincially under the *Fish and Wildlife Conservation Act, 1997* and federally under the *Ontario Fishery Regulations, 2007* and the *Aquatic Invasive Species Regulations, 2015* made under the *Fisheries Act*.
- Rules have been established under the *Public Lands Act* for removing invasive aquatic plants.
- Noxious weeds are regulated under the *Weed Control Act* where they impact agricultural practices.

The ISA does not supersede or impact the application of these or other applicable federal and provincial laws. Ontario will continue to work with the federal government on the application and use of these existing rules to address invasive species in Ontario.





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APPLYING RISK ASSESSMENT TO INFORM INVASIVE SPECIES REGULATION IN ONTARIO

A risk assessment process will be used to classify species for regulation under the Invasive Species Act, 2015. Using a risk-informed process ensures that decisions on the regulation of species (or other management actions) are science-based and reflect broad consideration of ecological, social, and economic values.

In determining which species should be subject to regulation under the act, the extent to which a species is present in the natural environment in Ontario, as well as a minimum of four broad considerations must be assessed. Described in section 4 of the ISA these include the:

1. Species' biological characteristics.
2. Harm the species has had on the natural environment or is likely to have in the future.
3. Dispersal ability of the species.
4. Social or economic impacts of the species.

These considerations form the basis of the risk assessment process that will be used to inform regulatory proposals for the listing of species under the ISA.



General considerations in risk assessment for Ontario

SPECIES SCOPE

The risk assessment process will be used to assess alien species that have had, or with the potential to have, significant negative impacts on biodiversity, natural resources management and dependent social and economic activities. This may include species that are present in Ontario as well as those that are not. This may include species that are present in Ontario as well as those that are not. Species native to Ontario that have been introduced by human activities beyond their natural range to new parts of the province may also be evaluated.

Species currently managed in Ontario for their social and economic benefits will generally not be assessed or considered for regulatory or subsequent control actions.

For example, several Salmon and Trout species have been stocked in the Great Lakes and their tributaries for over 100 years, and are now naturalized in the province's aquatic ecosystems. These species are not considered invasive, but rather are valued ecosystem components that provide significant social and economic benefits to Ontarians and are managed accordingly under the *Fish and Wildlife Conservation Act, 1997*. Similarly, many agricultural species are valued crops in Ontario, and will generally not be evaluated or considered for regulation or control under the ISA where the species is being intentionally cultivated or managed.

INFORMATION SOURCES

Ontario is committed to using the best available information at the time of preparing a risk assessment, including the most current scientific information and a diversity of other sources as applicable through literature reviews and public consultation.

GEOGRAPHIC SCOPE OF RISK ASSESSMENTS

Ontario occupies a large geographic area with a wide variety of climates, physical features and biological communities. Therefore, the risk of a species becoming invasive can vary considerably across the province. The geographic scale of the risk assessment will include consideration of this geographic diversity and how a species may impact various parts of the province including the Great Lakes watershed.

Regional or landscape-scale risk assessments may also be conducted and would be defined by patterns in climate, physical geography, geology and ecological community types, rather than by political or administrative boundaries. For example, if there is interest in exploring the potential for invasion across climatic or physiological gradients, risk assessments may be conducted for a part of Ontario or two or more eco-regions of the province simultaneously. This is particularly relevant when considering a species that may not be able to survive in the colder climate of northern Ontario, but may be able to survive and spread in more temperate parts of southern Ontario.



TEMPORAL SCOPE OF RISK ASSESSMENTS

Risk assessments will be reviewed and updated periodically to reflect emerging information. The appropriate timeframe for each risk assessment will be species-specific based on species biology and will be driven by ecological, social or economic considerations. Recommendations to amend regulations, or reconsider earlier decisions, may result from the update and review of risk assessments.

USE OF PREVIOUSLY COMPLETED AND EXTERNAL RISK ASSESSMENTS

MNRF has already undertaken risk assessments for some invasive species, based on information collected in a literature review and compiled in a peer-reviewed document. To avoid unnecessary duplication or delay, MNRF intends to use the results of completed risk assessments and risk assessment work underway to prioritize species and to develop associated regulatory proposals.

In addition, MNRF will use the results of risk assessments conducted and accepted by other jurisdictions in prioritizing species and recommending invasive species for regulation in Ontario. MNRF will review the applicability of these risk assessments. The review will include consideration of the scientific merit of the methodology and conclusions and whether the results are applicable to the climate, habitat types and biological communities of Ontario.

Key risk assessment principles

The risk assessment process will be science based and guided by the following principles:

- *The process will focus on species with potential or known impacts to the natural environment.*
- *Risk assessments will use the best available information at the time of completion.*
- *Risk assessments will be conducted using appropriate, peer-reviewed methods accepted by practitioners with expertise in this field.*
- *Risk assessments will consider the impacts (natural environment, social, economic) of a species' establishment in Ontario.*
- *Risk assessments will focus on provincial or regional level impacts, including impacts to the Great Lakes and neighbouring jurisdictions.*
- *Adaptive management will be applied, including periodically revisiting risk assessments when new information is obtained through research and monitoring.*
- *Effort will be made to align risk assessments and the regulation of species with neighbouring jurisdictions. This may include adopting or augmenting existing risk assessments completed outside of Ontario.*





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APPROACH TO ASSESSING INVASIVE SPECIES FOR REGULATION IN ONTARIO

A six-step risk assessment process will be used to assess species for regulatory consideration under the ISA. It is recognized that general consensus does not exist on the best assessment process currently available; however, there are similarities among the many assessment processes currently in use. The information used and criteria applied are generally transferrable across jurisdictional boundaries, and in many cases, the assessments and subsequent regulatory responses are ecologically, economically and socially applicable to Ontario. Therefore, risk assessments completed by other jurisdictions will be used to inform decisions made during the completion of this assessment process.

To support this process, a list of known or potentially invasive species in Ontario will be developed.

To compile the list of species for consideration, MNRF will at a minimum:

- Review lists of invasive species regulated in neighbouring jurisdictions.
- Invite invasive species specialists and taxa specialists to provide input and information about species that could be included on the list.

- Invite additional information from individuals and organizations.

This list will support a more efficient assessment process by allowing the MNRF to prioritize or group species for assessment, based on similar characteristics or other applicable considerations. This list will be updated as required to reflect the identification of new species that may be potentially invasive in Ontario.



STEP 1: Conduct screening-level ecological assessment

PURPOSE:

The screening-level ecological assessment will identify species that are unlikely to become invasive versus species that should be subject to a more detailed risk assessment process to determine their potential invasiveness.

To achieve this, MNRF will conduct a coarse level assessment in which scores will be assigned to identify the potential risk posed by the species by assessing the likelihood that the species has or will:

- Arrive in Ontario and be released into the province's natural environment.
- Survive once released.

- Establish a population maintained by natural reproduction.
- Spread over a broad geographic range.
- Have impacts on the environment, economy or society if established.

OUTCOME:

Species for which the screening determines there is no risk or a low risk to the natural environment in Ontario, including the Great Lakes, will not proceed beyond this step.

STEP 2: Conduct detailed-level ecological assessment

PURPOSE:

The detailed-level ecological assessment step will conduct an evaluation of the risk that the species presents to biodiversity, ecosystem function and the natural environment in Ontario (social and economic impacts are discussed in the next step).

This step will consider the likelihood and ecological impacts of invasion by considering the probability of an organism arriving, surviving, establishing a reproducing population, and spreading in Ontario. The ecological impacts of an invasion will be considered in more detail than in the screening-level ecological assessment, and will include an evaluation of the potential for and magnitude of:

- Ecosystem modification or degradation,
- Changes in the food web, including predator-prey dynamics and competition among species,
- Reductions in native species diversity, including adverse impacts on native species such as population declines or extirpation,
- Hybridization or other genetic impacts,

- Reductions in the quality or quantity of habitat available,
- Introduction of pathogens and/or other organisms associated with the species being assessed,
- Impacts on ecosystem structure, functions and processes that lead to the provision and maintenance of ecosystem services.

The detailed-level ecological risk assessment will also include an estimate of uncertainty (i.e., the level of confidence in the assessment based on the quality and quantity of available information) to indicate the confidence that decision-makers should have in the final result. Uncertainty will always be higher for poorly understood or little-studied species. Uncertainty is also higher when there is conflicting data on the potential invasiveness of the species (e.g., some of the published literature indicates the species could survive and establish in Ontario, while other literature suggests it would not).

A cautionary approach will be applied where there is a high level of uncertainty. Species for which there is a high level of uncertainty regarding the potential threat may be given a higher initial threat rating until additional information is collected to decrease the level of uncertainty in the assessment of the species.



OUTCOME:

The detailed ecological risk assessment will establish a category of risk that will be used to determine if the

species should continue through the risk assessment process. Low-risk species that are expected to have little to no ecological impact will generally not be subjected to further assessment.

STEP 3: Identify social and economic impacts

PURPOSE:

The identification of social and economic impacts will assist in determining how an invasive species may negatively impact Ontario's economy, businesses or the well-being of Ontarians.

MNRF will conduct literature reviews and where possible review existing social and economic impact summaries developed in other jurisdictions to identify the social and economic impacts of the species. This step will also enable the consideration of impacts to ecosystem services.

There are two broad categories of economic impacts that will be considered:

- *Market impacts* refer to a reduction in goods produced and sold or in benefits related to natural resources. Examples include decreased fisheries production, decreased availability of water for industry, declines

in the navigability of lakes and rivers and declines in property values.

- *Non-market impacts* include potential risks to ecosystem services such as water filtration, carbon storage, pollination and disease prevention.

In addition, impacts on the social well-being of Ontarians will be considered. This includes factors that affect the health and quality of life that citizen's experience, such as impacts on recreational activities, areas of cultural significance, or the provision of natural foods.

OUTCOME:

The impacts identified in this step will be considered in combination with the ecological impacts considered in Step 2 to support the determination of the overall level of risk of the species in Step 4.

STEP 4: Assess overall risk and peer review

PURPOSE:

The overall assessment of the risk posed by an invasive species will be determined by reviewing the outcomes of Steps 1-3 and submitting those outcomes for peer review.

Peer review will increase confidence that all relevant information has been included and will confirm the outcomes of Steps 1 through 3. Reviewers will be selected based on level of subject matter expertise and will include provincial government staff and other relevant experts. If there are divergent opinions, this will be reflected in the level of uncertainty attributed to the level of overall risk.

Species that are found to pose a medium or high level of overall risk will proceed to the Regulatory Impact Assessment, while species found to have a low level of risk will be removed from further consideration.

OUTCOME:

- A species that has been identified as a high ecological risk will be a priority for regulation, even if the species presents little risk to the economy or society.
- For species that are determined to be a medium ecological risk in the ecological risk assessment, the magnitude of the identified socio-economic impacts will be used to prioritize the species for regulatory consideration.
- Generally, species that are a low ecological risk will not be considered for regulatory action by MNRF.



STEP 5: Regulatory impact assessment

PURPOSE:

Following the peer review and determination of the overall level of risk, regulatory proposals will be developed in accordance with the outcomes of the steps above. This will include identifying the recommended prohibitions for each species. Regulatory proposals will be subject to regulatory impact assessments where the social and economic costs and benefits of the proposed regulation will be assessed. This will inform decisions on regulatory approaches and non-regulatory management actions. Unlike Step 3, where the impact of a species was considered, this step considers the direct impacts of the proposed regulation on factors including:

- Costs of compliance for industry and the general public.
- Costs of implementation, administration, and enforcement for government.

- Benefits of the proposal to the environment, including ecosystem services, the economy and society. These benefits can be derived, at least in part, by considering the impacts identified in the risk assessments and whether the proposed regulation will help avoid those impacts.

OUTCOME:

The final regulatory proposal may be amended in response to the regulatory impact assessment step, to ensure that the regulatory proposal will effectively achieve the management objectives for the invasive species.

The process for conducting the regulatory impact assessment, including associated postings and consultations, is set out in Ontario government policy for all provincial regulatory initiatives.

See: Ontario Regulatory Registry –
<http://www.ontariocanada.com/registry/home.jsp>

STEP 6: Public consultation

The Environmental and Regulatory Registries will serve as the primary means for undertaking public consultation on the regulation of species under the ISA. Postings to the registries will be used as a means to seek additional information to augment or support risk assessments being considered for adoption or completion, as well as to seek public comments on regulatory proposals under the ISA. In addition, public information sessions or other appropriate communication methods may also be utilized to seek advice and feedback from the public and stakeholders, as appropriate.

Public consultation will at a minimum occur following the completion of Step 5; however, it is likely that in many circumstances engagement of key stakeholders or the general public will assist in the completion of the various steps of the described process. In such cases, the MNRF may seek advice or information from applicable stakeholder organizations directly or from the general public through a variety of appropriate methods.

Upon completion of Steps 1 to 5, the following process will be followed for public consultation on, and approval of, regulations related to invasive species:

- The proposal will be simultaneously posted on the Ontario Regulatory Registry and the Ontario Environmental Registry website for public comment.
- When the public comment period is complete, all comments will be reviewed and considered prior to finalizing the regulation.
- The proposed regulations, including any recommended amendments resulting from public consultation will then be submitted for government approval.
- If the regulation is made, a Decision Notice for the regulation will be posted to the Environmental Registry and Regulatory Registry.





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TEMPORARY DESIGNATION OF INVASIVE SPECIES

In circumstances where a serious and imminent threat to Ontario's natural environment from a non-regulated invasive species is identified, and delays associated with making a regulation would unduly increase the threat, the Minister of Natural Resources and Forestry may make an order designating that species as an invasive species to which the ISA applies (see section 5 of the ISA).

The objective of this authority is to allow for the emergency designation of species where delaying the application of the act and the associated powers would unduly increase the threat of harm to Ontario's natural environment. The order is limited to a period of two years, during which the government may take action to control and eradicate the species, as well as initiate a risk assessment for the species to determine if the species should be regulated under the act.

This authority will be applied in limited circumstances and may include circumstances where a species is found for the first time in Ontario or in a part of Ontario where it was not known to previously occur.





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RE-EVALUATION OF RISK ASSESSMENTS

Over time, it will be necessary to revisit species that have been previously assessed to ensure that the conclusions of risk assessments are still valid. Sometimes new information about a species becomes available from monitoring and research activities, which could affect the assessment of risk. Even in the absence of no new scientific information, the results of the risk assessments and the overall prioritization process will need to be periodically re-evaluated. As ecological, social, and economic considerations change the risk presented by a species may change as well.

Species that were previously deemed to be a low risk may become a higher risk if, for example, a species that was previously not in trade is now found in trade, or if climate change has elevated the risk of the species. Conversely, the level of risk may decrease if the species is no longer found in trade or it is observed that the species' ability to

spread is limited. It is also important to evaluate whether regulatory or management measures have succeeded as intended or if unanticipated consequences have occurred. Ontario will revisit and, if necessary, revise any existing regulations and management actions periodically to ensure they reflect current levels of risk.





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SUMMARY

Invasive species are an urgent and growing threat to Ontario's biodiversity, affecting native species and ecosystems, and affecting the social and economic systems that depend on a healthy natural environment. A robust process for assessing potentially invasive species is needed to guide decisions on the regulation of invasive species and other management actions, and to ensure that government resources are focused on the species that pose the greatest threat to the province.

In addition, setting clear priorities will help in planning targeted education and outreach programs, developing research programs, designing monitoring programs, assessing the need for management and control actions, developing government policy, and determining enforcement priorities.

This document outlines the process that Ontario will use to support decisions on the regulation and management of invasive species in Ontario.



GLOSSARY

Alien species: Species of plants, animals, and micro-organisms introduced by human action outside their natural past or present distribution.

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

Carriers: A plant, animal, organism, conveyance or other thing that is capable of being a host to an invasive species or facilitating the movement of an invasive species from one place to another. Under the ISA, carriers may be prescribed in regulations.

Ecosystem services: The flows of goods and services from nature that provide indirect and direct contributions and benefits to society and the economy, including provisioning services (e.g., food, materials, water, medicines), regulating services (e.g., climate, clean water, natural disaster mitigation), habitat services (e.g., genetic diversity, migration), and cultural services (e.g., education, recreation). Flows of ecosystem services vary according to local biophysical and ecological conditions and therefore are dependent on the state and quantity of natural capital and biodiversity.

Invasive species: Alien species whose introduction or spread threatens the environment, the economy, and/or society including human health. For the purposes of the *Invasive Species Act, 2015*, an invasive species is defined as a species that is not native to Ontario or a part of Ontario, and

a) *is harming the natural environment of Ontario or of the part of Ontario in which it is present, or*

b) *is likely to harm the natural environment of Ontario or of a part of Ontario, regardless of whether it is present in Ontario or in a part of Ontario.*

This would include those species which are native to Ontario but have been introduced to a new geographic region due to human activity.

Non-native species: See alien species.

Pathways: One or more routes by which an invasive species is transferred from one ecosystem to another. A pathway is the physical means by which an invasive species is transported to a new region by humans, either deliberately or accidentally. Within a pathway, one or more vectors or routes of transfer exist by which an invasive species is transferred and one or more carriers may facilitate the transfer.

Risk Assessment: An analysis of the likelihood of a risk happening and the impact of the risk if it occurs. In the case of an invasive species, risk assessment considers the likelihood that a non-native species will be introduced, become established and spread, combined with the impact of its establishment on biodiversity and socio-economics.

Taxon (plural: Taxa): A group or rank in a biological classification into which related organisms are classified, for example a species, genus, family, or class of organisms.

Vectors: Routes of transfer within a pathway by which an invasive species is transferred from one ecosystem to another.



ACRONYMS USED

ISA – *Invasive Species Act, 2015*

MNRF – Ministry of Natural Resources and Forestry

MOECC – Ministry of Environment and Climate Change

MTO – Ministry of Transportation

OISSP – Ontario Invasive Species Strategic Plan

OMAFRA – Ontario Ministry of Agriculture,
Food and Rural Affairs

RIA – Regulatory Impact Assessment

