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Canadian Environmental Sustainability Indicators

Newly Established Invasive Alien Species in Canada



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Canadian Environmental Sustainability Indicators

Newly Established Invasive Alien Species in Canada

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Part 1. Newly Established Invasive Alien Species in Canada Indicator

Between January 2012 and December 2015, no new invasive alien species were found to have become established in Canada. Currently, 254 species are being federally regulated to prevent their establishment in Canada, including 23 that have been regulated for the first time since January 2012, the baseline date. None of these species have been found to have established in Canada since the baseline date.

Plants or animals that are not native to Canada can cause environmental and economic damage to our waterways, food supply and natural spaces. The best way to avoid this is to prevent their arrival in Canada. Actions to reduce the risk of invasion may be taken here at home, at our borders, or even in other countries.

Federal regulations can be designed to control the introduction or spread of invasive species in Canada. Regulatory actions may focus on high-risk species, such as Asian carp, or on high-risk pathways, such as ship ballast water and the ornamental plant trade. Some pathways cannot be controlled (for example, animals can fly or walk across our borders). Once a high-risk species is found in Canada, eradication efforts may be undertaken to prevent its establishment. For example, porcine epidemic diarrhea, a disease of pigs, was detected in 2014 and eradication efforts continue.

Species¹ may be regulated if a risk analysis shows they are potentially invasive and that regulation is likely to be effective.

Table 1. Known Newly Established Invasive Alien Species in Canada, 2012 to 2015

Year	Federally regulated species	Species not federally regulated
2012	0	0
2013	0	0
2014	0	0
2015	0	0

Note: Species are considered to be established when a reproducing population exists in Canada. A species that is the focus of eradication efforts will not be considered established until it is deemed no longer possible to eradicate.

Source: Canadian Food Inspection Agency, Environment and Climate Change Canada, and Fisheries and Oceans Canada (2016).

¹ Groups of species may be regulated together, for example when a disease may be caused by different agents or when related species within a genus are expected to have similar ecological impacts. In these cases, groups have been treated as a single species for the purpose of the indicator.

Alien species are species that have been introduced outside their natural past or present distribution through human action.² Invasive alien species are alien species that are harmful and whose introduction or spread threatens the environment, the economy or society, including human health.³ Alien bacteria, viruses, fungi, aquatic and terrestrial plants, mammals, birds, reptiles, amphibians, fish and invertebrates (including insects and molluscs) can all become invaders.

Hundreds of invasive species occur in Canada, including many familiar species that have been present for more than a century. Examples range from common weeds like dandelion and Canada thistle, backyard birds like House Sparrows and European Starlings, diseases like West Nile virus, crop- and forest-damaging pests like fruit moths and balsam woolly adelgid, to invertebrates that alter ecosystem function, such as golden star tunicate (sea squirt), zebra mussels and earthworms. In addition to environmental damage, these species cause billions of dollars in economic damage. Invasive weeds, for example, reduce agricultural productivity and increase the use of pesticides. Earthworms, which seem harmless in a garden, have altered nutrient cycling and the structure of the forest floor in eastern hardwood forests, and over time are altering the nature of the forest itself.

² Government of Canada (2004) [An Invasive Alien Species Strategy for Canada](#). Retrieved on June 28, 2016.

³ Species affecting human health are regulated under a distinct body of legislation and are not included in the indicator.

Part 2. Data Sources and Methods for the Newly Established Invasive Alien Species in Canada Indicator

Introduction

The [Newly Established Invasive Alien Species in Canada](#) indicator is part of the [Canadian Environmental Sustainability Indicators](#) (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

Description and rationale of the Newly Established Invasive Alien Species in Canada indicator

Description

The main indicator is the number of invasive alien species found to be newly established in Canada, reported by year of establishment and regulatory status. This provides a preliminary indication of the potential harmful consequences of new arrivals. Species are deemed to be established when they are successfully reproducing in Canada and any eradication efforts have been abandoned. Should a new invasive alien species be found to have established, its federal regulatory status (whether that species was regulated or unregulated, as well as whether the pathway of invasion was regulated, unregulated, or unknown) will be reported. It should be noted that some pathways cannot be controlled, particularly if species arrive as a function of natural spread.

The proportion of regulated species that have not established in Canada is a partial measure of regulatory success. For the purposes of this indicator, species are considered regulated only if regulatory measures are national in scope.⁴ Regulation of potentially invasive species is intended to prevent their introduction and establishment in Canada. Species are added to the list of regulated species based on an analysis of risk. Positive actions are taken to exclude these species from Canada, including, for example, requirements for inspections of goods before shipping or for the application of pest-control measures before shipments are allowed into Canada.

Both indicators report on species establishment since January 2012. With the implementation of the Federal Sustainable Development Strategy 2010–2013, this type of information began to be collected consistently across multiple programs, allowing information to be combined for the first time into a single indicator despite the varying approaches used to control different groups of invasive alien species.

⁴ The [Aquatic Invasive Species Regulations](#) list a number of aquatic invasive species (for example, zebra and quagga mussels) that are subject to prohibitions and controls at the sub-national level.

Rationale

Invasive alien species are a significant threat to biodiversity. In their new ecosystems, they become predators, competitors, parasites, hybridizers, and diseases of our native and domesticated plants and animals.

The expansion of global links through trade and travel increases the risk of invasive species being introduced. The number of new invasive species arriving from foreign countries and establishing in Canada is one measure of our effectiveness in minimizing the potential damage from these species. The regulatory status of these species and their arrival pathways provide information on what weaknesses in risk management need to be addressed.

Recent changes to the indicator

Five species were regulated for the first time in 2015, four under the Aquatic Invasive Species Regulations and one under the Plant Protection Act. In previous indicator reports, Bluetongue and Chinese mitten crab were erroneously reported as established before 2012; this has been corrected.

Data

Data source

Data from the Canadian Food Inspection Agency, Fisheries and Oceans Canada, and Environment and Climate Change Canada have been collated into a single database to support the indicator.

In addition to data collected by the lead federal agencies, data are also reported to these agencies from other sources. Agriculture and Agri-Food Canada, Canada Border Services Agency, Natural Resources Canada (Canadian Forest Service), Parks Canada Agency, the Canadian Wildlife Health Cooperative, provincial and territorial governmental organizations and non-governmental organizations actively work towards the control of invasive species and provide information. The data are incorporated by the lead federal agencies and thus contribute indirectly to the indicator.

Spatial coverage

National.

Temporal coverage

The indicator measures new establishments from a baseline of January 1, 2012. This could include species that were present earlier and not detected. Species known to have established prior to 2012 are not included.

Data completeness

All known new establishments are included. Some species are more difficult to detect and identify than others; data gaps may exist. Microorganisms are generally not detected unless they cause disease.

Data timeliness

The indicator reflects the state of knowledge as of January 2016.

Methods

Federal agencies and departments may become aware of new species in Canada through the normal course of business or through searches of public information. Once a new species is identified, government scientists determine whether it is from outside the country, whether it has the potential to cause harm, and whether a population has established.

Data on new invasive alien species and their origin are collected from available sources. New species are assessed to determine whether they should be considered established and their estimated year of establishment. Categories are assigned based on regulatory status: regulated or unregulated species, and regulated or unregulated pathways. It may be impossible to determine by which pathway a species has arrived; in such cases, the pathway is categorized as unknown. The main indicator is a simple count of the number of invasive alien species in each category found to be established in Canada since 2012. Because no new invasive alien species have been found to be established, categories are not yet reported.

In cases where a group of species is regulated as a unit, the unit is treated as a single regulated species for the purposes of the indicator. When a member of a regulated group is established, a new taxonomic unit is created for that species. For example, the import of all species within the genus *Helix* is prohibited. The European brown garden snail (regulated under the name *Helix aspersa*) and the Burgundy escargot snail (*Helix pomatia*) became established in Canada prior to 2011. For the purposes of the indicator, the unit is split and treated as one regulated species that was established before 2012 and one species that is regulated but not established.

Agencies and departments with responsibilities for controlling invasive alien species also conduct risk analysis. One possible outcome of a risk analysis is to regulate particular species or groups of species. Regulations may include, for example, import bans, a requirement for inspection of shipments or veterinary certificates, or transport limitations.

Table 2. Federally regulated invasive alien species, Canada, 2011 to 2015

Year	Alien species regulated and not established
2011	232
2012	234
2013	249
2014	249
2015	254

Caveats and limitations

The indicator includes species that are discovered during normal business and determined to have established since the baseline year. In general, active field searches for new invasive alien species are not made although surveillance is undertaken for some species.

Regulated refers only to federal regulations and federal regulatory status.

Newly detected species may be subject to an eradication effort. These species are not deemed to have become established unless eradication has failed and efforts have been abandoned.

Alien species may be present without becoming invasive, and it may take some time to recognize whether a species is invasive. The establishment date of a species may be difficult to determine, particularly if an invasion was not detected early. Range extensions of species native to the United States would not normally be considered an invasion.

While invasive alien species can also affect human health, the human health dimension is largely covered under existing human health programs and is excluded from the scope of An Invasive Alien Species Strategy for Canada, and thus from this indicator.

Comparisons to other data sources should be made with caution. In particular, counts may not match other sources because related species may be regulated as a group, because some members of a group may be established while others are not, and because species may be regulated under more than one piece of legislation.

Species that are native to a region in Canada that are invading elsewhere in Canada are not included, even if these species are federally regulated.

Annex A. References and additional information

References and further reading

[Aquatic Animals – Reportable Diseases](#)

[Aquatic Animals – Immediately Notifiable Diseases](#)

[Aquatic Invasive Species Regulations](#)

[Fish Inspection Act](#)

[Fish Inspection Regulations](#)

Government of Canada (2004) [An Invasive Alien Species Strategy for Canada](#). Retrieved on June 28, 2016.

[Health of Animals Act](#)

[Health of Animals Regulations](#)

[List of Pests Regulated by Canada](#)

[Plant Protection Act](#)

[Plant Protection Regulations](#)

[Plant Protection Policy Directives](#)

[Reportable Diseases Regulations](#)

[Seeds Act](#)

[Seeds Regulations](#)

[Terrestrial Animals – Reportable Diseases](#)

[Terrestrial Animals – Immediately Notifiable Diseases](#)

[Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act](#)

[Wild Animal and Plant Trade Regulations](#)

Please note that published lists of regulated species may be updated at different times. Not all regulated species are part of the published lists. Groups of regulated species are counted differently in different contexts and comparisons should be made with caution.

Related information

[Canada Border Services Agency – Protecting Canada from Invasive Species](#)

[Canadian Food Inspection Agency – Invasive Species](#)

[Environment and Climate Change Canada – Invasive Alien Species in Canada](#)

[Fisheries and Oceans Canada – Aquatic Invasive Species](#)

[Natural Resources Canada – Forest Invasive Alien Species](#)

[The Global Invasive Alien Species Information Partnership Gateway](#)

www.ec.gc.ca

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