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# Data Sources and Methods for the Newly Established Invasive Alien Species in Canada Indicator

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## Table of contents

1. Introduction.....	4
2. Description and rationale of the Newly Established Invasive Alien Species in Canada indicator .....	4
2.1 Description.....	4
2.2 Rationale .....	4
3. Data .....	4
3.1 Data source.....	4
3.2 Spatial coverage .....	5
3.3 Temporal coverage.....	5
3.4 Data completeness .....	5
3.5 Data timeliness.....	5
4. Methods.....	5
5. Caveats and limitations .....	6
6. References and further reading.....	6
6.1 References .....	6
6.2 Further reading.....	6

## 1. 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. This indicator is also used to measure progress towards the goals and targets of the [Federal Sustainable Development Strategy](#).

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

### 2.1 Description

The main indicator is the number of invasive alien species found to be newly established in Canada, reported by year 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. The federal regulatory status of a species that has successfully invaded (whether that species was regulated or unregulated, as well as whether the pathway of invasion was regulated, unregulated, or unknown) would speak in part to the appropriate targeting and effectiveness of control efforts. It should be noted that some pathways cannot be controlled, particularly if species arrive as a function of natural spread.

A secondary indicator, the proportion of regulated species that have not established in Canada, is reported as a partial measure of regulatory success. 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.

### 2.2 Rationale

Invasive alien species are a significant threat to biodiversity. In their new ecosystems, invasive alien species 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 improved.

## 3. Data

### 3.1 Data source

Data from the Canadian Food Inspection Agency, Fisheries and Oceans Canada, and Environment 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. These data are incorporated by the lead federal agencies and thus contribute indirectly to the indicator.

### 3.2 Spatial coverage

National.

### 3.3 Temporal coverage

The indicator measures new establishments from a baseline of January 1, 2012. Species known to have established prior to 2012 are not included. Species may have been present earlier and not detected.

### 3.4 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.

### 3.5 Data timeliness

The indicator reflects the state of knowledge as of December 2013.

## 4. 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, and the species are categorized based on whether the species is federally regulated and whether its pathway of origin is federally regulated. 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. Categories are 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.

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, one species, the Chinese mitten crab, *Eriocheir sinensis*, became established in Canada prior to 2011. The import of all species within the genus *Eriocheir* is prohibited. For the purposes of the indicator, one species is established, and the rest of the *Eriocheir* genus is counted as 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.

#### **Federally regulated invasive alien species, Canada, 2011 to 2013**

	<b>2011</b>	<b>2012</b>	<b>2013</b>
Alien species regulated and not established	231	233	248

## 5. 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. Only federal regulations and federal regulatory status are addressed by the indicator.

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.

## 6. References and further reading

### 6.1 References

Environment Canada (2004) [An Invasive Alien Species Strategy for Canada](#). Retrieved on 8 September, 2014.

### 6.2 Further reading

Federal acts and regulations relating to invasive alien species:

- [Plant Protection Act](#)
- [Plant Protection Regulations](#)
- [Plant Protection Policy Directives](#)
- [Health of Animals Act](#)
- [Health of Animals Regulations](#)
- [Reportable Diseases Regulations](#)
- [Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act](#)
- [Wild Animal and Plant Trade Regulations](#)
- [Fish Inspection Act](#)
- [Fish Inspection Regulations](#)

Published lists of regulated species:

- [Pests Regulated by Canada](#)
- [Aquatic Animals – Reportable Diseases](#)
- [Aquatic Animals – Immediately Notifiable Diseases](#)
- [Terrestrial Animals – Reportable Diseases](#)
- [Terrestrial Animals – Immediately Notifiable Diseases](#)

Please note that lists 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.

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