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# Data Sources and Methods for the Species at Risk Population Trends Indicator

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# 1 Introduction

The Species at Risk Population Trends indicator ([ec.gc.ca/indicateurs-indicateurs/default.asp?lang=en&n=79579EFA-1](http://ec.gc.ca/indicateurs-indicateurs/default.asp?lang=en&n=79579EFA-1)) is part of the Canadian Environmental Sustainability Indicators (CESI) program ([ec.gc.ca/indicateurs-indicateurs/default.asp?lang=En&n=47F48106-1](http://ec.gc.ca/indicateurs-indicateurs/default.asp?lang=En&n=47F48106-1)), 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 ([ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1](http://ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1)).

## 2 Description and rationale of the Species at Risk Population Trends indicator

### 2.1 Description

The indicator provides an assessment of the recovery trends of species at risk that i) are included on the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under the federal *Species at Risk Act* (SARA), ii) have a final recovery strategy or management plan that contains population goals, iii) are determined to be biologically and technically feasible to recover, and iv) have been reassessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) since the final recovery document (recovery strategy or management plan) was published.

### 2.2 Rationale

The degree to which species respond positively to management is a measure of success.

Species listed on the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under SARA as Extirpated, Endangered or Threatened must have recovery strategies prepared as a mean to focus management actions. Species recognized as of Special concern have management plans prepared. These strategies and plans are referred to here as "recovery documents". Recovery takes time: once recovery efforts are in place, it may take many years for changes in populations to be measurable. Early signs of progress may include, for example, a reduced rate of decline.

In general, successful recovery of species should arrest or reverse any unnatural decline, and remove or mitigate anthropogenic pressures, in order to improve or stabilize the likelihood of the species' persistence in the wild. A species will be considered recovered when the probability of its long-term persistence in the wild is returned to a normal level (that is, the level prior to human-induced threats acting upon the species).

Recovery strategies and management plans are as varied as the biology of the species they address. Recovery documents contain overall goals and outline objectives which often relate to population numbers and distribution. The documents consider the current and past abundance and distribution of the species, as well as the degree to which recovery is feasible, and recommend approaches for recovery or maintenance. Recovery strategies must be completed within one year of a species being listed as Endangered, and within two years of a species being listed as Threatened or Extirpated. Management plans must be completed within three years of a species being listed as one of Special concern.

### 2.3 Recent changes to the indicator

The indicator has been extended to include both recovery strategies and management plans. As a result, species of Special concern are now included.

## 3 Data

### 3.1 Data sources

#### Recovery strategies: Goals and objectives

Recovery goals and objectives were drawn from final recovery strategies<sup>1</sup> of species listed as Extirpated, Endangered or Threatened on the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under the *Species at Risk Act* (SARA). Final and proposed species recovery strategies are made available to the public through the Species at Risk Public Registry ([www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)). Under SARA, progress towards meeting the goals and objectives of a species' recovery strategy is to be reported every five years.

#### Management plans: Goals and objectives

Management plans contain goals and objectives that relate to the prevention of Special concern species from becoming Threatened or Endangered. Like recovery strategies, final and proposed species management plans are made available to the public through the Species at Risk Public Registry ([www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)).

#### Population trends

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is a committee of experts that determines the national status of Canadian wildlife species, subspecies, varieties or other designatable units that are suspected of being at risk of extinction or extirpation. The assessment report gathers the available science as well as Aboriginal and community knowledge, to provide a comprehensive view of species status. COSEWIC reassesses species every 10 years, or more often if warranted. It should be noted that COSEWIC reports, including reassessments, are independent from other work under SARA.

The latest available information on population trends was extracted from the most recent COSEWIC assessments, which are also available through the Species at Risk Public Registry ([www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)).

### 3.2 Spatial coverage

Coverage is national, but significant biases in information availability exist. Species knowledge is greatest in southern Canada, in part because the area is more accessible, and in part because more species at risk occur in southern Canada.

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<sup>1</sup> The Species at Risk Public Registry provides both "final" and "proposed" recovery strategies for species at risk in Canada, in keeping with the provisions of SARA. A recovery strategy is considered "final" once all consultation and approval processes have been completed. The process is similar for management plans. Available from: [www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm).

### 3.3 Temporal coverage

The first final recovery strategies and management plans were published in 2006. The indicator includes all species meeting the criteria for inclusion from that date.

### 3.4 Data completeness

All species with final recovery documents are considered; these are species with a status under *Species at Risk Act* (SARA) as Extirpated, Endangered, Threatened or of Special concern. Three criteria are considered:

1. Species must be deemed feasible to recover.
2. Species must have goals or objectives relating to population size or distribution.
3. Species must have been reassessed since the publication of the final recovery strategy/management plan, to allow a comparison to previous conditions.

All species meeting these criteria are included.

Five species were deemed not feasible to recover at the time of their assessment: Grizzly Bear (Prairie population) ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1293](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1293)), Eskimo Curlew ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1044](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1044)), Timber Rattlesnake ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1328](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1328)), Tiger Salamander (Great Lakes population) ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1753](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1753)), and Incurved Grizzled Moss ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1264](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1264)).

The recovery strategies for eight species contain only operational goals, such as verification of the presence of the species in Canada. These are Kirtland's Warbler ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=909](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=909)), Gravel Chub ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1360](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1360)), Blanchard's Cricket Frog ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=2112](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=2112)), Puget Oregonian ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1263](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1263)), Island Blue ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1544](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1544)), Mormon Metalmark (Prairie population) ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=1457](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1457)), Margined Streamside Moss ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=967](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=967)), and Silver Hair Moss ([www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=968](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=968)). Kirtland's Warbler has since been sighted.

### 3.5 Data timeliness

This indicator is current to May 2014.

## 4 Methods

### 4.1 Listing

Species potentially at risk undergo an assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts. COSEWIC completes a species assessment (status report) and ranks species as Extinct, Extirpated, Endangered, Threatened, Special concern, Not at risk or Data deficient. COSEWIC reassesses each species at risk at least once every 10 years, or at any time if it has reason to believe that the status of the species has changed.

COSEWIC assessments are provided to the Minister of the Environment, who recommends to the Governor in Council which species to add to the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under the *Species at Risk Act* (SARA). Species listed as Endangered, Threatened or Extirpated under SARA must have a recovery strategy prepared by Environment Canada, Parks Canada or Fisheries and Oceans Canada, as appropriate. For species listed as of Special concern, a management plan must be prepared.

## 4.2 Recovery strategies

Recovery strategies assess whether recovery is feasible, outline what threats need to be addressed, set goals, objectives and approaches for the species recovery, and identify critical habitat. Recovery strategies for species deemed recoverable are followed by action plans, which outline specific activities required to meet the goals and objectives of the recovery strategy.

Species recovery strategies must be completed within one year of the species being listed as Endangered, and within two years of the species being listed as Threatened or Extirpated on the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under SARA.

## 4.3 Management plans

Management plans include measures for the conservation of species of Special concern and their habitat and, when possible, are prepared for multiple species in a shared ecosystem or landscape. Management plans are required within three years of the species being listed as of Special concern on the List of Wildlife Species at Risk ([www.sararegistry.gc.ca/species/default\\_e.cfm](http://www.sararegistry.gc.ca/species/default_e.cfm)) under SARA.

## 4.4 Data extraction

Species meeting the criteria for inclusion were those deemed feasible to recover at the time of assessment and which had objectives related to population size and/or distribution. Recovery goals and objectives were drawn from recovery documents. Population recovery goals could include, for example, maintaining or increasing the total number of individuals of a species, restoring the area of occupation, and/or increasing the number of sites occupied by a species.

A search was made for COSEWIC reassessments produced since the recovery document was finalized. Relevant data were extracted from these reassessments, based on the recovery goals.

## 4.5 Scoring

A comparison was made between the recovery goals and the trends in observed data, accounting as much as possible for the length of time elapsed between the recovery document and the reassessment, and for the biology of the species. Using a weight-of-evidence approach, species were categorized into one of four groups, and the rationale was recorded:

1. Population trends consistent with recovery goals ("Yes").
2. Population trends not consistent with recovery goals ("No").
3. A mix of consistent and inconsistent population trends ("Mixed evidence").
4. Insufficient data to determine trends.

The indicator is a count of the number of species categorized in each group.

# 5 Caveats and limitations

Coverage of species is very narrow compared to the number of wildlife species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Extirpated (22), Endangered (306), Threatened (165) or of Special concern (200), or compared to the number of

species listed on Schedule 1 of the *Species at Risk Act* (SARA) as Extirpated (23), Endangered (243), Threatened (135), or of Special concern (169).

It takes time for response to become apparent: while an insect population might begin to recover in a few years, it takes many years to detect changes in tree or whale populations. While the indicator uses the best information available, this may include periods of time before recovery plans were finalized. Indicator results should not be interpreted as a measure of recovery success until sufficient time has passed to allow species to recover and to collect sufficient information to assess that recovery.

Observations of rare species are often difficult to collect, and assessments are necessarily based on incomplete information.

With time, the number of species with completed recovery documents will increase, the number of reassessed species will increase, and trends will become more meaningful as populations have sufficient time to respond.

## 6 References and further reading

### 6.1 References

Government of Canada (2014) List of Wildlife Species at Risk. Retrieved on 10 June, 2014. Available from: [www.registrelep.gc.ca/species/schedules\\_e.cfm?id=1](http://www.registrelep.gc.ca/species/schedules_e.cfm?id=1).

Government of Canada (2014) Species at Risk Public Registry. Retrieved on 10 June, 2014. Available from: [www.sararegistry.gc.ca/default\\_e.cfm](http://www.sararegistry.gc.ca/default_e.cfm).

Government of Canada (2012) Recovery Guidance Handbook (ROMAN). Retrieved on 10 June, 2014. Available from: [www.sararegistry.gc.ca/sar/recovery/roman\\_e.cfm](http://www.sararegistry.gc.ca/sar/recovery/roman_e.cfm).

Government of Canada (2014) Committee on the Status of Endangered Wildlife in Canada. Retrieved on 10 June, 2014. Available from: [www.cosewic.gc.ca/eng/sct1/index\\_e.cfm](http://www.cosewic.gc.ca/eng/sct1/index_e.cfm).

### 6.2 Further reading

Government of Canada (2012) Species at Risk Act. Retrieved on 10 June, 2014. Available from: [www.sararegistry.gc.ca/approach/act/default\\_e.cfm](http://www.sararegistry.gc.ca/approach/act/default_e.cfm).

Environment Canada (2013) Habitat Stewardship Program. Retrieved on 10 June, 2014. Available from: [ec.gc.ca/hsp-pih/default.asp?lang=En&n=59BF488F-1](http://ec.gc.ca/hsp-pih/default.asp?lang=En&n=59BF488F-1).

Fisheries and Oceans Canada (2011) Aquatic Species at Risk. Retrieved on 19 June, 2014. Available from: [www.dfo-mpo.gc.ca/species-especies/index-eng.htm](http://www.dfo-mpo.gc.ca/species-especies/index-eng.htm).



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