



Data Sources and Methods: General Status of Species Indicator

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1 Introduction

The Canadian Environmental Sustainability Indicators report on the status of species which provides a measure of the state of biodiversity in Canada. Biodiversity reflects the number, variety and variability of living organisms. The protection of biodiversity is important to preserve ecosystems and the services they provide for us.

Every 5 years, the *Wild Species* series publishes a report on the general status of species in Canada. These general status assessments find and use existing information and expertise to develop general status ranks for as many species as possible. The *Wild Species* series also identifies which species need a more detailed status assessment or additional management attention.

2 Description and rationale of the General status of species indicator

The General Status indicator summarizes the state of individual species in Canada. A “species” is defined as a population of organisms that does not usually interbreed with other populations, even where they overlap in space and time (CESCC 2011). The general status indicator provides a measure of extinction risk and an indication of the overall state of biodiversity in Canada, since the loss of a species is a loss of biodiversity. To better understand which species are at risk, a companion indicator provides information on extinction risk for species group.

3 Data

3.1 Data source

Data for the General status of species indicator are drawn from the *Wild Species* reports (CESCC 2001; CESCC 2006; CESCC 2011).

Data contributing to the assessment of individual wildlife species in the *Wild Species* reports are drawn from a wide range of sources and are cited within the relevant reports.

3.2 Spatial coverage

Species are assessed throughout Canada at the regional level (in all provinces, territories and ocean regions) and at the national level.

3.3 Temporal coverage

The status of wild species is generally reassessed by the Canadian Endangered Species Conservation Council (CESCC) every five years. The first assessment was done in 2000 for 1670 species (CESCC 2001). New species groups were added in subsequent reports and in 2005, 7732 species were assessed (CESCC 2006). In 2010, 11 950 species were assessed and fish species were not reassessed (CESCC 2011).

3.4 Data completeness

The General status of species indicator covers only the suite of wildlife species assessed in the *Wild Species* 2010 report (CESCC 2011). Knowledge regarding wild species varies among regions and among taxonomic groups. A risk ranking was attributed only to species that have sufficient data to be assessed. Fish species were not reassessed in 2010.

3.5 Data timeliness

The general status of species is assessed every five years; this indicator is current to the end of 2010.

4 Methods

4.1 The attribution of a general status rank

In the *Wild Species* series, the general status of species from selected taxonomic groups is assessed. Priority is given to taxonomic groups assessed in previous *Wild Species* reports. New taxonomic groups to be assessed are selected based on provincial and territorial priorities as well as recommendations from other organizations, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Biological Survey of Canada, the Canadian Food Inspection Agency and academia. The selection of taxonomic groups also reflects important conservation stakes (e.g. pollinators), existing knowledge and the resources available for assessment.

All species from the selected taxonomic groups are ranked according to 10 categories. Table 1 presents the definition of each rank category. For more information on ranks, please consult the *Wild Species* series (<http://www.wildspecies.ca/wildspecies2010/data-categories.cfm?lang=e>).

Seven criteria are used by regional and national committees to assign a species' rank: population size, number of occurrences, geographic distribution, trend in population, trend in distribution, threats to population and threats to habitat. When biological information is available, experts assign a score from A (worst) to D (best) to each criterion. Experts use a score matrix that provides a biological definition of the four scores possible for a given criteria. The translation of scores into a general status rank is usually discussion-driven and experts agree to a rank based on the scores they have established. However, certain jurisdictions have established a rule-driven process to standardize this process. The amount and type of information are used as factors in weighting the contribution of each score to the final overall rank. For more information on the methodology behind rank attribution, please consult the *Wild Species* series (<http://www.wildspecies.ca/wildspecies2010/data.cfm?lang=e>).

Species are first assigned a rank in each province, territory and ocean region (i.e., Atlantic, Pacific, Eastern Arctic and Western Arctic) where they occur. Provincial and territorial governments list species that occur in their region and interpret available information to assign the status of species. Fisheries and Oceans Canada lists species that occur in each ocean region and compiles regional ranks for marine species.

The National General Status Working Group (NGSWG) then establishes national ranks based on the information provided by each province, territory and ocean region. Although exceptions occur, the national rank of a species is usually the lowest level of risk among regional ranks.

Table 1: Definition of general status ranks

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|----------------|--|
| Extinct | Species that are extirpated worldwide (i.e., they no longer exist anywhere). |
| Extirpated | Species that are no longer present in a given geographic area, but occur in other areas. |
| At risk | Species for which a formal, detailed risk assessment (COSEWIC status assessment or provincial or territorial equivalent) has been completed and that have been determined to be at risk of extirpation or extinction. A COSEWIC designation of “endangered” or “threatened” automatically results in a national rank of “at risk”. Where a provincial or territorial formal risk assessment finds a species to be “endangered” or “threatened” in that particular region, then, under the general status program, the species automatically receives a provincial or territorial general status rank of “at risk”. |
| May be at risk | Species that may be at risk of extirpation or extinction and are therefore candidates for a detailed risk assessment by COSEWIC, or provincial or territorial equivalents. |
| Sensitive | Species that are not believed to be at risk of immediate extirpation or extinction but may require special attention or protection to prevent them from becoming at risk. |
| Secure | Species that are not believed to belong in the categories “extirpated”, “extinct”, “at risk”, “may be at risk”, “sensitive”, “accidental” or “exotic”. This category includes some species that show a trend of decline in numbers in Canada but remain relatively widespread or abundant. |
| Undetermined | Species for which insufficient data, information or knowledge is available with which to reliably evaluate their general status. |
| Not assessed | Species that are known or believed to be present regularly in the geographic area in Canada to which the rank applies, but have not yet been assessed by the general status program. |
| Exotic | Species that have been moved beyond their natural range as a result of human activity. |
| Accidental | Species occurring infrequently and unpredictably, outside their usual range. |

Source: CESCC 2011

4.2 The General status of species indicator

The General status of species indicator summarizes the general status of selected Canadian species assessed in 2010 and having a known risk ranking. The status of species in twenty taxonomic groups were assessed in 2010: macrolichens, mosses, vascular plants, freshwater mussels, spiders, odonates, predaceous diving beetles, ground beetles, lady beetles, bumblebees, black flies, horse flies, mosquitoes, selected macromoths, butterflies, crayfishes, amphibians, reptiles, birds and mammals.

The national General status of species indicator uses national ranks defined in the *Wild Species* 2010 report. The regional breakdown uses ranks defined at the provincial, territorial and ocean region levels. The indicator only considers four rankings: “at risk”, “may be at risk”, “sensitive” and “secure”. The six other ranks are not considered when calculating the percentage of species deemed “secure”.

4.3 Companion indicator: General status per species group

A companion indicator reports the general status ranks for nine taxonomic groups: mammals, birds, reptiles, amphibians, freshwater mussels, vascular plants, mosses, lichens, and arthropods. The arthropod group in the CESI indicator is the aggregation of 12 taxonomic

groups in the *Wild Species* 2010 report: spiders, odonates, predaceous diving beetles, ground beetles, lady beetles, bumblebees, black flies, horse flies, mosquitoes, selected macromoths, butterflies and crayfishes. While a large number of arthropod species was assessed, these are only a small proportion of the arthropods in Canada. All species within the eight other taxonomic groups have been assigned a rank.

The percentage of species ranked either “at risk” or “may be at risk” presented for species groups, is calculated on the same basis as the national General status of species indicator. Only four rankings are considered: “at risk”, “may be at risk”, “sensitive” and “secure”.

5 Caveats and limitations

The number of species assessed in the *Wild Species* series has increased from 1670 in 2000 to 11 950 in 2010. However, with an estimated 70 000 species found in Canada (Mosquin *et al.* 1995), there are still many species left to assess, with the vast majority of these species being insects and other invertebrates.

The General status of species indicator reflects the state of biodiversity in Canada. However, it only represents species diversity and does not report on genetic and ecosystem diversity. While species diversity is connected with genetic and ecosystem diversity, the loss of populations does not have the same impact as a loss of an entire species, nor does it occur at the same rate. Therefore, this indicator provides a picture of only one aspect of biodiversity in Canada.

6 References

[CESCC] Canadian Endangered Species Conservation Council (2001) *Wild Species 2000: The General Status of Species in Canada*. Minister of Public Works and Government Services Canada. Retrieved on 20 May, 2011. Available from: <http://www.wildspecies.ca/reports.cfm?lang=e>

[CESCC] Canadian Endangered Species Conservation Council (2006) *Wild Species 2005: The General Status of Species in Canada*. National General Status Working Group. Retrieved on 20 May, 2011. Available from: <http://www.wildspecies.ca/reports.cfm?lang=e>

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Mosquin, PGT *et al.* (1995) *Canada's biodiversity: the variety of life, its status, economic benefits, conservation costs and unmet needs*. Canadian Museum of Nature