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Data Sources and Methods for the Changes in Wildlife Species Disappearance Risks Indicator

June 2012

ISBN: En4-144/9-2012E-PDF
Cat. no.: 978-1-100-20799-5

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1 Introduction

The Changes in Wildlife Species Disappearance Risks indicator is a part of the Canadian Environmental Sustainability Indicators (CESI) program (<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En>), which provides data and information to track Canada's performance on key environmental sustainability issues.

The CESI program uses the findings of COSEWIC (Committee on the Status of Endangered Wildlife in Canada) to report on changes in wildlife species disappearance risks 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.

2 Description and rationale of the changes in wildlife species disappearance risks indicator

2.1 Description

The changes in wildlife species disappearance risks indicator measures conservation effectiveness and is developed in partnership with the COSEWIC Secretariat at Environment Canada. The indicator tracks changes in the level of risk for species assessed by COSEWIC as "at risk" in Canada.

2.2 Rationale

Species are recognized and listed as at-risk of extinction or extirpation as a means to focus management action towards high priority issues. Successful management should reduce the risk of species extinction.

2.3 Changes since last report

The indicator was first reported by the CESI program in June 2011 with data current to November 2010. The indicator is being updated to bring the data current to December 2011.

3 Data

3.1 Data source

Data are drawn from COSEWIC Wildlife Species Status Reports, available at The Species at Risk Public Registry (available from: http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?type=doc&docID=18).

COSEWIC maintains a database of wildlife species assessment results, which were summarized for this indicator. A search can be made for wildlife species of interest at Wildlife Species Search (available from: http://www.cosewic.gc.ca/eng/sct1/index_e.cfm).

Data contributing to the assessment of individual wildlife species is drawn from a wide range of sources and is cited within the relevant status reports.

3.2 Spatial coverage

Regional representation is not considered when choosing wildlife species for assessment, although wildlife species with a small area of occupancy have greater priority. However, wildlife species knowledge is greatest in southern Canada and in terrestrial systems, so these wildlife species are over-represented in the group of assessed wildlife species.

3.3 Temporal coverage

In general, wildlife species are re-assessed every 10 years. The date of reassessment therefore varies widely within the dataset.

3.4 Data completeness

Data cover only the suite of wildlife species that have been reassessed and have sufficient data to be assessed.

3.5 Data timeliness

COSEWIC evaluates wildlife species twice per year; this indicator is current to the end of 2011.

4 Methods

COSEWIC uses a process based on science and Aboriginal and community knowledge to assess wildlife species at risk.¹ All native mammals, birds, reptiles, amphibians, fish, arthropods, mollusks, vascular plants, mosses and lichens are included in COSEWIC's current mandate. In doing its work, COSEWIC develops the prioritized "COSEWIC Candidate List" of wildlife species needing assessment, manages the production of wildlife species status reports, and holds meetings at which wildlife species are assessed and assigned to risk categories. In all of its actions, COSEWIC uses the best available information relevant to assessing a wildlife species' risk of extinction or extirpation, which it may obtain from any credible source of knowledge of the wildlife species and its habitat.

COSEWIC annually commissions status reports for high-priority candidate wildlife species on the COSEWIC Candidate List or for wildlife species that require re-assessment ("update status reports"). A status report is a comprehensive technical document that compiles and analyzes the best available information on a wildlife species' status in Canada. It contains information on the basic biology of a wildlife species, as well as information on a wildlife species' distribution in Canada, population sizes and trends, habitat availability and trends, and threats to the wildlife species.

All status reports (including updated status reports and unsolicited reports) must meet COSEWIC's standards for quality and completeness, and are subject to thorough reviews by the appropriate Species Specialist Subcommittee and the Aboriginal Traditional Knowledge Subcommittee, as well as by jurisdictions that have a responsibility for the wildlife species (including governments of the provinces and territories where the wildlife species occurs, federal departments responsible for the wildlife species, and wildlife management boards). Additional outside experts may also be asked to review status reports. When the reviews are complete and any required revisions have been incorporated, the report is distributed to all COSEWIC members.

COSEWIC members use status reports as a basis for discussion and for status assignment at semi-annual Wildlife Species Assessment Meetings. For each wildlife species considered at a Wildlife Species Assessment Meeting, COSEWIC sequentially considers each of five items to determine a Canadian status designation:

¹ Many wildlife species in Canada have not yet been assessed by COSEWIC, but are suspected of being at some risk of extinction or extirpation. These wildlife species, referred to as 'candidate wildlife species' are identified and prioritized by the Species Specialist Subcommittees or by the Aboriginal Traditional Knowledge Subcommittee as candidates for detailed status assessment. Candidates may also include wildlife species already assessed by COSEWIC as Not at Risk or Data Deficient, but where new information suggests they may be at risk.

1. Is there sufficient information presented in the report to determine wildlife species eligibility?
2. Given sufficient information, is the wildlife species eligible for assessment?
3. Is the status report adequate and acceptable for assessment purposes?
4. What status is suggested by application of approved COSEWIC quantitative assessment criteria and guidelines?
5. Does the suggested status conform to the COSEWIC definition for the proposed status category?

Wildlife species are assigned to one of seven status categories: Extinct (X), Extirpated (XT), Endangered (E), Threatened (T), Special Concern (SC), Not At Risk (NAR) or Data Deficient (DD). In 2011, 876 wildlife species had status categories. (see Table 1)

Table 1: Status of wildlife species assessed by COSEWIC as of December 2011

| STATUS | Total |
|------------------|-------|
| Extinct | 14 |
| Extirpated | 24 |
| Endangered* | 281 |
| Threatened* | 158 |
| Special Concern* | 177 |
| Not at Risk | 172 |
| Data Deficient | 50 |
| Grand Total | 876 |

* The sum of species designated as Endangered, Threatened and of Special Concern make up a total of 616 species at risk.²

COSEWIC also groups species that have a status category by “change status” which can be specified if more than one assessment has been done. This is what the indicator in CESI is based on. Those that are “new” have only been assessed once and therefore they are not included in the indicator. (see Table 2)

Table 2: Relationship between COSEWIC status changes and CESI changes in disappearance risk

| COSEWIC change status | Definition | CESI changes in disappearance risk |
|---------------------------|--|------------------------------------|
| In a higher risk category | Wildlife species placed in a higher risk category after the most recent reassessment | Higher risk |
| No change ¹ | Wildlife species stays in the same category after reassessment | No change |
| In a lower risk category | Wildlife species placed in a lower risk category after reassessment | Lower risk |
| No longer at risk | Wildlife species moved to the Not at Risk category from a risk category | Lower risk |
| New | Wildlife species examined for the first time are | Excluded |

² COSEWIC includes the “extirpated” category in the at-risk group in their reporting.

| | | |
|-------------------------|---|-------------------------|
| | assigned a category of New | |
| Changed | Wildlife species moved to the Data Deficient category from a risk category or to a risk category from the Data Deficient category | Excluded |
| Reassigned ² | Wildlife species that has been assigned to a different designatable unit than previously | Case-by-case assignment |

¹ Wildlife species that are “data deficient” on both dates when an assessment is made are excluded.

² Wildlife species that are reported in the “reassigned” category are examined individually, and, where direction of change can be determined unambiguously, they are placed into the appropriate group. The 59 wildlife species with a status change of “reassigned” were grouped into 31 units whose status could be determined. For example, a wildlife species that was split into two on reassessment would be treated as one unit. If both new units changed in the same direction on reassessment, the group was given a CESI change category. Of the 31 units, 5 were assigned to no-change, 3 to lower-risk, 5 to higher-risk, and the remaining 18 could not be determined. For more information on the allocation of wildlife species with a COSEWIC change status of “Reassigned,” please consult Annex 1.

5 Caveats and limitations

Knowledge of which wildlife species may be at risk is far from complete, and only a portion of those suspected to be at risk can be assessed. COSEWIC prioritizes assessments based on expert opinion. Early efforts focused mainly on vertebrates and plants, and these are also the best-known wildlife species. As a result, these wildlife species are over-represented among wildlife species that have been reassessed.

6 References and further reading

Government of Canada (2012) Committee on the Status of Endangered Wildlife in Canada. Retrieved in January 2012. Available from: http://www.cosewic.gc.ca/eng/sct1/index_e.cfm.

6.2 Further reading

Government of Canada (2012) Species at Risk Public Registry. Retrieved on 12 March, 2012. Available from: http://www.registrelep.gc.ca/default_e.cfm.

International Union for Conservation of Nature (2012) IUCN Red List of Threatened Species. Retrieved on 12 March, 2012. Available from: <http://www.iucnredlist.org/>.

National General Status Working Group (2012) Wild Species Reports. Retrieved on 12 March, 2012. Available from: <http://www.wildspecies.ca/>.

Annex 1: Allocation of wildlife species with a COSEWIC change status of “reassigned”, 2011

For the CESI indicator, species in the “reassigned” category have been classified into “higher risk,” “lower risk” or “no change” categories when adequate information is available. This table summarizes the rationale for and conclusions of that classification.

| CESI ID | COSEWIC IDs | NAME | Last assessed | CESI change class | Rationale for CESI assignment | Taxon group |
|---------|-------------------------|---|---------------|-------------------|---|------------------------|
| 1 | 954, 955, 956, 957, 958 | Lake Sturgeon (<i>Acipenser fulvescens</i>) | 01/11/2006 | no change | “Western populations” unit designated Endangered May 2005. Western populations unit was split into five separate populations November 2006; all new populations designated Endangered | Fishes (freshwater) |
| 2 | 1075, 1076 | Eastern Sand Darter (<i>Ammocrypta pellucida</i>) | 01/11/2009 | no change | The species was considered a single unit and designated Threatened in April 1994 and November 2000. Split into separate units in November 2009; both units were designated Threatened. | Fishes (freshwater) |
| 3 | 1054 | Bowhead Whale (<i>Balaena mysticetus</i>) | 01/04/2009 | lower risk | Hudson Bay-Foxe Basin population and Davis Strait-Baffin Bay population were each designated Threatened in May 2005. In April 2009 these populations were considered a single unit (Eastern Canada-West Greenland population) and designated Special Concern. | Mammals (marine) |
| 4 | 717, 718 | Blue Whale (<i>Balaenoptera musculus</i>) | 01/05/2002 | higher risk | A single unit was designated Special Concern in April 1983. The unit was split into two populations in May 2002 and both were designated Endangered. | Mammals (marine) |
| 5 | 874, 875 | Fin Whale (<i>Balaenoptera physalus</i>) | 01/05/2005 | unknown | A single unit was designated Special Concern in April 1987. In May 2005 the Pacific population was designated Threatened and the Atlantic population was designated Special Concern | Mammals (marine) |
| 6 | 1115, 1116, 1117 | Mountain Sucker (<i>Catostomus platyrhynchus</i>) | 01/11/2010 | unknown | A single unit was designated Not at Risk in April 1991. Split into three populations in November 2010, designated Threatened, Special Concern, and Not at Risk. | Fishes (freshwater) |
| 7 | 686, 687 | Piping Plover 2 subspecies (<i>Charadrius melodus subsp</i>) | 01/05/2001 | no change | A single unit was designated Threatened in April 1978 and Endangered in April 1985. In May 2001, the species was re-examined and split into two groups according to subspecies, both of which were designated Endangered. | Birds |

| | | | | | | |
|----|------------|--|------------|-------------|---|--------------------------|
| 8 | 873, 876 | Kiyi (<i>Coregonus kiyi subsp</i>) | 01/05/2005 | unknown | The Kiyi was designated Special Concern in April 1988. Split into two subspecies in May 2005: the Upper Great Lakes Kiyi was designated Special Concern, and the Lake Ontario Kiya was designated Extinct. | Fishes (freshwater) |
| 9 | 130, 366 | Beluga Whale (<i>Delphinapterus leucas</i>) | 01/05/2004 | unknown | Part of the Southeast Baffin Island-Cumberland Sound population was moved to a different unit in 2004; comparisons over time are not possible. | Mammals (marine) |
| 10 | 963, 1004 | Allegheny Mountain Dusky Salamander (<i>Desmognathus ochrophaeus</i>) | 01/04/2007 | unknown | A single unit was designated Threatened in 2001. Split into two populations in April 2007, which were designated Endangered and Threatened. | Amphibians |
| 11 | 780 | North Atlantic Right Whale (<i>Eubalaena glacialis</i>) | 01/05/2003 | no change | The Right Whale was considered a single species and designated Endangered in 1980, 1985 and 1990. Split into two species in May 2003; the North Atlantic Right Whale was designated Endangered in 2003. The North Pacific Right Whale (ID 781) has since been re-evaluated. | Mammals (marine) |
| 12 | 995 | Peregrine Falcon anatum/tundrius (<i>Falco peregrinus anatum/tundrius</i>) | 01/04/2007 | unknown | Two subspecies (Threatened in May 2000 and Special Concern in 1992) were combined and designated Special Concern in April 2007. | Birds |
| 13 | 1108, 1009 | Atlantic Cod (maritime) (<i>Gadus morhua</i>) | 01/04/2010 | higher risk | In May 2003, the Maritimes population was designated Special Concern. The Maritimes population was split into two units in 2010, both of which were designated Endangered. | Fishes (marine) |
| 14 | 1106, 1107 | Atlantic Cod (Arctic) (<i>Gadus morhua</i>) | 01/04/2010 | unknown | In May 2003, the Arctic population was designated Special Concern. The Arctic population was split in 2010 into two units, designated Special Concern and Data Deficient | Fishes (marine) |
| 15 | 749, 750 | Enos Lake Benthic Threespine Stickleback (<i>Gasterosteus aculeatus</i>) | 01/11/2002 | higher risk | Original designation (including both Benthic and Limnetic groups) was Threatened in April 1988. Split into two units when re-examined in November 2002; both were designated Endangered. | Fishes (freshwater) |
| 16 | 945, 946 | Southern Flying Squirrel (<i>Glaucomys volans</i>) | 01/04/2006 | lower risk | Designated Special Concern in April 1988. Split into two populations in April 2006; both were designated Not at Risk. | Mammals (terrestrial) |
| 17 | 1137, 1138 | Chestnut Lamprey (<i>Ichthyomyzon castaneus</i>) | 01/11/2010 | unknown | The species was considered a single unit and designated Special Concern in April 1991. Split into two populations in November 2010; both were placed in the Data Deficient category | Fishes (freshwater) |
| 18 | 970, 971 | Northern Brook Lamprey (<i>Ichthyomyzon fossor</i>) | 01/04/2007 | unknown | The species was considered a single unit and designated Special Concern in April 1991. The species was split into separate units in April 2007: one unit was designated Special Concern and the other Data Deficient. | Fishes (freshwater) |
| 19 | 1016 | Bigmouth Buffalo (<i>Ictiobus cyprinellus</i>) | 01/04/2008 | unknown | A single unit was designated Special Concern in 1989; in 2008 the unit was split and this sub-unit was assessed as Not at Risk; the other sub-unit (ID 1024) was reassessed in 2009. | Fishes (freshwater) |

| | | | | | | |
|----|---------------|--|------------|-------------|---|--------------------------|
| 20 | 719, 720 | Western Screech-Owl, twosubspecies (<i>Megascops kennicottii</i>) | 01/05/2002 | unknown | Species considered in April 1995 and placed in the Data Deficient category. It was split according to subspecies in May 2002, and the subspecies were designated Special Concern and Endangered in May 2002. | Birds |
| 21 | 914 | Deepwater Sculpin (<i>Myoxocephalus thompsonii</i>) | 01/04/2006 | unknown | In 2006 the unit was enlarged from the unit considered in 1987. | Fishes (freshwater) |
| 22 | 915 | Atlantic Walrus (<i>Odobenus rosmarus rosmarus</i>) | 01/04/2006 | unknown | Two separate populations: Eastern Arctic (Not at Risk in 2000) and Northwest Atlantic (Extirpated in April 1987 and May 2000) were combined in 2006 and designated Special Concern. | Mammals (marine) |
| 23 | 1021, 1022 | Eastern Foxsnake (<i>Pantherophis gloydi</i>) | 01/04/2008 | higher risk | A single unit was designated Threatened in May 2000. The unit was split into two populations in April 2008 and both were designated Endangered. | Reptiles |
| 24 | 983, 984 | Gray Ratsnake (<i>Pantherophis spiloides</i>) | 01/04/2007 | unknown | A single unit was designated Threatened in May 2000. Split into two populations in April 2007, designated Endangered and Threatened. | Reptiles |
| 25 | 973, 974 | Five-lined Skink (<i>Plestiodon fasciatus</i>) | 01/04/2007 | unknown | A single unit was designated Special Concern in 1998. In April 2007 two units were designated Endangered (Carolinian population) and Special Concern (Great Lakes/St Lawrence population). | Reptiles |
| 26 | 1018, 1019 | Western Chorus Frog (<i>Pseudacris triseriata</i>) | 01/04/2008 | unknown | A single unit was designated Not at Risk in May 2001. In April 2008 the unit was split into two, designated Threatened (Great Lakes / St. Lawrence-Canadian Shield population) and Not At Risk (Carolinian population). | Amphibians |
| 27 | 822 | Barren-ground Caribou (<i>Rangifer tarandus groenlandicus</i>) | 01/05/2004 | lower risk | In 1991 the Low Arctic population was designated Threatened. The Dolphin and Union population is composed of a portion of the former "Low Arctic population," and it was designated Special Concern in May 2004. | Mammals (terrestrial) |
| 28 | 823 | Peary Caribou (<i>Rangifer tarandus pearyi</i>) | 01/05/2004 | no change | This unit was created in 2004 for the Peary Caribou subspecies (designated Endangered) and contains all or part of three previous units (designated Endangered, Endangered and Threatened) | Mammals (terrestrial) |
| 29 | 1113,1114 | Showy Goldenrod (<i>Solidago speciosa</i>) | 01/11/2010 | unknown | The species was considered a single unit and designated Endangered in 1999, confirmed in 2000. Split into two populations designated Endangered (Great Lakes Plains population) and Threatened (Boreal population) in 2010. | Vascular plants |
| 30 | 621, 622, 623 | American Badger, three subspecies (<i>Taxidea taxus subsp</i>) | 01/05/2000 | unknown | A single unit was designated Not at Risk in 1979. In 2000, each of three subspecies was given a separate designation (Endangered, Endangered, and Not At Risk). | Mammals (terrestrial) |
| 31 | 11, 601, 161 | Spring Salamander (<i>Gyrinophilus porphyriticus</i>) | 01/05/2011 | higher risk | The species was considered a single unit and designated Special Concern in 1989 and 2002. Split into two populations in May 2011. The Carolinian population was designated Extirpated and the | Amphibians |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | Adirondack / Appalachian population was designated Threatened in May 2011. | |
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