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Data Sources and Methods: Changes in Wildlife Species Disappearance Risks Indicator

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Introduction

The Canadian Environmental Sustainability Indicators (CESI) use 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 wild Canadian wildlife species, subspecies, varieties or other designatable units that are suspected of being at risk of extinction or extirpation. COSEWIC uses a process based on science and Aboriginal and community knowledge to assess wildlife species at risk. All native mammals, birds, reptiles, amphibians, fish, arthropods, molluscs, 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.

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.

How the indicator was derived

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. 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 ranks: Extinct (X), Extirpated (XT), Endangered (E), Threatened (T), Special Concern (SC), Not At Risk (NAR) or Data Deficient (DD). In 2010, 857 wildlife species had ranks.

Table 1: Status of wildlife species assessed by COSEWIC as of 2010.

STATUS	Total
Extinct	14
Extirpated	22
Endangered*	270
Threatened*	153
Special Concern*	172
Not at Risk	171
Data Deficient	49
Grand Total	851

* The sum of species Endangered, Threatened and of Special Concern make up a total of 595 species at risk.¹

COSEWIC reports on wildlife species status changes in the following way:

- New - First assessment by COSEWIC
- In a higher risk category - Wildlife species placed in a higher risk category after reassessment on the date shown
- In a lower risk category - Wildlife species placed in a lower risk category after reassessment on the date shown.
- No change - Wildlife species stays in the same category after reassessment on the date shown.
- Changed - Wildlife species moved to the Data Deficient category from a risk category, or to a risk category from the Data Deficient category on the date shown.
- Reassigned - Wildlife species that has been assigned to a different designatable unit than previously on the date shown.
- No longer at risk - Wildlife species moved to the Not at Risk category from a risk category on the date shown.

The Wildlife Species Disappearance Risk indicator is derived from COSEWIC status changes and summarizes the proportion of wildlife species that have been reassessed that are in a higher risk category, in a lower risk category, or have no change in extinction risk.

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

COSEWIC change status	CESI changes in disappearance risk
In a higher risk category	Higher risk
No Change	No change
In a lower risk category	Lower risk
No longer at risk	Lower risk
New	Excluded
Changed	Excluded
Reassigned	Case-by-case assignment

¹ COSEWIC includes the "extirpated" category in the at-risk group in their reporting.

Wildlife species that are “data deficient” on both dates are excluded. 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 57 wildlife species with a status change of “reassigned” were grouped into 30 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 30 units, 5 were assigned to no-change, 3 to lower-risk, 4 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.

Data sources

Data are drawn from COSEWIC Wildlife Species Status Reports, available at The Species At Risk Public Registry (http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=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 (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.

Caveats and limitations

Knowledge of which wildlife species may be at risk is far from complete, and only a proportion 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.

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.

Temporal coverage

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

Data quality completeness

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

Data quality timeliness

COSEWIC evaluates wildlife species twice per year; this indicator is current to the end of 2010.

For more information

For further information on species at risk and extinction risk assessment:

- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (<http://www.cosewic.gc.ca/>)
- Species at Risk Public Registry (<http://www.sararegistry.gc.ca/>)
- IUCN Red List of Threatened Species (<http://www.iucnredlist.org/>)
- Wild Species Reports (<http://www.wildspecies.ca/>)

Annex 1: Allocation of Wildlife Species with a COSEWIC Change Status of “Reassigned”, 2010

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	The “Western populations” unit was designated Endangered in May 2005. The Western populations unit was split into five separate populations in November 2006 with 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. It was split into separate units in November 2009, with both units designated Threatened.	Fishes (freshwater)
3	1054	Bowhead Whale (<i>Balaena mysticetus</i>)	01/04/2009	lower risk	The Hudson Bay-Foxe Basin population and the 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. In November 2010, it was split into three populations 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	Fishes (freshwater)

					Special Concern, the Lake Ontario Kiya was designated Extinct.	
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. This was split into two populations in April 2007, which were designated Endangered and Threatened.	Amphibians
11	780, 781	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 April 1990. It was split into two species in May 2003 with the North Atlantic Right Whale designated Endangered and the North Pacific Right Whale designated Endangered.	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 2 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. In 2010, the Arctic population was split into two units, designated Special Concern and Data Deficient.	Fishes (marine)
15	749, 750	Enos Lake Benthic Threespine Stickleback (<i>Gasterosteus sp.</i>)	01/11/2002	higher risk	The original designation (including both Benthic and Limnetic species) was Threatened in April 1988. It was split into two species when re-examined in November 2002 and 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, it was split into two populations in April 2006 and 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. It was split into two populations in November 2010 and 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. It was split into separate units in April 2007, with 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 subunit assessed as Not At Risk, the other subunit was reassessed in 2009.	Fishes (freshwater)
20	719, 720	Western Screech-Owl, 2 subspecies (<i>Megascops kennicottii</i>)	01/05/2002	unknown	The species was 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. It was split into two populations, designated Endangered and Threatened, in April 2007.	Reptiles
25	973, 974	Five-lined Skink (<i>Plestiodon fasciatus</i>)	01/04/2007	unknown	A single unit was designated Special Concern in April 1998. In April 2007, two units were designated Endangered and Special Concern.	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 and Not At Risk.	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 comprised 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 (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 was designated Endangered in 1999, confirmed in 2000. It was split into two populations designated Endangered and Threatened in 2010.	Vascular Plants
30	621, 622, 623	American Badger, 3 subspecies (<i>Taxidea taxus subsp</i>)	01/05/2000	unknown	A single unit was designated Not at Risk in 1979. In 2000, each of 3 subspecies was given a separate designation (Endangered, Endangered, and Not At Risk).	Mammals (terrestrial)