



INDICATOR: Trends in Species of Conservation Concern Based on General Status Assessment

Strategic Direction: Reduce Threats

Target: 10. By 2015, the status of species and ecosystems of conservation concern in Ontario is improved.

Theme: State of Ecosystems and Species — Species Diversity

Previous version: [Trends in species of Conservation Concern Based on General Status Assessment 2015](#)

Background Information

Globally, the majority of indicators that measure biodiversity show net declines over recent decades. The global Living Planet index shows an average of 68% decrease in population sizes of monitored mammals, birds, amphibians, reptiles and fishes between 1970 and 2016. (World Wildlife Fund 2020). The Living Planet Report Canada (2020) state that species of global conservation concern (IUCN threatened status) have declined by 42% over that same time period. These species are threatened by human activities such as development and the consumption of natural resources.

The Living Planet Report Canada also revealed that “populations of Canadian species assessed as at risk nationally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) have declined by 59% on average from 1970-2016”.

The general status of a broad cross-section of wild species in Canada is assessed every 5 years in the Wild Species reports produced by the National General Status Working Group. The provincial ranks for species in Ontario are assessed through NatureServe’s Subnational Conservation Status Ranks maintained by Ontario’s Natural Heritage Information Centre and serve as a tool which can help identify which species’ populations are sensitive or may be at risk and need further protection. Comparing the rankings between species groups is useful for determining patterns of threats that may be affecting these groups of species and pointing the way to improved conservation practices to mitigate the threats. At the provincial and national levels, each assessed species is assigned a rank in one of 10 conservation status categories (Table 1). The first five categories represent species of conservation concern.



Table 1. Definitions of NatureServe Subnational conservation status ranks (Canadian Endangered Species Conservation Council 2016).

Rank	Definition
Presumed extirpated SX	Not located in the jurisdiction despite intensive searches and virtually no likelihood of rediscovery.
Possibly extirpated SH	Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
Critically imperiled S1	At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
Imperiled S2	At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
Vulnerable S3	At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
Apparently secure S4	At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
Secure S5	At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
Unrankable SU	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
Unranked SNR	National or subnational conservation status not yet assessed.
Not Applicable SNA	A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species or ecosystems) (see Master et al. 2012, Appendix A, pg 70 for further details). Note: When the Element Global Rank is GNA, the Element National Rank should be entered as NNA and Element Subnational Rank should be entered as SNA for all national and subnational records associated with it.

This indicator examines the status of Ontario wild species assessed in the 2015 conservation status assessment as well as changes from the previous assessment in 2005 and 2010. It provides an update to information presented in State of Ontario's Biodiversity 2015 (OBC 2015).

Data Analysis

The status ranks for Ontario species from the 2005, 2010 and 2015 national general status assessments (CESCC 2006, 2011, 2016) were downloaded from the national general status assessment [website](#). For Ontario, species subnational status ranks (S-ranks) are maintained by the [Ontario Natural Heritage Information Centre](#).

Starting with the 2015 report, the National Working Group is using the NatureServe ranking system. In the previous reports — 2000, 2005, and 2010 — the general status ranking system was used. For comparison purposes the species rankings from previous years were converted to the NatureServe system (Table 2).

Table 2. Comparison of the NatureServe rounded ranks with the previous General Status ranking system (CESCC 2016).

Previous General Status ranking system		NatureServe rounded ranks	
Extinct	0.2	X	Presumed Extirpated
Extirpated	0.1	H	Possibly Extirpated
At Risk	1	1	Critically Imperiled
May Be At Risk	2	2	Imperiled
Sensitive	3	3	Vulnerable
		4	Apparently Secure
Secure	4	5	Secure
Undetermined	5	U	Unrankable
Not Assessed	6	NR	Unranked
Exotic	7	NA	Not Applicable
Accidental	8		

In the 2015 report, 15,858 Ontario species were assessed, a significant increase from the 2010 report, which assessed 6995 species and the 2005 which assessed 4052. The 2015 report included new taxonomic groups such as sponges, fungi, and terrestrial and freshwater snails and slugs, that had not been assessed in the 2010 or 2005 reports. There were also new species added to each of the previously assessed taxonomic groups except freshwater fishes*, amphibians, and reptiles.



The number of insects groups assessed has expanded since 2005, when only tiger beetles and odonates (dragonflies and damselflies) were assessed. Predaceous diving beetles, ground beetles, lady beetles, bumblebees, black flies, horse flies, mosquitoes and selected micromoths were included in 2010. In 2015 an additional 11 more insect groups were assessed: mayflies, grasshoppers and relatives, lacewings, ants, bees, yellowjacket wasps, caddisflies, moths and butterflies, scorpionflies, bee flies, flower flies. To simplify presentation, all insect groups have been included in a larger general group named “insects”.

The status of freshwater fishes was not re-assessed in the Wild Species 2010, so 2005 data for this group are presented that year.

A summary of the proportion of native species in secure or conservation concern categories is presented (n = 7739) for each taxon group and for all species combined based on the 2015 assessment (Figure 1). This summary table excludes species in the exotic, undetermined, accidental and not assessed categories.

For 4,063 species that were assessed both in 2005 and 2010 and the 6,989 species assessed in both 2010 and 2015 (Figure 2), the number of species with changes in conservation status ranks and the reasons for changes were examined (Table 4). The reasons for changes in status are important. Some changes in rank occurred as a result of real changes in the distribution, population size or threats to the species causing ranks to either increase or decrease in risk (see Figure 3). Many of the changes in risk were due to improved information about the species, but do not represent real changes in distribution and abundance (i.e., new survey data provided a more accurate assessment of the status of the species). Some changes in rankings also occurred due to taxonomic changes – a formerly recognized species is combined with another species or a single species is divided into two or more species. Procedural changes and rectifying errors from the previous report also resulted in some changes in the conservation status of species.

Results

Trend: Fair **Data Confidence:** High **Geographic Extent:** Great Lakes

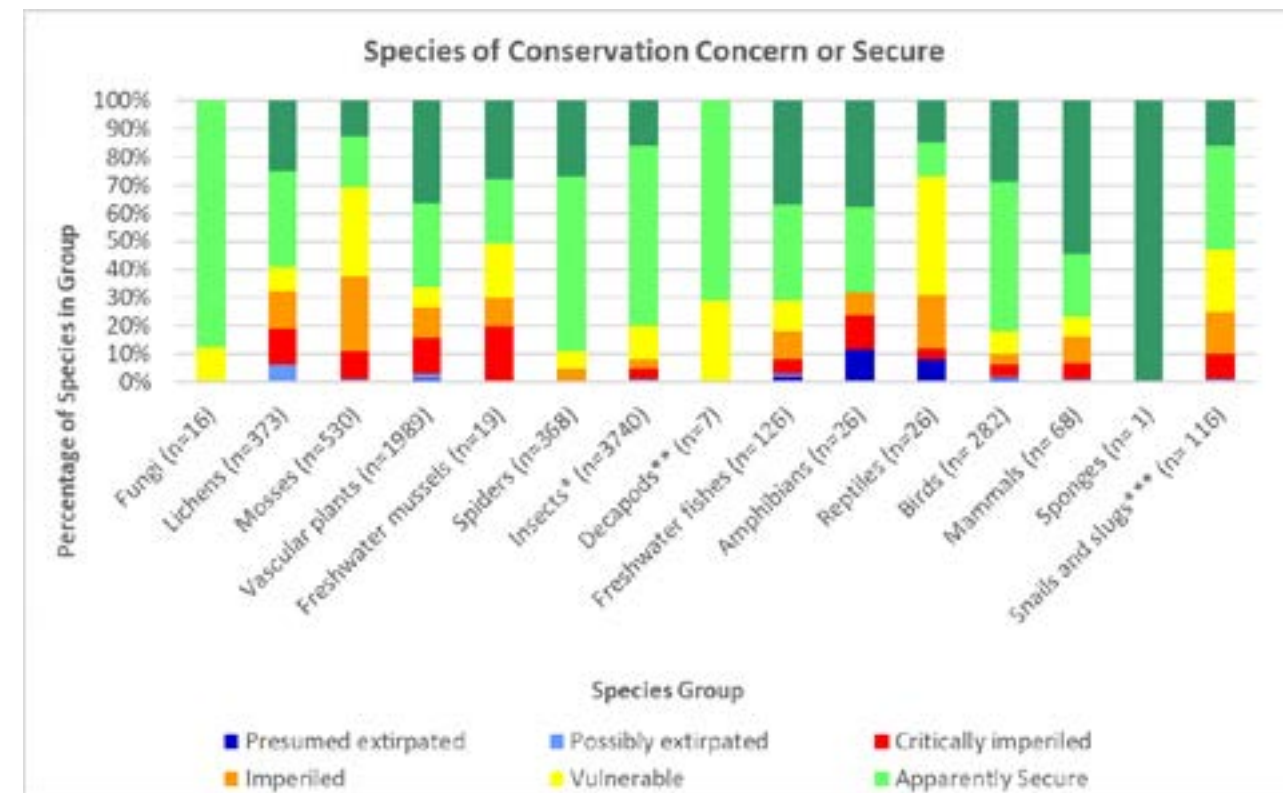


Figure 1. Proportion of Ontario native wild species assessed in secure and conservation concern categories (n = number of secure species and species of conservation concern in group). Does not include species assessed as unranked, unrankable or not applicable.

*Insect groups assessed include mayflies, dragonflies and damselflies, stoneflies, grasshoppers and relatives, lacewings, beetles, ants, bees, yellowjacket wasps, caddisflies, moths and butterflies, scorpionflies, black flies, mosquitoes, horse flies, bee flies, flower flies.;

** decapods: in 2005 and 2010 were strictly freshwater crayfish, in 2015 freshwater shrimp and crab were added.

*** includes terrestrial and freshwater snails and slugs.



Table 3. Species ranks for Ontario species assessed in 2005, 2010, 2015 (Natural Heritage Information Centre 2006, 2011, 2016).

Taxonomic group	Presumed extirpated			Possibly extirpated			Critically imperiled			Imperiled			Vulnerable			Apparently secure			Secure			Unrankable			Unmarked			Not applicable			Total																												
	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015																							
Fungi			0			0			0			0			2			14			0			31			0			0			0			47																							
Lichens		0	0		2	23		1	50		102	47		26	33		126	128		90	92		61	53		10	0		0	1			418			427																							
Mosses		1	3		1	2		1	51		192	141		79	167		142	98		64	68		41	148		0	0		1	2			522			680																							
Vascular plants		0	0		24	22		25	44		55	62		253	441		427	212		184	149		139	533		576	591		722	736		726	81		73	49		0	0		0	0		1017	1051		1080		3055		3099		3118						
Freshwater mussels		0	0		0	0		0	0		8	12		14	10		6	7		9	9		14	6		6	16		7	7		20	0		0	1		1	1		0	0		0	0		7	41		41		79							
Spiders		0	0		0	0		0	0		32	18		9	22		215	229		95	99		366	355		0	0		34	34		0	0		0	0		0	0		34	34		751		757													
Insects		0	0		2	0		3	36		0	3		151	45		95	125		40	105		460	30		716	2375		60	223		591	5		317	3707		0	0		1598	2		76		690		182		1538		9735							
Decapods		0	0		0	0		0	0		0	0		0	0		0	0		0	0		2	2		2		5		5	5		0	0		0	0		0	0		1	0		0	0		2	2		4		9		9		12		
Freshwater fishes		1	1		3	5		5	1		10	10		6	3		3	13		21	21		14	41		41		43		45	45		46		6		6		8		1		1		0		20		20		153		153		154				
Amphibians		0	0		3	2		2	0		5	6		3	0		0	2		0	1		0		8		7		8		10	10		10		0		0		0		0		0		0		0		0		25		26		26			
Reptiles		0	0		2	0		0	0		12	13		1	0		0	5		5	5		11	4		3		3		4	4		4		1		1		0		0		0		1		1		1		27		27		27				
Birds		1	1		3	1		1	3		16	17		12	10		7	11		21	36		22		171		154		150		81		81		81		0		4		3		0		0		1		177		182		201		478		483		487
Mammals		0	0		0	0		0	1		3	3		4	2		2	6		9	8		5		15		15		15		37		37		37		4		5		2		1		1		0		10		10		13		81		81		83
Sponges			0			0			0			0			0			0			0			0			0			1			5			0			0			0			0			0			6								
Terrestrial and freshwater snails and slugs			0			1			11			18			25			43			18			70			0			34			0			0			0			0			0			34			220								
All species groups		2	3		40	30		39	111		109	128		556	511		866	605		291	450		916		813		2006		3718		966		1392		1793		97		874		4433		3		13		1599		1229		1377		2087		4051		7148		15858

Insects groups assessed include: mayflies, dragonflies and damselflies, stoneflies, grasshoppers and relatives, lacewings, beetles, ants, bees, yellowjacket wasps, caddisflies, moths and butterflies, scorpionflies, black flies, mosquitoes, horse flies, bee flies, flower flies.

2005 data is used for fishes - 2010 assessment not complete.

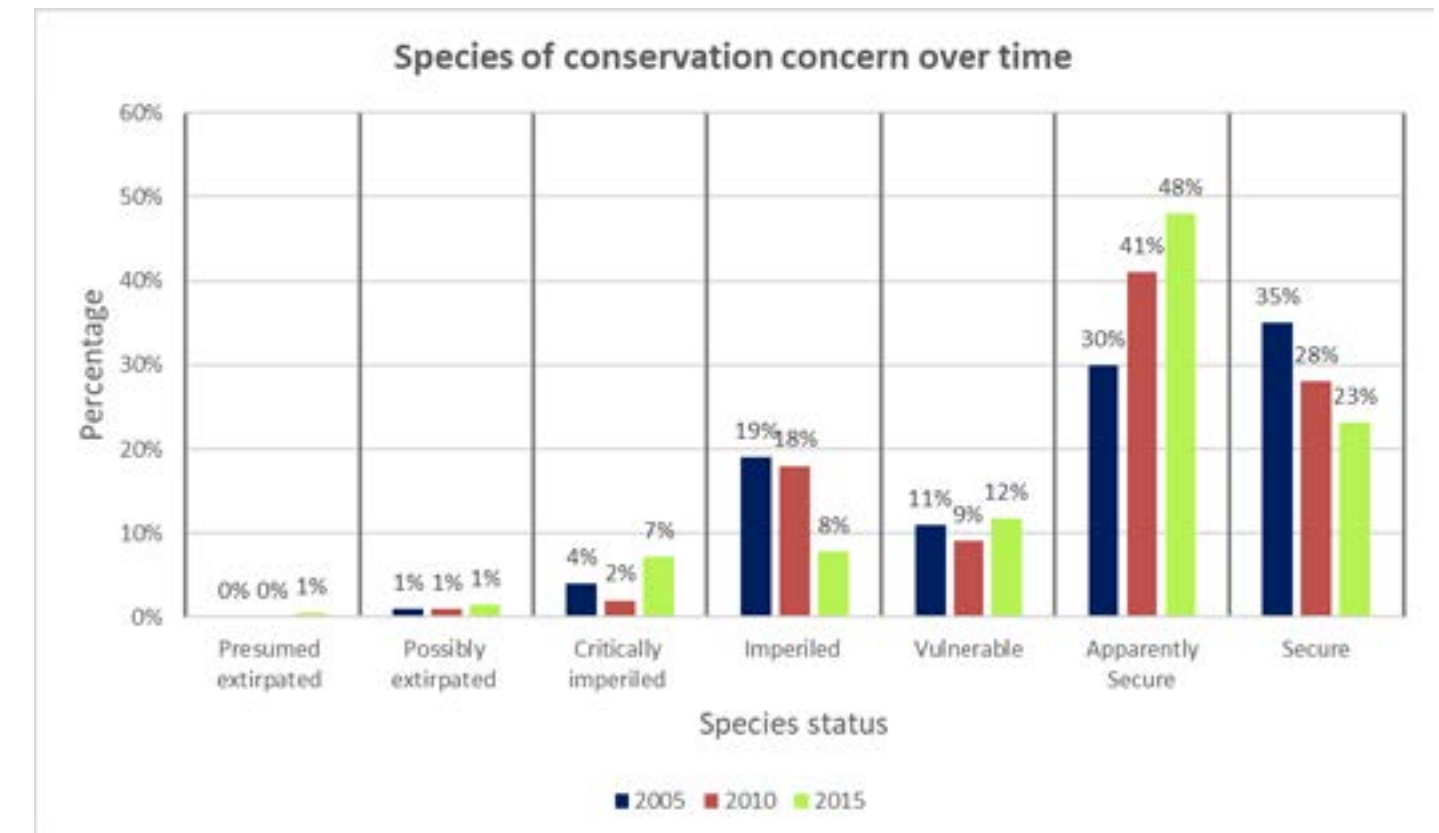


Figure 2. A comparison of the conservation status of native Ontario species assessed in 2005 (n = 2,854), 2010 (n = 4,758) and 2015 (n=7,739).



Table 4. Summary of changes in conservation status ranks for Ontario species assessed in 2005 and 2010, the summary of changes from 2010 and 2015, as well as the reasons for rank change. This table compares species groups that were assessed in 2005 and in 2010 as well as species that were assessed both in 2010 and 2015 to show the changes in the status between those years. Species groups that are new in 2010 are not included in the 2005-2010 comparisons (lichens, mosses, spiders, new insect groups). Species new in 2015 are not included in the 2010-2015 table. In 2005-2010, 4063 species were assessed together, with 69 species excluded.

Direction of conservation status change and reason for rank change

	Total 05-10	Total 10-15	Better information 05-10	Better information 10-15	Increasing risk 05-10	Increasing risk 10-15	Decreasing risk 05-10	Decreasing risk 10-15
Species in lower risk rank	134	203	128	92	n/a	n/a	6	11
Species in higher risk rank	45	628	32	359	13	5	n/a	n/a
Into accidental or exotic (labelled as Not Applicable in 2015)	16	49	16	24	n/a	n/a	n/a	n/a
Into undetermined	18	135	18	n/a	n/a	n/a	n/a	n/a
From undetermined to another rank	22	154	22	21	n/a	n/a	n/a	n/a
Total number of changes	235	1,169	216	496	13	5	6	11
No change	3,759	5,820						

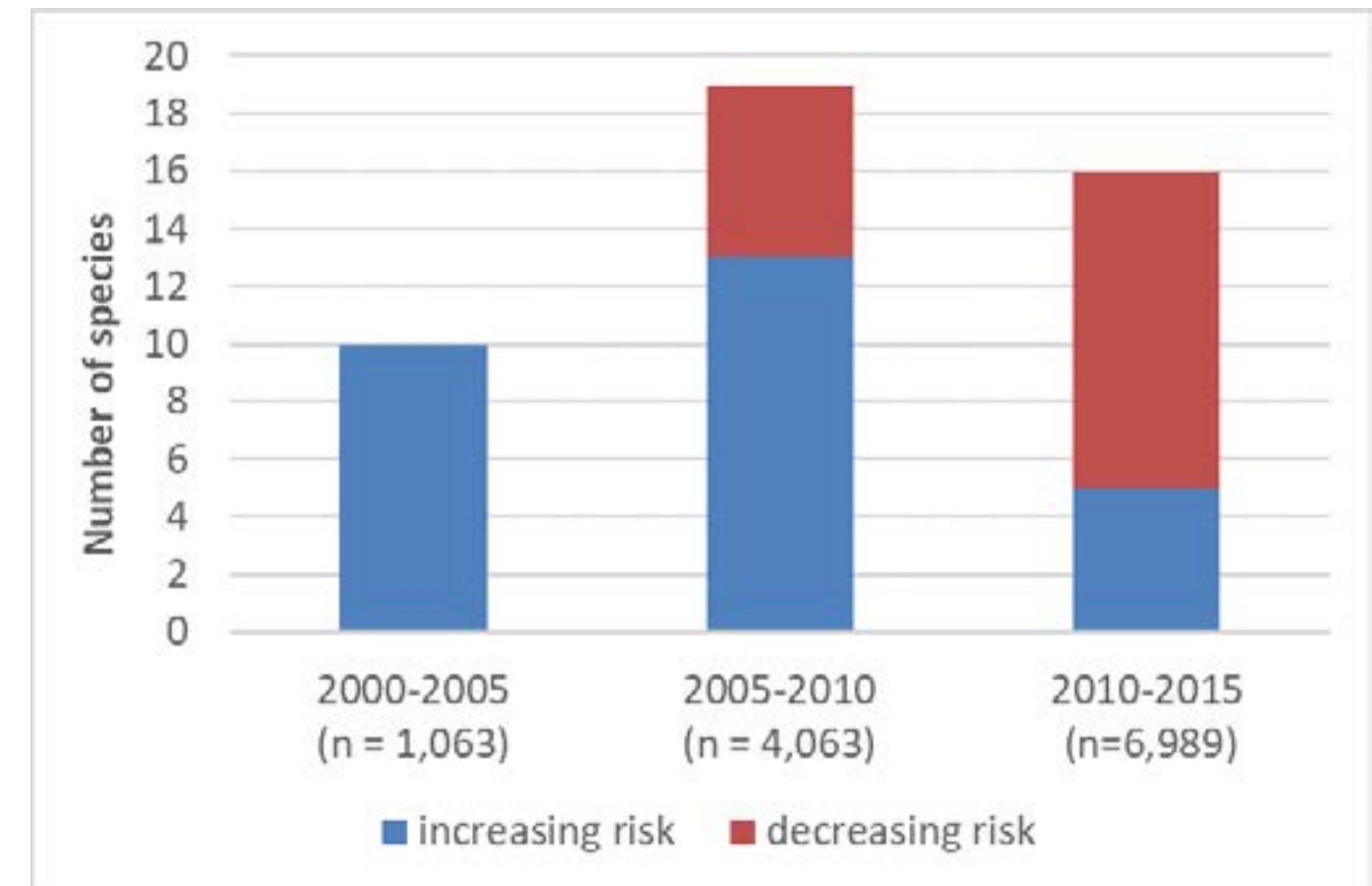


Figure 3. Number of species with real conservation status rank changes due to increasing risk and decreasing risk between the 2000 and 2005 assessments (OBC 2010), between the 2005 and 2010 assessments (OBC 2015), and between 2010 and 2015.

Status

- Reptiles and freshwater mussels were shown to be some of the most vulnerable species groups in the 2015 assessment, which is similar to the 2010 update. The assessment for reptiles showed that 73% (n=26) were categorized as species of conservation concern (ranked as presumed extirpated, possibly extirpated, critically imperiled, imperiled, or vulnerable), a 1% increase from the 2010 report at 72% (n=25), and 49% (n=71) of freshwater mussels were assessed as species of conservation concern, a large decrease from the 2010 report at 68% (n=40). However, a new category; mosses, also had a high percentage of vulnerable species at 69% (n=530).
- Based on the species that have been assessed, (excluding unrankable, unranked, or not applicable categories) some of the groups with the highest percentage of secure species includes spiders at 89%, with a 1% increase from the 2010 report, and birds at 82% which increased from 79% in 2010. Some new species groups also had high percentages of secure species including sponges (100%) and fungi (87%).



- Though spiders were listed as most secure, just over half (51%) of spiders species, 83% of sponges and 62% if insects were assessed as unrankable, unranked or not applicable, a slight increase from 2010 (40%), due to lack of information, illustrating how relatively little we know about some groups of organisms.
- In 2010, mammals were listed as the species in the vertebrae group with the highest proportion of secure species (80%) however, their number has decreased to 76% and birds are at 82% in 2015.
- General status ranks of 8,863 new Ontario species have been introduced in the Wild Species 2015 report, including new categories of fungi, sponges, terrestrial and freshwater snails and slugs, as well as additions to lichens, mosses, vascular plants, freshwater mussels, spiders, insects, decapods, freshwater fishes, amphibians, and mammals.
- 1,169 of 6,989 species (17%) assessed in 2010 and 2015 had a change in conservation status rank. Almost half (42%) of the changes in ranks can be attributed to improved knowledge.
- Since 2010, five species changed status due to increasing risk. These changes can be attributed to changes in population size, distribution or threats to the species. Eleven species changed status due to decreasing risk.

Links

Related Targets: N/A

Related Themes: N/A

Web Links

General Status of Species in Canada <http://www.wildspecies.ca/home.cfm?lang=e>
<https://www.natureserve.org/conservation-tools/conservation-status-assessment>

References

Canadian Endangered Species Conservation Council (CESCC). 2006. Wild species 2005: The General Status of Species in Canada. National General Status Working Group. [Available at: www.wildspecies.ca/wildspecies2005/GS2005_site_e.pdf]

<https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/changes-status-wildlife-species-risk.html>

Canadian Endangered Species Conservation Council (CESCC). 2011. Wild species 2010: The General Status of Species in Canada. National General Status Working Group. [Available at: http://publications.gc.ca/collections/collection_2011/ec/CW70-7-2010-eng.pdf]

Natural Heritage Information Centre. 2016. Biotics 5 database. Natural Heritage Information Centre, Ministry of Northern Development, Mines, Natural Resources and Forestry, Peterborough Ontario. <https://www.natureserve.org/conservation-tools/conservation-status-assessment>

Ontario Biodiversity Council. 2015. State of Ontario's Biodiversity 2015. A report of the Ontario Biodiversity Council, Peterborough, ON.

World Wildlife Fund (WWF). 2014. Living planet report 2014: species and spaces, people and places. [McLellan, R., Iyengar, L., Jeffries, B. and N. Oerlemans (Eds)]. WWF, Gland, Switzerland. [Available at: http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/]

WWF (2020) Living Planet Report 2020. Bending the curve of biodiversity loss: a deep dive into the Living Planet Index. Marconi, V., McRae, L., Deinet, S., Ledger, S. and Freeman, F. in Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland. <https://livingplanet.panda.org/>

WWF-Canada. 2020. Living Planet Report Canada: Wildlife At Risk. Currie J. Snider, J. Giles E. World Wildlife Fund Canada. Toronto, Canada. DOI: 10.13140/RG2.2.16556.49280

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Ontario Biodiversity Council. 2021. State of Ontario's Biodiversity [web application]. Ontario Biodiversity Council, Peterborough, Ontario. [Available at: <http://ontariobiodiversitycouncil.ca/sobr> (Updated: July 5, 2021)].