



Wildlife Species Conservation Status Ranks in New Brunswick

Trends Analysis
2000 – 2024



Atlantic Canada Conservation Data Centre
Centre de données sur la conservation du Canada atlantique

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Cover photos from left to right

Harris' Checkerspot (*Chlosyne harrisii*) [S5] by Sean Blaney

Common Buttonbush (*Cephalanthus occidentalis*) [S2S3] by Sean Blaney

Frosted Glass-whiskers Lichen (*Sclerophora peronella*) [S1] by Iain Crowell



Table of Contents

Overview.....	4
Executive summary	4
Highlights	4
 Introduction.....	 10
 Methods.....	 12
 Results	 16
Species composition	16
Current status ranks	18
Proportion of species considered at risk	21
Change in conservation status over time	22
 Discussion.....	 26
Biodiversity trends and patterns in New Brunswick	26
Biodiversity data gaps in New Brunswick	31
 Appendices	 33
Appendix 1: General status rank definitions	33
Appendix 2: NatureServe status rank definitions	34

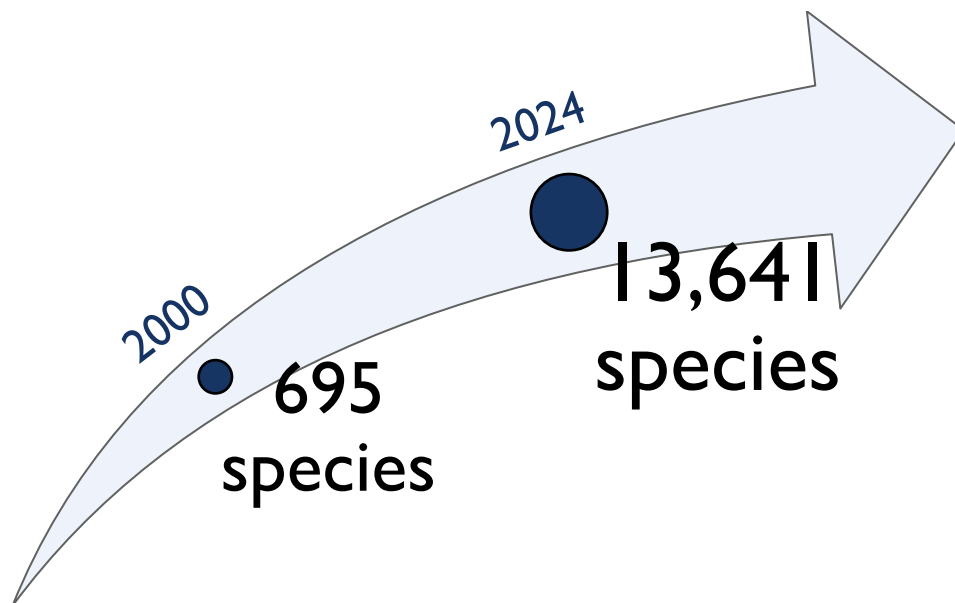
Overview

Executive Summary

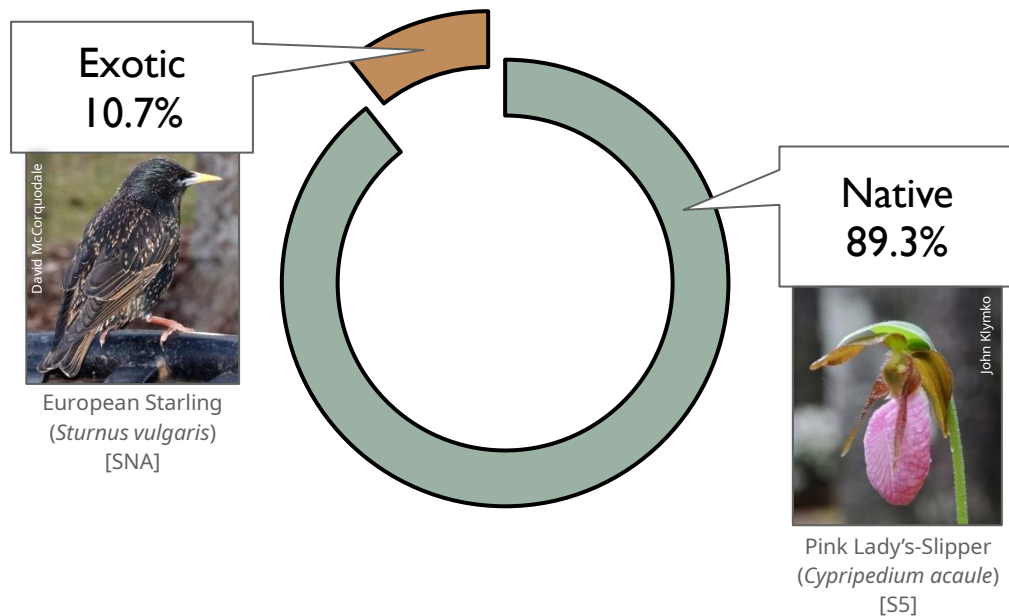
The Government of New Brunswick implemented a Biodiversity Strategy in 2009 that aims to conserve genetic, species, and ecosystem diversity and ensure the sustainable use of biological resources within the province. In support of a renewed provincial Biodiversity Strategy, this report summarizes the state of New Brunswick's wildlife species based on changes to provincial conservation [status ranks](#) from 2000 – 2024.

Highlights

1. **We have made a lot of progress in understanding New Brunswick's biodiversity since 2000**, going from 695 species assessed in seven taxonomic groups in 2000 to 13,641 species assessed in 46 taxonomic groups in 2024:



2. **More than 10% of assessed species in New Brunswick are not native to the province.** Of the 13,641 New Brunswick species assessed as of January 2024, 12,178 species (89.3%) are considered native and 1,463 species (10.7%) are considered exotic (not present in New Brunswick prior to European settlement and arrived with direct human assistance):



3. **38.0% of New Brunswick species are considered Secure or otherwise not of conservation concern.** Secure = ranked S4 to S5; 25.9% of species. Otherwise not of conservation concern = status rank SNA – Exotic or SNA – Accidental; 12.1% of species.
4. **10.3% of New Brunswick species are considered of conservation concern**, in the categories of Critically imperilled (S1 and S1S2; 405 species, 3.0% of total), Imperilled (S2 and S2S3; 273 species, 2.0% of total), Vulnerable (S3 and S3S4; 693 species, 5.1% of total), and Historical / Extirpated (SH and SX; 40 species, 0.2% of total).

5. **More than ½ of all species are too poorly understood to assess.** 10,000 or more species have not yet been listed for the province and 51.7% of all listed species are so poorly understood that we can only assess them as status Unranked (SNR) or Unrankable (SU). Only 11 of 46 taxonomic groups assessed have 80% of species with status ranks more precise than “Undetermined”. Extensive work is still needed to understand the basics of most species’ provincial conservation status.

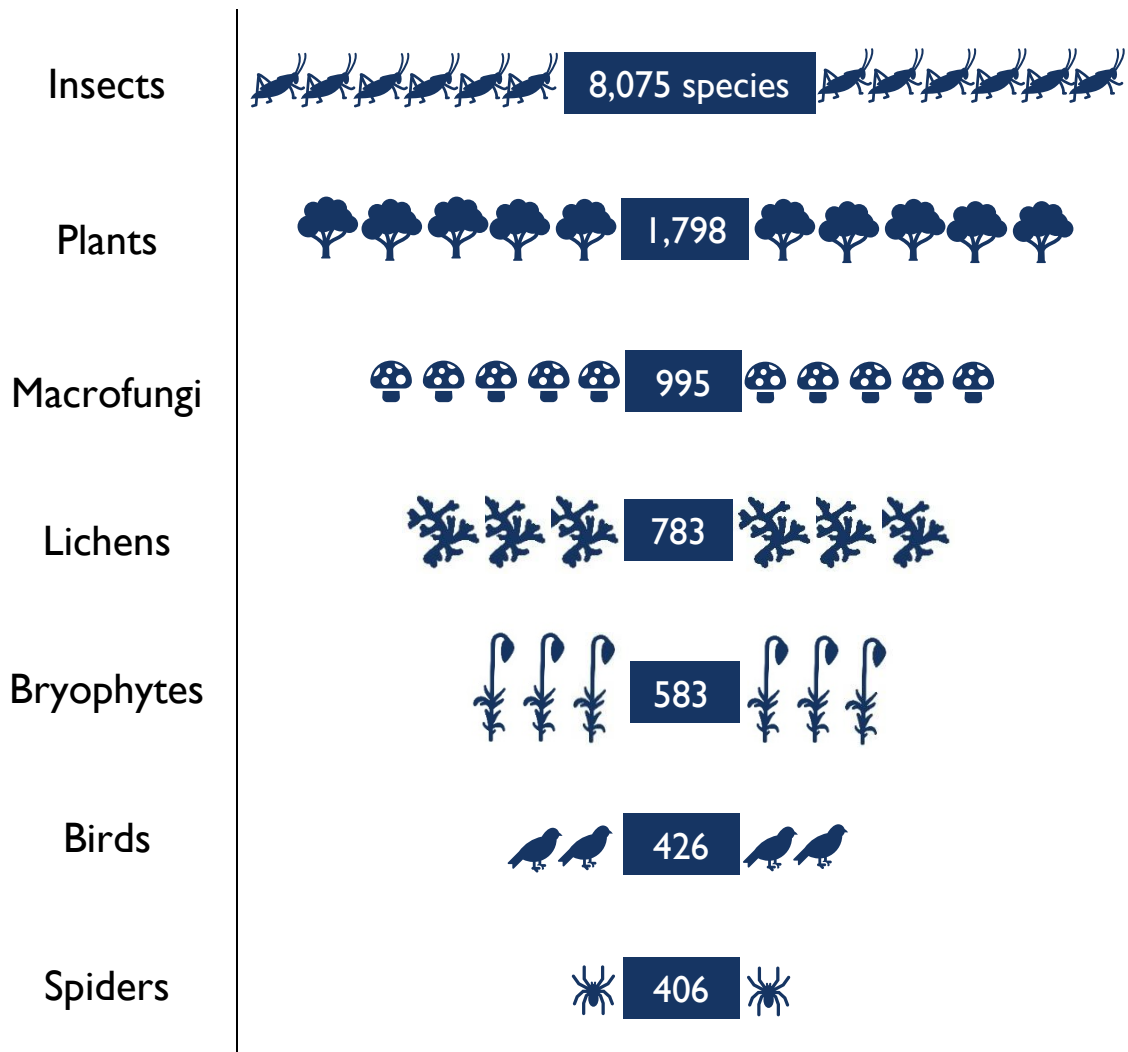
Sprinkled Grasshopper
(*Chloealtis conspersa*)
[SU]



Sean Blaney

6. **New species continue to be discovered and described even in relatively well-known taxonomic groups such as vascular plants.** More than 1,000 species in the assessed taxonomic groups were first discovered for New Brunswick after 2000.

7. **A substantial majority of assessed species in New Brunswick are insects** (8,075 species; 59.2% of total). This proportion will continue to increase as the province's insects are more fully documented and assessed. The other most diverse taxonomic groups are vascular plants (1,798 species), macrofungi (995 species), lichens (783 species), bryophytes (583 species), birds (426 species) and spiders (406 species):



8. **Since 2000, status rank change shows considerably more species have moved in a less-threatened direction than a more-threatened direction.** However, this result needs to be interpreted with caution because most rank changes reflect better data more than better conditions for wild species, and because declines are difficult to document meaning that population trend data is unavailable for most species.
9. **Birds appear to be the most threatened taxonomic group**, with 48.8% of species being of conservation concern and 15.7% of species experiencing increased threat since 2000. They also have the most well-understood trend information of any taxonomic group. If birds are representative of other taxonomic groups (which may not be the case), we could be significantly underestimating overall level of threat.



10. **Eight species considered to be potentially lost from New Brunswick have been rediscovered since 2000.** All are vascular plants: Single-spike Sedge (*Carex scirpoidea*); Broom Crowberry (*Corema conradii*); Canada Honewort (*Cryptotaenia canadensis*); Downy Rattlesnake-plantain (*Goodyera pubescens*); Water Blinks (*Montia fontana*); Alpine Timothy (*Phleum alpinum*); Van Brunt's Jacob's-ladder (*Polemonium vanbruntiae*); Northeastern Bladderwort (*Utricularia resupinata*).



Introduction

In October 2023, Atlantic Canada Conservation Data Centre (AC CDC) was contracted by New Brunswick Department of Natural Resources and Energy Development (NB DNRED) to contribute to the renewal of the province's Biodiversity Strategy by analyzing the results of species' conservation status assessments (General Status Ranks) completed every five years since 2000. The specific objective of the work was: "To deliver a generalised summary of the state of biodiversity in New Brunswick based on the province's conservation status ranks, to provide evidence-based, foundational information to support the development of a renewed Biodiversity Strategy and to inform the Goals and Actions that are captured within this Strategy."

In 1996, Canadian provincial and territorial wildlife ministers signed the *Accord for the Protection of Species at Risk*, committing to "monitor, assess and report regularly on the status of all wild species". In 2002, this commitment was included in the federal *Species at Risk Act*, section 128 that stipulates "...at the end of each subsequent period of five years, the Minister must prepare a general report on the status of wildlife species".

These reports have been completed at five-year intervals since 2000, with all Canadian provinces and territories submitting assessments of the conservation status of wildlife species in their jurisdictions to the National General Status Working Group (NGSWG) made up of representatives of federal, provincial and territorial governments, NatureServe Canada and the AC CDC. NGSWG compiles provincial and territorial ranks, assigns national conservation status ranks and publishes the results in *Wild Species: The General Status of Species in Canada* reports available [here](#).

Excel files of the provincial, territorial and national conservation status ranks of all species assessed in 2000, 2005, 2010, 2015 and 2020 General Status reports are available [here](#). Each successive five-year report has included a wider range of taxonomic groups so that the number of New Brunswick species assessed has risen from approximately 695 in 2000 to 13,461 in 2020.

The status rank categories used in the assessments of the General Status of Species in Canada have changed over time. For the 2000, 2005 and 2010 reports, the status categories were: Extinct, Extirpated, At Risk, May Be At Risk, Sensitive, Secure, Undetermined, Not Assessed, Exotic and Accidental (see definitions in [Appendix 1](#)).



Cardinal Flower
(*Lobelia cardinalis*)
[S3S4]

The 2015 and 2020 reports changed to the conservation rank standard of the NatureServe network used by all Canadian Conservation Data Centres, including AC CDC, in which the primary ranks are **S1 – Critically Imperilled**; **S2 – Imperilled**; **S3 – Vulnerable**; **S4 – Apparently secure**; **S5 – Secure**; **SX – Extinct or Extirpated**; **SH – Historical records only, potentially extirpated**; **SU – Unrankable**, used for species with insufficient data for assessment, usually where understanding of range and/or abundance is especially incomplete; **SNR – Not ranked**, used when data was not evaluated beyond confirmation of presence; **SNA – Conservation status not applicable**, used primarily for exotic and accidental species. Rank categories are defined in [Appendix 2](#) and a full description of categories and methods is available [here](#).

Methods

To evaluate changes in status of wildlife species over time, we compiled the New Brunswick results from the 2000, 2005, 2010, 2015 and 2020 General Status of Wildlife reports into a single Excel spreadsheet. To incorporate changes in status since 2020¹ we also added all New Brunswick provincial status ranks in the AC CDC database as of January 24, 2024 for species in assessed taxonomic groups.

To ensure that species whose scientific name had changed over time could be tracked as a single taxon, we standardized all the scientific names in each five-year report to the nomenclature of the AC CDC taxonomic database as of January 2024. This resulted in a dataset of 13,641 species considered confirmed as wild species in New Brunswick and 129 species that had been listed in one or more five-year report but are now excluded because of taxonomic changes or reconsideration of the evidence for occurrence, such as revisions of identification or correction of other errors.



We then evaluated status rank changes over time. Differences in methods between the General Status categories used from 2000 to 2010 and the NatureServe ranks used 2015 and onwards were dealt with using an equivalency table. No rank change was considered to have occurred under the combinations in [Table 1](#).

¹ Although the status ranking for the 2025 General Status of Species in Canada report is well under way, the 2025 status ranks have not yet been finalized and were not entered into the AC CDC database as of January 2024. 2024 status ranks from the AC CDC are thus nearly identical to the 2020 General Status ranks, with only 182 new species added and 23 rank changes of previously recorded species.

Table 1: General Status Rank and NatureServe Rank equivalency table. Because of differences in how threats and number of occurrences were weighted in the two status assessment systems, one S-rank can equate to more than one General Status Rank (see bolded **green** and **orange** S-ranks).

General Status Rank (2000 – 2010)	NatureServe Status Ranks Considered Equivalent (2015 onwards)
Extinct or Extirpated	SX, SH
At Risk or May Be At Risk*	S1, S1S2, S2, S2S3
Sensitive	S2, S2S3, S3, S3S4
Secure	S3, S3S4 , S4, S4S5, S5
Undetermined	SU
Not Assessed	SNR
Exotic	SNA + Origin = Exotic
Accidental	SNA + Regularity = Accidental

* At Risk or May Be At Risk categories reflect a difference in degree of assessment and/or legal designation and do not represent a difference in risk of extinction, so they were considered identical in our analysis.

We assigned a “no change in status” result to species meeting all the following conditions:

- i. no change in NatureServe rank (2015 to present),
- ii. no change in General Status Rank (2000 – 2010), and
- iii. General Status and NatureServe rank combinations as listed in **Table 1.**

For species where ranks changed between assessments, we classified the changes as indicating “**More threatened**” or “**Less threatened**” using the hierarchy of threat level presented in **Table 2.**

Table 2: Threat level hierarchy for species with rank changes between assessments, used to evaluate whether a rank change indicated increased or reduced threat. For example, if a species was ranked S3 (Vulnerable) in the 2010 assessment and S4 (Apparently Secure) in the 2015 assessment, then that species was considered to have been assessed as “less threatened”.

Secure < Sensitive < May Be At Risk & At Risk < Extirpated < Extinct
S5 < S4S5 < S4 < S3S4 < S3 < S2S3 < S2 < S1S2 < S1 < SH < SX
Secure < S2S3 and lower NatureServe S-rank
S3 < At Risk & May Be At Risk < Extirpated < Extinct

MORE THREATENED   **LESS THREATENED**

We also designated the following types of status change:

Historical: Species assessed as Extirpated, Extinct, SX or SH after initially having a different rank. This is a subset of the “More threatened” category.

Rediscovery: Species initially assessed as Extirpated, SX or SH and subsequently confirmed as persisting in New Brunswick. This is a subset of the “Less threatened” category.

Less certain: Species assigned a status rank of Undetermined or SU (Unrankable) after initially having a different status rank.

Origin change: Species where the rank changed because of a change in its origin designation (Native, Exotic, Unknown).

Regularity change: Species where the rank changed because of a change in its regularity designation (Accidental / Non-regular, Regularly occurring).

Undetermined to ranked: Species initially assessed as Undetermined, SU (Unrankable) or SNR (Not Ranked) and subsequently revised to another rank with that rank remaining unchanged.

Unranked to Unrankable: Species initially assessed as Unranked or SNR (limited effort made to assess data and assign a status rank) and subsequently revised to Undetermined or SU (Unrankable, meaning that available information was evaluated and found to be insufficient to determine a more precise status rank).



Results

Species Composition

Table 3 lists the New Brunswick species numbers in each taxonomic group for each five-year General Status of Species in Canada report (2000 – 2020) and in the AC CDC database as of January 2024. The number of species assessed has grown substantially over each five-year interval assessment, with approximately 20 times the number of species currently assessed (13,641) as were assessed in 2000 (695). As less well-known insect groups have been assessed, insects have come to make up the majority (59.2%) of the species assessed. That percentage will increase significantly in future years as the highly diverse flies (Diptera) and wasps and relatives (Hymenoptera) are more completely assessed and as the substantial remaining undiscovered portion of New Brunswick's insect species richness is more fully documented. The most diverse non-insect taxonomic groups, in descending order, are vascular plants (1,768 species, 12.9% of the total), macrofungi (995 species, 7.3% of the total), lichens (783 species, 5.7% of the total), bryophytes (538 species, 3.9% of the total), birds (426 species, 3.1% of the total) and spiders (406 species, 3.0% of the total).



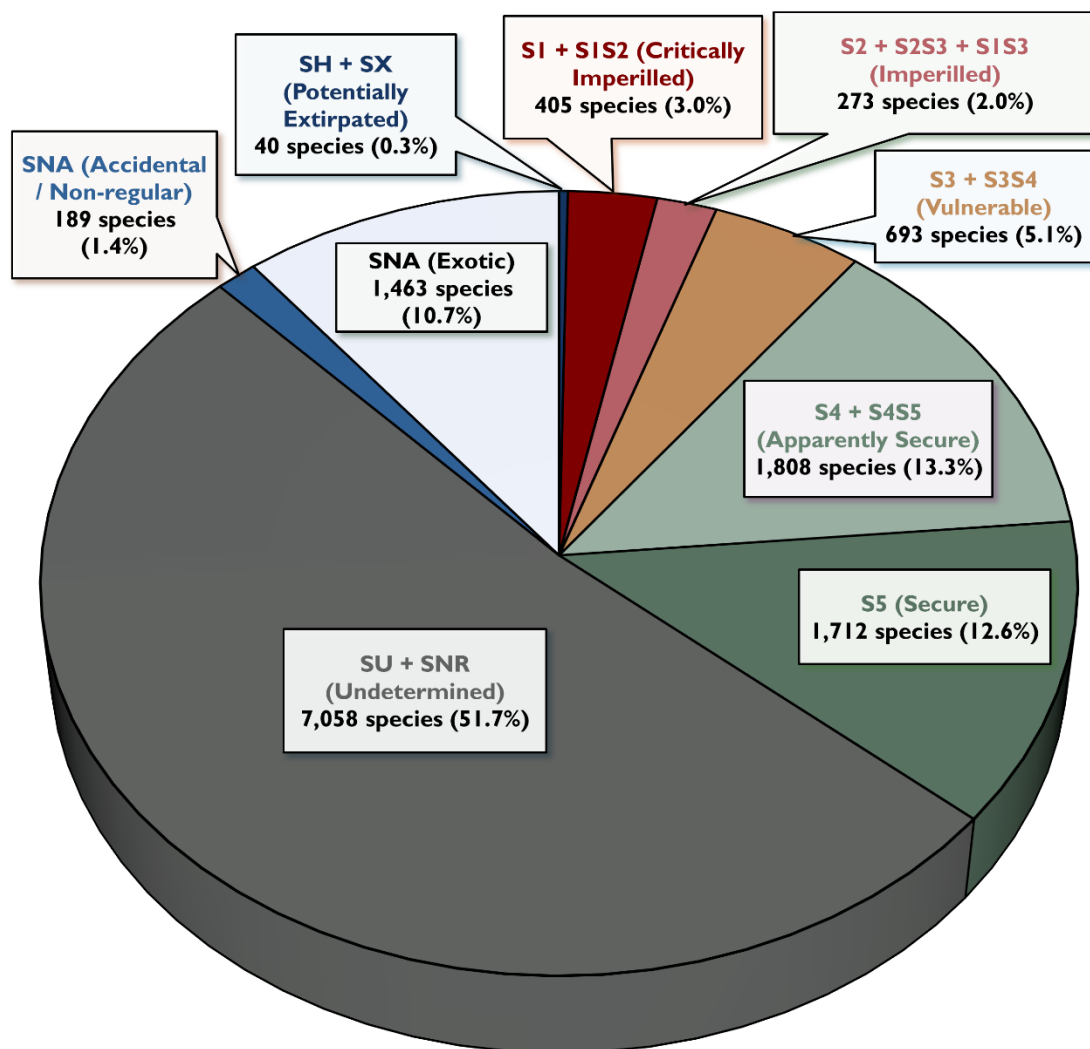
Table 3: Number of species by taxonomic group assessed in each five-year General Status of Species in Canada report (2000 – 2020) and in the AC CDC database as of January 24, 2024. GS# = identification number for each taxonomic group in the General Status databases. Grey shaded cells indicate that not all known species in the group were assessed in that year.

GS#	Taxonomic Group	2000	2005	2010	2015	2020	2024
1	Slime moulds	-	-	-	-	51	51
2	Macrofungi	-	-	-	29	989	995
3	Lichens	-	-	302	320	727	783
4	Bryophytes	-	-	385	525	531	538
5	Vascular plants	97	1622	1655	1697	1743	1768
6	Sponges	-	-	-	8	8	8
7	Bivalves	-	12	12	28	28	28
8	Terrestrial & freshwater snails & slugs	-	-	-	92	95	96
9	Leeches	-	-	-	-	11	11
10	Earthworms	-	-	-	-	17	20
11	Millipedes	-	-	-	-	7	7
12	Crayfishes	-	3	3	3	3	4
13	Water mites	-	-	-	-	255	256
14	Ticks	-	-	-	-	11	11
15	Harvestmen	-	-	-	-	11	11
16	Pseudoscorpions	-	-	-	-	2	2
17	Spiders	-	-	381	390	405	406
18	Springtails	-	-	-	-	12	12
19	Mayflies	-	-	-	119	119	119
20	Dragonflies & damselflies	-	129	131	134	141	144
21	Stoneflies	-	-	-	86	86	86
22	Grasshoppers & relatives	-	-	-	45	51	53
23	True bugs	-	-	-	-	982	989
24	Lacewings	-	-	-	13	14	14
25	Beetles	-	10	452	2738	3176	3185
26	Sawflies	-	-	-	-	205	216
27	Ants	-	-	-	55	69	70
28	Bees	-	-	15	206	214	217
29	Yellowjackets & relatives	-	-	-	34	35	35
30	Caddisflies	-	-	-	171	172	172
31	Moths & butterflies	78	0	164	1665	1712	1740
32	Scorpionflies	-	-	-	10	10	10
33	Fleas	-	-	-	-	26	26
34	Selected flies	-	-	117	340	983	999
35	Freshwater fishes	49	50	0	52	52	52
36	Amphibians	16	16	16	16	16	16
37	Reptiles	7	7	7	7	7	7
38	Birds	394	411	412	398	404	426
39	Mammals	54	54	55	57	57	58
TOTAL SPECIES		695	2314	4107	9238	13437	13641

Current status ranks

Figure 1 illustrates the status assessment categories of New Brunswick's species, showing that 10.4% are of some conservation concern (Extirpated [SX], Historical [SH], or Critically Imperilled to Vulnerable [S1 to S3S4]) and 38% are of no apparent conservation concern (25.9% Secure [S4 to S5], 1.4% not of regular occurrence, 10.7% exotic). Over half of the species assessed for New Brunswick (7058 spp., 51.7% of the total) are Unrankable [SU] or Not Ranked [SNR].

Figure 1: Frequency of status ranks across all New Brunswick species (N=13,641) in the AC CDC database as of January 24, 2024.

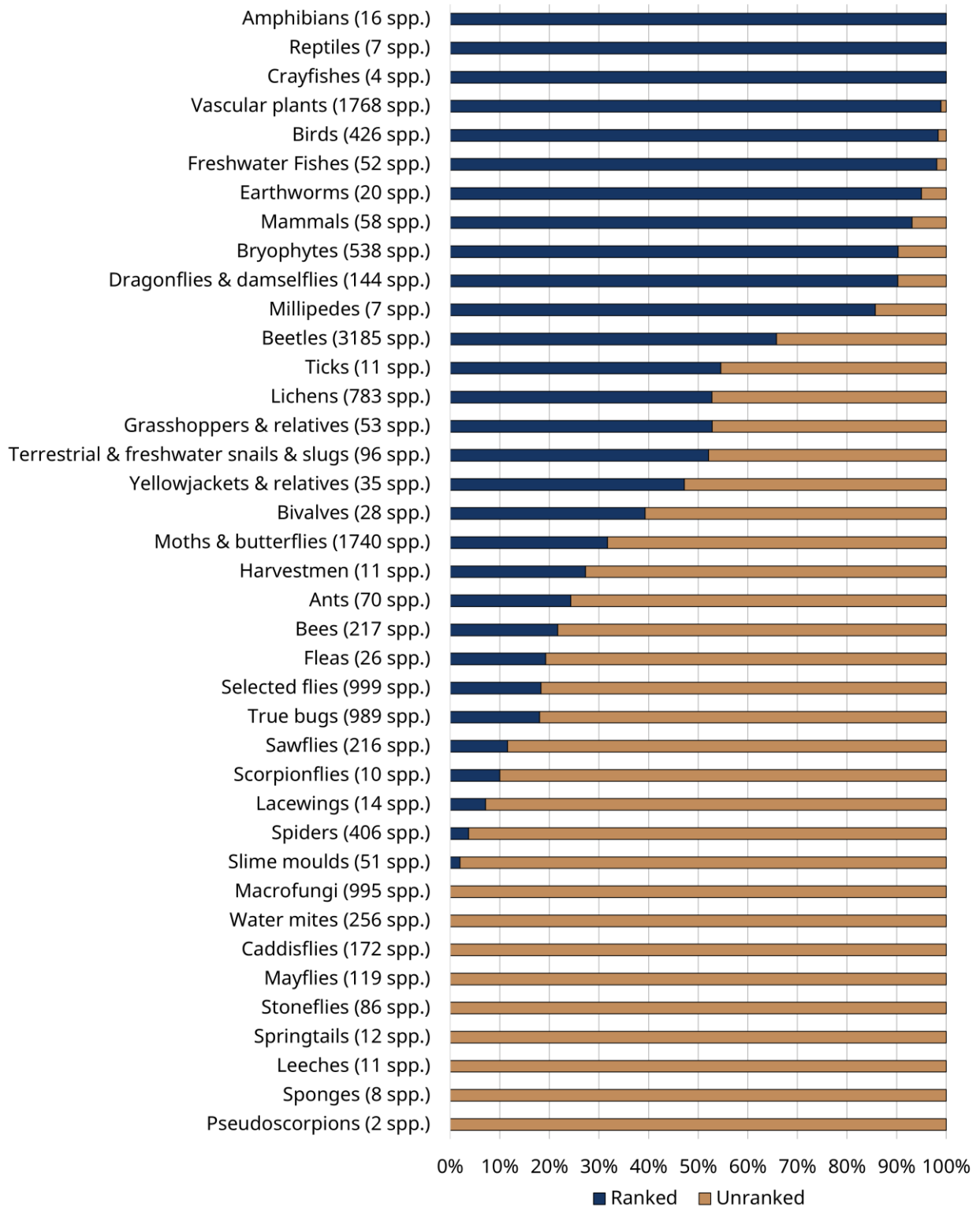


Species' conservation status is poorly understood in most taxonomic groups. **Figure 2** shows the proportion of species in each taxonomic group for which status is undetermined (Unrankable [SU] or Not Ranked [SNR]). Out of the 40 different taxonomic groups assessed in 2020, only 16 have a majority of species with ranks indicating some understanding of status (i.e. not "SU" or "SNR"). Of the 16 groups having a majority of species assessed, the earthworms, crayfishes and millipedes fall into the "well assessed" category primarily because almost all their species are exotic, meaning that they can easily be ranked SNA without requiring a strong understanding of species' distribution, abundance or population trend.

The most thoroughly understood General Status taxonomic groups are the vertebrates (amphibians, reptiles, freshwater fishes, birds and mammals), vascular plants, bryophytes and dragonflies and damselflies, all of which have 80% or more of their species with a conservation status that is neither Unrankable [SU] nor Unranked [SNR]. Certain other insect sub-groups, such as the butterflies, tiger beetles, and bumblebees, are equally well-understood but are included within very diverse insect orders that include many poorly understood species.



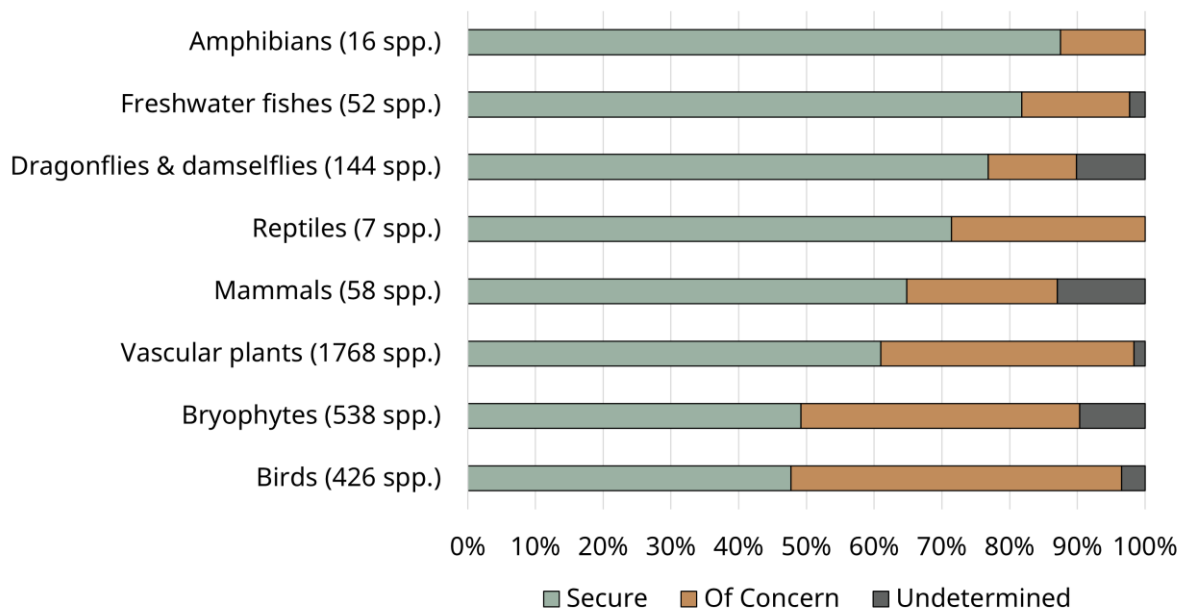
Figure 2: Proportions of New Brunswick species by taxonomic group with status ranked (numeric S1 to S5 or exotic rank) vs. unranked (status poorly understood, assessed as Unrankable [SU] or Unranked [SNR]). The number of species (spp.) in each taxonomic group is shown in parentheses.



Proportion of species considered at risk

Figure 3 illustrates the proportion of native and regularly occurring species² in the well-understood taxonomic groups that are of conservation concern, secure or of undetermined conservation status. These taxonomic groups collectively had 67.5% of species secure, 27.4% of species of conservation concern and 5% of species undetermined. The least threatened taxonomic groups are amphibians, dragonflies and damselflies, and freshwater fishes (12.5%, 13.0% and 15.9% of species considered of conservation concern, and 87.5%, 76.8% and 81.8% considered secure) while the most threatened taxonomic groups are birds, bryophytes and vascular plants (48.8%, 41.1% and 37.4% of native and regularly occurring species considered of conservation concern and 47.7%, 49.2% and 61.0% of species considered secure).

Figure 3: Proportions of native and regularly occurring New Brunswick species (i.e. not exotic or accidental) in the well-understood taxonomic groups that are of conservation concern (ranked SX, SH, S1 to S3S4) relative to those that are considered secure (ranked S4 or S5) or undetermined (ranked SU or SNR). The number of species (spp.) in each taxonomic group is shown in parentheses.



² "Regularly occurring" excludes species that are present in New Brunswick only as rare or occasional vagrants from other areas.

Change in conservation status over time

In addition to the great increase in taxonomic scope across the five-year reports, there have been many new species discovered in New Brunswick since 2000. 1,170 new species (8.6% of the 2024 total) were added to a five-year assessment list after the initial comprehensive assessment for their taxonomic group (e.g. vascular plants were first comprehensively assessed in 2005, so any vascular plant species first listed after 2005 is a “new” species). In addition to new discoveries, the “new” species include some added to the list because of taxonomic change (as when two or more subspecies of a species already known for the province are raised to the species level), but most of the new species are taxonomically distinct and newly discovered for New Brunswick. **Table 4** lists number of newly listed species by taxonomic group. Beetles (476 species), moths & butterflies (191 species), vascular plants (150 species) and lichens (93 species) have the largest number of new species recorded since 2000.

Out of the 13,641 species with conservation status ranks in New Brunswick, 4,373 were assessed only in the 2020 report or afterwards, meaning that they have not gone through a second ranking assessment. The remaining 9,268 species have been assessed at least twice and could therefore have experienced a change in status. **Table 5** shows the nature of rank changes by taxonomic group. Ranks stayed the same for 91.9% of species assessed two or more times, from first to last assessments, while 8.1% (747 species) had their ranks changed. Rank changes were more likely to reflect a decreased threat (368 species; 49.3% of rank changes) than an increased threat (134 species; 17.9% of rank changes). Rank changes in 245 species (32.8% of rank changes) could not be assigned to a change in threat level because they were related to a change in interpretation of the species’ origin (native vs. exotic) or regularity (regularly occurring vs. accidental), or they were revisions from Unrankable (SU) to a numeric rank or vice versa.



Table 4: New species recorded for New Brunswick since 2000, by taxonomic group. Species are considered “new” if they were added to the General Status species list in the years after their taxonomic group had first been comprehensively listed. Most species in the totals are new discoveries, but some are the result of taxonomic change in taxa already known for the province.

Taxonomic Group	# New Spp.	Total # Spp.	% New Spp.
Crayfishes	1	4	25.0%
Ants	15	70	21.4%
Bees	41	217	18.9%
Earthworms	3	20	15.0%
Beetles	476	3185	14.9%
Grasshoppers & relatives	8	63	12.7%
Lichens	93	783	11.9%
Moths & butterflies	191	1740	11.0%
Dragonflies & damselflies	15	144	10.4%
Vascular plants	150	1768	8.5%
Birds	32	426	7.5%
Lacewings	1	14	7.1%
Spiders	25	406	6.2%
Freshwater fishes	3	52	5.8%
Sawflies	11	216	5.1%
Selected flies	49	999	4.9%
Bryophytes	24	538	4.5%
Terrestrial & freshwater snails & slugs	4	96	4.2%
Mammals	2	58	3.4%
Yellowjackets & relatives	1	35	2.9%
True bugs	13	989	1.3%
Macrofungi	10	995	1.0%
Caddisflies	1	172	0.6%
Water mites	1	256	0.4%
TOTAL	1,170	13,641	8.6%



Table 5: Type of rank changes by taxonomic group. “More Threat” and “Less Threat” are defined in [Table 2](#). “Other Change” includes rank changes from Undetermined to a numeric rank and vice versa as well as changes based on revision of origin (native vs. exotic) and regularity (regularly occurring vs. accidental). Groups only assessed in 2020 are not listed.

Taxonomic Group	Conservation Status Rank Change Type			
	More Threat	Less Threat	No Change	Other Change
Amphibians	0	0	16	0
Ants	0	0	40	15
Bees	1	6	192	7
Beetles	6	2	2696	36
Birds	67	16	319	12
Bivalves	0	2	26	0
Bryophytes	10	11	502	3
Caddisflies	0	0	171	0
Crayfishes	0	0	3	0
Dragonflies & damselflies	0	45	83	6
Freshwater fishes	3	2	47	0
Grasshoppers & relatives	0	0	41	4
Lacewings	0	0	13	0
Lichens	2	8	304	11
Macrofungi	0	0	29	0
Mammals	3	4	47	3
Mayflies	0	0	119	0
Moths & butterflies	4	9	1625	27
Reptiles	0	0	7	0
Scorpionflies	0	0	9	1
Selected flies	2	18	260	60
Spiders	0	0	361	30
Sponges	0	0	8	0
Stoneflies	0	0	86	0
Terrestrial & freshwater snails & slugs	0	0	91	1
Vascular plants	36	244	1396	26
Yellowjackets & relatives	0	1	30	3
TOTALS	134	368	8521	245

The most notable patterns of rank change by species group are:

1. **Birds have experienced by far the greatest increase in level of threat**, with 67 species (15.7% of the total) having had a rank change indicating increased threat between 2000 and 2024. The next nearest increase in threat was in freshwater fishes in which 5.7% of species were ranked as being at greater risk.



2. **Damselflies and dragonflies are by far the most likely to have had rank changes suggestive of decreased level of threat** with 45 out of 144 species (31.3%) showing such changes. Vascular plants (244 species; 13.8%) were the next most likely to have rank changes suggesting reduced threat.



Discussion

What these results say about biodiversity trends and patterns in New Brunswick

Our assessment of status rank changes since 2000 provides some reasons for optimism, some areas of concern, and substantial indication that we still have a lot to learn about New Brunswick's biological diversity.

We have made substantial progress in documenting biodiversity at the species level in New Brunswick. Prior to 2000, comprehensive species lists had never been compiled for many of the taxonomic groups for which we now have full lists and conservation status ranks.



Since 2000 we have discovered more than 1,000 new species for the province.

The scope of our assessments has increased from 695 species in seven taxonomic groups to 13,641 species in 46 taxonomic groups, and we will increase the number of listed species by several thousand more in the upcoming 2025 assessment. The 2025 assessment will also continue the trend of revision of species from conservation status ranks of Unrankable (SU) and Unranked (SNR) to more precise status ranks.

We can feel fortunate that **a substantial majority (67.5%) of the species in the best-known taxonomic groups are considered relatively stable and secure in the province.** In general, the threats facing these well-known taxonomic groups are not unlike the threats facing the less well-known groups, for which most or all species have

status ranks undetermined (SU or SNR). There is thus reason to expect that the ratio of roughly two-thirds of species being secure could be applicable across the thousands of species that we know very little about, with some variation depending on taxonomic group. New Brunswick has a relatively low human population, a substantial amount of land where the human footprint is small in comparison to more urbanized regions, and an increasing amount of permanently protected conservation land. These factors contribute to species' resiliency in adapting to climate change and reduce the likelihood of species' extirpations from New Brunswick.

The patterns in status rank change over time also provide some reason for optimism, as considerably more species have seen rank changes reflective of a reduced threat level than an increased threat level. We need, however, to interpret these results with caution. Although some species have experienced increased populations or reduced threats, the majority of these "reduced threat" rank changes are associated with better understanding of status rather than actual change in conditions. It is much easier to document an increased number of occurrences than it is to accurately assess population change across the whole of New Brunswick. **Population trends are poorly known for the vast majority of our species, which greatly limits the precision of status assessments, and it means that we are likely unaware of many cases where declines may be occurring.**

Tri-coloured Bumble Bee
(*Bombus ternarius*)
[S5]

John Klymko



Another small but notable reason for optimism is the fact that eight species considered potentially extirpated from New Brunswick have been rediscovered since 2000.

All are vascular plants: Single-spike Sedge (*Carex scirpoidea*); Broom Crowberry (*Corema conradii*); Canada Honewort (*Cryptotaenia canadensis*); Downy Rattlesnake-plantain (*Goodyera pubescens*); Water Blinks (*Montia fontana*); Alpine Timothy (*Phleum alpinum*); Van Brunt's Jacob's-ladder (*Polemonium vanbruntiae*); Northeastern Bladderwort (*Utricularia resupinata*). This illustrates both the value of new field surveys and the need for caution in concluding that species are extirpated or extinct.



Although most of our species are likely secure in the province, we have more than 1,400 species considered to be of conservation concern, including 405 in the Critically Imperilled range (S1 and S1S2 ranks). Many additional species with a current conservation status of Unranked (SNR) or Undetermined (SU) would be assessed as being of conservation concern if we had sufficient information on their distribution, abundance, threats and population trends. Roughly 28% of native, regularly occurring species in our well-known taxonomic groups are considered of conservation concern and as noted above, the trends in the well-known groups are probably roughly applicable across the 51.7% of species with status undetermined. **If 28% of the species with status undetermined were of conservation concern, that would mean an additional 1,975 species of conservation concern.** In general, threats to biodiversity are increasing in New Brunswick with climate change, ongoing intensive forestry and other land use activities, invasive species, and substantial human population growth and associated housing and commercial development. There are likely many species, particularly in more densely populated and altered landscapes, such as the Wolastoq (Saint John River) valley and the Northumberland Strait coast, that will be more threatened in the future.



Status assessment involves applying standardized methods and using the best available information and expertise, but it is frequently limited by a lack of solid data. Status assessments can easily underestimate threat because for only a tiny minority of species is data sufficient to detect anything other than severe population change. The pattern of status rank change in birds provides some concerning evidence in this regard. Because birds are relatively easily detected and of considerable interest to the general public, a range of government-led and citizen science projects provide more insight into bird species' population changes than is available for any other taxonomic group. Birds are also notable as the taxonomic group with the greatest proportion of species of conservation concern (48.8% of regularly occurring native species vs. the average of 27.5%), and birds have the greatest number of species for which rank changes between 2000 and the present have suggested an increased level of threat (15.7% of species). Birds may truly be more threatened than most other species groups given that a high proportion of species migrate substantial distances out of the province and are thus exposed to a greater range and magnitude of threats than are sedentary species in undeveloped areas of New Brunswick.

The fact, however, that the best understood taxonomic group is also the most threatened bears the question, if we understood all species' populations as well as we do for birds, would we see much higher levels of conservation concern?




Photo by Denis Doucet

What these results say about data gaps in our understanding of biodiversity in New Brunswick

We still have a great deal to learn about the species that call New Brunswick home. More than half (51.7%) of the species that have been listed for New Brunswick are so little known that we can only rank them as conservation status Unrankable (SU) or Not Ranked (SNR). The 1,000+ species newly discovered for New Brunswick since 2000 strongly suggest that many more species remain to be discovered in the taxonomic groups that are already assessed.

There are also thousands of species occurring in New Brunswick in taxonomic groups such as the flies and wasps that have not yet been comprehensively treated by the General Status program. McAlpine and Smith (2010)³ estimated that there were about 32,000 species in the Canadian portion of the Atlantic Maritime Ecozone, which includes the three Canadian Maritime provinces and adjacent areas of Quebec. We do not have a similar estimate for just the province of New Brunswick, but 78.7% of species with status ranks in at least one Maritime province in the AC CDC database are documented for New Brunswick, suggesting that perhaps about 75%, or 24,000 of the 32,000 species in the Atlantic Maritime Ecozone, occur in New Brunswick. This means that 10,000 or more species could be added to 13,641 that currently have New Brunswick status ranks.

Even for the species with more precise status ranks we generally have much more to learn. On one hand, we find that additional fieldwork consistently documents new occurrences of species of conservation concern and can frequently change status assessments in a less threatened direction. On the other hand, we rarely have sufficient

³ McAlpine, D.F., & I. M. Smith, (Eds.). 2010. Assessment of species diversity in the Atlantic Maritime Ecozone. NRC Research Press.



information to understand population trends and threats in detail which can underestimate the level of conservation concern.

To fully document the province's biodiversity and to more accurately assess species' statuses in New Brunswick, we will need to continue the strong efforts of the past 25 years to understand species occurrence in all regions of New Brunswick and to translate field data into information relevant to status assessment.



Appendices

Appendix 1: General Status Rank definitions as used in the 2000, 2005 and 2010 General Status of Wildlife reports.

Extinct	The species has no surviving individuals.
Extirpated	The species has no surviving individuals in the jurisdiction, but individuals remain elsewhere.
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 (i.e. Endangered or Threatened).
May Be At Risk	Species 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 is 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 is not believed to belong in the categories Extinct, Extirpated, 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 is known or believed to be present regularly in the geographic area in Canada to which the rank applies but has not yet been assessed by the general status program.
Exotic	Species has been moved beyond their natural range because of human activity. Exotic species are excluded from all other categories.
Accidental	Species occurs infrequently and unpredictably, outside the usual range.

Appendix 2: NatureServe Status Rank [definitions](#).

Provincial Rank	Definition
SX	Extirpated (N- and S-ranks) — Species or ecosystem not located despite intensive searches and virtually no likelihood of rediscovery.
SH	Possibly Extirpated (N- and S-ranks) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.
S1	Critically Imperilled — At very high risk of extinction (G-rank) / extirpation (N- and S-ranks) due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
S2	Imperilled — At high risk of extinction (G-rank) / extirpation (N- and S-ranks) due to very restricted range, very few populations, steep declines, or other factors.
S3	Vulnerable — At moderate risk of extinction (G-rank) / extirpation (N- and S-ranks) due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
S4	Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure — Common; widespread and abundant.
SU	Unrankable – Unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNR	Unranked – Provincial conservation status not yet assessed.
SNA	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., exotic and accidental species).
[S-rank]B	Breeding – Rank refers to individuals breeding in the province.
[S-rank]N	Non-breeding – Rank refers to resident individuals outside the breeding season in the province.
[S-rank]M	Migrant – Rank refers to individuals migrating in the province.