Annual Report
2024-2025

Our Mission:

To be the authoritative, primary source of accessible, current, and reliable information on the distribution and abundance of Canada's natural diversity—especially species and ecosystems of conservation concern

NatureServe Canada

A Network Connecting Science with Conservation
Un Réseau pour la science et la conservation

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Cover photo: A humpback whale breaches into the sunlit spray left behind by another breaching whale in the Salish Sea off Quadra Island, B.C. Photo credit: Liron Gertsman Photography, lirongertsman.com

From the Chair and Executive Director

EXPANDING THE BODY OF KNOWLEDGE regarding Canada's species and ecological communities and making this information available to support science-based research and decision-making is the purpose of the NatureServe Canada (NSC) Network. Our growing body of biodiversity data, derived products, and expertise is made publicly available through our Conservation Data Centres (CDCs), NatureServe Explorer and Explorer Pro, and through custom data requests managed by NSC.

Fiscal 2024-2025 was a very productive year for NSC and our member and collaborating organizations. Thanks to significant in-kind project support from the provincial and territorial CDCs (i.e., dozens of employees and data assets) and project funding from the federal government, we made major advancements on priority projects, including General Status, Canadian National Vegetation Classification, Canadian Terrestrial Ecological Framework, Species Habitat Modelling, EBAR range mapping, and promoting the use of the iNaturalist.ca platform. Underlying these "flagship" projects is our Network's ongoing efforts to continuously expand, refine, and distribute our information on species and ecological communities, at subnational, national, and global levels.

It "takes a Network" to generate, manage, and share biodiversity data for such a large country. The NatureServe Canada Network is continuously working to build our capacity and funding to tackle this task. NatureServe Canada thanks our members, partners, and funders for your ongoing work and support towards our shared biodiversity science and conservation goals.

Chris Friesen, Chair of the Board

Patrick Henry, Executive Director

About Us

Canada is home to about 80,000 known species, with thousands more species to be scientifically identified or first discovered. These organisms belong to a vast tapestry—the diversity of life at genetic, species, and ecosystem levels, vital for environmental, economic, and social health.

At NatureServe Canada, our vision is for the natural heritage of Canada to be thoroughly documented, for that information to be readily available to the public, and where conservation of biodiversity and resource decision-making are guided by high quality scientific data and information. Our mission is to be the authoritative, primary source of accessible, current, and reliable information on the distribution and abundance of Canada's natural diversity—especially species and ecosystems of conservation concern.

NatureServe Canada and its network of provincial and territorial Conservation Data Centres (CDCs) work together and with other government and non-government organizations to develop, manage, and distribute authoritative knowledge regarding Canada's plants, animals, and ecosystems. NatureServe Canada and the Canadian CDCs are members of the international NatureServe Network, spanning over 60 government and non-government organizations in Canada and the United States.[1] NatureServe Canada is the Canadian affiliate of NatureServe, based in Arlington, Virginia that provides scientific and technical support to the international network.

A bald eagle with a hake in its talons. Photo credit: Liron Gertsman Photography, lirongertsman.com

NatureServe Canada, based in Ottawa, Ontario, is governed by a Board of Directors comprised of representatives of its Constituent Member provincial and territorial CDCs. Our membership includes Associate members Nature Conservancy of Canada and NatureServe. The NatureServe Canada Network is further complimented by non-member federal government partners which are responsible departments for the *Species at Risk Act*: Environment and Climate Change Canada, Fisheries and Oceans Canada, and Parks Canada. Our members and partners collaborate on national projects which promote coordination of biodiversity data and information development, and distribution, to inform research and land, resources, and conservation decision-making.

Each CDC adheres to NatureServe's rigorous scientific methods and standards developed since the 1970s. Together, NatureServe Canada and the Canadian CDCs strive to answer questions such as: What species and ecosystems exist in each province or territory? What is the condition and conservation status of their populations? Which species or ecosystems are at risk of extinction (global) or extirpation (from Canada or a province or territory)? Where precisely are species at risk and rare ecosystems found?

We presently maintain information on 72,282 species and 5074 ecological communities. Our Network steadily adds new knowledge about biodiversity, including about species newly documented for Canada or species newly described to science. The Network also helps document the most important places for biodiversity in Canada, to aid in management decisions concerning them.

1 See: https://www.natureserve.org/natureserve-network

NatureServe Canada: Advancing the Canadian National Vegetation Classification

WITH FINANCIAL SUPPORT FROM Environment and Climate Change Canada, NatureServe Canada (NSC) is leading a broad partnership to develop the Canadian National Vegetation Classification (CNVC). When complete, the CNVC will provide a consistent, systematic, and authoritative classification and description of Canadian ecosystems, based on vegetation patterns and ecological processes. While the CNVC can, in principle, describe all ecosystems in their current state, from natural to modified (e.g. old fields) to intensively managed (e.g. forest plantations), the initial project focus is on natural terrestrial (including wetland) ecosystems. The goal of this ambitious project is to complete a synthesis of these ecosystems by 2028.[2]

The CNVC is a hierarchical classification that describes and classifies vegetation types across the landscape, from wetland shorelines and peatlands through mesic grasslands and rainforests to dry forests, rocky barrens, and tundra. The classification hierarchy is based on eight levels of vegetation description, in order from coarsest scale to finest scale: Biome, Subbiome, Ecobiome, Division, Macrogroup, Group, Alliance, and Association. Types at each level are described using standardized names, specific definitions, and factsheets, and then made publicly available.

The CNVC is a tool for coordinating the exchange of ecosystem information among governments, NGOs, and other user groups to support research and land management activities. More specifically, the CNVC serves as a standardized ecological framework, linked to jurisdictional classification; provides ecologically meaningful units for reporting; supports predicting and monitoring landscape and ecosystem change; informs ecosystem-based management in the context of ecological land classification; and assists in conservation planning to assess status and trends in ecosystem condition, loss, and restoration.

Project activity in 2024-25 focused on analysis of grasslands in Alberta, Saskatchewan, and Manitoba, including assessment of grasslands at risk; a description of all temperate vegetation types in the prairie provinces; an assessment of Rocky Mountain vegetation in Alberta; a review of Arctic vegetation types; assessment of temperate forest types in Québec and Ontario, and a quantitative vegetation analysis workshop. Such activities rely on extensive collaboration and investments by the federal government, provincial and territorial governments, and conservation organizations. Projects are coordinated by the CNVC Technical Committee, which has representation from across agencies and organizations. Regional Work Groups across Canada compile, analyze, and refine vegetation types within the distinct biomes of each region.

An example of the CNVC, using Great Lakes Alvar. The eight classification levels are provided, showing each type and subnational distribution across its range in Canada and the U.S. Codes in parentheses provide a unique alphanumeric identifier for the type. The Ontario Natural Heritage Information Program has an equivalent type shown at the association level. Photo credit: Wasyl Bakowsky, NHIC

Level	Types	Subnations
L1. Biome	Temperate-Boreal Grassland & Shrubland (TT4)	
L2. Subbiome	Temperate Grassland & Shrubland (TT4.b)	
L3. Ecobiome	Temperate Grassland & Shrubland (TT4.b1)	
L4. Division	Laurentian-Acadian Grassland & Shrubland (D333)	
L5. Macrogroup	Laurentian-Acadian Calcareous Scrub & Grassland (M507)	MB, MI, NY, OH, ON, SK, WI
L6. Group	Great Lakes Alvar (G061)	MI, NY, OH, ON, WI
L7. Alliance	Great Lakes Alvar Grassland (A3104)	MI, NY, OH, ON
L8. Association	Northern Dropseed - Little Bluestem Alvar Grassland	MI, ON
	ON: Northern Dropseed - Little Bluestem - Scirpus-like Sedge Alvar Grassland Type	

2 For details on the CNVC, see http://cnvc-cnvc.ca/index.cfm

Atlantic Canada: Floristic Monitoring of Sable Island's Freshwater Ponds

Slender, crescent-shaped Sable Island is the most remote location in Nova Scotia, separated from the mainland by about 175 kilometres. The sandy island is most famous for its feral horses, but its native biodiversity, shaped by isolation and by harsh and dynamic habitats, is a much more significant natural feature. Sable Island is home to several endemic species and varieties of plants and animals. Since 2013 the island's 34 square kilometres of beaches, dunes, grasslands, heathlands, wetlands, and ponds have been designated as the Sable Island National Park Reserve.

The island's habitats are constantly changing as winds and waves shift loose sand. Rising sea levels and more intensive storms associated with climate change are likely to increase rates of habitat change. The habitats most sensitive to these impacts are the freshwater ponds and associated wetlands. They represent a very small percentage of the island's total area, but they support a disproportionate share of Sable's vascular plant diversity. They are also critical to most of the island's terrestrial animals. Dune-breaching and subsequent saltwater incursions have eliminated some of these habitats. Horse grazing also significantly affects native plant communities. Monitoring and conservation of remaining freshwater ponds has thus been identified as a high management priority.

Freshwater pond and feral horses on Sable Island. Photo credit: Sean Blaney

To help monitor the island's ecological integrity, the Atlantic Canada Conservation Data Centre (ACCDC) was contracted by Parks Canada to undertake vascular plant studies at 20 freshwater ponds in each of 2015, 2018, and 2024. Over seven fieldwork days in 2024, full vascular plant lists with abundance estimates for each species were compiled for all ponds, and precise occurrence data was collected for provincially rare species.

Sable Island's isolation and limited habitat diversity results in a flora of very low diversity. However, certain species of the ponds, such as the bog pondweed (*Potamogeton polygonifolius*), are rare elsewhere in eastern North America.

Surveys by the ACCDC in 2024 documented 97 native and 18 introduced vascular plant species around the sampled ponds, and an additional eight native and 11 introduced species located away from the ponds. Records included 87 occurrences of seven provincially rare species, and numerous provincially secure species known to be rare on Sable Island. A revised abundance status for 26 species was also provided. With many previous botanical studies and relatively few species making new discoveries quite difficult, the documentation of seven taxa not previously known to occur on the island, and relocation of three species previously considered extirpated from the island, were also noteworthy results.

Bog pondweed (*Potamogeton polygonifolius*) is found in freshwater ponds on Sable Island. More common in Europe, northern Africa, and the Azores, it is considered a potentially native disjunct species on Sable Island. Elsewhere in North America it is only known from Newfoundland, St. Pierre and Miquelon, and New Jersey, where it is considered to have been probably introduced. Photo credit: Sean Blaney

Ontario: Shining a Light on Bryophytes

BRYOPYHTES ARE NON-VASCULAR PLANTS—plants without a vascular system comprised of xylem and phloem to transport water—and are one of the oldest extant lineages of plants on Earth. Consisting of some 20,000 species worldwide, the bryophytes include three major lineages: the mosses, the liverworts, and the hornworts.

Bryophytes are characteristically limited in size and prefer moist habitats, although some species can survive in drier environments. Thanks to their typically small size and unique physiology, bryophytes often create habitat and provide oxygen and water retention in places that are not as readily colonized by vascular plants. However, the small size and unique structure of bryophytes present challenges in detecting and identifying them. Many botanists lack the specialized equipment and/or the knowledge and expertise to undertake field studies and specimen examination for this group. Consequently, there remain large gaps in the knowledge of bryophyte species in Ontario. For many species, there is a paucity of data necessary to assign a meaningful conservation status rank.

Spoon-leaved moss (*Bryoandersonia illecebra*) is listed as "Threatened" under the federal *Species at Risk Act*. In Canada it is found only in southern Ontario where it is at the northernmost reach of its range in North America. Photo credit: Don Sutherland/NHIC

A renewed focus on bryophytes by Ontario Natural Heritage Information Centre (NHIC) staff, combined with a need to provide Ontario bryophyte conservation status rank updates for the forthcoming Wild Species 2025: The General Status of Species in Canada report[3], has resulted in many updates to the NHIC's bryophyte data holdings in recent years. Since 2023, fieldwork across Ontario has recorded over 75 new or updated occurrences of tracked bryophyte species.

A notable recent find was a new colony of fan moss (*Forsstroemia trichomitria*) on Pelee Island, located in 2024. The colony represents the only known extant occurrence of this species in Canada to grow in conditions like those in its core range to the south; all other extant occurrences in Canada are found on rock.

In March of 2025, NHIC staff also identified a new species of liverwort for the province, *Frullania riparia*, which was found during 2023 fieldwork in northwestern Ontario near Minnesota. This is the northernmost North American record of the species, whose only other confirmed occurrence in Canada is from southern Québec.

A sample of fan moss (*Forsstroemia trichomitria*) found on Pelee Island in 2024. Photo credit: Cassandra Robillard, NHIC

These new occurrences from fieldwork complement ongoing work to compile existing bryophyte species occurrence records from other sources, including citizen science platforms and herbarium specimen datasets. These have contributed to conservation status rank updates for 60 species of bryophyte in the last two years, which in turn will better inform priorities for future work targeting bryophyte species of conservation concern.

3 For information on the Wild Species program of the Government of Canada, in cooperation with the provinces and territories: www.wildspecies.ca

Manitoba: Identifying New Great Plains Toad Breeding Sites

The Great Plains toad (*Anaxyrus cognatus*), while common throughout the great plains in the United States and northern Mexico, reaches the northern extent of its range in Canada's southern prairie provinces. Manitoba's subpopulation was known to occur in the extreme southwest near the towns of Melita, Coulter, and Lyleton. Since 2010, increased survey effort has improved the understanding of this species' range in Manitoba's mixed grass prairie.

Soil with till and sand stemming from glaciation allows the Great Plains toad, which cannot withstand freezing, to burrow deep underground to overwinter. The species is also adapted to dryness. Years can pass without suitable precipitation for breeding, but when spring rain and runoff fills shallow pools and semi-ephemeral wetlands, an explosive level of nocturnal calling for mates and of breeding can occur. Afterwards, toads shelter in shallow daytime burrows, and they forage for arthropod prey on grasslands, pastures, cultivated fields, and roadways.

A Great Plains toad (*Anaxyrus cognatus*). Photo credit: Brooks Duncan

The Great Plains toad is listed as "Special Concern" under the federal *Species at Risk Act*, and as "Threatened" under Manitoba's Endangered Species and Ecosystems Act. Threats include drainage and loss of wetlands, cultivation or overgrazing of grassland, and increased frequency of drought due to climate change. By minimizing agricultural land drainage and following best management practices regarding grazing, farmers can benefit from toads, what with their enormous appetite for insects.

Knowledge about population size and trends of the Great Plains toad in Manitoba is accumulating. Since 2010, the Manitoba Conservation Data Centre (MBCDC) has performed nocturnal listening surveys for the shrill call of the toad. The MBCDC has covered ground from the border with the U.S. north to Highway 1 at Oak Lake, and from the Saskatchewan border east to Deloraine. Surveying continually refines knowledge of occupancy and relative abundance in known toad habitat by identifying key properties and wetlands used by breeding toads. As the toads tend to return to breeding sites year after year, such sites may be crucial to the species' persistence.

Recent survey data extended the precise population boundary east and north; the MBCDC will continue investigating new occurrences at this boundary. As well, survey data has been used in the development of federal management plans and in the assessment and status reports of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In 2023, COSEWIC re-examined and upheld the "Special Concern" status, incorporated MBCDC data from 2010-2019, and increased the index of area of occupancy by 432 square kilometres. A database of Great Plains toad occurrences provides an excellent launch point for more in-depth research on the species in Manitoba and Canada.

Range (in red) of the Great Plains Toad in Manitoba (map courtesy of the Manitoba Conservation Data Centre)

Saskatchewan: Documenting the Population of an Endangered Shorebird

A piping plover (*Charadrius melodus*). Photo credit: Mdf CC BY-SA 3.0

The piping plover (*Charadrius melodus*) is a small shorebird endemic to North America. In the breeding season, piping plovers prefer to feed and nest along water bodies which have high water lines in spring, and which then recede slowly to reveal sparsely vegetated sandy or gravelly beaches. Many such beaches are also places frequented by people. Habitat destruction and degradation, shoreline erosion, human disturbance of nesting and foraging birds, and predation are thus the principal reasons for the piping plover being listed as "Endangered" under the federal *Species at Risk Act,* and as "Endangered" under *The Wild Species at Risk Regulations* in Saskatchewan.

The subspecies *Charadrius melodus melodus* breeds on the Atlantic coast (Newfoundland to North Carolina), and the subspecies *Charadrius melodus circumcinctus* breeds along the Great Lakes and in the Great Plains. In the northern Great Plains of Saskatchewan, plovers breed on the shorelines of Lake Diefenbaker, Reed Lake, Old Wives Lake, Chaplin Lake, Lake of the Rivers, Willow Bunch Lake, the Quill Lakes, Manitou Lake, and numerous small basins. Annually, these waterbodies provide habitat for approximately 22-41% of the Great Plains breeding population.

In 2024, Nature Saskatchewan in partnership with the Canadian Wildlife Service coordinated the Prairie Canada Piping Plover Census. The Saskatchewan Conservation Data Centre (SKCDC) and associated staff contributed to this effort by surveying 77 km of shoreline and incorporating the collected data into Biotics (the web-enabled tabular and spatial data management platform used by the NatureServe Network). The data is also available through SKCDC's project review website (HABISask[4]) where it can help to inform conservation planning and environmental review.

Over the survey period of May 27 to June 16, 810 plovers were identified (out of 887 plovers in total for the prairie provinces). This represented a slight increase over the lowest census count of 771 plovers in 2011 but was also considerably below the highest census count of 1420 in 2006.

Nature Saskatchewan's Plovers on Shore program works to raise awareness and to protect piping plover habitat from destruction. As of 2024, 76 public and private landholders and land managers were participating in the program. Collectively, they were conserving approximately 353 kilometres of shoreline habitat through actions such as maintaining wetlands and preventing livestock use of shorelines during the plover breeding season.

4 https://biodiversity.sk.ca/HABISask.htm

Alberta: Documenting the Occurrence of the Endangered Whitebark Pine

Whitebark pine needles and cone. Photo credit: Walter Siegmund, CC BY-SA 3.0

THE WHITEBARK PINE (*Pinus albicaulis*) occurs in subalpine and timberline zones in the Rocky Mountains of Alberta and B.C., in other mountain ranges in southern B.C., in the northern Rockies of the United States, and in some other mountain ranges in the western U.S. This long-lived, five-needled pine has large, wingless, nutrient-rich seeds that, for dispersal and reproduction, are almost entirely dependent on the Clark's nutcracker (*Nucifraga columbiana*). Nutcrackers feed almost exclusively on whitebark pine seeds when seeds are available, and they store the seeds for year-round use.

Whitebark pine is also a keystone species—a species that has a disproportionately large effect on its natural environment, relative to its abundance and which plays a critical role in maintaining the structure of an ecological community. For example, "nutritious whitebark pine seeds are an important food-source for at least 13 species of birds in 6 families and 8 species of mammals in 3 families."[5]

Further, whitebark pine helps to stabilize ecosystem function. For example, it shades snowpack which helps to slow snowmelt, thus regulating downstream flows. Its roots also stabilize soil, reducing erosion particularly on steep, rocky slopes. Thus, whitebark pine helps to protect watershed health—of importance, for example, for drinking water and for agriculture.

Unfortunately, whitebark pine grows slowly, takes considerable time to reach sexual maturity, and has a high degree of dependence on the Clark's nutcracker for seed dispersal. This natural vulnerability is exacerbated by several major anthropogenic threats—notably an introduced fungal disease called white pine blister rust, but also outbreaks of mountain pine beetles, increased competition from shade-loving trees caused by fire suppression, and climate change. In Canada, whitebark pine is listed as "Endangered" under the federal *Species at Risk Act*.

Whitebark pine seeds. Photo credit: Amber Drysdale, CC SA-BY 3.0

Efforts to protect and recover whitebark pine (and limber pine, *Pinus flexilis*) in Canada are being waged by the Whitebark Pine Ecosystem Foundation of Canada (WPEFC). Each year and specific to whitebark pine (and limber pine) in Alberta, the WPEFC submits a large amount of data to the Alberta Conservation Information Management System (ACIMS, i.e., Alberta's Conservation Data Centre). This data is obtained through aerial and field surveys of five-needle pine stands, the location of trees resistant to blister rust, and the location of seedling plantings. The ACIMS currently manages over 400 element occurrences (EOs) of whitebark pine and limber pine.[6] In 2024-2025 ACIMS processed data from approximately 2000 observations to update and create EOs for these species. These EOs help track the status of the species and help protect important whitebark pine occurrences during development planning. ■

5 For more information: https://whitebarkpine.ca/about/why-does-whitebark-pine-matter/

6 The element occurrence concept is the linchpin of the work of the NatureServe Network. Element occurrences typically represent populations and ecosystems that, if conserved, can contribute to the survival or persistence of the element (e.g., species, subspecies, ecosystem).

British Columbia: Innovative Applications of Species Habitat Modelling to Guide Field Surveys

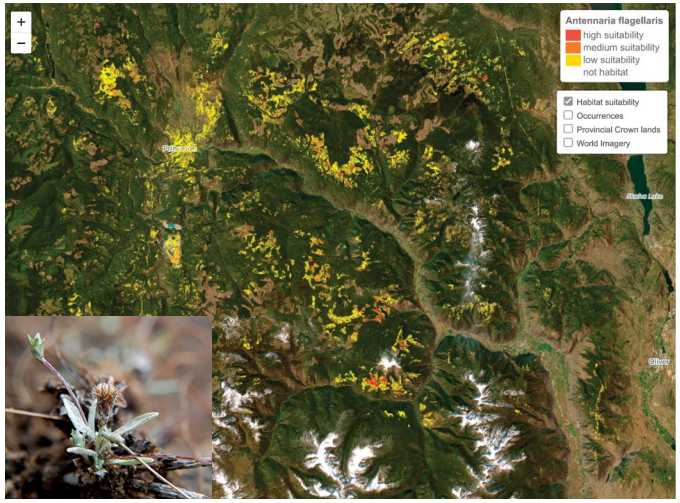
The British Columbia Conservation Data Centre (BCCDC) is developing species habitat models (SHM) for a wide array of taxa. These models aim to diversify available mapping products and enhance the strategic use of SHM in guiding field surveys—particularly for rare species in data-deficient regions.

An initial modelling effort focused on Aleutian adder's mouth orchid (*Malaxis monophyllos* var. *monophyllos*), a rare plant with just two known occurrences in Canada, located at the southern limit of its range on Haida Gwaii. Due to the limited number of local records, the BCCDC incorporated range-wide North American data—including a curated herbarium dataset from Alaska with an additional 76 records—to build a habitat suitability model and identify potential survey areas across the islands. Although no new observations were made during field verification in 2024, the model proved valuable for prioritizing survey locations and revealed the challenges of applying broad-scale models in highly localized environments.

Drawing on these insights, the BCCDC refined its approach in a second project targeting stoloniferous pussytoes (*Antennaria flagellaris*), which is the subject of an upcoming reassessment by the Committee on the Status of Wildlife in Canada (COSEWIC). For this project, BCCDC element occurrences were combined with data from Washington state and research-grade iNaturalist records. Early consultation on the draft model with an external expert and a BCCDC botanist led to methodological shifts: spatial resolution was increased from 800m to 30m; machine learning-based variable selection was changed to an expert-driven approach emphasizing ecologically relevant predictors; and the background extent was limited to southern BC and Washington.

To enhance targeted survey planning, land tenure data was overlaid so that provincial Crown lands were identified for focused surveys, while excluding private properties. Although some high-suitability areas proved less accessible—highlighting logistical and funding limitations—this emphasized the importance of broader stakeholder engagement. Final survey sites for *Antennaria flagellaris* were selected based on model output, land ownership, proximity to known populations (reflecting species dispersal), and logistical feasibility (e.g., access via paved roads). These sites were surveyed in the spring of 2025 and a new population of *Antennaria flagellaris* was found, providing confirmation of the impact that SHM can have on successfully locating species.

This integrative approach demonstrates how habitat modelling, expert insight, and strategic planning can converge to improve the efficiency of field surveys under budgetary constraints. These initiatives underscore BCCDC's strong commitment to advancing biodiversity monitoring across the province. They also illustrate innovative approaches to funding data collection, supported through partnerships with Environment and Climate Change Canada, the BC Parks License Plate Funding Program, and core support for the SHM Project via the Future Forest Ecosystems Centre (BC Ministry of Forests). By continuously refining its modelling techniques and embracing collaborative tools, the BCCDC is enhancing its ability to detect species at risk across BC, in aid of their protection.



A map developed by the BCCDC showing areas of high, medium, and low suitability for possible locations of stoloniferous pussytoes (Antennaria flagellaris), an "Endangered" plant under the federal Species at Risk Act. Photo insert of the plant by Ryan Batten, BCCDC

Yukon: Another Successful Bioblitz!

A BIOBLITZ IS AN EVENT that attempts to capture a snapshot of biodiversity in an area over a short period of time. It is a useful and efficient tool for collecting and updating baseline biodiversity data in an area. As importantly, a bioblitz also brings together scientists, naturalists, and local people to enhance their understanding and appreciation of biodiversity.

The Yukon Conservation Data Centre (YTCDC) has regularly held bioblitz events since 2016, in various regions of the Territory. In 2024 the YTCDC partnered with British Columbia Parks which was hosting a week-long bioblitz in Tatshenshini-Alsek Provincial Park. The YTCDC planned a complementary, four-day bioblitz in July on the Yukon side of the border with BC, along the road to and from the town of Haines Junction.

Key objectives of the Yukon bioblitz were to enhance knowledge of Yukon species and ecosystems in this poorly studied corner of the Yukon; to encourage public participation and interest in biodiversity research and conservation; and to build connections within the Yukon biodiversity and biology community. Surveys were undertaken at eight sites along the Haines Road, and a further six remote sites accessed by helicopter.

Over the four days 4894 observations were recorded on the iNaturalist app by 59 observers. A total of 828 different species were recorded, and of the total observations only 84 of them were of exotic (non-native) species—less than two percent of all observations.

At least seven species—two lichens, four beetles, one snail—new to the Yukon were identified. Most of these species had otherwise been recorded from primarily coastal Alaska or BC. An example is the hanging fringe lichen (*Anaptychia crinalis*). This species has a wide North American and Eurasian distribution but had not previously been documented for the Yukon. Indeed, its discovery also marked the first record of any *Anaptychia* species in the Yukon.

Another example is the margined snail-eating beetle (*Scaphinotus marginatus*). Although known from western North America, including northern BC. and coastal Alaska, this species had only been previously observed close to the Yukon, from just south of the BC. border at Swift River. The species may be expanding its range northward.

Other noteworthy finds, among many, from the bioblitz include several observations of the tree lung lichen (*Lobaria pulmonaria*), previously known only from the extreme southeast of the Yukon, and the first record of the rare rattlesnake fern (*Botrypus virginianus*), in western Yukon. ■

Among seven species newly identified for the Yukon, from the 2024 bioblitz, was the margined snail-eating beetle (*Scaphinotus marginatus*). Photo credit: John Reynolds CC-BY 4.0

During the 2024 bioblitz several observations were made of the tree lung lichen (*Lobaria pulmonaria*), previously known only from the extreme southeast of the Yukon. Photo credit: Denny Bohmer, YTCDC

Northwest Territories: Assessing Snake Survival and Health in the Wake of Wildfire

A red-sided garter snake (*Thamnophis sirtalis parietalis*) near Fort Smith, Northwest Territories. Photo credit: Peter Lin, GNWT

THE RED-SIDED GARTER SNAKE (*Thamnophis sirtalis parietalis*), a subspecies of the common garter snake, is the most northern ranging reptile in the western hemisphere. Its most northerly populations occur in the area surrounding Fort Smith in the Northwest Territories (NWT), including the northern reaches of Wood Buffalo National Park. Population size in the NWT is unknown but is believed to be in the range of 1000 to 10,000 mature individuals.

Like other reptiles, snakes are ectothermic or cold-blooded animals and cannot survive in freezing temperatures for very long. These northern populations of snakes survive a harsh climate by spending about seven months of the year underground in communal dens, called hibernacula, which they return to with high fidelity year after year.

In 2023, an extremely large and intense wildfire burned through much of the snakes' habitat, including all hibernacula, in this region of the NWT. This event, and the increasing threat of climate-driven drought and wildfire in the region overall, contributed to the NWT Species at Risk Committee's recent assessment of the red-sided garter snake as a species at risk in the NWT.

In response, a collaborative study was developed by the NWT Conservation Data Centre, Government of the Northwest Territories, Parks Canada, and Thompson Rivers University to study the wildfire's impacts on the northern snake populations. In the spring of 2024, less than a year after the wildfire swept through the area, graduate student Johanna Stewart led an intensive search effort which documented surviving snake populations at all surveyed hibernacula.

Snakes from these populations were measured, weighed, examined, and swabbed for disease to assess their post-fire condition and health. Each snake was also marked with a passive internal transponder, a small microchip inserted under the skin, which is used as part of a mark-recapture study to estimate population size and characteristics.

In addition to ongoing mark-recapture surveys, a second field season in 2025 will involve assessing the distribution and abundance of wood frogs (*Lithobates sylvaticus)* and boreal chorus frogs (*Pseudacris maculata*), which are the snakes' main prey source. As well, field personnel will examine predation on the snakes by other animals.

The information gathered over the course of this study will enhance the understanding of fire ecology in the northern boreal forest. It will also help improve conservation and management strategies not only for the red-sided garter snake, but also for other species facing the increasing effects of climate-driven wildfire. ■

Tagging a red-sided garter snake as part of the 2024 fieldwork led by the NWT Conservation Data Centre. Photo credit: Peter Lin, GNWT

NatureServe: Advancing Species Conservation Status Assessments Using RARECAT

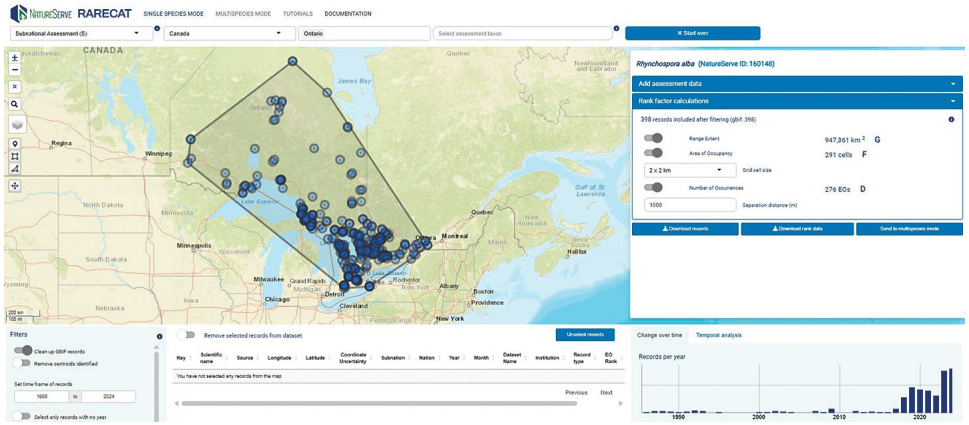
OVER SEVERAL DECADES the NatureServe Network has pioneered a standardized approach to conservation status assessment which is now applied to tens of thousands of species, and to thousands of ecosystems. Species conservation status assessments, at global, national, or subnational levels, begin with selecting a species and defining the geographic scope of the assessment, followed by research and data collection, the application of methods to those data to inform factors of rarity, threat, and trend, the recording of supporting information, review of the assessment, and then publication. Any component of the ranking process may vary depending on the geographic scope and organizational practices.

While it is desirable to increase efficiency, while maintaining high quality work, tools to support and speed up assessments have been lacking, insufficient, and often decentralized. A holistic support system that emphasizes collaboration is critical for efficient, high-quality ranking efforts.

Resources to support the broad view of ranking are not yet realized, but gains are being made with NatureServe's new Rapid Analysis of Rarity and Endangerment Conservation Assessment Tool (RARECAT). In essence, RARECAT facilitates the extraction, vetting, and filtering of observation data, visualization of data quality and quantity over space and time, and calculation of the three fundamental factors of species rarity (Range Extent, aka Extent of Occurrence; Area of Occupancy; Number of Occurrences) to support high quality and efficient conservation status assessments for both common and rare species of any taxonomic group.

RARECAT can be used in single species or multispecies mode. In the latter, RARECAT enables data to be extracted from online or uploaded sources, filters controlled by the user to be applied, and rarity statistics to be calculated across the whole set of up to 100 species and subspecies. Users can move easily between single species and multispecies modes to review a single taxon assessment while preserving the information for the group of taxa. Users can also include a temporal analysis component to review changes in rarity factors over two points in time. A flagging system provides a visual warning that a more in-depth review may be warranted, due to decreases in factors over time.

RARECAT development in early 2025, involving representatives from NatureServe, NatureServe Canada, and the General Status of Species in Canada[7] team, resulted in version 2.1.1. of the tool being released.[8] Additional testing of the tool is proceeding towards refining RARECAT functionality as needed based on user feedback.



7 https://www.wildspecies.ca/

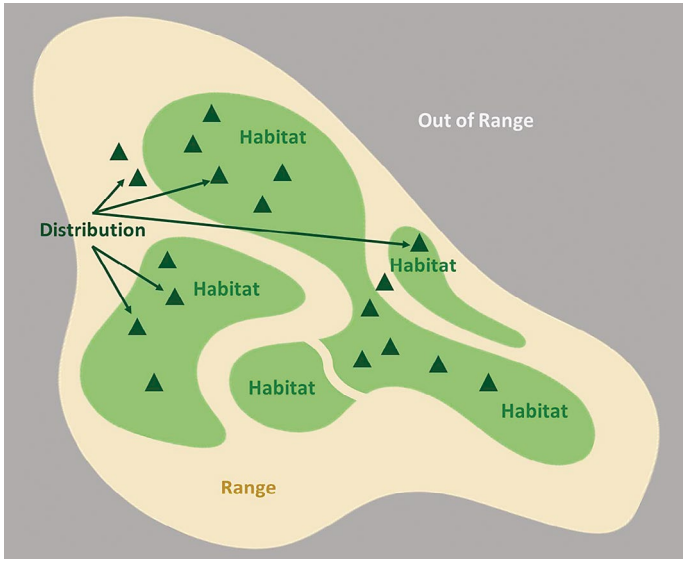
8 Please contact NatureServe Canada (info@natureserve.ca) if you would like more information about RARECAT.

NatureServe Canada: National Species Habitat Modeling Initiative

Species habitat modeling (SHM), also known as species distribution modeling (SDM) or ecological niche modeling (ENM), is a process that uses ecological models to predict the distribution of species across geographic space and over time. These models help to understand how environmental conditions influence species' occurrences and/or abundance. Models can also be used for predictive purposes such as forecasting future species' distributions or assessing the impact of climate change on species.

Discussions with NatureServe Canada (NSC) members and partners have confirmed that there is significant interest in advancing national SHM collaboration. The vision is to see partner organizations and agencies pool capacity and expertise to develop shared tools and resources to undertake SHM at multiple scales.

NatureServe Canada is well positioned to coordinate national SHM work in Canada. NatureServe (an Associate Member of NSC) has a project team and a mature modeling project which delivered the Map of Biodiversity Importance ("a portfolio of maps that identify areas critical to sustaining [America's] rich biodiversity[9]). In addition to accessing NatureServe's modeling team and infrastructure, NSC can draw on its Ecosystem-based Automated Range project which has resulted in an abundance of vetted species occurrence data from over 250 sources.[10] Preliminary work has also been done to scope out a Canada-wide SHM initiative. This has included researching prior and current Canadian SHM projects, inventorying environmental predictor data, and assembling and surveying a Working Group of over 100 people representing 35 organizations and agencies.



Conceptualization of habitat, distribution, and range. Green triangles represent the distribution of the species, while light green areas represent habitat. Yellow denotes the species range. Credit: NatureServe

A subset of the SHM Working Group is engaged in the first phase of a technical pilot project. After discussing various options for working with the NatureServe modeling team, it was decided that the scope of the first phase would be to publish existing Canadian models, including standardizing metadata; determining a Model Confidence rating for each model; and adding to the NatureServe model database so models can be made publicly available in the Model Dashboard, and in the by-invitation Model Output Review Tool for expert review. A second phase will potentially involve assembling species occurrence and environmental predictor spatial data, as well as testing the NatureServe modeling workflow and code to see how well it meets Canadian needs.

NatureServe Canada continues to coordinate the Canadian SHM Working Group and has been sharing information publicly on the project webpage.[11] However, it is imperative that funding be secured for 2025-26 and beyond to ensure the required labour and infrastructure are in place for the project to progress. ■

9 www.natureserve.org/map-biodiversity-importance
10 https://www.natureserve.org/canada/ebar
11 https://www.natureserve.org/canada/featured-projects/shm-initiative

Summary Financial Data

From NatureServe Canada's audited financial statements for 2024-25: to access the full statements, please visit www.natureserve.ca.

STATEMENT OF FINANCIAL POSITION		
Year ending March 31	2025	2024
ASSETS		
Current		
Cash	791,677	994,216
Accounts receivable	370,506	796,989
Prepaid expense	1,234	1,233
	1,163,417	1,792,438
Capital Assets	—	—
Total Assets	1,163,417	1,792,438
LIABILITIES AND NET ASSETS		
Current Liabilities		
Accounts payable and accrued liabilities	796,811	1,408,635
Deferred revenue	—	14,000
	796,811	1,422,635
Net Assets	366,606	369,803
Total Liabilities and Net Assets	1,163,417	1,792,438

STATEMENT OF OPERATIONS		
Year ending March 31	2025	2024
REVENUE		
Charitable organization/foundation funding	122,200	267,424
Dues	16,500	16,500
Government funding	2,661,283	2,780,432
Other	25,237	27,552
Total Revenue	2,825,220	3,091,508
EXPENDITURES		
Contracts	2,684,536	2,907,132
Office costs	26,506	10,635
Other	3,317	2,134
Professional fees	21,793	18,049
Sponsorship	—	13,309
Travel, annual meeting, workshops	92,265	26,057
Total Expenditures	2,828,417	2,977,316
Excess (Deficiency) Revenue Over Expenditures	(3,197)	114,192

An Invitation to Contribute to Conservation Science

A financial investment in conservation science is an investment in knowledge about nature, upon which depends the health of the environment, the economy, and our society. NatureServe Canada is a registered Canadian charity (#862330529RR0001). We welcome tax deductible donations in support of our business—conservation science. As well, membership in NatureServe Canada is available to organizations that support our mission, which manage data of conservation value, and/or are active in promoting science-based conservation action nationally or sub-nationally. Online donations can be made at www.natureserve.ca.

For inquiries, please contact Patrick Henry, Executive Director, phenry@natureserve.ca; 613-986-1535.

Kirtland's warbler (*Dendroica kirtlandii*), a Globally Vulnerable (G3) songbird, and listed as "Endangered" under the federal *Species at Risk Act*. Photo credit: Jeol Trick, USFWS, CC BY 2.0

In Gratitude to Our Members in 2024–25—Thank You!

NatureServe Canada is deeply grateful for the contribution and collaboration of our Constituent and Associate members, and Federal Government Collaborators—thank you!

CONSTITUENT MEMBERS

- Alberta Conservation Information Management System
- Atlantic Canada Conservation Data Centre
- British Columbia Conservation Data Centre
- Manitoba Conservation Data Centre
- Northwest Territories Conservation Data Centre
- Nunavut Conservation Data Centre
- Ontario Natural Heritage Information Centre
- Saskatchewan Conservation Data Centre
- Yukon Conservation Data Centre

ASSOCIATE MEMBERS

- Nature Conservancy of Canada
- NatureServe

FEDERAL GOVERNMENT COLLABORATORS

- Environment and Climate Change Canada—Canadian Wildlife Service
- Fisheries and Oceans Canada
- Parks Canada Agency

NatureServe Canada
A Network Connecting Science with Conservation
Un Réseau pour la science et la conservation

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