



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

ANNUAL REPORT 2022–2023



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.

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Cover photo: Lake Minnewanka, in Banff National Park.
Photo credit: Zeljko Kozomara, CC BY-SA 4.0.

From the Chair and Executive Director

IN ADDITION TO advancing our core business of developing, managing, and sharing subnational, national, and global species spatial and taxonomic data, NatureServe Canada (NSC) made impressive progress during fiscal 2022-23 on special projects including: the Canada Key Biodiversity Areas initiative, EBAR range mapping, the Canadian National Vegetation Classification, Data Security Policy and Procedures, and the Explorer Pro Open Data platform.

All NSC projects are collaborative efforts that pool the resources, expertise, and capacity of dozens of agencies, organizations, and individual experts. For example, our EBAR range mapping project is supported by government and non-government cash funding, while relying on the in-kind contributions of over 220 biologists (from within and beyond the NSC Network) who provide expert review to refine the auto-generated species ranges. Our website has recorded over 45,000 downloads of (to date) 586 published EBAR ranges and GIS data packages!

Fiscal 2022-23 involved discussions within our Network of the importance of expanding NSC and Conservation Data Centre (CDC) ecology programs. With funding from Environment and Climate Change Canada and the in-kind contributions of CDCs, and provincial and territorial governments, NSC is leading a collaborative project to complete the Canadian National Vegetation Classification—a national taxonomy for vegetation communities that will facilitate standardized mapping and status ranking of Canada’s ecosystems. Much work lies ahead and we are grateful to our project collaborators for their contributions to this important initiative.

Finally, a big “thank you” to our members, partners, and funders for your ongoing work and support towards our shared biodiversity science and conservation goals. We encourage prospective new partners to reach out to discuss projects that are in line with our mission and that could benefit from the expertise and capacity offered by our membership. ■



Bruce Bennett, Chair



Patrick Henry, Executive Director

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 organic 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. NatureServe Canada is based in Ottawa, Ontario and is governed by a Board of Directors comprised of representatives of its member provincial and territorial CDCs. NatureServe Canada's membership includes Associate members: Environment and Climate Change Canada, Fisheries and Oceans Canada, Nature Conservancy of Canada, and Parks Canada. Our membership structure and our national projects promote coordination of biodiversity data and information development, and distribution, to inform research, resources development, 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 64,319 species and 4649 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. ■



The Atlantic Puffin (*Fratercula arctica*) is the only puffin native to the Atlantic Ocean. Although it has a wide range and large population, its numbers are declining. Photo credit: Charles J. Sharp CC BY-SA 4.0.

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



Supporting Key Biodiversity Areas Identification in Canada

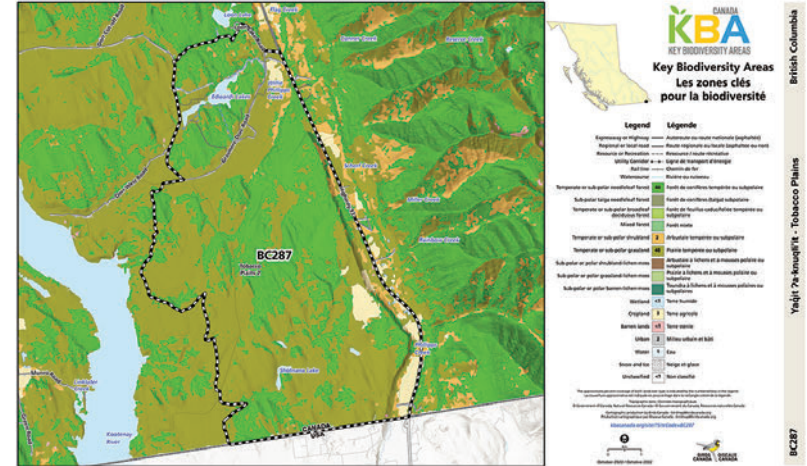
A KEY BIODIVERSITY AREA (KBA) is an area of land or water that aids significantly in the persistence of biodiversity at a national or global level. As of March 2023, over 16,300 KBAs, covering over 20.6 million km², had been identified worldwide.²

Formally launched in October 2022 and led by Wildlife Conservation Society Canada, Birds Canada, and NatureServe Canada (NSC), a coalition of Indigenous, federal, provincial, territorial, and non-government organizations is working to identify KBAs in Canada. Among other benefits, this work will help support Canada’s commitment to conserve 30% of Canada’s land and water by 2030.³

Fiscal 2022-2023 saw impressive progress in the identification of KBAs in Canada. As of this writing, 80 KBAs (including at least one in every province and territory) have been confirmed, while another 874 are under review (led by British Columbia with 172, Québec with 130, and Ontario with 116).⁴

NatureServe Canada’s role in the Canadian KBA initiative focuses on data mining, management, and distribution, and on producing EBAR range maps to inform KBA identification.⁵ NatureServe Canada manages the EBAR-KBA database and establishes data license agreements in order to provide KBA experts access to the data. Through this project, NSC has shared thousands of Conservation Data Centre “Element Occurrence” data records,⁶ and millions of species observation data records from non-Network sources, to inform analyses and delineation of KBA sites.

KBA Canada data and information products are being made available to the public at no cost via the KBA Canada Registry,⁷ with the species occurrence spatial data accessible via the NatureServe Explorer Pro platform.⁸ Through these avenues, users can (among many other data queries) generate reports on the



The Yaqit ʔa-knuqʔiʔit—Tobacco Plains KBA, in southeastern British Columbia, contains the only occurrence in Canada of the Palouse Prairie ecosystem. The site contains 100% of the Canadian population and an estimated 2.1% of the global population of the nationally *Endangered Spalding's Campion (Silene spaldingii)*.

criteria for which a KBA was identified, which species are present at given KBA sites, and download species spatial data for a KBA site. ■

2 For information on the KBA initiative worldwide: <https://www.keybiodiversityareas.org/>

3 At December 31, 2022, Canada had conserved 13.6% of its land and freshwater (including 12.7% in protected areas), and 14.7% of its marine territory (including 9.1% in protected areas). Source: <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html>

4 To track progress in Canadian KBA identification: <https://gis.natureserve.ca/portal/apps/dashboards/ad84def2aef04ecabb3b38982764f59e>

5 EBAR = Ecosystem-based Automated Range, and refers to a method of species range mapping. For more information: <https://www.natureserve.org/canada/ebars>

6 Per NatureServe’s methodology, “an Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.”

7 See <https://kbacanada.org/>

8 See <https://explorer.natureserve.org/pro/Map/>



British Columbia: Nighttime Shooting of a Threatened Owl

ELEVEN O'CLOCK IN THE EVENING, in March. Chill air coats the coastal coniferous forest. Slowly peering around the base of a large Douglas Fir, an observer finds the target. Unaware it is being watched, the target is given away by its bright red and yellow heat signature in a sea of greyish-looking vegetation. The observer takes a shot, and the target lets out a call which slowly fades away into the still, cold night...

This is not a scene from a Hollywood science fiction movie, or a paramilitary operation, it is just another night in the life of a British Columbia Conservation Data Centre (BCCDC) zoologist! Embracing technology, the BCCDC recently added a thermal scope to its arsenal of survey equipment. And what better use of a thermal scope than to track the coastal and nationally *Threatened* Western Screech-Owl (*Megascops kennicottii kennicottii*).

The *kennicottii* subspecies, one of two Western Screech-Owl subspecies in B.C., is distributed from southeastern Alaska to coastal southern Oregon. These small, non-migratory owls used to be common in south-coastal BC. However, the subspecies underwent a large and significant decline due to habitat loss and likely predation and competitive impacts from the relatively recently arrived Barred Owl (*Strix varia*).

The BCCDC has mapped nearly 70 element occurrences for coastal Western Screech-Owl, but very few individuals are known to remain on southern Vancouver Island. A few pairs are managing an existence in larger tracts of forest, and while at least one pair is known to nest annually in nesting boxes on private property, an exceedingly small number of natural nest sites have been discovered. Thus, there is still much to discover about the nesting habits of these birds.

Being small, elusive, and nocturnal, these owls are hard to keep tabs upon even where they are known to occur. This is where thermal technology shines bright. The ability to see in complete darkness, combined with photo/video capabilities, allows biologists to 'shoot' their subject and thus offers an unobtrusive glimpse into the lives of these owls that

would not otherwise be possible. Thermal technology, combined with traditional field work and additional technology such as autonomous recording units, is enabling BCCDC biologists along with other government and non-government colleagues, to reveal the secrets of the remaining screech-owls—and thus to better understand the conditions needed for the owl's survival and recovery. ■



A Western Screech Owl (*Megascops kennicottii kennicottii*) photographed at night. Photo credit: Megan Buers.



The Western Screech Owl *kennicottii* subspecies is listed as *Threatened* under the federal Species at Risk Act. Photo credit: Blair Dudeck.



Saskatchewan: Re-visiting Alvar



Alvar in east-central Saskatchewan. Photo credit: Sarah Vinge-Mazer.

ALVAR IS A GLOBALLY IMPERILED calcareous habitat characterized by shallow mineral soils over limestone or dolomite bedrock, a natural lack of trees, and an unusual prairie-like flora. Few people familiar with alvar would envision it in Saskatchewan's northern boreal forest, as it occurs in only five countries worldwide, and in Canada most of it is found in the Great Lakes basin. Nonetheless, alvar occurs in east-central Saskatchewan. Though long known to the First Nations in the area, alvar was only recently documented by scientists. Notably, in 2020 Michael Rudy, then Acting Botanist for the Saskatchewan Conservation Data Centre (SKCDC), confirmed the occurrence of alvar between Cumberland and Limestone lakes in the northeastern part of the province.

information on how the Saskatchewan sites might differ from other alvar in Canada. As these sites are situated at a different latitude/longitude than the rest of Canada's alvars, they stand to be unique types warranting conservation attention.

Alvar sampling in 2022 concerned vegetation communities, invertebrates, and vertebrates including bats. Since the priority was to collect vegetation data to compare with other sites across Canada, mid-July was chosen as the time to visit as this is the best time to be able to identify as many plant species as possible.

Vegetation sampling was designed to describe the dominant plant communities. While analysis is not yet complete, there is anecdotal evidence of at least four different types of plant communities: grassland, shrubland, wetland, and savannah. Several plant species, such as

Biologists with the SKCDC travelled to alvar sites in 2022 to further collection of data that was initiated in 2020. The goal was to confirm the existence of alvar at several sites that had not yet been visited by scientists, and to collect

Geum triflorum var. *triflorum*, *Solidago ptarmicoides*, *Carex praegracilis*, *Koeleria macrantha*, and *Orthocarpus luteus*, were found in these alvars which are usually only found in southern Saskatchewan in a prairie context. Tracked (rare) species documented included

Allium schoenoprasum var. *sibiricum* (S3), *Artemisia campestris* ssp. *canadensis* (S3), *Carex capitata* (S3), *Minuartia rubella* (S3), *Packera platensis* (S1), *Poa alpina* ssp. *alpina* (S2), *Potentilla rubricaulis* (S3), *Ranunculus pedatifidus* var. *affinis* (S3), *Solidago ptarmicoides* (S3), and *Trisetum spicatum* (S3).



Pink Prairie Onion (*Allium stellatum*) is one of many plant species within the alvar complex in east-central Saskatchewan. Photo credit: Michael Rudy.

Lichen and moss samples were collected to be identified by external experts. Also, no non-native plant species were observed at the alvar sites, thus potentially making them some of the most pristine alvars in the world. Deliverables from this project will inform future land use planning and land stewardship by First Nations, land use planners, and other stakeholders in this area of Saskatchewan. ■



Ontario: Working as a Community to Track Biodiversity

MORE THAN 30,000 NATIVE species occur in Ontario, making the province, along with British Columbia and Québec, the most biodiverse of Canada's provinces and territories. Serving a province of over a million square kilometers, with more than 2,700 species of conservation concern, the Ontario Natural Heritage Information Centre (NHIC) relies on the public as a significant contributor of species observation information in support of land use planning, natural resource management, conservation, species research, and more.

In July of 2022, NHIC data analysts launched a mobile-friendly, community science data reporting tool. The NHIC tool—the NHIC Observation Reporting Form—is a user-friendly method for the public to submit incidental species observations.⁹

Until the advent of the Form, the public typically reported species observations by



A Spiny Softshell Turtle (*Apalone spinifera*), photographed among other turtles near London, Ontario, May 2023. The Spiny Softshell Turtle is listed federally and in Ontario as *Endangered*. Photo credit: Gord Harrison.

phone and/or email with NHIC staff. This process often required considerable back-and-forth communication between observers and the NHIC. Now, with the simple and easy to navigate Form, it takes a similar amount of time to complete compared to other community science platforms (e.g., iNaturalist, eBird). The process for submitting

species observation information has been made more efficient, and the information collected subject to greater standardization. In support of their observations, contributors provide the respective observation dates, locations (with map coordinates), and photos (if they have them).

Most importantly, the Form is spurring community engagement across Ontario in biodiversity information generation. More than 1700 species observation reports alone were submitted within weeks of the Form going live online, and reporting is growing rapidly. All in all, the public is now the largest contributor of species observations to the provincial record, thanks to the tremendous potential of online community science platforms, of which the NHIC Observation Reporting Form is part. ■



Natural Heritage Information Centre (NHIC) Observation Reporting Form

This form can be used to submit casual sightings of species of conservation concern including species at risk and provincially rare species in Ontario.

⁹ See <https://engage.ontario.ca/en/content/natural-heritage-information-centre-nhic-observation-reporting-form>



Québec: First Documented Population of an Endangered Dragonfly

THE RAPIDS CLUBTAIL (*Phanogomphus quadricolor*) is a small (41-46 mm), elusive, and relatively rare dragonfly with translucent wings and a brownish-black body with yellowish-green stripes. Native to eastern North America, where its preferred habitat is along medium- to large-sized rivers, the Rapids Clubtail is known from Maine to Minnesota, south to Georgia and Kentucky and, in Canada until recently, only from a few areas in southern Ontario. Listed by NatureServe as Globally Vulnerable (G3), in Canada Rapids Clubtail is also listed as *Endangered* under the federal *Species at Risk Act*.



An adult Rapids Clubtail (*Phanogomphus quadricolor*), photographed in Québec in 2022. Photo credit: Michel Savard, Entomofaune du Québec.

On November 28th, 2021 and on the citizen science platform, iNaturalist, Isabelle Pothier, an amateur naturalist, posted pictures of a dragonfly she had observed in July of the same year, near Maniwaki in western Québec. North American specialists were quick to agree: Isabelle had documented the first ever Rapids Clubtail observation for Québec!

Alerted by this observation, dragonfly enthusiasts of the *Initiative pour un Atlas des odonates du Québec* and the *Centre de données sur le patrimoine naturel du Québec* (CDPNQ) partnered to survey the Maniwaki area more intensively in the summer of 2022.

The CDPNQ is a member of the international NatureServe Network. Though it is not currently a member of NatureServe Canada (NSC), the CDPNQ and NSC collaborate to advance shared biodiversity science and data objectives.

Before 2022, the Odonata inhabiting this area of Québec was poorly known. However,

over June 25-30, 2022, a team devoted over 130 person-hours in the field to document 60 species of Odonata—more than a doubling of Odonata species recorded from this area!

Most importantly, two exuviae of the Rapids Clubtail were found on the first morning of the fieldwork.¹⁰ Over the ensuing days, the field team would find a total of 22 exuviae, six larvae, and three adults! These findings confirmed the presence of a breeding population of the Rapids Clubtail—the first ever documented in Québec and located more than 100 kilometers to the north of the closest known population.

The discovery of a Rapids Clubtail population in Québec is an exciting discovery which also increases knowledge of the global distribution of this species. It is also another example of how citizen science can contribute to biodiversity conservation. Until the 2022 inventory, the Canadian range of Rapids Clubtail was thought to be restricted to a few small areas of southern Ontario. Building on the experience acquired through this inventory, members of the *Initiative pour un Atlas des odonates du Québec* also managed to locate another population, in the Estrie region of Québec (i.e., in the Eastern Townships). ■

¹⁰ Exuviae are the remains of an exoskeleton and related structures left after insects, for example, have moulted.



The Maritimes: Harnessing Citizen Science to Update Conservation Assessments

EARLY IN 2023, the Atlantic Canada Conservation Data Centre (ACCDC), under contract with Environment and Climate Change Canada, reassessed the provincial ranks for butterfly and moths (Lepidoptera) for New Brunswick, Nova Scotia, and Prince Edward Island (PEI). This is the third time this entire insect order has been assessed, with the last review being in 2018.

As is the case in conservation status reviews, a variety of data sources were used, from ACCDC field work to museum collections. In this most recent assessment, the greatest single source of data by far was iNaturalist. Nearly 77,000 research grade observations were available for the region, 88% of which were posted since the 2018 reassessment.

iNaturalist data was responsible for most rank changes. There were 532 additions to provincial species lists (159, 105, and 268 for New Brunswick, Nova Scotia, and PEI, respectively) and 282 changes to existing ranks (64, 34, and 184 for New Brunswick, Nova Scotia, and PEI, respectively). Most changes to existing ranks were from SU (meaning unranked at the provincial level) to a numeric one (e.g., SU to S4S5), as additional records

allowed for the rank calculator to be filled out more fully.

Extra attention was paid to iNaturalist observations that added species to provincial lists. Using metadata provided by NatureServe Canada, the observations vetted by recognized experts, like Greg Pohl of the Canadian Forest Service or Christian Schmidt of the Canadian National Collection of Insects, Arachnids, and Nematodes, could be earmarked and accepted without further review. New provincial records that had not received authoritative review were compiled and distributed via email to various experts. Not all of the potentially new provincial records proved to be correctly identified, but most did.

Perhaps the biggest iNaturalist surprise was Canada's first record of Palmetto Borer (*Litoprosopus futilis*), photographed by Mark Dennis on Cape Sable Island, at the southern tip of Nova Scotia. As the common name suggests, this moth's larvae feed on palms, and it only occurs regularly as far north as the Carolinas. There are a couple of other iNaturalist records of vagrant Palmetto Borers from the U.S. eastern seaboard.

Another exciting iNaturalist observation from Cape Sable Island is a potential record



A Palmetto Borer Moth (*Litoprosopus futilis*), photographed in 2022 on Cape Sable Island in Nova Scotia—and the first Canadian record of this species. Photo credit: Mark Dennis.

of *Aristotelia ivae*. This micromoth feeds exclusively on Eastern Baccharis (*Baccharis halimifolia*), a nationally *Threatened* plant that in Canada only occurs in southern Nova Scotia. Moth specimens are needed to verify this identification, so the observation is inspiration for some targeted surveys of caterpillars and moths of Eastern Baccharis. ■



Yukon: A Record-breaking Bioblitz

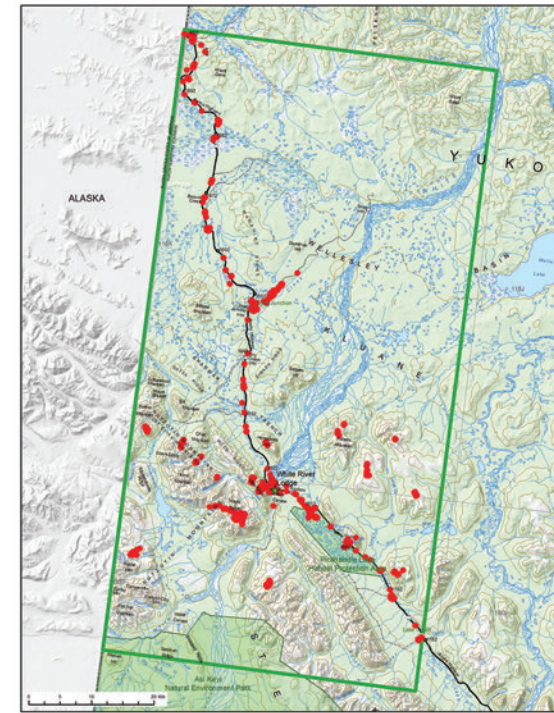
A BIOBLITZ IS A PERIOD of intensive biological surveying, by scientists, naturalists, and volunteers, to record within a continuous time period as many species within a designated area as possible. Over a one-week period in mid-July 2022, in the Beaver Creek area in the Yukon, bordering on Alaska, the Yukon Conservation Data Centre (YTCDC) coordinated what may have been—based on the number of taxa recorded—the single-most successful bioblitz in North America to date: as of April 30, 2023, 1852 taxa were documented! This includes 467 vascular plants, 232 beetles, 188 lichens, 164 bryophytes, 163 moths, and 157 spiders.

Of the total, 108 species were newly added to the list of Yukon's biodiversity. They included

three species also newly documented for North America (e.g., Sahlberg's Ocellate Rove Beetle, *Phyllodrepa sahlbergi*), four other species newly documented for Canada (a twirler moth, *Aproaerema anthyllidella*), and at least 11 undescribed species.

As well, information was gathered on 22 species of conservation concern, including the nationally *Endangered* Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*). The Yukon is one of the last places that still has healthy populations of this bee. (Sixteen other species of bumblebee were also noted during the bioblitz.) Other at-risk taxa documented included the Transverse Lady Beetle (*Coccinella transversoguttata*), the Short-eared Owl (*Asio flammeus*), and the Collared Pika (*Ochotona collaris*).

Twenty-one vascular plant taxa and six insect taxa, representing 1.45% of the total taxa recorded, are not native to the Yukon. The low number of exotics means the study area, despite being bisected by a major highway, is one of the most pristine parts of continental North America. Of the six exotic insects, three are new for the Yukon (e.g., Narcissus Bulb Fly, *Merodon equestris*).



Boundary of Beaver Creek Bioblitz with sites where iNaturalist observations were recorded.

The 2022 Beaver Creek Bioblitz was made possible thanks to the efforts of 65 participants hailing from across 21 organizations, including Environment and Climate Change Canada, Natural Resources Canada, White River First Nation, Canadian Museum of Nature, Yukon Conservation Society, Royal BC Museum, New York Botanical Garden and five universities. As one of the goals of the project was to help inspire the next generation of scientists and naturalists, it was gratifying to see the participation of young adults involved in, for example, the Yukon Youth Conservation Corps. ■



Some of the participants in the 2022 Beaver Creek bioblitz
Photo credit: Sarah Juliet Nadler, Yukon Conservation Society.



Northwest Territories: Processing Wildlife Camera Data to Detect Species at Risk

Thaidene Nënë—“The Land of the Ancestors” in Dēnesųliné Yati—is an Indigenous Protected Area of more than 26,000 km² in the Northwest Territories. At its core is Thaidene Nënë National Park Reserve, Canada’s newest national park. Here is the place where the barrens and subarctic boreal forest converge on the shore of one of the world’s largest freshwater lakes in a stunning display of rugged, northern beauty.¹¹



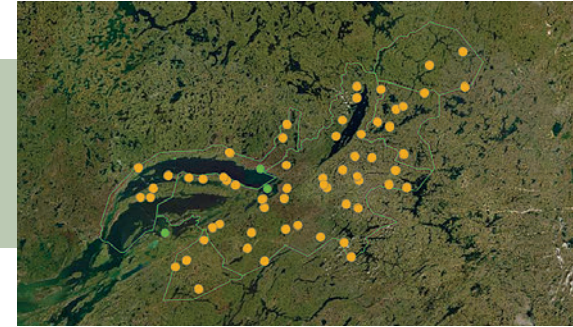
A Muskox (*Ovibos moschatus*) in Thaidene Nënë National Park Reserve. Photo credit: Government of the Northwest Territories.

AS PART OF A MULTI-YEAR PROJECT to better understand the biodiversity of this immense protected area, wildlife cameras were deployed between August 2021 and August 2022 across the Reserve and the Greater Park Ecosystem. The specific purpose was to help map the distribution and occurrence of Barren-ground Caribou,

Wolverine, Grizzly Bear, and other species-at-risk, as well as other non-threatened wildlife.

This project involves the Northwest Territories Conservation Data Centre (NTCDC) and other agencies and organizations including: Parks Canada, Government of the Northwest Territories Department of Environment and Natural Resources (Conservation Planning Division, Wildlife and Fish Division), Łutsel K’e Dene First Nation, Environment and Climate Change Canada (Canadian Wildlife Service), University of British Columbia, Wilfrid Laurier University, and University of Alberta/Alberta Biodiversity Monitoring Institute.

Supported by resources from the above organizations, including Parks Canada funding allocated through NatureServe Canada’s (NSC) national CDC Data Enhancement Project, a total of 304 cameras were deployed and were retrieved in August and September, 2022. Between September



Distribution of wildlife cameras deployed across Thaidene Nënë from August 2021 to 2022.

2022 and March 2024, images will be uploaded to Wildtrax for data processing, including species identification and verification.¹² In the context of ongoing NTCDC data enhancement work for Parks Canada, the data from the camera traps will in future be processed into Element Occurrences and Source Features, as per Parks Canada priority species criteria. Using reporting templates provided by NSC, the NTCDC will provide a report of the work completed including how many images were recorded, how many images were tagged with species IDs, and the numbers and types of species-at-risk detected by the cameras. A complete dataset of species-at-risk point occurrences will be provided to the NTCDC, and made available to Thaidene Nënë National Park Reserve, by the end of March 2024. ■

11 Text excerpted from <https://parks.canada.ca/pn-np/nt/thaidene-nene>

12 “WildTrax is an online platform that simplifies the processing, organization, storage, and sharing of environmental sensor data.” For more information: www.wildtrax.ca



Nunavut: An Expanded Species List for Quttinirpaaq National Park

AT 37,775 SQUARE KILOMETRES, Quttinirpaaq National Park is Canada's second-largest national park, as well as the world's second-most northern park. Established on northeastern Ellesmere Island in 1988, Quttinirpaaq ("top of the world" in Inuktitut) is renowned for its extensive ice caps and glaciers, desert-like conditions, and species uniquely adapted to a harsh polar place.

To maintain viable populations of native species within the protected areas managed by the Parks Canada Agency, it is necessary to first know which species are present. As a long-term member of NatureServe Canada (NSC), Parks Canada has established annual contracts with NSC to enable Conservation Data Centres to support the Agency's information needs, for example to develop species lists or to improve species distribution information for specific national parks.

In this vein, in 2022-23 and in collaboration with Parks Canada, the Nunavut Conservation Data Centre (NUCDC) developed an expanded list of species found in Quttinirpaaq. Using two online data web portals (Global Biodiversity Information Facility, Biodiversity of Life



The purple flowers of River Beauty (*Chamerion latifolium*), photographed in Quttinirpaaq National Park, Nunavut. Photo credit: Paul Gierszewski, CC BY-SA 3.0.

Data System), the citizen science platform, iNaturalist, and published references, an initial list maintained by Parks Canada was updated with new species and species distribution information.

Species records were reviewed for locational errors and to determine if given species were known from Nunavut. Those species not currently reported from Nunavut were investigated to determine whether their names were valid or whether they were treated under a different scientific name. Contact, as necessary,

with museum and herbaria curators helped to determine if specimens housed there might have been re-identified. Taxonomic experts were also consulted on the likelihood of given species being present in Nunavut, generally, and in Quttinirpaaq, specifically. Older references, such as a 1963 report on entomological studies in the Lake Hazen area, a 1967 paper on moss records from Ellesmere Island, a 1973 paper on freshwater algae of Ellesmere Island, and a 1986 account of Collembola (springtails) of the Canadian Arctic, also proved invaluable for expanding the species lists.

Through this project, a total of 479 new taxa were added to the Quttinirpaaq list, ranging from bacteria, beetles, and caddisflies to fungi, lichens, and liverworts. The greatest number of new records were added in the taxonomic groups of flies (134), mosses (95), vascular plants (70), and lichens (49). In addition, updates were made to 223 taxa previously recorded for the park. The updated, more comprehensive list of taxa known from Quttinirpaaq National Park now consists of 777 taxa. The PCA-NUCDC project also added 115 new species to the NUCDC's database of species in Nunavut. Given the project's success, a similar project in 2023-2024 focusing on a different national park in Nunavut is intended. ■



Advancing the Canadian National Vegetation Classification

ECOSYSTEMS HAVE A DIVERSE SET of species interacting with each other and their habitats. By classifying and describing ecosystems in a systematic and standardized manner, within and across jurisdictional boundaries, scientists aid the understanding and exchange of ecological information across those boundaries. As well, standardized classification strengthens the regional, national, and international assessment of biodiversity, improves the monitoring of ecosystem change in response to climate change, invasive species, and land use, and aids ecosystem-based management and conservation planning. Ecosystem classification also assists in conservation reporting, for example on how many hectares of given ecosystems have been protected in Canada pursuant to Canada's commitments under the Global Biodiversity Framework.¹³

The Canadian National Vegetation Classification (CNVC) supports such aims.¹⁴ Begun in the late 1990s, the classification concerns all the natural and semi-natural terrestrial and aquatic vegetation in Canada, with consistency with the completed U.S. National

Vegetation Classification.¹⁵

The classification hierarchy is based on eight levels of vegetation description. These are, in order from coarsest scale to finest scale: Class, Subclass, Formation, Division, Macrogroup, Group, Alliance, and Association.

NatureServe Canada (NSC) has been involved for many years in supporting the advance of the CNVC. With financial support from Environment and Climate Change Canada, NSC is administering a multi-agency effort to finalize the CNVC. A technical team, coordinated by NatureServe and comprised of provincial and territorial government ecologists, and independent experts, is working to “crosswalk” existing provincial and territorial vegetation classifications with the emerging CNVC. The current focus is on describing temperate vegetation and non-forested boreal vegetation types. When complete, the CNVC will support future updating of the Canadian Terrestrial Ecological Framework (CTEF),



Boreal forest in Pukuskwa National Park. Photo credit: Hans-Jürgen Hübner CC BY 3.0.

Beach-head Iris (*Iris setosa*), photographed during the 2022 Beaver Creek Bioblitz in the Yukon. Photo credit: Bruce Bennett.

by providing standardized vegetation attributes for describing the eco-levels of the framework. ■

¹³ The Global Biodiversity Framework was “adopted [in Montréal in December 2022] during the fifteenth meeting of the Conference of the Parties (COP 15) following a four year consultation and negotiation process.” For more information, see <https://www.cbd.int/gbf/>

¹⁴ For details on the CNVC, see <http://cnvc-cnvc.ca/index.cfm>

¹⁵ See <https://usnvc.org/>



Mapping Canada's Ecological Diversity

CANADA'S VAST RANGE of ecosystems, including boreal and temperate forests, Arctic tundra, wetlands, and grasslands, support an immense variety of plant and animal species, many of which are unique and found nowhere else in the world. They also underpin Canada's economy and socio-economic wellbeing. However, human-caused disturbances such as the conversion and degradation of land, the introduction of invasive species, and pollution threaten ecosystem integrity. The effects of climate change, including rising temperatures, altered precipitation patterns, and increasing frequency of wildfire and other extreme weather events, exacerbate these threats.

NatureServe, NatureServe Canada (NSC), and the NatureServe Network (Network) track and assess ecosystems because of their habitat values and provision of ecosystem services. As a tool in this work, the International Vegetation Classification (IVC) describes ecosystem patterns at global, regional, and local scales, using an eight-level hierarchy. The highest levels of the IVC capture continental patterns of biodiversity, using broad ecosystem categories such as boreal forests and alpine tundra. Lower levels address the finer details of ecosystem structure and composition. NatureServe has

developed the IVC with partners of the U.S. National Vegetation Classification (USNVC) and Canadian National Vegetation Classification (CNVC), including government agencies, the Ecological Society of America, and the Network.

Network programs and affiliated government agencies in the United States and Canada collect data on these terrestrial ecosystems by using ground-based field surveys, drones, aerial photography, satellite imagery, and other methods. By defining, mapping, and evaluating threats to natural ecosystems, NatureServe, NSC, and the Network provide information needed to support conservation efforts.

The map on this page represents the first time NatureServe has mapped all ecosystems across the United States and Canada. Here, ecosystems are visualized at the subclass level (*see legend at right*), one of the broader levels of the IVC hierarchy. The map was made possible through NatureServe's partnership in the U.S. with the LANDFIRE program, and in Canada with Environment and Climate Change Canada, participating Network member programs, and provincial and territorial agencies. Moving forward, the goal is to provide maps of ecosystems at finer scales. These scales are



Forest and Woodland	Alpine and Polar Tundra
■ Temperate and Boreal Forest and Woodland	■ Temperate Alpine and Polar Tundra
■ Tropical Forest	■ Perennial Snow and Ice
Grassland, Savanna, and Shrubland	Wetland
■ Temperate Grassland, Boreal Grassland, and Shrubland	■ Forest Wetland
■ Tropical Savanna, Grassland, and Shrubland	■ Shrub and Herb Wetland
Desert and Semi-desert	■ Peatland
■ Warm Desert	■ Salt Marsh
■ Cool Semi-desert	Other
	■ Open Rock Vegetation
	■ Developed

needed to support status assessments of ecological systems, and such assessments will, in turn, support initiatives such as the Key Biodiversity Area Canada project (*see page four*). ■



Summary Financial Data

The summary financial data on this page is drawn from NatureServe Canada’s audited financial statements for 2022-23. To access the full statements, please visit www.natureserve.ca.

STATEMENT OF FINANCIAL POSITION		
Year ending March 31	2023	2022
ASSETS		
Current		
Cash	881,186	777,742
Accounts receivable	418,643	485,253
Prepaid expense	1,020	1,020
	1,300,849	1,264,015
Capital Assets	534	1,067
Total Assets	1,301,383	1,265,082
LIABILITIES AND NET ASSETS		
Current Liabilities		
Accounts payable and accrued liabilities	979,508	949,440
Deferred revenue	66,264	134,946
	1,045,772	1,084,386
Net Assets	255,611	180,696
Total Liabilities and Net Assets	1,301,383	1,265,082

STATEMENT OF OPERATIONS		
Year ending March 31	2023	2022
REVENUE		
Charitable organization/foundation funding	427,039	207,872
Dues	16,500	16,500
Government funding	2,292,797	2,042,133
Other	11,414	40,557
Total Revenue	2,747,750	2,307,062
EXPENDITURES		
Contracts	2,621,925	2,231,312
Office costs	10,278	12,395
Other	1,987	2,320
Professional fees	17,902	17,421
Sponsorship	0	10,000
Travel, annual meeting, workshops	20,743	4,283
Total Expenditures	2,672,835	2,277,731
Excess (Deficiency) Revenue Over Expenditures	74,915	29,331

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 financial gifts 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 processed through our website (www.natureserve.ca) and inquiries can be directed to Patrick Henry, Executive Director, phenry@natureserve.ca; 613-986-1535. ■



Sean Blaney, the longtime Executive Director and Senior Scientist of the Atlantic Canada Conservation Data Centre, at the Alward Brook Bog, New Canaan, New Brunswick. Photo credit: [Tori Weldon/CBC](#).



In Gratitude to Our Members in 2022–23—Thank You!

NatureServe Canada is deeply grateful for the contribution and collaboration of our Constituent and Associate members—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

Environment and Climate Change Canada—
Canadian Wildlife Service
Fisheries and Oceans Canada

Nature Conservancy of Canada
NatureServe
Parks Canada Agency



Environment and Climate Change Canada

Environnement et Changement climatique Canada



Fisheries and Oceans Canada

Pêches et Océans Canada



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

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