



NatureCounts

Strategy to 2030

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TARGET 21

“All countries need data, information and knowledge to identify threats to biodiversity, and determine needs and priorities, plan and take evidence-based decisions and actions, set benchmarks and monitor and report on progress for the conservation and sustainable use of biodiversity.”

–Secretariat of the Convention on Biological Diversity, on Target 21 of the Global Biodiversity Framework



NatureCounts

NatureCounts is an open data platform that collects and interprets biodiversity data, and makes those data available and accessible to inform research and conservation action.



The NatureCounts Platform:



Facilitates data collection by citizen science and research programs.



Integrates and streamlines data from hundreds of projects into a single database.



Supports the analysis of the data to generate knowledge of bird populations, power exploration, and support decision-making.




Shares data freely with the conservation community to drive conservation action and engage Canadians with the natural world.




Provides tools and knowledge that support sound decision-making for policy and regulatory processes.

NatureCounts at a Glance

Citizen Scientists play a crucial role in conservation by participating in bird monitoring programs.




More than 70,000 volunteers spend millions of hours collecting data throughout Canada each year.




Researchers and professionals also contribute data through collaborative programs.

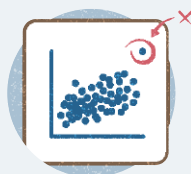
NatureCounts is a Birds Canada platform to collect, interpret, share, and access bird data.



NatureCounts maintains the largest collection of Canadian bird information, with > 20 million observations added annually.



The NatureCounts website, along with other resources, make these data and findings freely available to everyone. [Access it here.](#)



Birds Canada scientists ensure data accuracy, extract key information about bird population health, and publish results.

Effective conservation actions can then be identified. These are implemented by people across society to help birds.



Identifying, restoring & protecting habitats



Changing policy & legislation



Adapting land use practices

Platform Components



The NatureCounts Website is where users can submit, access, and explore data and conservation practitioners can manage their programs and volunteers. [View here.](#)



The NatureCounts Mobile App allows citizen scientists and researchers to collect high quality wildlife monitoring data in a flexible and user-friendly format. [Download here.](#)



The NatureCounts R Package allows R users to connect directly to the NatureCounts database to access data or complete analyses. [Download here.](#)



The NatureCounts Summary Tools make the extensive information in NatureCounts easy to visualize, query, and understand. [View here.](#)



Partnerships with dozens of organizations foster both data contributions and data use through access to the discoverable and secure NatureCounts data repository.



The State of Canada's Birds Portal presents population status and information about each of Canada's 703 bird species in readable, accessible, visually appealing summaries.



Engagement and Education Resources empower individuals to participate in monitoring programs, learn about birds, and use NatureCounts tools to have a positive impact for conservation.

Guiding Principles



CONSERVATION IMPACT

NatureCounts benefits bird populations by facilitating data collection, providing data access, and supporting analysis and action.



USER FOCUS

NatureCounts prioritizes a positive user experience and reduces barriers to participation for everyone, following IDEA principles (Inclusion, Diversity, Equity, and Access).



OPEN ACCESS DATA

NatureCounts follows international data standards and FAIR principles (Findability, Accessibility, Interoperability, and Reuse) of digital assets (go-fair.org).



COLLABORATION

NatureCounts facilitates and enables the work of hundreds of conservation actors by sharing data, expertise, and resources.



EFFICIENCY

NatureCounts makes software, tools, and data flexible and reusable for multiple purposes and projects, maximizing resources and minimizing costs.

WORKING TOGETHER FOR CONSERVATION

NatureCounts supports conservation at every level, from citizen scientists collecting data to federal ministers developing policy.

A core tenet of NatureCounts is ensuring the right people have easy access to the right tools and information to work towards the conservation of birds and their habitats.

NatureCounts Community

NatureCounts serves a diverse group of people.

Data contributors collect or share data through the NatureCounts platform. **Data users** access those data for research and conservation, either in its raw form or through analyses and decision-support tools.

The NatureCounts community includes:

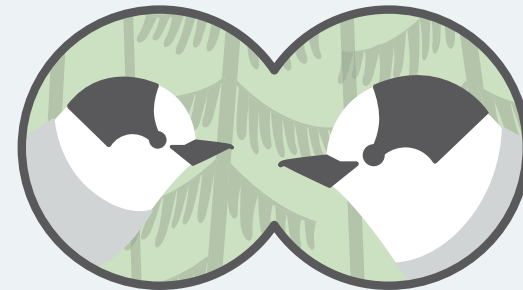
- ▶ Citizen scientists
- ▶ Birds Canada staff and partners
- ▶ Governments (federal, provincial, municipal)
- ▶ First Nations
- ▶ Consultants and industry
- ▶ Researchers and academia
- ▶ Non-governmental organizations
- ▶ Conservation data centres
- ▶ Science advisory panels
- ▶ Educators
- ▶ The general public

The Power of Citizen Science

NatureCounts is made possible by volunteer citizen scientists who gather vast amounts of data that are applied to conservation.

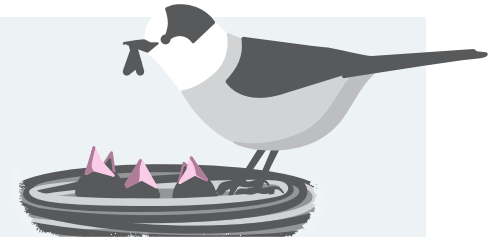
Tens of thousands of Canadians are involved in citizen science programs, spending millions of hours collecting data each year. In addition, hundreds of expert volunteer reviewers validate the data and ensure its quality.

Citizen science data is a vital tool for understanding changes in bird populations and the natural world. It enables research, informs conservation action, and allows us to measure the success or failure of conservation efforts.

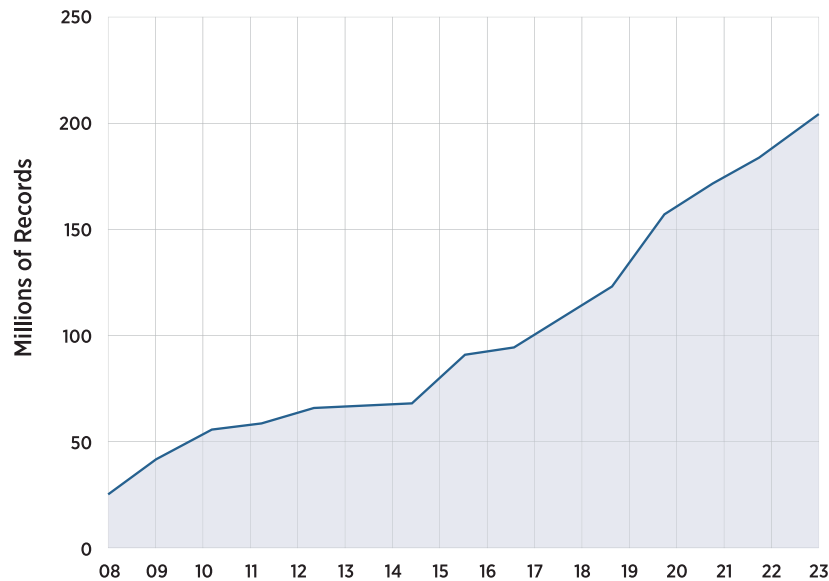


NatureCounts in 2023

205 MILLION
RECORDS



Number of records in NatureCounts 2008-2023



13,000,000

Species at risk records

35,000

Data requests

400,000

Pageviews / year

4,000

Supported publications

70,000

Data contributors

680

Datasets

Ambition

NatureCounts has been widely used since its inception in 2008, but it has **immense potential** to drive more conservation action, reach a wider audience, and better meet the growing demand for data and interpretive tools outlined in Target 21 of the Kunming-Montreal Global Biodiversity Framework. Our ambition is to collect, analyze, and share critical information to inform **wide-reaching** and **effective action** by the conservation community.

“In the midst of a global biodiversity crisis, these databases may hold the key to detecting important obstacles and threats to conservation, as well as determining the best interventions before it is too late.”

–Binley *et al.*, 2023. Bulletin of the Ecological Society of America.



THE PROBLEM

North America has lost 3 billion birds since 1970. **In Canada, 31% of birds are below their target population levels as of 2019.** Urgent action is needed.



THE RESOURCE

NatureCounts contains **hundreds of millions of bird records** which, along with meaningful analyses, are freely available.



THE SOLUTION

NatureCounts **bridges the gap between data and action** by empowering people with the tools to identify threats, make good decisions, and take informed action.

Vision and Goals



VISION NatureCounts is the primary source of bird knowledge in Canada. It contributes to preventing, halting, or reversing population declines by facilitating community engagement, scientific research, informed decision-making, and conservation action.

Goal 1 : **Collect Data**



Acquire data that are most relevant for bird conservation.



Goal 2 : **Interpret Data**



Generate high quality results and exploration tools.



Goal 3 : **Drive Impact**



Connect results with key users to achieve positive conservation outcomes.

This plan identifies specific objectives that will lead to significant advances in all three categories by 2030.

1 Collect Data

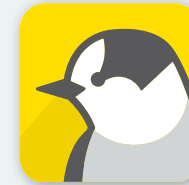
Acquire data that are most relevant for bird conservation

Overview

By ensuring that all relevant historic and new data are incorporated into NatureCounts, we will increase the accuracy and relevance of analyses and make the largest possible dataset available to data users.



The NatureCounts App



The NatureCounts app allows users to collect high quality wildlife monitoring data in a flexible and user-friendly format. The app complements eBird, allowing researchers to collect tailored data for their studies while easily integrating those data into the existing eBird platform. The flexible architecture also makes setting up new projects nimble and efficient.

Further development of the app will focus on supporting countless research and monitoring initiatives in Canada and beyond. New tools will allow users to create their own data entry projects for birds or other taxa, which will seamlessly flow into NatureCounts.

“This app is amazing. I’m going to be able to go from the field today straight into data analysis tomorrow, it’s saving me so much time!”

-Janine McManus, Grassland Bird Research Biologist

Objectives

1.1 Support data entry for diverse survey protocols

- ▶ Expand online and mobile app support to additional protocols.
- ▶ Create user support and training tools.
- ▶ Improve usability through new project and volunteer management tools.
- ▶ Build informative dashboards to acknowledge, inspire, and engage citizen scientists.

1.2 Increase data contribution through partnerships

- ▶ Establish new data contribution relationships through targeted engagement.
- ▶ Expand data collection APIs to allow integration of raw and analysed data from partners. (i.e. population trends)
- ▶ Build self-directed tools to allow anyone (i.e. academics, consultants, NGOs) to create new data collection projects through NatureCounts.

1.3 Ensure high reliability of curated data

- ▶ Maintain industry leading practices on data security, management, and sharing following FAIR principles.
- ▶ Leverage existing reviewer networks to expand data validation to all datasets using new interfaces.
- ▶ Create metadata management tools to maintain fully populated and discoverable metadata for all surveys.

Key Performance Indicator	Baseline (2023)	Goal (2030)
Total number of citizen scientists contributing data through all platforms	70,000	100,000
Number of volunteers submitting data through NatureCounts	4,000	10,000
Number of data entry projects supported by the NatureCounts platform	40	100
Records uploaded via import tool from external partners	1.5 million	10 million
Number of datasets housed in NatureCounts	680	2,500
Number of validated data records stored in NatureCounts	200 million	500 million

Empowering Champions

Taking part in scientific monitoring projects helps participants connect to the natural world and offers a concrete and effective way to contribute to conservation action.



2 Interpret Data

Generate high quality results and exploration tools

Overview

NatureCounts aims to provide scientifically rigorous, interactive products such as expert assessments, population trends, information on causes of change, species and trend distribution maps, and others. NatureCounts develops products and tools tailored to the needs of its users, and ultimately the needs of bird populations and the environment.



State of Canada's Birds



The State of Canada's Birds will be a flagship product for bird conservation, produced as a partnership between Birds Canada and Environment and Climate Change Canada. The website, hosted on NatureCounts, will generate accessible, easy-to-read species accounts for each of Canada's 703 birds. Each account will include a summary of population trends and goals for that species, and real-time outputs (i.e. maps, plots, calendars) from the NatureCounts database.

The State of Canada's Birds will be a living resource that is updated by experts as new data are collected and assessed, ensuring that the most current information is available at all times. These accounts will be the primary source of information on how Canada's birds, and by extension its natural habitats, are faring.

"The new State of Canada's Birds will be an invaluable tool for informing and engaging Canadians, and connecting conservation professionals with the data, analyses, and expert insights they need to generate positive change for birds in Canada."

-Marie-Anne Hudson, Environment and Climate Change Canada

Objectives

2.1 Apply quantitative techniques to investigate bird population dynamics

- ▶ Complete analyses and publish results to inform conservation priorities (i.e. population trends, climate impacts, causes of decline, etc.).
- ▶ Build a platform to facilitate open source sharing and re-use of analysis code.
- ▶ Integrate trend and phenology tools into the NatureCounts website.
- ▶ Expand research and conservation collaborations.

2.2 Report on bird populations in Canada at multiple scales

- ▶ Publish the State of Canada's Birds to provide comprehensive status and ecology summaries for all bird species in Canada.
- ▶ Incorporate regional assessments into the State of Canada's Birds.
- ▶ Review status assessments for all bird species in Canada internally and with partners.

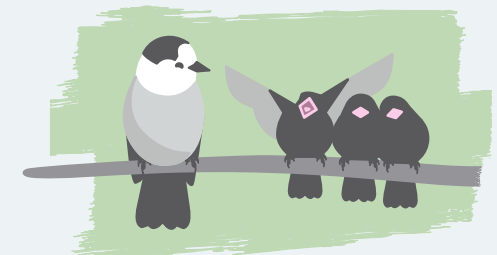
2.3 Identify and address key information gaps

- ▶ Ensure NatureCounts houses the right information to address current challenges.
- ▶ Inform the development of monitoring programs or partnerships to address identified information gaps.
- ▶ Develop research partnerships to investigate causes of population declines and recommend solutions.

Key Performance Indicator	Baseline (2023)	Goal (2030)
Number of trends for different programs, species, and regions incorporated into Summary Tools	373,000	500,000
Number of scientific publications supported by Birds Canada data and expertise	4,000	5,500
Number of annually updated species accounts available to NatureCounts users that synthesize our current understanding of the status of each species in Canada	0	703
Percentage of species in Canada for which status and goals are available	81 %	90 %

Moving Beyond Raw Data

NatureCounts houses information on many aspects of ecology and conservation including population trends, timing of migration and nesting, and regional and national goals and assessments.



3 Drive Impact

Connect results with key users to achieve positive conservation outcomes

Overview

Climate change, biodiversity loss, and the protection of species and habitats at risk are significant and urgent global challenges. Surmounting these challenges requires an engaged community that can easily access relevant information. NatureCounts activities over the next five years will unlock the immense potential for the platform to reach a wider audience and leverage existing knowledge into solid decision-making and concrete change.



Protecting Biodiversity and Habitats

The Global Biodiversity Framework adopted in 2023 by Parties to the UN Convention on Biological Diversity seeks to reverse the dangerous decline in nature that threatens the survival of one million species and impacts the lives of billions of people. Meeting the Framework’s ambitious objectives will rely heavily on knowledge of biodiversity. NatureCounts data are already used by major conservation initiatives to identify habitats and species that need protection. One such initiative is the Key Biodiversity Area (KBA) program, which uses a data-driven approach to identify, steward, and protect the most important lands for biodiversity nationally and globally.

“Accessible biodiversity-related data, information and knowledge are critical for creating baselines, regularly assessing progress and taking necessary action. This issue is cross-cutting, with implications for all the goals and targets of the Kunming-Montreal Global Biodiversity Framework”

-Secretariat of the Convention on Biological Diversity, on Target 21 of the Global Biodiversity Framework

Objectives

3.1 Support and grow a community of conservation action

- ▶ Solidify the NatureCounts team as international leaders in conservation data science.
- ▶ Recruit an Engagement Coordinator and implement a multifaceted engagement plan to expand awareness and adoption.
- ▶ Deliver new workshops and training resources to empower data users to access tools and data.
- ▶ Increase understanding and flexibility to support Indigenous data sovereignty and data use.

3.2 Cement NatureCounts as the primary hub for bird information in Canada

- ▶ Actively seek external applications of NatureCounts tools.
- ▶ Increase discoverability, accessibility and visibility of NatureCounts data, including by issuing permanent digital object identifiers (DOI) for datasets and sharing data with major global data initiatives (ebird, KBAs, CDCs, GBIF, etc.)
- ▶ Expand long term awareness by integrating NatureCounts directly into post-secondary wildlife/ornithology courses.

3.3 Contribute to policy decisions impacting bird populations

- ▶ Integrate NatureCounts data resources into status assessment processes, like those administered by COSEWIC and NatureServe.
- ▶ Integrate NatureCounts tools with environmental assessment processes at federal, provincial, and municipal levels.
- ▶ Drive use of NatureCounts data in myriad land use planning decisions (protected areas, priority places, COP15 commitments, agricultural practices, biodiversity offsetting, etc.).

Key Performance Indicator	Baseline (2023)	Goal (2030)
Percentage of species in Canada that are within target population levels	69 %	75 %
Number of NatureCounts users downloading data	2,645	5,000
Number of external data requests received for research and conservation	35,000	120,000
Number of unique visitors to State of Canada's Birds website	0 / yr	100,000 / yr
Number of target users reached with online and in-person NatureCounts tutorials	40	500
Number of conservation initiatives by key stakeholder groups that are supported by NatureCounts	3	25

Data Driven Conservation Processes

Comprehensive, standardized data and interpretation tools enable environmental professionals to quickly and simply integrate the latest information into decision-making actions and legal frameworks.



Looking Ahead

By completing the objectives outlined in this plan, NatureCounts will achieve significant progress towards realizing its vision.



VISION NatureCounts is the primary source of bird knowledge in Canada. It contributes to preventing, halting, or reversing population declines by facilitating community engagement, scientific research, informed decision-making, and conservation action.

NatureCounts in 2030

NatureCounts data collection tools (web and mobile apps) will flexibly facilitate data collection by anyone involved in population studies.

NatureCounts will serve the needs of diverse users, and leverage the utility of their data for a multitude of other projects.

The NatureCounts dataset will contain all relevant information on bird populations and offer all the necessary tools to allow decision-makers, researchers, and other users to access it and the knowledge it generates.

NatureCounts will have established new strategic partnerships that enhance our knowledge, especially for species, habitats, or regions with current information gaps.

NatureCounts will identify concrete actions needed to prevent, halt or reverse population declines, and integrate these actions into evidence-based advocacy.

NatureCounts will be an established and well-known leader in innovative population monitoring technologies and software.

NatureCounts will serve as a model and inspiration for biodiversity repositories around the world; sharing experience, resources, and tools to support global conservation efforts.



Acknowledgements

The success and impact of NatureCounts relies entirely on the amazing data contributors and data users that form an extensive community of conservation actors. Data housed in NatureCounts has been collected and contributed by the dedicated efforts of citizen scientists and conservation partners. The conservation applications of data accessed through NatureCounts have been achieved through to combined efforts of a multitude of internal and external partners, researchers, and organizations. **Thank you!**

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