

CITIZEN SCIENCE IN ALBERTA

*Celebrating
Nature
through
education
and
appreciation
...since
1970!*



3/15/2013

A look at how and why we should engage Albertans in Nature and Science

Citizen Science in Alberta

A LOOK AT HOW AND WHY WE SHOULD ENGAGE ALBERTANS IN NATURE AND SCIENCE

INTRODUCTION

Alberta is fortunate to have a wide diversity of wildlife and wild spaces! In the past, most Albertans had a connection to this diverse landscape, either by growing up in rural Alberta, visiting grandparents on the farm, or going out into the country to hunt, fish, pick berries, or enjoy a peaceful walk surrounded by nature. As well, over the last century, many local natural history clubs, fish and game associations and youth organizations (e.g. 4-H, Junior Forest Wardens, Scouts and Guides, etc.) have engaged Albertans in bird counts, plant inventories, hunter training, camping and other outings and events to appreciate and learn about Alberta's natural heritage.

Natural Heritage is the legacy of natural objects and intangible attributes encompassing the countryside and natural environment, including flora and fauna (biodiversity), geology and landforms.

As demographics and technology change, it has become more challenging to compete with other activities and engage Albertans in nature conservation and appreciation. Today, 80% of Albertans live in urban settings. Most of our youth are growing up in cities. Additionally, much of Alberta's projected population growth (which may grow from 3.6 million today to as high as 5-7 million by 2041) will come from out of province (and in fact, out of country).¹ With this population shift has come an inherent loss of knowledge about Alberta's varied landscapes and its wildlife. Many new Albertans do not have a traditional rural background and are not aware of what "nature" in Alberta looks like or where it can be found. Few have knowledge about the plants and animals in their neighborhoods, let alone outside of city boundaries.

There are many reasons why all Albertans need to be aware of our natural heritage. Foremost, many studies show that a connection to nature leads to a healthier, less-stressed lifestyle. This is particularly believed to be true for children, as documented by Richard Louv, who coined the phrase *Nature Deficit Disorder*. At Nature Alberta, we believe that all native plants and animals have a right to co-exist with Albertans, who in turn benefit by having access to a healthy, natural environment. Increasing our understanding of nature will lead to increased enjoyment of it.

¹ For more information about Alberta's population trends, see http://www.finance.alberta.ca/aboutalberta/population_reports/2012-2041-alberta-population-projections.pdf.

As well as being responsible for their own health and well-being, many Albertans are concerned about the well-being of our province. To engage in policy-level decisions regarding how we develop our natural resources and market our commodities, how we plan our settlement and communities, and what we want the province to look like in the future, Albertans need to understand the “whole picture”, including what lives on the landscape. Plants and animals are not only present for our viewing appreciation or other aesthetics. They also play an integral and complex role in providing ecosystem goods and services – the breathable air, drinkable water and productive soils we all rely on to live. Whether members of the public are providing input into provincial water policy, regional land use planning or a municipal sub-division, they need to understand the ecological side of the budget, as well as the economics.

Since forming in 1970, **Nature Alberta** has been promoting a federation of natural history organizations operating in Alberta. **Natural history** is the study of plants or animals, leaning towards observational rather than experimental methods. A person who studies natural history is a **naturalist**.

Many would argue that despite the age of internet communication, ecological literacy is declining, not improving. With a lack of knowledge and understanding of nature, also comes a divergence in opinion. More and more, when a wildlife or land use issue arises, the information gaps seem larger, the misinformation seems greater, and the resulting spectrum of opposing viewpoints (including the rhetoric and emotions) seems longer. Without the benefit of irrefutable science to provide room for common ground, policy development can be stalled, to the detriment of wildlife and wild spaces that are impacted daily by our management decisions, or lack thereof.

THE BENEFITS OF CITIZEN SCIENCE

The role of Nature Alberta and many other conservation and wildlife organizations in the province is to fill information gaps by being a respected source of knowledge and by disseminating non-biased information so that Albertans are well informed with facts that lead to constructive discussion. One way to provide information, and, even better, get buy in from Albertans, is to include them in the collecting of data and information through Citizen Science programs.

Citizen science is, simply, scientific research, including the collecting and analyzing of data, conducted by volunteers. Citizen Science is used by researchers and conservation groups to monitor biodiversity or other aspects of natural history and has long been recognized as a legitimate means of collecting scientific data. It involves a relationship between public volunteers, conservation groups, academia and other researchers and governments. The level of difficulty of programs can range from easy checklists participants can do on their own to trained volunteers working with professional scientists in remote locations. In contributing their time and effort, citizen scientists are supporting important conservation and research efforts. Additional benefits of citizen science include:

- 1) *Enriching our connection to nature and building support and stewardship for the maintenance of biodiversity and ecological systems that support us all.* Working with citizen scientists gets more people out and into the natural world as well as involved in the scientific process where the public is inspired to appreciate nature through hands-on research projects. Engaging Albertans in citizen science programs can invoke a sense of stewardship, such that all Albertans want to conserve, enjoy and value our natural resources.
- 2) *Advancing scientific knowledge.* For example, largely through the work of citizen scientists, complete and accurate maps of the breeding ranges of every North American bird have been documented. Citizen scientists have also collected plant and other phenology data that is helping scientist understand climate change.
- 3) *Building comprehensive datasets.* The use of volunteers allows scientists to gather data on a large geographic scale and over a long time period (think about the thousands of volunteers who have conducted Christmas bird counts across North America for more than a century). This helps researchers compare the results from one area or time with another, distinguish trends, and understand differences among sub-populations or geographic areas.
- 4) *Using research dollars efficiently.* Although having professional researchers is a must, we cannot afford to hire all the scientists, graduate students, and field technicians we need. Alberta is a big and complex landscape. Understanding how nature contributes to ecological goods and services is a challenge. We are also a young province and have yet to fully inventory our natural resources (particularly our plants, lichens and mosses, fungi and invertebrates).² Understanding how the landscape and the plants and animals in it interact is a large task for which there will never be enough funded scientists to figure out. This is where volunteer citizen scientists can help out!

OUR FINDINGS

In a nutshell, to help Nature Alberta achieve its mission and objectives, citizen science can be used to entice more Albertans to get engaged in a greater appreciation of our natural resources which in turn can lead to better decision-making about our landscapes and our natural resources. To find out more about what citizen science projects are available to Albertans, we undertook a search via internet and personal contact with some of our partner organizations. What we found is that there is a broad swath of citizen science opportunities across North America (and elsewhere) involving participants in a diverse array of activities such as searching the galaxy, monitoring climate, mapping geography, inventorying

² For an example of how we are still documenting new species in Alberta, see this great article on new mite species discovered through the work of the Alberta Biodiversity Monitoring Institute at <http://www.abmi.ca/abmi/aboutabmi/aboutabmi.jsp?categoryId=30&showNews=true&newsId=444>.

biodiversity, etc. Some activities can be done on a computer at a desk. Many are carried on outside in the natural world.

Entire websites, like www.scistarter.com, www.scientificamerican.com/citizen-science, <http://citizenscientistsleague.com/about/> and www.openscientist.org are dedicated to cataloguing and promoting citizen science opportunities. Given the electronic age we now live in, many researchers are also using “crowd-sourcing” to engage volunteers and collect data via electronic applications (i.e. “apps”), smart phones, Tweets and other social media tools. (For an example of a project using social media, check out Snowtweets at <http://snowcore.uwaterloo.ca/snowtweets/about.>)

Although many of the citizen science projects we found are provided by organizations based out of the United States (e.g. Cornell Lab of Ornithology, Audubon Society, etc), many of them have partnered with Canadian sponsors or accept data from Canadian contributors and many are relevant to Albertans (e.g., Journey North, GeoWiki). Several national Canadian organizations, like Bird Studies Canada and Nature Canada, also deliver a handful of programs that again, are also relevant to Albertans (e.g. Canadian Lakes Loon Survey, Frog Watch, etc.). And finally, a number of provincial organizations, including Nature Alberta, Alberta Conservation Association, Alberta Fish and Game Association and several local history clubs, bird banding groups and nature centres provide citizen science opportunities here in the province.

WHAT SEEMS TO BE MISSING?

It is difficult to determine how many Albertans are aware of the Citizen Science programs that do exist and how many are taking part in them. For privacy reasons, most programs cannot release participant details and many do not categorize participants by province. However, looking at various programs, it would appear that birding programs are likely the most popular and programs with an electronic submission are most likely the most utilized (e-bird has received over 30,000 checklists from Alberta birders since the program started in 2002). Missing are a wider variety of programs that appeal to youth. Urban programs are also few in number but starting to grow with many backyard birding and naturalization programs and studies of urban animals like squirrels. No programs targeted at an Aboriginal audience were identified.

We do know, however, that there is an appetite for them as Nature Alberta get requests from volunteers all the time asking ‘What can we do?’ Often these requests come from individual adults. Sometimes they come from teachers or leaders looking for classroom and youth group activities and sometimes the requests come from corporate groups looking for worthy causes to donate their time via a team-building experience.

Given the number of them one can find on the internet, there seems to be resurgence in the popularity of citizen science programs, particularly for those that incorporate a new twist with crowd-sourcing and social media. This resurgence seems very strong in the United States, but seems a bit slower in Alberta,

where there have not been a lot of new programs utilizing new technology in recent years (with the exception of Dr. Mark Boyce and Alberta Conservation Association's Moose Survey app). This may be a capacity issue as developing citizen science programs can be expensive. Project management and delivery, volunteer recruitment and engagement, development of 'apps' and the maintenance of databases requires a substantial commitment from organizers and their sponsors.

Also, although there are numerous provincial, national and even international citizen science programs and databases Albertans can already contribute to (without developing anything new), no one agency in Alberta is promoting this suite of activities or championing Albertans to get involved. Programs are generally not that well advertised and perhaps not as heavily utilized as they could be without such promotion. Individuals, teachers, Cub Scout leaders, etc. are often unaware of the opportunities that exist or have to search out each individual program. It is not always easy to find information about programs as no central Alberta directory (like Sci-starter.org) exists. The good news is that promotion of existing projects is a great role for Nature Alberta to take on.

A lack of program participation might also be because of a poor track record. Citizen science programs and the organizations that operate them lose their credibility if programs are not done well, from start to finish. True citizen science projects are long-term, engage volunteers, collect meaningful data that can be compared and interpreted over time, and that informs management and policy. A good citizen science program communicates its intent, follows through on implementation and reports annually on its progress. For some good advice about setting up a citizen science program, see <http://www.ceh.ac.uk/products/publications/documents/CitizenScienceGuide.pdf>.

In the past, Nature Alberta has been good at mobilizing volunteers (think about the 1,000 volunteers that collected breeding bird data throughout Alberta for the first breeding bird atlas). Unfortunately, we have not been as good at analyzing data collected, reporting back trends to volunteers and passing our information on to other wildlife and land use managers. If we are to develop citizen science programs in the future, we need to improve this aspect of our programs.

Finally, despite the recent spate of articles bemoaning the lost connection between youth and nature, most citizen science programs are targeted at adults with fewer offerings for teachers, students and elementary school age children. Given that youth are quicker to adopt new technologies, it seems like there is a great deal of potential out there to develop programs that engage social media and youth in citizen science activities.

A WORD ABOUT DATABASES

Alberta has a number of databases including Nature Alberta's own Natural History Database; the Government of Alberta's Fisheries and Wildlife Management Information System (FWMIS) and Alberta Conservation Information Management System (ACIMS); and the work of the Alberta Biodiversity Monitoring Institute; etc. Unfortunately, not all of these databases are designed for easy use by the public such that Albertans can contribute their biodiversity sightings as well as look up data by other submitters.

"In my 25 years working as a biologist in Alberta, I have had countless occasions where a farmer, hunter, birder, hiker or just someone enjoying their backyard or lakefront property has passed on an anecdote to me about a particularly colorful bird, a strange looking fish, a partially albino deer or moose, a particularly large hatch of midges or some other interesting natural history event. Each time, I feel at a loss as to how to advise the informant as to what to do with their carefully collected information."

Looking at other jurisdictions, the technology certainly does exist to produce such excellent programs. Nationally, programs like e-bird and e-butterfly are making the collection of data for these species much more interactive than in the past. But what about other species? A program like *I-spot: your place to share nature* (available in South Africa, United Kingdom and the United States) makes it easy for participants to both contribute to and seek information on a large variety of species (e.g. mammals, fish, plants, etc). A tool like this would be fantastic in Alberta!

Naturalists, birders, botanists, hikers, hunters, anglers, trappers, guides and outfitters are our best eyes and ears out on the landscape. Many of these individuals have numerous personal anecdotes that relay important natural history information. Tapping into this vast resource, as well as growing the number of observers, particularly from youth and urban audiences, can only benefit the knowledge base used to manage our natural resources. Plus the more Albertans engaged in collecting citizen science, the more voices to speak up for this resource when needed. Unfortunately, because of the capacity/costs, no one organization is likely able to bring such a program to Alberta. But a partnership could and should be formed, which in turn, could benefit many researchers and conservation organizations working in the province.

GOING FORWARD – NEXT STEPS

While Nature Alberta is working to expand its outreach to a new urban, technologically-savvy audience via social media and other education and outreach programming, we also want to give Albertans knowledge about the many ways they can appreciate nature by participating in Citizen Science. This work is a natural fit with Nature Alberta's mission (*a strong voice for the greater appreciation and conservation of Alberta's natural environment*). All Albertans, whether they are urban-dwellers, youth, new-comers, or experienced hunters, can increase their appreciation and how they value Alberta's natural environment by contributing to citizen science programs. To move forward in this direction, Nature Alberta has recently developed the following Citizen Science program outcomes:

- **Engaging Albertans in Nature:** Nature Alberta encourages Albertans to appreciate nature by promoting their participation in Citizen Science programs, connecting volunteers to the breadth of citizen science programs available from Nature Alberta and many other conservation organizations in Alberta and elsewhere.
- **Contributing to Wildlife Conservation:** Nature Alberta contributes to wildlife conservation in Alberta by ensuring its existing Natural History Database and any new data collected by Nature Alberta Citizen Science programs is made available to the public, researchers, wildlife managers and other database managers.
- **Providing Citizen Science Opportunities:** To support its mandate to be a voice for Alberta’s natural heritage, Nature Alberta may, from time to time, create specific citizen science-based programs to collect data on a specific species, habitat or issue in Alberta. Examples of current and past projects include the May Species Counts and Breeding Bird Atlases.

To achieve these outcomes, we will undertake the following actions;

Goal	Objectives / Deliverables
Engaging Albertans in Citizen Science	Using its electronic and other media, NA will promote Citizen Science (CS) opportunities as a means of engaging Albertans in nature and science. For example, we will produce feature articles on different CS projects in our hardcopy magazine <i>Nature Alberta</i> (e.g. see Appendix 1) and post CS reports and announcements on our website, Facebook and Twitter account.
	NA will specifically maintain a Blog on its website (<i>100 things you can do to nurture your nature!</i>) that provides a list of links to Citizen Science programs relevant to Albertans. Our goal is to make it easy for Albertans to find programs they can contribute to by providing a “one-window” access point to such programs through the Nature Alberta website. The blog will be searchable and will be added to as we hear about new programs.
Contributing to Wildlife Conservation	The NA Natural History Database is brought up-to-date, is accessible to the public, and is promoted and exchanged with researchers and other database-holders.
	NA supports the work of other conservation organizations by promoting their programs/contribution to wildlife management and encouraging NA supporters to contribute to these programs (e.g. Ruffed Grouse drumming survey or Alberta Amphibian Monitoring Program).
Providing Citizen Science Opportunities	From time to time, NA will initiate a Citizen Science project. All such projects must have a clear, answerable, nature-related question; must examine existing databases to see if an answer already exists; utilize wherever possible citizen scientists to collect data; and ensure the answer is communicated to volunteers.
	NA will develop a strategy to promote and maximize the effectiveness of the well- established May Species (Bird, Plant and Mammal) Counts.
	Where resources and time allows, Nature Alberta will work with other partners to see a Citizen Science driven biodiversity mapping project like i-spot is developed for Alberta.

Now that we've had an opportunity to see what Citizen Science programs already are available to Albertans, where there are gaps, and what niches Nature Alberta might fill, we can move forward with developing this aspect of natural resource management in Alberta. To ensure success, we need to continue to think about what are the best citizen science programs for the province (those that best fit management needs) and how they can best be delivered. So, our journey continues...stay tuned!

ACKNOWLEDGEMENTS

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APPENDIX 1 – CITIZEN SCIENCE ARTICLE FROM NATURE ALBERTA, FALL 2012

DRAFT



Citizen Science in Alberta

BY SARAH VANDERWOLF

Watching birds and counting butterflies may sound like hobbies to some, but for participants in what is known as “citizen science”, these activities are also part of an important and ongoing effort to monitor the abundant wildlife living throughout Alberta’s diverse natural habitat.

A growing number of Albertans are participating in citizen science projects such as the annual Christmas Bird Count and the Canadian Lakes Loon Survey, in which amateur scientists help assess the status of population, distribution, breeding, and migration patterns of birds, butterflies, and other animals from year to year.

“Citizen science” is a recently coined term that describes an old idea: involving members of the public in scientific endeavours requiring large amounts of data. Public participation is particularly important in the field of natural science, in which ongoing monitoring of songbirds, loons, hawks, owls, butterflies, and other plant and animal species helps create a more complete portrait of changes in Alberta’s natural world in response to environmental changes such as forestry, oil and gas development, climate change, and singular events such as flooding or spring snowstorms.

Citizen science is particularly valuable in two ways, says Dr. Geoff Holroyd, a lifelong birder and recently retired Environment Canada research scientist, as well as a recently-appointed Nature Alberta Director. Involving the public in tracking wildlife populations allows for more comprehensive data gathering and increased public awareness of conservation. Dr. Holroyd also

believes there is significant public interest in wildlife and natural science, and that citizen science allows members of the public to become directly involved in preservation of the natural world. This bodes well for the future of our province’s natural habitats, as initiatives that are driven solely by government bodies or NGOs (non-governmental organizations) will not have the same positive impact as those that have the benefit of broad public support and engagement. And besides, says Dr. Holroyd, participation is fun and rewarding to see his observations used to protect our natural resources.

A key ingredient to a successful citizen science project is ensuring that contributions are utilized and valued, says Ted Hindmarch, President of Nature Alberta. Like Holroyd, Hindmarch has had an interest in birding for most of his life, but acknowledges that “birding with a purpose” provides more fulfillment than doing it simply as a hobby.

Hindmarch, a self-described “Grade 12 graduate, learn-by-the-seat-of-your-pants amateur naturalist” who is also a Captain in the Canadian Forces (he retired in November 2012), says he finds the opportunities to be physically active and get outdoors, away from the hustle and bustle

of modern urban life, to be the most appealing aspects of citizen science. Hindmarch has travelled throughout western Canada, from Dawson Creek to Drumheller, in pursuit of rare bird sightings. He estimates he has seen over 300 bird species in Alberta within the last ten years as part of a personal hobby that he says his wife calls an “obsession.”

Data collected from citizen science projects can reveal patterns in bird behaviour, such as this spring, when Holroyd learned that Ruby-throated Hummingbirds had arrived in Winnipeg but were still a week or two away from making their migratory return to Alberta, according to the e-Bird database (which is an extensive data source maintained by the Ornithology Lab at Cornell University). E-Bird recently achieved an important milestone by reaching 100 million total records of bird sightings, says Holroyd.

Citizen science observations have also shown that Whooping Cranes have been sighted in the summer in central Alberta, and that loons are seriously affected by heavy rains which disrupt their nesting season by flooding their nests, as happened in May 2012 in the foothills. An unexpected spring blizzard can have a noticeable impact on bird populations, as Hindmarch observed during a bird count in Waterton Lakes National Park in May 2002; many insectivorous birds had not survived due to the impact of the snowfall on insect populations, the birds’ food.

HELEN TREFRY

Locally collected data from citizen scientists can be entered into large-scale databases to identify trends throughout Alberta and North America. The Atlas of Breeding Birds of Alberta, for example, was a five-year project that relied upon the efforts of volunteers throughout the province to determine the presence of birds within defined areas of 100 km². Active participation in this ambitious project permitted almost complete coverage of the entire province, says Hindmarch, and the result is a comprehensive data source providing information about habitat preference, distribution, and population status of birds throughout Alberta. (The Atlas of Breeding Birds of Alberta (1992), as well as The Atlas of Breeding Birds of Alberta: A Second Look (2007) are both available from the Nature Alberta bookstore.)

Other large data sources derived from citizen scientists are the relatively new e-Bird database maintained by Cornell University and the National Audubon Society's annual Christmas Bird Count, which dates back over a century. Both of these initiatives include data collected from across North America and allow birders to become engaged in a larger community of citizen scientists. Scientists then use the collected data to identify trends in the overall health of our environment, including water, air, natural resources, climate and more. These and a variety of other programs are coordinated in Canada by Bird Studies Canada.

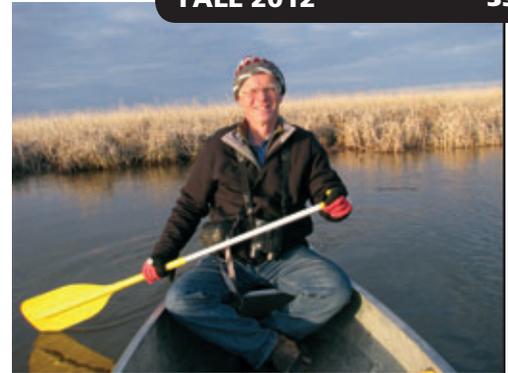
The harmful impacts of DDT on bird populations were first identified from data collected through the Christmas Bird Count,

says retired forestry professor Dr. Jim Beck, which provides a notable example of the importance of citizen scientists' work. Many bird species that were formerly endangered have made remarkable recoveries in the last few decades due to conservation efforts such as banning DDT in Canada in 1970. Peregrine Falcons, for instance, were removed from the endangered species list in 1999 in both Canada and the U.S.

Dr. Beck and his wife Barbara have travelled extensively in Canada, particularly in the northern territories, to track birds and butterfly populations. They are also strong promoters of the Alberta Butterfly Counts, in which data is collected on the distribution, range, and timing of flight of butterflies in the province.

"We're not biologists, we just like doing things for science," says Dr. Beck. Citizen science offers an opportunity to get away from the rat race, he explains, and he finds northern Canada a particularly intriguing destination since many animal species in these remote areas are largely undocumented. Dr. Beck says he and his wife have travelled to every community in the Northwest Territories and Yukon that is accessible by road during their years as avid bird and butterfly watchers.

The very nature of citizen science – self-reported and carried out by non-professionals – means that the data is not infallible, says Dr. Beck. While this does not negate its value and importance, he stresses, users of data collected from citizen scientists should be very careful about how much reliability they put into outliers.



Dr. Beck also cautions against the use of recorded birdcalls while in hot pursuit of bird sightings during mating season, since the sound of other birds elicits defensive behaviour and disrupts the birds' normal mating behaviour, such as protecting their nests and feeding their young. Using electronic animal calls is illegal for hunters, says Dr. Beck, and bird watchers should be equally cautious in the tactics they use while birding.

While birding is the predominant activity among citizen scientists due to its long history as a popular pastime, citizen science is by no means limited to birds. Participants interested in tracking other animal or plant species or monitoring environmental changes such as weather patterns have every opportunity to get involved in citizen science projects that promote scientific literacy and conservation awareness amongst families and communities.

For more information about volunteering opportunities with Nature Alberta, contact Executive Director Petra Rowell petrar@naturealberta.ca; for other opportunities or information, please visit:

<http://birds.audubon.org/christmas-bird-count>

<http://www.birdscanada.org/volunteer/index.jsp?lang=EN>

<http://www.ebird.org>

<http://www.birds.cornell.edu>

<http://www.pwrc.usgs.gov/bbs>

APPENDIX 2: TABLE OF CITIZEN SCIENCE OPPORTUNITIES AVAILABLE TO ALBERTANS

DRAFT

	Citizen Science Program	Description	Link	Program Organizer	Best time to Blog
1	Become a Citizen Scientist	<p><i>Introductory Blog for first post when new website goes live early April, 2013.</i></p> <p><i>Let your inner Citizen Scientist loose!</i> Nature Alberta is pleased to announce a new resource on our website. Under <i>What's New</i>, check out our <i>100 Things you can do for Nature</i> blog! Every week, a new blog will highlight one of the many Citizen Science programs available to Albertans from a variety of organizations in Alberta and elsewhere. Learn more about how you can get involved in providing valuable information about Alberta's wildlife and wild spaces!</p>	<u>ADD NEW WEB ADDRESS WHEN LIVE</u>	Nature Alberta	March
2	Waterfowl Nesting Habitat Enhancement	<p><i>Create habitat by building a nestbox!</i> This program, organized by the Alberta Conservation Association, engages landowners, conservation groups and other volunteers to install monitor and maintain artificial nest structures in areas where natural nesting habitat is limited. Alberta Cavity-nesters can decline if suitable habitat is not available to them. For more information about how to build a nestbox, check out their link...</p>	<u>http://www.ab-conservation.com/go/default/index.cfm/programs/wildlife/wildlife-projects/waterfowl-nesting-habitat-enhancement-project/overview/</u>	Alberta Conservation Association	March
3	Ruffed Grouse Survey	<p>Support the Alberta Fish and Game Association and conduct a Ruffed Grouse Survey! Grouse are an important game species in Alberta. Volunteers drive a specific route in or near AFGA properties, stopping at several sites to listen for grouse drumming. Anyone with an interest in grouse management can volunteer. Forms and instructions are provided. Contact...</p>	<u>http://www.afga.org/html/content/wtfstewardship/</u>	Alberta Fish and Game Association	April
4	Baillie Bird-a-thon	<p><i>Support Bird Studies Canada and raise funds for bird conservation!</i> During a 24-hour period in May, sponsored individuals or teams attempt to find as many bird species as they can. Proceeds go to Bird Studies Canada and other organizations for bird research and conservation. This is one of the oldest sponsored bird count in North America: more than 7,000 people from across Canada (and from several countries around the world) participate in and/or sponsor the event every year. For more info...</p>	<u>http://www.gifttool.com/athon/AthonDetails?ID=1914&AID=1845</u>	Bird Studies Canada	April

5	North American Breeding Bird Survey	<i>Join birders across North America and conduct your own breeding bird survey route.</i> The North American Breeding Bird Survey is designed to collect long-term data on the population status and trends of breeding birds throughout North America. The BBS has been running in Alberta since 1968 when it started with 4 routes. Today 85 to 90 routes are visited by volunteers every year. Everyone with good hearing/eyesight, ability to identify all breeding birds in the area by sight and sound can participate.	http://ec.gc.ca/reom-mbs/default.asp?lang=En&n=416B57CA-1	Canadian Wildlife Service/ United States Geological Survey	April
6	May Species Count	<i>Take part in Nature Alberta's May Species Count!</i> May Species Count counts birds at various locations around Alberta during the second last weekend of May.	http://naturealberta.ca/alberta-natural-history/bird- CHANGE TO NEW WEB PAGE WHEN IT GOES LIVE.	Nature Alberta	April
7	Waterton Lakes Spring Bird Count	Count spring birds at Waterton Lakes National Park's Spring Birds Count. Count birds in the park as part of a province-wide bird monitoring program.	http://www.pc.gc.ca/pn-np/ab/waterton/ne/ne3/ne3b.aspx	Parks Canada	Summer
8	Waterton Lakes Spring Plant Count	The Waterton Lakes National Park's Spring Plant Count counts plants in the park as part of a province-wide spring plant monitoring program.	http://www.pc.gc.ca/pn-np/ab/waterton/ne/ne3/ne3b.aspx	Parks Canada	Summer
9	Waterton Lakes Weed and Wildlife Watchers	Waterton Lakes National Park's Weed and Wildlife Watchers help with the early detection of non-native plants in the park, and reporting of sightings of key wildlife.	http://www.pc.gc.ca/pn-np/ab/waterton/ne/ne3/ne3b.aspx	Parks Canada	Summer
10	Alberta Volunteer Amphibian Monitoring Program (AVAMP)	<i>Provide valuable information about Alberta's frogs and toads!</i> Amphibian populations have been declining in Alberta and some species, like Northern Leopard Frogs, are <i>At Risk</i> . Volunteer Citizen Scientists can support the ACA by volunteering to survey Alberta's amphibians. The goals of the program are to 1) increase awareness of the conservation issues facing amphibians and 2) provide a better understanding of the distribution and general status of amphibians in Alberta. Anyone with an interest and basic knowledge in amphibians can participate but you should be able to identify	http://www.ab-conservation.com/go/default/index.cfm/programs/wildlife-projects/avamp/overview/	Alberta Conservation Association	May

		different amphibian species by sight or by listening to their calls. For more information, follow the link...			
11	Frog Watch	<i>Help Nature Canada monitor frog and toad populations across Canada!</i> Travelling to other parts of the country this summer? Report your frog and toad sightings to the Frog Watch program, a national Amphibian database maintained by Nature Canada. Amphibian populations have been declining across Canada and some species are At Risk. Here's your chance to help learn more about Canada's amphibian populations.	http://www.naturewatch.ca/english/frogwatch/ab/intro.html	Nature Canada	May
12	Crowsnest Pass Boreal Toad Project	<i>Help the Crowsnest Conservation Society monitor Boreal Toads in the Crowsnest Pass!</i> If you are a conservationist or research working in the Crowsnest Pass area of southern Alberta, you can report your sightings of boreal toads. Data collected is used for wildlife management purposes including setting setbacks around breeding ponds. For more information, follow the link ...	http://www.ab-conservation.com/go/default/index.cfm/programs/program-reports/2011-2012/wildlife/wildlife-volunteer-and-outreach-project/	Crowsnest Conservation Society/ Alberta Conservation Association	May
13	Canadian Lakes Loon Survey	<i>Help Bird Studies Canada monitor loon populations at Alberta lakes.</i> Surveyors with this national program monitor loon breeding success and undertake conservation activities to help protect wildlife, waterbirds, and especially loons (which build their nests very close to the water's edge) on Canadian lakes. Aquatic health is important to many lake property owners and loons are a good indicator of lake health. Anyone can participate, particularly lake property owners or campers. An information kit is provided. Contact...	http://www.bsc-eoc.org/volunteer/clls/index.jsp?lang=EN&targetpg=index	Bird Studies Canada	May
14	Migratory Bird Banding	<i>Help monitor migratory bird populations at the Beaverhill Bird Observatory!</i>	http://www.beaverhillbirds.com/	Beaverhill Bird Observatory	Spring through fall
15	Neo-tropical Songbird Studies	<i>Help monitor neo-tropical songbird populations at the Lesser Slave Lake Bird Observatory and Boreal Centre for Bird Conservation.</i>		Lesser Slave Lake Bird Observatory /Boreal Centre for Bird Conservation	Spring through fall

16	Bird Monitoring	<i>Check out what the Calgary Bird Banding Society is up to at Inglewood Bird Sanctuary.</i>	http://www.calgarybirdbandingsociety.org/	Calgary Bird Banding Society	Spring through fall
17	Marsh Monitoring Program	<i>Monitor birds and amphibians at your favourite marsh!</i> Record bird and amphibian observations at your local marsh. A long-term, marsh bird and amphibian monitoring program that utilizes volunteers to collect scientifically robust data. (current focus on the great lakes but could be imported to Alberta)	http://www.bsc-eoc.org/volunteer/glmmpp/index.jsp	Bird Studies Canada/ Environment Canada	Spring through fall
18	Alberta Plant Watch	<i>Take notice when everything is in bloom!</i> Designed to help identify ecological changes that may be affecting the environment, the goal of this program is to get all ages involved in helping scientists discover how, and more importantly why, the natural environment is changing.	http://www.naturewatch.ca/english/plantwatch/	Environment Canada/ Nature Canada	Spring - Summer
19	Backyard Habitat Certification program.	<i>Get certified!</i> Make your backyard wildlife friendly and get acknowledged for your effort by the Canadian Wildlife Federation's Backyard Habitat Certification program.	http://www.cwf-fcf.org/en/what-we-do/habitat/gardener-to-gardener/get-certified/	Canadian Wildlife Federation	Spring - Summer
20	Garlic Mustard Field Survey	Garlic Mustard Field Survey aims to integrate volunteer survey observations of invasive garlic mustard with eradication efforts to track the effectiveness of different control options.	http://www.GarlicMustard.org	Garlic Mustard Organization	Spring - Summer
21	Prairie Nest Records Scheme	The Prairie Nest Records Scheme (PNRS) is essentially, a collection of cards, each detailing one or more visits to an occupied bird's nest, a nest under active construction, or an active nesting colony in the Prairies, the Northwest Territories or Nunavut. The majority of cards are submitted by field volunteers who find nests and record the relevant data.	http://naturealberta.ca/alberta-natural-history/bird-projects/prairie-nest-records-scheme-pnrs ADD NEW WEBSITE	Nature Alberta	
22	Important Bird Areas	Become an Important Bird Areas Caretaker! This science-based initiative works to identify, conserve, and monitor a network of sites that provide essential habitat for Canada's bird populations. Alberta has approximately	ADD NEW WEBSITE	Nature Alberta	

		40 of 600 sites across Canada. Anyone can become an IBA caretaker.			
23	Alberta Lake Watch Program	<i>Help sample water quality at one of Alberta's lakes!</i> Resident volunteers and boats are needed to help technicians sample water quality at lakes around Alberta. If you live or visit a particular lake, why not contact the Alberta Lake Management Society to see how you can help out? Lake health is important to everyone! Many volunteers provide a boat and driver to the technician they are assisting. Lake reports are produced at the end of the field season. For more information, contact...	http://www.alms.ca/content.php?content=1	Alberta Lake Management Society	June
24	Celebrate Urban Birds	<i>Just add water!</i> You have the perfect naturalized backyard but did you remember to add water for your feathered friends? Check out why water is important to wildlife by visiting the Celebrate Urban Birds organization.	http://celebrateurbanbirds.org/learn/gardening/providing-water-for-birds/	Cornell Lab of Ornithology	Summer
25	Alberta Water Quality Awareness Day	<i>Help monitor Alberta's waterbodies.</i> This province-wide program focuses on increasing people's awareness and understanding of water quality and watershed health, through hands-on water quality testing. It supports the provincial Water for Life strategy which recognizes the importance of water quality for society, the economy and the environment. Anyone can participate including individuals, school groups; other youth clubs; lake and other stewardship groups. Instructions and a kit are provided to participants who sign up online. Contact...	http://www.awqa.ca/pages/index.php	Alberta Lake Management Society	June 2014?
26	Worm Watch	<i>Count worms!</i> This educational program makes learning about the soil ecosystem fun. It is also part of a national volunteer monitoring program used to identify ecological changes that may be affecting our environment.	http://www.naturewatch.ca/english/wormwatch/	Environment Canada/ Nature Canada	Summer
27	Lost Ladybug Project	Identify ladybugs. North American	www.lostladybug.org	Lost Ladybug Organization	Summer
28	Living by Water	<i>Get a homesite consultation on your lake property!</i>	ADD NEW WEBSITE	Nature Alberta	July-August

29	e-butterfly	<i>Contribute your butterfly sightings to a national database!</i> Volunteers observe, photograph and collect butterflies contributing to an interactive online national database.	http://ebutterfly.ca/	University of Ottawa	Summer
30	Brake for Rattlesnakes	Brake for Rattlesnakes! Support this group's rattlesnake conservation efforts.	http://www.ibrakeforrattlesnakes.com/About_us.html	I Brake for Rattlesnakes	Summer
31	Waterton National Park Volunteer Programs	<i>Help out the staff of Waterton National Park.</i> Throughout the summer and on specific dates, participants can get involved in counting weeds, wildlife, native plants, birds and butterflies in the park.	http://www.pc.gc.ca/pn-np/ab/waterton/ne/ne3/ne3b.aspx		Summer
32	Zombee Watch	<i>Watch for Zombees!</i> This project is tracking the spread of zombie flies that parasitize honey bees.	https://www.zombeewatch.org/map/public		Summer
33	The Backyard Bee Count/Great Sunflower project	<i>Plant flowers then count the bees that visit them.</i> The objective of this project is to plant flowers, observe how many and how often bees visit those flowers, and then enter that information into a database on The Great Sunflower Project Web site	http://www.greatsunflower.org/	Great Sunflower organization	Summer
34	Fossil Dig	Visit a fossil dig site in Alberta's badlands! Bonebed 30 Guided Expedition	http://sales.tpr.alberta.ca/dpp/Default.aspx?hview=bycategory&tagid=7	Alberta Tourism, Parks and Recreation	Summer
35	Ellis Bird Farm	<i>Visit the Ellis Bird Farm!</i> Before you go, check out the critters that live at the Ellis Bird Farm via their webcams including an owl's nest, swallow nest and beaver lodge.	http://www.ellisbirdfarm.ca/		Summer
36	Bluebird trails	<i>Monitor a bluebird trail!</i>	http://www.ellisbirdfarm.ca/images/stories/pdf/attracting_bluebirds_Fact_Sheet.pdf		Summer
37		Learn about Peregrine Falcons by watching Alberta's breeding pairs on webcams.	http://www.rdrn.fanweb.ca/programs/ongoing_programs/peregrine_web_cam.htm http://www.ucalgary.ca/peregrine_falcon/video		Summer
38	Red Deer River Naturalists	<i>Naturescape your backyard!</i>			Summer

39	Bring Back the Pollinators	Get involved in invertebrate conservation programs like Bring back the Pollinator!	http://www.xerces.org/		Summer
40	Waterton Lakes Butterfly Count	<i>Help Waterton Lakes National Park conduct a Butterfly Count!</i> Volunteers work with park staff to catch, identify and count Waterton's butterflies.	http://www.pc.gc.ca/pn-np/ab/waterton/ne/ne3/ne3b.aspx	Parks Canada	Summer
41	Dragonfly Swarm Project	Help researchers study Dragonfly Swarms! The Dragonfly Swarm Project aims to report dragonfly swarms observed to learn more about this understudied phenomenon.	http://thedragonflywoman.com/dsp/		Summer
42	Great Canadian Shoreline Clean-up	<i>Be a part of the Great Canadian Shoreline Clean-up!</i>		Vancouver Aquarium and WWF	Sept.
43	Ice Watch	<i>Observe freeze-up and thaw trends.</i> Part of the NatureWatch suite of national volunteer monitoring programs designed to help identify ecological changes that may be affecting our environment. IceWatch allows Canadians of all ages to participate in discovering how - and more importantly, why - our natural environment is changing.	http://www.naturewatch.ca/english/icewatch/	Environment Canada/ Nature Canada	Fall and Spring
44	Chronic Wasting Disease Surveillance	<u>CWD surveillance in Alberta</u> has two parts--farmed species and wild species of deer and elk. In some areas hunter submission is mandatory and in others it is volunteers. <u>Information for hunters</u> tells what the surveillance study needs and how to prepare, store and send the sample to Alberta Sustainable Resources.		AESRD	Fall
45	Moose Survey	<i>Alberta hunters - contribute to wildlife management by submitting your moose sightings!</i> The survey is designed to collect long term data on moose populations and trends. Started in 2012 by Dr. Mark Boyce, the survey is coordinated by University of Alberta biological sciences department. Mobile app downloads are also available. The study is also co-sponsored by Alberta Sustainable Resources and the ACA.	www.biology.ualberta.ca/moose		Fall
46	Feeder Watch	<i>Monitor birds at your backyard feeder.</i> Participants record the number of birds observed at their backyard feeders over a period of time. ; The season is starting every winter on the second Saturday of November and runs for 21 weeks. Requires an annual participation fee of \$35 for Canadian participants.	http://www.birds.cornell.edu/pfw/index.html	Bird Studies Canada/The Cornell Lab of Ornithology	Oct.

47	SnowTweets	<i>Tweet about snow depth!</i>	http://snowcore.uwaterloo.ca/snowtweets/about/	University of Waterloo	Winter
48	Christmas Bird Count	Spend 24-hours counting wintering birds in Alberta. A 24 hour bird count conducted on any one day between December 14 and January 5 inclusive; carried out within a 24-km diameter circle that stays the same from year to year. International This count has provided long-term data on wintering bird populations in Alberta. Anyone: Counts are generally group efforts, organized by local birding/natural history clubs, though single-observer counts can be conducted. Longest Citizen Science survey in the world (The 112th Annual Audubon Christmas Bird Count occurred in 2011.)	http://www.bsc-eoc.org/volunteer/cbc/index.jsp?targetpg=index&lang=EN	Bird Studies Canada	Dec.
49	The Alberta Nocturnal Owl Survey	Become a volunteer with the Alberta Nocturnal Owl Survey! Owls are an important part of our wildlife but are not often seen. This project increases the understanding of owl distribution, abundance, population trends and habitat associations using annual 2X night surveys in March-April. Volunteers travel a route, stopping to play owl calls and listen back for responses. Anyone with an interest in owls can participate. A guide and forms are provided.	http://www.beaverhillbirds.com/owl_surveys.php	Beaverhill Bird Observatory	Feb.
50	The Great Backyard Bird Count	<i>Count winter birds at your backyard feeder!</i>	http://www.birdcount.ca	Bird Studies Canada	Feb.
51	Wildlife Trust Fund Volunteer Steward	<i>Support the Alberta Fish and Game Association and become a habitat steward!</i> Become a volunteer steward with the AFGA and help this organization look after its properties by conducting habitat assessments, carrying out maintenance, documenting wildlife and other tasks required to preserve key wildlife habitat critical to maintaining wildlife in Alberta. Interested participants must submit an application. Forms and a manual are provided. Contact...	http://www.ab-conservation.com/go/default/index.cfm/programs/program-reports/2011-2012/wildlife/wildlife-volunteer-and-outreach-project/		Anytime
52		<i>Trappers supporting the ACA Wolverine project!</i>	http://www.ab-conservation.com/go/default/index.cfm/give/wolverine/		Anytime

53	Journey North	<i>This one is for teachers!</i> Help document migrating species while engaging your students in a global study of wildlife migration and seasonal change. K-12 students share their own field observations with classmates across North America. They track the coming of spring through the migration patterns of monarch butterflies, robins, hummingbirds, whooping cranes, gray whales, bald eagles— and other birds and mammals; the budding of plants; changing sunlight; and other natural events.	http://www.learner.org/jnor-th/	Journey North	Anytime
54	Geo-Wiki	<i>Contribute land cover and land use information to Geo-Wiki!</i> This project involves a global network of volunteers who wish to help improve the quality of global land cover maps.	http://geo-wiki.org/login.php?ReturnUrl=/index.php	Geo-wiki	Anytime
55	Climate Prediction	Help scientists understand climate change.	http://climateprediction.net/		Anytime
56	Project Squirrel	<i>Great project for urban youth – record your squirrel observations!</i> Organized out of Chicago, Project Squirrel is looking for squirrel monitors in the US and Canada. Observations can be from as many places as you like. However, it's recommended as most effective to submit at least one observation per site per season. The more observations the better.	http://www.projectsquirrel.org/		Anytime
57	Trailex	Report observations on trails throughout the Bow Valley. a website that allows trail users to share information about trail safety in the Bow Valley (from Banff to Bragg Creek).	http://www.trailex.org/		Anytime
58		Join a local natural history club.		Nature Alberta	Anytime
59	Fish Webcam	Learn about fish by watching this webcam. You will see Walleye, Perch, <u>Northern Pike</u> , and more on this live underwater lake <u>camera</u> .	http://sportsmansparadiseonline.com/Live_Underwater_Fish_Cam.html	Sportsman's Paradise Online	Anytime
60	Live Turkey Vulture Nest Cam	Learn more about Turkey Vultures in the United States!	http://sportsmansparadiseonline.com/Missouri_Turkey_Vultures_Cam.html	Sportsman's Paradise Online	Anytime
61	Eagle webcams.	Learn more about eagles.	http://www.hancockwildlife.org/index.php?topic=camsites	Hancock Wildlife Organization	Anytime

62		Explore the Rockies and post your photos online.	http://www.explorerochies.com/wildlife-sightings.aspx		Anytime
63	Erika knows Green!	Check out <i>Erika Knows Green: Water Conservation</i> website. Help spread the green message to kids! Kids can learn to be green and more environmentally-conscious in this water conservation story. It's a great way to teach them simple things that they can do at home to save water.	http://itunes.apple.com/ca/app/erika-knows-green-water-conservation/id353703123?mt=8	StoryBoy	Anytime
64	My Birds of Prey	Download an app and learn about birds of prey	http://itunes.apple.com/us/app/my-birds-of-prey-hd/id508806600?mt=8	Birdcage Press LLC	Anytime
65	Science Outreach - Athabasca		http://scienceoutreach.ab.ca		
66	Science for Citizens / SCISarter.com	Sign up for a citizen science newsletter and find the program that's right for you! http://www.citizensciencecenter.com/	www.scistarter.com http://www.citizensciencealliance.org/projects.html		
67	Community Research Canada	Hook up with a researcher!	http://communityresearchcanada.ca/		
68	Alberta Stewardship Network	Join a Watershed Stewardship Group			
69	Operation Grassland Community	Landowners! Help biologists create wildlife habitat.	http://www.afga.org/html/content/ogcconservation/		
70	Habitat Legacy Partnership Project Southern Alberta	Landowners! Volunteer to enhance and create wildlife habitat in southern Alberta. See also Multi-SAR http://www.ab-conservation.com/go/default/index.cfm/programs/wildlife/wildlife-projects/multisar/overview/	http://www.ab-conservation.com/go/default/index.cfm/programs/wildlife/wildlife-projects/habitat-legacy-partnership-project/overview/	Alberta Conservation Association & Pheasants Forever	
71	Salt lick mapping initiative	Help map animal salt licks!	http://www.ab-conservation.com/go/default/index.cfm/programs/wildlife/wildlife-projects/wildlife-habitat-initiative-in-low-disturbance-zones/overview/	Alberta Conservation Association	Anytime

72		Download their app and visit one of ACA's lands....			Anytime
73		Become a steward for one (or more!) of Alberta's protected area!	http://www.albertaparks.ca		Anytime
74		Visit one of Alberta's provincial parks and protected areas. Alberta Parks has a variety of volunteer programs including the natural area stewards, weed pulls and trail maintenance.	www.albertaparks.ca .		
75	e-bird	<i>Contribute your bird sightings to a national database.</i> The goal of e-bird is to maximize the utility and accessibility of the vast numbers of bird observations made each year by recreational and professional bird watchers. This program is amassing one of the largest and fastest growing biodiversity data resources in existence. eBird documents the presence or absence of species, as well as bird abundance through checklist data.	http://ebird.org	Cornell Lab of Ornithology	Anytime
76	Road Watch	Report wildlife crossings. Participants report sightings of wildlife crossing Highway 3. The goal is to collect, analyze and communicate information highlighting crossing locations of wildlife along the highway based on local knowledge and observations.	http://www.rockies.ca/roadwatch/about.php	Miistakis Institute	Anytime
77	Alberta Bird List	<i>Submit bird sightings to Nature Alberta's bird database.</i>		Nature Alberta	Anytime
78	Young Naturalists Club	<i>Start a Young Naturalists Club in your neighborhood.</i>		Nature Alberta	Anytime
79	Project Budburst	Provide your data to project budburst!	http://neoninc.org/budburst/ - Project Budburst		
80	Bird Study Groups	Join a bird study group. Study groups such as Calgary and Edmonton Bird Study Groups			Anytime
81	Plant Study	Join a plant study group		Alberta Native Plant Council	Anytime
82		Check out the Miistakis Institute!	http://www.rockies.ca/current_projects.php -		
83		Support the Castle Crown Wilderness Coalition! This group uses volunteers for weed pulls and other stewardship activities.			
84	Nature Conservancy Volunteer	Become a Conservation Volunteer with Nature Conservancy Canada.	http://www.natureconservancy.ca/en/what-you-can-do/conservation-volunteers/		

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