NATURE ALBERTA MAGAZINE

WINTER 2021
VOLUME 50 | NUMBER 4

A COMMUNITY CONNECTED BY A LOVE OF NATURE

Eastern Kingbirds
Avian Attitude

Raptors of the Red Deer River Valley

Keeping Urban Coyotes Wild

Loons and Lake Health

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Craig and Mark Stumpf-Allen

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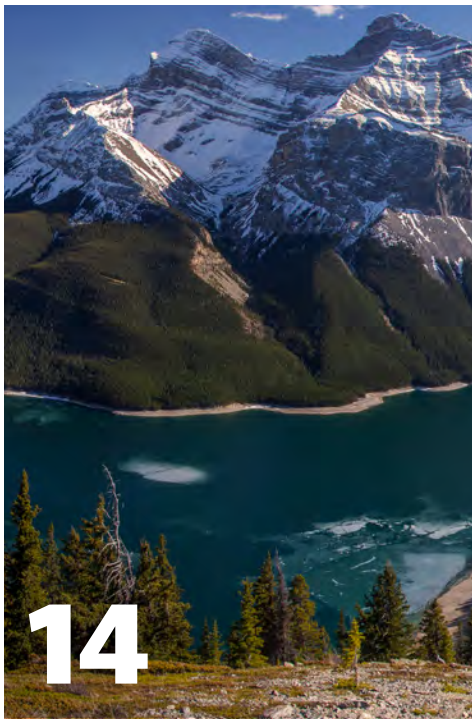

NATURE ALBERTA MAGAZINE

VOLUME 50 | **NUMBER 4** | **WINTER 2021**
ISSN 1713-8639

Publisher Nature Alberta
Managing Editor Jason Switner
Technical Editor Richard Schneider
Creative Susan May, intrinsic design
Cover Image Myrna Pearman

Editorial Committee
The Magazine Editorial Committee, which consists of dedicated volunteers, who all have a passion for nature, lend their respective experience and expertise to developing editorial outlines, commissioning articles and reviewing/vetting article submissions for the magazine. The committee includes:

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Nature Alberta magazine is published four times per year by:

Nature Alberta
11759 Groat Road
Edmonton, AB T5M 3K6
(780) 427-8124
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Nature Alberta Magazine (electronic) is made available free of charge at naturealberta.ca. Print copies of Nature Alberta Magazine are available by annual subscription, which covers the cost of postage and handling of four issues per year for $30 Canada (Canadian funds + GST). Publications Mail Agreement No. 40015475

About Nature Alberta
Alberta is home to incredible natural spaces comprised of beautiful and varied landscapes, and rich biodiversity reflected in our abundant and diverse flora and fauna. Across the province, natural history clubs and their members are engaging Albertans in the conservation and appreciation of this natural heritage. Nature Alberta represents a network of these natural history organizations in Alberta.

NATURE ALBERTA

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THE PRESIDENT'S PERSPECTIVE

As I write this, 2020 is finally ending; a year of unprecedented challenges, global changes, like an opened Pandora's box. It's a time of change for Nature Alberta, too, as we say goodbye to Linda Howitt-Taylor as president. For the past three years she has been advocating and promoting the changes needed to revitalize Nature Alberta. Her leadership has helped guide and build dynamic teams that will drive us successfully into 2021 and beyond. As incoming President, I thank Linda for everything she has done and the inspiration she has provided. She now moves into the position of Past President, where her knowledge and expertise will be valued and called upon. I wish Linda all the best and hope she now has more time to relax and enjoy the natural Alberta around her.

To introduce myself, my name is Elizabeth Watts. I have a B.Sc. in Microbiology, and have enjoyed a career in clinical trials research — lots of data for processing and details to be scrutinized. While not known for any hiking ability, I love being outside, camping and soaking up the beauty of Alberta. I plan on taking up kayaking at the first available opportunity. I'm on the board of the Alberta Mycological Society, and enjoy guided forays in the fields and forests (my personal favourite) learning about the boundless world of fungi, including what is and is not OK to eat. I live close to Elk Island National Park, so volunteering on the Friends of Elk Island Society board is a natural fit. We work to promote, conserve and research the unique ecosystems found in the Park, and support educational needs as they arise.

2020 has shown us that change is possible and adaptation is necessary. The pandemic has resulted in a surge in people's desire to reconnect with nature. We can build on that and collaborate with the diverse network of clubs, organizations and individuals throughout Alberta that appreciate the unique ecology and beauty of our land. Even during the winter months, we can use innovative solutions and technology — including our new website, social media, and video conferencing to connect to and enhance our experience of "This Land of Ours" (with apologies to Oscar Brand).

Whether you're a longtime member or new to Nature Alberta, I welcome you as we venture into the new year. Thank you for adding your voice to those who speak on behalf of our natural environment.

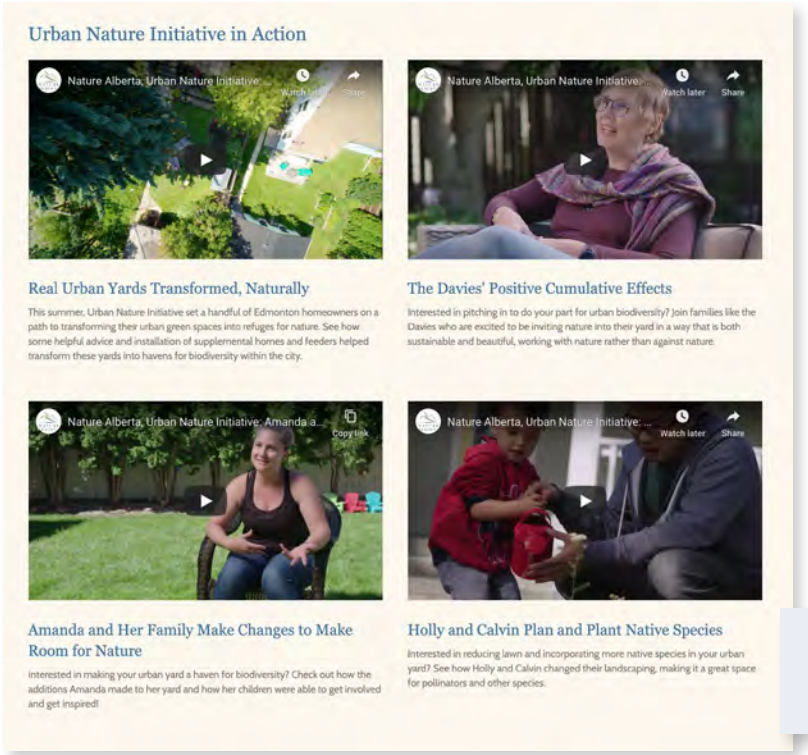
ELIZABETH WATTS

Nature Alberta News

The New naturealberta.ca

Have you had a chance to explore our completely revamped website? It's been rebuilt from the ground up to emphasize three core themes: Learn About Nature, Experience Nature, and Protect Nature. Combining a hub of resources with an ever-expanding library of content — including integrating articles from this magazine in a searchable blog-like format — our aim is to become the best resource available to learn about nature and conservation in Alberta.

The site is designed to serve as a hub for what we hope will become a Nature Network — a place where all our member clubs can spotlight their news and events, so anyone in the province can easily find and participate in activities in their area. We're excited to have an online presence that can grow along with us as an organization!



Urban Nature Initiative Update

Since this past spring, Urban Nature Initiative (UNI) Coordinator Kelsie Norton has worked with homeowners throughout the Edmonton to create urban oases — yards equipped with various tools and techniques to enhance and support biodiversity. The results of the program are now available to see — and inspire!

Visit **naturealberta.ca/support-urban-nature** to watch four videos that feature homeowners putting beneficial management practices (BMPs) into action in their yards. These folks accomplished some pretty impressive things in just one season. If you're inspired to make some changes in your yard, you don't have to go it alone. Supporting Nature and Biodiversity in Urban Yards is packed with tips and techniques just like the ones put into practice on the demonstration yards. You can read or download a copy at **naturealberta.ca/support-urban-nature**, or contact **birds@naturealberta.ca** for a physical copy.

We have to give special thanks to Ryan Northcott of Panoramic Media for the beautiful work on the videos. Panoramic Media specializes in corporate filmmaking and drone photography and cinematography, bringing a wider perspective to the production process. Ryan's work speaks for itself and we would encourage anyone looking for professional video production to get in touch with him. Visit **panoramicmedia.com** or email **ryan@panoramicmedia.com**.

We also thank the Edmonton Community Foundation for funding the UNI, and homeowners like Lissa, Amanda, Holly, and Calvin for sharing their urban nature journeys.

PANORAMIC MEDIA

EDMONTON COMMUNITY FOUNDATION

Parks Win a Reprieve

Albertans love their parks! Individuals like you from across the province have written to the government by the thousands, voicing their opposition to the proposal to delist 164 parks from the provincial parks system. And thousands of "Defend Alberta Parks" lawn signs have sprung up in neighborhoods everywhere. Fortunately, it seems the message finally got through.

Just before Christmas, like Ebenezer Scrooge, Minister of Environment and Parks Jason Nixon appeared to have a change of heart, declaring that "Many Albertans, including myself, love and value our parks and wild spaces." More significantly, he reversed the government's policy direction and promised, in writing, that no parks will be delisted and that "all will retain their current designations and associated protections."

This is an important development. As recounted in the Summer 2020 issue of *Nature Alberta Magazine*, the Alberta government has been rapidly advancing an anti-environmental policy agenda. In addition to the proposed delisting of parks, it has rescinded the Coal Policy put in place to protect sensitive lands in the East Slopes, permitted the sale of Crown lands, increased the intensity of forest harvesting, reduced environmental monitoring, and permitted hunting of sandhill cranes for the first time in Alberta's history.

It is important that we celebrate the policy reversal on parks and acknowledge the power we have to effect change by working together. But don't take those lawn signs down just yet! This is not a time to be complacent. This year the government will be advancing plans to align the management of parks and public lands, and there is a danger that the level of protection within parks could decline as a result. Alberta conservation groups, including Nature Alberta, are prepared to engage on this front to keep our parks protected. We hope that you will remain engaged as well, since it's the choir, not the conductor, that makes the music.

Coal: The Bad News

Since rescinding Alberta's long-standing Coal Policy, the Kenney government has wasted no time in leasing the once-protected lands for coal mining. In December, nearly 2,000 ha of East Slopes landscapes that the Lougheed government identified as ecologically sensitive were put up for bid. A large open-pit mine, proposed by Australian mining giant Benga Mining, is already in review, and many more are in queue. You can read more about the implications of mining in this important landscape in Sarah Milligan's article on page 14.

Coal: The Good News

The new coal mines in the East Slopes are targeting metallurgical coal, mainly for export to Asia. The news is much better for the thermal coal that is burned to make much of Alberta's electricity. TransAlta and Capital Power — the two main producers of coal-generated power in the province — are transitioning from coal to natural gas years ahead of schedule (now 2021 and 2023, respectively). This will reduce greenhouse gas emissions by millions of tonnes each year, reduce the release of mercury and other pollutants into the air, and reduce the demand for thermal coal mining. ■

Eastern Kingbirds

BY MYRNA PEARMAN

Eastern kingbirds are readily identifiable by their distinctive black and white plumage. MYRNA PEARMAN

Last August, while enjoying an evening walk in the Great Sandhills east of Leader, Saskatchewan, I had an unexpected encounter with an eastern kingbird. It flew in surprisingly close, a big, juicy two-striped grasshopper in its beak. I watched as it bashed the hapless hopper against a horizontal branch, then tossed it into the air, caught it at a different angle and bashed it again. It repeated this process three times before gobbling it down. It then sat for a few moments in apparent contentment before flying off.

This encounter was one of many I've had with eastern kingbirds. Common across most of Alberta, these highly visible birds are readily identifiable by their black plumage, conspicuous white tail tip, and distinctive shallow, rowing wingbeat flight pattern. Regularly seen perched on barbed wire, fenceposts, and treetops, they wait — in classic flycatcher style — on a perch for an insect to fly by, then sally out to snatch it in mid-air. They supplement their insect diet with fruit, especially in late summer.

Eastern kingbirds belong to a group of birds known as the tyrant flycatchers, and the Latin name of this species, *Tyrannus tyrannus*, reflects their pugnacious nature. They are extremely aggressive toward each other, with territorial disputes often including dramatic aerial combat. They are also aggressive toward other species, especially crows and other nest predators. Apparently, they will also attack humans if their nests are threatened, but I have never been subjected to any aggression, even when (quickly and quietly) observing their nests and young.

Although eastern kingbirds will nest in a variety of locations and have been known to use artificial nesting structures, it has been my observation that they prefer to build their dishevelled yet sturdy nests over water. The female constructs the nest, which can take up to two weeks to complete. She lays two to five red-splotched white eggs, which she incubates for 14–17 days. The nestlings, which hatch with orange skin covered in white fuzz, grow quickly and fledge at about 16–17 days. Both adults feed the young. Interestingly, genetic research confirms that kingbirds not only mate outside the pair bond, but they sometimes parasitize each other's nests.

While watching one eastern kingbird nest near Delburne a few years ago, I was able to observe and photograph the parents tending the nest. There was more than feeding going on. I also observed that the parents would wait for the young to defecate, whereupon they would either eat the fecal sac or carry it away from the nest.

Eastern kingbird fledglings stay dependent on their parents for about three to five weeks, which is thought to be one reason why the species is only single-brooded (laying a single clutch during a breeding season). They remain together as a family group until the young are fully independent.

Eastern kingbirds overwinter in South America, primarily in the western Amazon, where they forage together in flocks along riparian areas. Fruit is eaten during fall migration and makes up most of their diet on the wintering grounds.

The next time you're out hiking, travelling the backroads, or canoeing, keep your eyes peeled for these wild neighbours. It's worth taking the time to observe and appreciate their striking beauty, spirited behaviour, and saucy attitude. Enjoy the show! ■

Eastern kingbirds build a messy but sturdy nest, often low over the water. Both adults are diligent parents. MYRNA PEARMAN

Eastern kingbird young are very demanding of their parents for two to three weeks after fledging. MYRNA PEARMAN

Myrna Pearman is a naturalist, writer, photographer, and recently retired as the Biologist and Site Services Manager at Ellis Bird Farm. She can be reached at myrna@myrnapearman.com.

Winter LakeKeepers

BY BRADLEY PETER

For many, cold weather and freezing lakes means an end to lake activities for the year. However, for a determined group of citizen scientists, frozen lakes signal the start of a new environmental monitoring opportunity.

In Alberta, the bulk of lake monitoring occurs during the warm summer months, and not for selfish reasons. The summer is when threats to lake ecosystems and water resources are most obvious: toxic cyanobacteria blooms form expansive neon scums, invasive plants grow into dense mats, and boaters risk carrying invasive organisms from lake to lake. As the summer ends, the invasive plants die off, and cyanobacteria go dormant, sinking to the bottom of the lake... Or do they?

In February of 2013, bright pink photosynthetic cyanobacteria, called *Planktothrix rubescens*, rose from the depths of Fork Lake and became trapped in the surface ice. Looking down through the ice created a dramatic effect: the ice glowed an otherworldly pink. Subsequent ice cores revealed row upon row of frozen cyanobacteria, and toxicity tests detected toxin concentrations that more than doubled Alberta's recreational guideline. This discovery led to a blue-green algae advisory posted by Alberta Health Services — in February. The same phenomenon was later observed at Matchayaw Lake during November of 2017.

What factors lead to these under-ice blooms of toxic cyanobacteria? Because so little data has been collected from lakes in the wintertime, we don't have a clear answer. The same goes for other important questions related to lake ecosystems, such as how do summer cyanobacteria blooms influence the quality of winter fish habitat, or what effect does climate change have on winter lake conditions? These gaps in our understanding of Alberta's lake ecosystems inspired the Alberta Lake Management Society (ALMS) to begin investigating lakes under the ice.

Volunteer Vien Lam collecting data from Spring Lake during an ice fishing trip. MARIELLE LAM

Winter limnology presents interesting logistical challenges. Sample sites that are easily accessible in the summer can become dangerous in the winter depending on snow and ice conditions. Traditional sampling gear might not fit into an auger hole. Delicate instrumentation might freeze. And how do I keep my fingers warm? Fortunately, Alberta has an active community of individuals who are equipped for winter fieldwork and regularly visit lakes between December and April: ice anglers. Recognizing this community of potential citizen scientists, ALMS developed the Winter LakeKeepers program with financial support from the Alberta Ecotrust Foundation.

Before heading out, participants in the Winter LakeKeepers program first complete an ice safety quiz. Then, they are provided with training materials and a sampling kit. Sampling kits include a multimeter probe used to measure temperature and oxygen concentrations throughout the water column, a sample bottle and glove to allow for the collection of a total phosphorus sample, a hot water bottle to prevent the contents of the sampling kit from freezing, and a field sheet for recording environmental observations. Environmental observations are crucial to understanding winter lakes. For example, snow cover and ice transparency are critical factors influencing the amount of light available under the ice — a key requirement for the growth of cyanobacteria.

In 2018, the pilot year of the program, ten volunteers braved the elements to collect data from ten lakes. These samples were collected primarily during pre-planned ice fishing excursions. The following year, the program caught on with watershed stewardship groups and participation more than doubled. In 2019, 25 volunteers sampled 22 lakes across 44 sampling events. Geographically, lakes ranged from Beauvais Lake in the south to Snipe Lake in the north. As a testament to Alberta's citizen science community, volunteers were making excursions solely for data collection, rather than in addition to a pre-planned ice fishing trip.

After only two years, the program has started to generate interesting results. Some lakes that exhibit low phosphorus concentrations in the summer demonstrated high phosphorus concentrations in the winter. One volunteer measured high dissolved oxygen concentrations and observed a pink hue to the water — a sure sign that cyanobacteria was making another appearance. ALMS has prepared the results into reports on their website, and the data is uploaded to DataStream, an open-source water quality portal that is becoming increasingly popular amongst citizen science programs.

Winter LakeKeepers is just one of many citizen science programs offered by ALMS and other organizations across Alberta. These types of programs are an affordable way to deliver environmental monitoring, but the benefits are not just in the economics. Engagement of citizen scientists creates an ownership of environmental data, breaks down the silos that separate academics from the public, and enables citizens to use environmental data to improve the health of the environment. Through programs such as Winter LakeKeepers, ALMS hopes to ensure a sustainable future for healthy lake and aquatic ecosystems.

An ice core collected from Fork Lake in 2013 reveals bands of frozen pink cyanobacteria.
DR. RON ZURAWELL

ALMS would like to thank our incredible volunteers and the generous support of our funders, including Alberta Environment and Parks and the Alberta Ecotrust Foundation. We always welcome more volunteers; if you are interested in becoming involved with any of ALMS' programs, please visit **alms.ca** ■

LakeKeepers

Bradley Peter is a Professional Biologist and the Executive Director of the Alberta Lake Management Society.

Why Are Common Loon Chicks Becoming Less Common?

BY KRISTIN BIANCHINI

The common loon is a bird that most Canadians easily recognize. With its jewel-like red eyes, striking black and white plumage, and beautiful, echoing call, the common loon is a bird that is hard to miss and even harder to forget.

Like most people, I've always been excited to spot a loon or to hear its call when I've been near a lake. But it wasn't until I started working with loons as a biologist that I realized how fascinating and important these birds truly are.

I started studying loons in 2019, when I began work as a postdoctoral researcher with Birds Canada and Acadia University. I had two jobs. The first was to analyze almost 40 years of loon monitoring data from over 1,500 lakes, and the second was to spend a summer canoeing around northern Ontario to look for loons. You can imagine which job excited me the most.

My summer looking for loons was one I will never forget. I spent the better part of three months driving over rugged logging roads, bushwhacking through the forest, and paddling across countless waterbodies to study 69 lakes near Sudbury, Ontario. My goal was to figure out which lakes had loons and to count how many of those loons had chicks. Specifically, I wanted to determine the number of six-week-old young per loon pair—a measurement loon researchers refer to as "productivity." Most predation losses occur within the first six weeks of life, so the number of six-week-old young per pair is a good indicator of the number of loon chicks that will survive to become adults.

Measuring loon productivity is also an excellent indicator of lake health. As top predators, loons are sensitive to damage at lower levels of the food chain. For example, processes that decrease the number of fish in a lake can cause food shortages, especially for young loons. Being a top predator also makes loons more vulnerable to pollutants, like acid rain and mercury.

Acid rain occurs when sulphur dioxide and nitrogen oxides are released into the atmosphere by vehicles, power plants burning fossil fuels, and industrial processes like metal smelting, manufacturing, and oil refining. Once in the atmosphere, these chemicals transform and make rainwater acidic, which lowers the pH of lakes over time. In highly acidic lakes (pH less than 6), fish growth and survival can become reduced, leading to lower productivity in fish predators like loons.

An additional consequence of acid rain is that it speeds the transformation of elemental mercury into its organic and more toxic form, methylmercury. As a result, the mercury naturally present in the environment can become damaging. Additional mercury enters the environment through the burning of fossil fuels (especially coal), certain industrial processes, and waste incineration. Mercury from such sources is stable in the air and can travel far from the initial point of release.

Because mercury is not broken down when ingested, it becomes increasingly concentrated at higher levels of the food chain. The implication is that top predators, like loons, can ingest high concentrations of mercury as they eat contaminated fish. Adult loons with high mercury in their bodies spend less time caring for chicks, and chicks with high mercury in their bodies are worse at fighting off infections and avoiding predators. As a result, there are fewer six-week-old young per pair on lakes with higher mercury levels.

In theory, the lakes I visited for my field work should have provided excellent habitat for loons. They were all remote lakes with very little human disturbance, and to my eye, the lakes looked clean and unpolluted. But of the 69 lakes I visited, only four had loon chicks. On average, there were

Common loon adult with small chick. DARWIN PARK

just 0.09 six-week-old young per loon pair on these lakes. That is just 20% of what previous studies have suggested is required to maintain a stable number of adult loons. These results suggest that the loon populations on these lakes are in trouble.

Unfortunately, similar declines are also being observed in other locations. Data from the Canadian Lakes Loon Survey, a citizen science monitoring program managed by Birds Canada, indicate that loon productivity in Canada has dropped from over 0.8 six-week-old young per pair per year in 1981 to under 0.6 in 2018. Other studies have shown similar declines elsewhere.[1] Therefore, even though loon populations are currently considered stable in Canada, if this trend continues, we could start to see fewer and fewer common loons every summer.

Determining the specific causes of the observed decline in loon productivity is no easy task because there are numerous interacting threats to untangle. Besides acid rain and mercury pollution, there is also shoreline development and boating activity to consider. And there are natural challenges as well, such as depredation of loon eggs and chicks by other animals and harassment from biting black flies. Sorting this all out was the goal of my desk job.

Determining the specific causes of the observed decline in loon productivity is no easy task because there are numerous interacting threats to untangle.

Working with a team of colleagues, I analyzed 38 years of Canadian Lakes Loon Survey data from 1,577 Ontario lakes. I focused on Ontario because this province had the longest dataset and included the largest number of lakes. In all, I examined the effects of 16 different factors on loon productivity, including lake acidity, fish mercury levels, fish abundance, lake size, lake location, spring temperatures, spring and winter precipitation, and the presence of loon predators and competitors. What I found was that lake acidity and mercury are key drivers of common loon productivity declines.[2] Lakes with higher acidity (pH less than 6) had lower productivity and showed steeper declines in productivity

An increasingly frequent sight: a common loon adult without any young in springtime. RICHARD SCHNEIDER

over time. I also found that loons produced fewer chicks on lakes with higher fish mercury concentrations.

What about loons in Western Canada, far from the mining developments and dense human populations of Ontario? Unfortunately, acid rain is a problem here as well. In Alberta, sulfur dioxide and nitrogen oxides are emitted from urban centres and by oilsands projects, and both sources are projected to increase acid rain production across northeastern Alberta in coming years.[3] Moreover, soils in northern Alberta have a low buffering capacity, so even small amounts of acid rain can cause lakes to become acidic.[4] This combination of high acid rain production and soils with a low buffering capacity poses a big problem for loons, which breed in the northern half of the province.

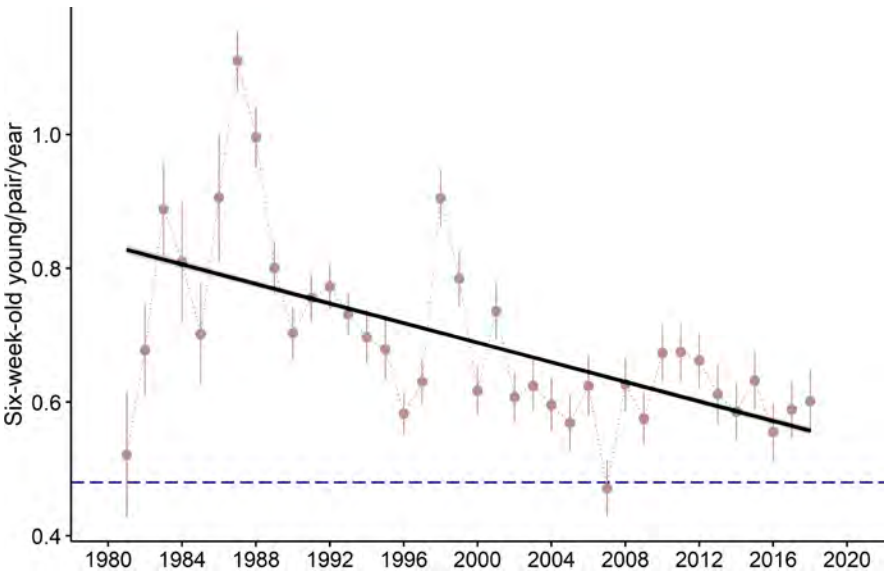


Figure 1. Common loon productivity in Canada declined between 1981 and 2018. The horizontal dashed line indicates the level needed to maintain a stable loon population.

Mercury also poses a significant threat to loons in Alberta. Many lakes in Alberta currently have mercury concentrations that exceed the province's safe consumption limits.[5] If eating fish is not safe for people, you can bet it is not safe for birds that eat nothing but fish. Mercury contamination is of particular concern in northeast Alberta because oilsands operations are a significant source of methylmercury emissions.[6]

Climate change may also intensify the problems that acid rain and mercury pose for loons in Alberta and elsewhere. A study from Ontario found an association between recent changes in climate, including warmer temperatures and higher precipitation, and increased fish mercury concentrations.[7] Climate change is also predicted to cause more frequent and extreme water level fluctuations, and this can increase lake acidity and the amount of mercury in loons.[8]

What You Can Do To Help

There are many meaningful ways for you to support loon conservation, and thankfully, there is still time to avert serious population declines. By learning more about loons and the threats they face, you can help spread awareness of their plight and can get others interested in protecting this amazing species. Another way is to support Birds Canada (**birdscanada.org**), the country's leading science-based bird conservation organization.

You can also help by becoming a citizen scientist yourself and participating in the Canadian Lakes Loon Survey: **birdscanada.org/loons**. My research would not have been possible without the amazing efforts of thousands of survey participants. By taking part in the loon surveys, you can collect critical information to help conserve loon breeding pairs and their chicks.

Finally, for anyone who lives on a lake or who enjoys visiting a lake in the summer, there are a number of simple ways to have a positive impact. Slow down while boating, especially near the shoreline. This helps to minimize wakes and prevents washing out loon nests and separating small chicks from their parents. Allow native wetland plants to grow in wide strips along shorelines to provide shelter for small loon chicks and habitat for the fish that loons depend on. Use non-toxic, lead-free fishing tackle, which prevents loons from ingesting toxic lead jigs and sinkers. Anglers should also properly dispose of fishing lines to avoid loons becoming entangled and injured. By working together, we can ensure that this beloved species is around for years to come. ■

References:

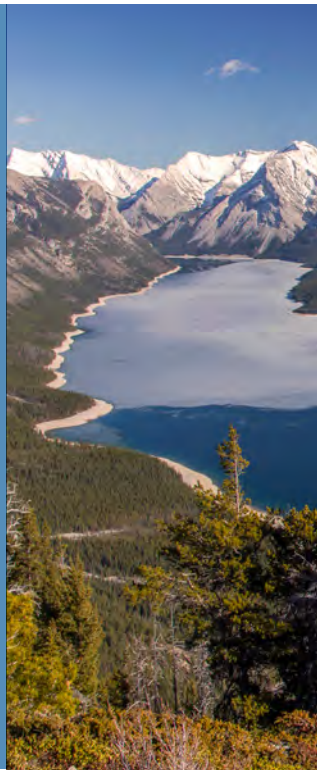
1. Tozer, D.C., C.M. Falconer, and D.S. Badzinski. 2013. Common Loon Reproductive Success in Canada: The West is Best but Not for Long. Avian Conservation & Ecology 8:1.
2. Bianchini, K., D.C. Tozer, R. Alvo, S.P. Bhavsar, and M.L. Mallory. 2020. Drivers of declines in common loon (Gavia immer) productivity in Ontario, Canada. Science of the Total Environment 738:139724.
3. Government of Alberta. 2014. 2011 Acid Deposition Assessment for Alberta. Alberta Environment and Sustainable Resource Development, Edmonton, Alberta.
4. Carou, S., I. Dennis, J. Aherne, R. Ouimet, P.A. Arp, S.A. Watmough, I. DeMerchant, M. Shaw, B. Vet, V. Bouchet, and M. Moran. 2008. A National Picture of Acid Deposition Critical Loads for Forest Soils in Canada. Canadian Council of Ministers of the Environment, Ottawa, Ontario.
5. Government of Alberta. 2016. Mercury in Fish in Alberta Water Bodies 2009-2013. Alberta Health, Health Protection Branch, Edmonton, Alberta.
6. Kirk, J.L., D.C.G. Muir, A. Gleason, X. Wang, G. Lawson, R.A. Frank, I. Lehnherr, and F. Wrona. 2014. Atmospheric deposition of mercury and methylmercury to landscapes and waterbodies of the Athabasca oilsands region. Environmental Science & Technology 48:7374-7383.
7. Chen, M.M., L. Lopez, S.P. Bhavsar, and S. Sharma. 2018. What's hot about mercury? Examining the influence of climate on mercury levels in Ontario top predator fishes. Environmental Research 162:63-73.
8. Watras, C.J., H.-Y. Teng, A.W. Latzka, M.W. Meyer, and Z. Zhang. 2020. Near-decadal oscillation of water levels and mercury bioaccumulation in the Laurentian Great Lakes region. Environmental Science & Technology Letters 7:89-94.

Breeding pair with small chicks. DARWIN PARK

Kristin Bianchini is from St. Albert, Alberta. After completing her Ph.D. at the University of Saskatchewan, she moved to Ontario, where she is currently working as a postdoctoral researcher with Birds Canada and Acadia University.

A Fisheye View of Cumulative Effects in Alberta's Southern East Slopes

BY SARAH MILLIGAN



In photography, a fisheye lens allows the photographer to capture an extremely wide angle of view. You can take a snapshot of an entire landscape complete with mountains, forests, meadows, and lakes. If you are a photographer exploring Alberta's southern East Slopes, your fisheye lens might capture just that—a seemingly untouched, beautiful landscape. Turn around and point your lens in another direction, however, and you might see a road crisscrossing a cold mountain stream and well sites, cutblocks, and random campsites dotting the background. This is actually a very busy landscape.

The southern East Slopes region is both busy and ecologically significant. It is home to the headwaters of the Bow and Oldman Rivers and provides a number of ecological services, including fresh water for downstream communities and irrigation districts, habitat for numerous native species, and world-renowned tourism and recreation activities. Its natural resources support forestry, oil and gas, mining, ranching, and agriculture.

However, no landscape can provide an inexhaustible supply of benefits to humans. And in the southern East Slopes region, there are growing indications that a tipping point has been reached. Wildlife — particularly our native fish species — are illustrative of this. Native fish communities are acutely sensitive to landscape and watershed mismanagement, which makes them an important indicator species. If they're not doing well, it's a signal that other aquatic and terrestrial wildlife might not be doing too well either.

Bull trout, the only native char to historically occupy all the drainages of Alberta's Eastern Slopes, and westslope cutthroat trout, the only subspecies of cutthroat trout native to Alberta, inhabit the cold waters found along Alberta's East Slopes. Both are listed as threatened species in Alberta and have experienced rapid declines in abundance and distribution due to progressive habitat alteration and changes in climate. Westslope cutthroat trout once inhabited most streams in southwestern Alberta from the alpine zone to the prairies, but today are largely restricted to the Rocky Mountains and foothills.[1] Bull trout have also experienced a significant westward contraction of their historic range.[2]

As Lorne Fitch, professional biologist and former adjunct professor with the University of Calgary, puts it: "Native trout declines are a message hard to ignore. Their plight is a signal that many of the values Albertans hold for the East Slopes are at risk."[3] Given the alarms these species are sounding, it's time to ask serious questions about the future of this important region. What will the landscape and wildlife populations look like? What is our land-use trajectory and is it sustainable? If it's not, how do we change our trajectory?

To answer these questions, we need to put down our camera and pick up another tool called ALCES: A Land Cumulative Effects Simulator. ALCES is a computer model that tracks land-

Panorama of Lake Minnewanka. Z. KOZOMARA

use activities and their accumulating footprint over time at high resolution. It allows us to understand how landscapes will change over time and to assess the ecological effects of these changes. The model does this by integrating scientific findings obtained through ecological field studies and then applying these findings to future landscapes.

For example, studies have shown that industrial processes — including timber harvest, mining, oil and gas exploration and extraction, and the associated access roads — cause habitat fragmentation, which negatively affects trout populations. Industrial access roads also facilitate entry to remote areas by anglers, which increases angling pressure. Roads and other industrial features can also lead to greater frequency and intensity of flooding, blockages and changes in water flows, and increased sediment and phosphorus loads.

Assessments of future landscapes also need to take climate warming into account. Bull trout and westslope cutthroat trout are at particular risk because they are cool-water species and become stressed by warmer water temperatures. Progressive changes in climate will also have a dramatic effect on the water cycles, which in turn will impact stream flows, water quality, spawning substrates, food availability, and disease risk for aquatic species.[4]

By integrating all of this ecological information and applying it to evolving future landscapes, ALCES can predict how trout and other species are likely to fare in coming decades. We can use the model to explore alternative management scenarios, helping us to understand the implications of today's actions on tomorrow's landscapes. Such studies afford us a glimpse into alternative futures and allow us to select the future we want.

In 2019, the Alberta Chapter of The Wildlife Society (ACTWS) commissioned a cumulative effects assessment of this type for Alberta's southern East Slopes. The overarching goal was to provide a science-based assessment of two alternative management scenarios and to use that to inform land use and conservation planning in the region. One scenario, the business-as-usual model, assumed that resource development would continue along its current trajectory. A second scenario, the protection model, placed an emphasis on protecting the land from further industrial development. The protection scenario also assumed that non-permanent industrial footprints (access roads, seismic lines, and well sites) would be reclaimed and that a combination of access management and regulatory protection would lower angling mortality to levels observed in other protected areas in the province.

Several outcome measures were used to assess the consequences of each scenario, taking cumulative effects fully into account. The focus was on bull trout and westslope cutthroat trout viability, measured in terms of the Alberta government's Fish Sustainability Index.[5] Additional environmental metrics included the overall intensity of the industrial footprint, the amount of

intact land, water quality, and an indicator of approximate water flow. Natural resource gross domestic product was used to assess economic outcomes.

The analysis afforded a fisheye view of the future of Alberta's southern East Slopes — and it doesn't look good under the business-as-usual model. The Fish Sustainability Index is predicted to progressively decline as human and climate-induced stressors progressively degrade freshwater habitats. Consequently, further declines in the abundance and distribution of bull trout and westslope cutthroat trout can be expected. Few sustainable populations are likely to remain outside of protected areas.

Fortunately, there is an alternative. If we train our fisheye lens on a future landscape that is protected rather than developed, things look much better for trout. Watershed protection resulted in substantial risk reduction in several watersheds, allowing fish sustainability to stay at moderate risk 50 years into the future despite climate change. Factors contributing to the effectiveness of protecting these watersheds include higher elevation and therefore lower sensitivity to climate warming, relative habitat intactness, and the potential for habitat reclamation. The potential to reduce access is also critical for lowering angling pressure, which was identified as a limiting factor for both trout species.

By comparing the Fish Sustainability Index and natural resource GDP results under the two management scenarios, it was possible to identify the watersheds where environmental benefits were greatest and the economic costs of protection were lowest. Most of these priority areas for conservation were in western watersheds (Figure 1). Fortunately, these watersheds have low potential for new oil and gas development. Therefore, the economic consequences of protection relate mainly to forest harvesting, which contributes much less to GDP than energy development. The upshot is that western watersheds are both of highest value to trout and carry the lowest cost of protection. For an area described as the last stronghold for trout populations in the region, this is good news.

The cumulative effects assessment found that other environmental outcome measures displayed a similar spatial pattern to trout sustainability, indicating that land-use impacts encompass the broader ecosystem. Water quality and intact land cover are low in the eastern downstream portion of the study area, where land conversion to agriculture and settlement is widespread. In the business-as-usual scenario, resource development caused further habitat fragmentation of the landscape, with intact land cover being largely limited to protected areas after five decades. In addition to the ecological implications, this can also lead to hydrologic changes, including elevated risk of runoff and downstream flooding.

The view from our model-assisted fisheye lens is quite clear. This isn't just a fish issue, it's an entire ecosystem issue. Achieving a balance in the southern East Slopes — ecologically, economically, and socially — will require more than maintaining the status quo. Conservation action will be needed to maintain viable native fish communities along with other natural capital values. Furthermore, we know where this action should be targeted. The cumulative effects assessment has identified target areas where there are good prospects for protecting or restoring values and the where costs of protection can be minimized.

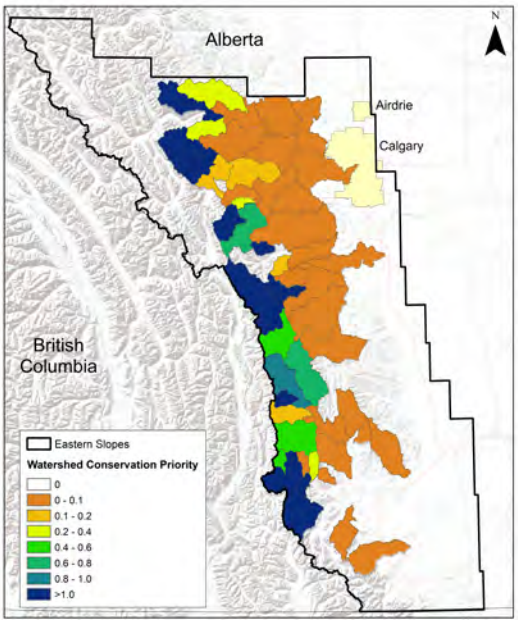


Figure 1. Watershed conservation priority ranked by conservation cost-effectiveness. Higher values indicate higher priority.

So, now that you've seen a glimpse into the world of tomorrow, how does it feel to be there? Are you happy with the status quo or would you rather see a different trajectory for Alberta's Southern East Slopes?

There is opportunity for change. As surprising as it may sound, watershed planning for the East Slopes of Alberta is still in its infancy. Management decisions regarding our resources occur at many levels, from individual landowners through to government-led regional planning. As fisheries biologist Jennifer Earle describes: "As an individual, you might not think there is much you can do to address large landscape threats such as sedimentation, man-made barriers to fish passage, and climate change. As part of a group, however,

you can get involved in stewardship initiatives that help champion these issues and effect change at a local scale through volunteer projects."[6] The Alberta Chapter of The Wildlife Society and organizations like it need members and financial support to continue to engage in science-based conservation and management of wild animals and wild spaces. Please consider lending a hand. ■

ACTWS's full report, *Cumulative Effects of Land Uses and Conservation Priorities in Alberta's Southern East Slope Watersheds*, can be read at: bit.ly/actws-east-slopes

Sarah Milligan is a Professional Biologist whose interests include wildlife, habitat, and landscape ecology. She lives and works in Alberta and holds a M.Sc. in Conservation Biology and Environmental Science from the University of Alberta.

Coal Mining in the Southern East Slopes

The Alberta Chapter of The Wildlife Society, along with other groups like the Canadian Parks and Wilderness Society, the Crowsnest Conservation Society, Timberwolf Wilderness Society, and Livingstone Landowners Group, recently participated in the Grassy Mountain Mine Public Hearing. Benga Mining Ltd. is proposing to construct and operate an open-pit metallurgical coal mine near the Crowsnest Pass, approximately seven kilometres north of the community of Blairmore. As proposed, the life of the mine is about 25 years. The hearing was an opportunity for groups and individuals to voice their support or opposition to the proposed coal mine. It was also an ideal platform for presenting the results of the cumulative effects assessment, which included the proposed Grassy Mountain coal mine footprint and its estimated revenue in the analysis. The results indicate that the watershed containing the proposed coal mine is ranked as a high-priority watershed, suggesting that the conservation benefits to trout and ecosystem services over the long-term outweigh the short-term economic gains from the mine.

Without the clarity of a fisheye view into the future of Alberta's southern East Slopes, that message is eyebrow-raising. It's an important reminder that the people who reside, work, or play in these watersheds, as well as those who never set foot in the watershed but still value it, need the tools of this report to inform decisions about the future. The Grassy Mountain Mine is unlikely to be the last large-scale development project to be proposed for Alberta's southern East Slopes. In 2020, the government of Alberta rescinded the 1976 Alberta Coal Policy, which has opened headwaters in the East Slopes to open-pit coal mining. This is additive, of course, to the myriad of other land-use pressures that have already put the health and function of an ecologically significant landscape at risk.

References:

1. Alberta Westslope Cutthroat Trout Recovery Team. 2013. Alberta Westslope Cutthroat Trout Recovery Plan: 2012-2017. Alberta Environment and Sustainable Resource Development, Alberta Species at Risk Recovery Plan No. 28. Edmonton, AB, 77 pp. Accessed from open.alberta.ca/publications/9781460102312

2. Alberta Sustainable Resource Development. 2012. Bull Trout Conservation Management Plan 2012-17. Alberta Sustainable Resource Development, Species at Risk Conservation Management Plan No. 8. Edmonton, AB, 90 pp. open.alberta.ca/publications/9781460102305

3. Fitch, Lorne (2020). "A Dangerous Man with a Dangerous Concept." Nature Alberta Magazine, 50(3), 12-14.

4. Ebersole, J.L., R.M. Quiñones, S. Clements and B.H. Letcher (2020). Managing climate refugia for freshwater fishes under an expanding human footprint. Frontiers in Ecology and the Environment, 18(5), 271-280.

5. Fish Sustainability Index was estimated according to Alberta Environment and Parks' Cumulative Effects Joe Model, which was developed to assess multiple threats to aquatic species at risk in Alberta.

6. Earle, Jennifer (2020). "Alberta's Bull Trout Need Our Respect – and Our Help." Nature Alberta Magazine, 50(2), 8-11.

Keep Those Wily URBAN COYOTES Wild!

BY COLLEEN CASSADY ST. CLAIR

I've heard many opinions about urban coyotes. "They don't belong here! Can't the government move them somewhere else?" "They have a right to exist and we've invaded their space." "They make me afraid for my kids and myself, just walking down my own front street." "I love seeing coyotes and have never had a negative experience with one." These kinds of sentiments about coyotes come via emails, conversations, radio call-in shows, and posts to the website of the Edmonton Urban Coyote Project (**edmontonurbancoyotes.ca**).

I began studying urban coyotes a little over a decade ago because Alberta's cities, like virtually every city in North America, have seen a steady increase in reports of urban coyotes over time. This is likely the result of cities expanding into rural areas and coyotes expanding their range over the past many decades.

My goal was to understand how coyotes make a living in cities and to identify the factors that are associated with conflict. I hoped this information would facilitate coexistence between people and coyotes to increase security for people while supporting the many ecological and aesthetic benefits coyotes bring to cities. The associated research has been a collaborative effort with wonderful participation from academic colleagues, civic officials, a private company, citizens, and, especially, several graduate and undergraduate students in my lab at the University of Alberta.

What I've concluded over the past ten years is that there are four broad components to reducing conflict: (1) remove or secure attractants, (2) control and protect pets, (3) increase wariness of bold coyotes, and (4) prevent denning in residential areas. None of these recommendations is unique to Alberta's cities or the studies in my lab. But we've uncovered some details that help us stay a step ahead of wily coyotes, which have shared space with people for millennia and are extremely good at adapting to, and then exploiting, our human habits. I use these terms—adapt and exploit—in a neutral way. Coyotes are among the handful of species that thrive in cities, in contrast to most other species, which avoid urban areas or face local extinctions.

Top: A mature coyote in prime condition. TONY LEPRIEUR

Right: An urban coyote at rest. COLLEEN CASSADY ST. CLAIR

Before sharing some of the details of what we've learned, I think it's important to acknowledge some characteristics of urban coyotes that are relevant to successfully coexisting with them. Relative to surrounding rural areas, coyotes frequently reach higher population densities in cities because of earlier breeding, larger litters, and higher survival of pups. In addition, urban pups are slower to disperse, which results in large family groups of adult-looking animals. Their urban diets are more diverse than in rural areas and they readily make use of buildings and other infrastructure as den sites. Coyotes that would not survive or reproduce without human sources of food and shelter are able to do so in cities. The food subsidy is usually the root of subsequent problems with conflict, which often involves den sites in residential areas.

Alberta's cities... have seen a steady increase in reports of urban coyotes over time. This is likely the result of cities expanding into rural areas and coyotes expanding their range over the past many decades.

In Edmonton, it is increasingly common for coyotes to den in derelict sheds or under decks and sunrooms. Last spring, we discovered nine pups in such a location, birthed by a small, apparently lone female. She likely sought this denning location, which required Houdini-like contortions while crawling under a fence to access, mainly for its security from other, more dominant coyotes. The large size of her litter (five to six is average) probably meant she had access to high-calorie human food, such as garbage, but there was no such food source immediately around the den site.

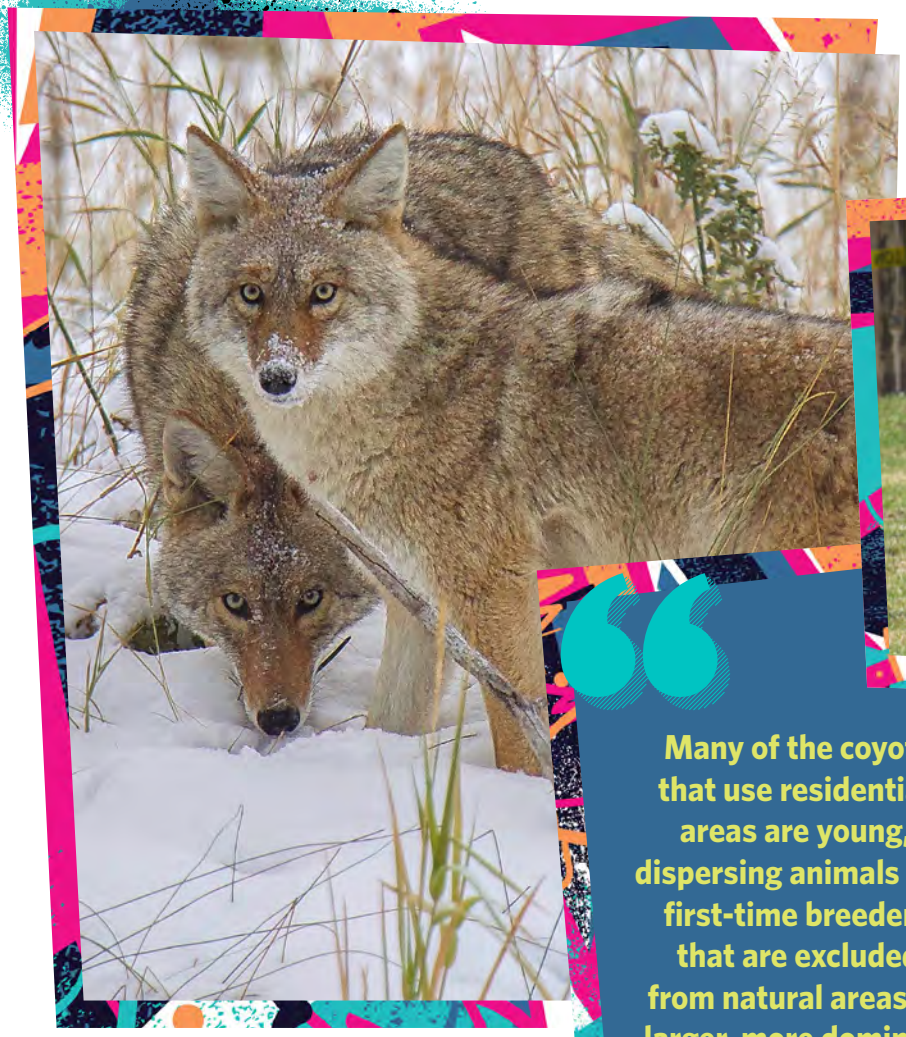
What kind of food could a meek but wily coyote like this one find nearby? There are many surprising sources. Work in my lab, led by Maureen Murray and Deanna Steckler, showed that urban coyotes eat rodents, rabbits, insects, and berries, as expected. But they also eat birdseed, fruit (of both native and domestic species), pet food, compost, and all manner of garbage, ranging from a leather glove to an entire wrapped burrito. Several people have shared stories and photos of coyotes climbing crabapple trees to eat the apples!

Sometimes people provide food to coyotes and other wildlife intentionally. This has motivated a proposed and very welcome bylaw amendment in Edmonton to prohibit feeding of wildlife except for conventional, suspended bird feeders. Over the years, every single time I've investigated clusters of complaints about aggressive coyotes, I have found evidence of access to human sources of food. Feeding was associated with the lethal attack on a 110-pound dog in Edmonton and severe bites to the head of a toddler in Burnaby. Repeated access to human sources of food produces food conditioning: the association animals make between people and food. It consistently generates conflict, whether with coyotes, wolves, bears, or geese.

Natural food sources are also abundant in cities, especially sprawling cities like Edmonton and Calgary where there are abundant open fields, forested areas, river valleys, golf courses, grassy freeway verges, and major railway lines with spilled agricultural products. Prey sources such as insects, rodents, and birds have become more abundant through progressive policies of pest management that eschew chemical control. Underground stormwater pipes create naturalized habitat and attractive wetlands bordered by shrubs and grasses. These natural features provide many ecosystem services cities need, but they also attract coyotes. Conflict can result, especially in adjacent residential or recreational areas.

For wildlife professionals tasked with managing urban wildlife, the presence of coyotes, even in residential areas, does not automatically signal conflict. Conflict requiring intervention occurs only when people or their pets are directly threatened by coyotes with aggressive and repeated approaches. This behaviour is almost always accompanied by food conditioning and/or the presence of a den site, both of which increase defensive behaviour toward pets and sometimes people. Thus, key actions for minimizing conflict are: securing or removing attractants, preventing food conditioning, controlling or containing pets, and preventing establishment of den sites in residential areas.

Many of the coyotes that use residential areas are young, dispersing animals and first-time breeders that are excluded from natural areas by larger, more dominant coyotes. Murray's work showed that animals suffering from mange (a skin parasite) are more likely to use residential areas, particularly during the day. She also identified the characteristics of residential yards that are most likely to attract coyotes. These



Left: Two coyotes at home in one of Calgary's natural areas.
TONY LEPRIEUR

Below: A coyote casually moves through a playground.
COLLEEN CASSADY ST. CLAIR

> **Many of the coyotes that use residential areas are young, dispersing animals and first-time breeders that are excluded from natural areas by larger, more dominant coyotes.**

include the lack of a fence, presence of hiding cover (dense vegetation, sheds, old cars, piles of debris), and food sources. Mangy animals were much more likely than healthy coyotes to shelter under decks and beside house foundations. In a nasty feedback loop, eating human-sourced food, especially compost containing mycotoxins, can result in immune suppression, which increases susceptibility to parasites and disease. Another student, Scott Sugden, showed that animals in poor condition exhibit disrupted microbiomes in their intestines, which appear to stem from protein-poor diets.

Beyond the conflict associated with coyote behaviour, a new parasite makes it more important to deter coyotes from residential yards and similar human-use areas like playgrounds and community gardens. The tapeworm parasite *Echinococcus multilocularis* has been known for decades to infect coyotes, but a new, more virulent strain has arrived from Europe, probably with imported dogs, only in the last decade or so. This parasite usually cycles between coyotes and their rodent prey, but humans can be infected if they accidentally eat the microscopic eggs deposited with coyote feces. Since 2013, 17 Albertans have been diagnosed, but the infected number may be much higher because symptoms, related to liver cysts, can take 10 to 15 years to develop.

Because the rates and severity of conflicts with coyotes has been rising in residential areas, grad student Gabrielle Lajeunesse and I are initiating a community-based aversive conditioning program for residential neighbourhoods. We are investigating whether intensive and repeated frightening encounters with trained volunteers can teach coyotes to be generally more wary of people, thereby reducing the likelihood of encounters and conflicts. By designating both treatment and control neighbourhoods, we will later be able to assess the effects of the hazing program.

In both neighbourhood types, volunteers will conduct patrols, assess coyote wariness, and follow up on complaints by residents. In treatment neighbourhoods, volunteers will react to coyotes that permit close approaches (i.e., that are habituated to people) by chasing them while throwing tennis balls, shaking a can full of coins, and shouting. Similar but more intensive forms of aversive conditioning are already used in Edmonton and Calgary by city wildlife professionals and have been used successfully to manage bears in protected areas for a couple of decades. We hope our community-based aversive conditioning program will complement current approaches by increasing the frequency and immediacy of negative experiences for coyotes encountering people in residential areas.

If we are successful at deterring coyotes from residential areas, it becomes that much more important to support coexistence in natural areas, where most people prefer our urban coyotes to reside. This means restricting off-leash dogs to designated areas where coyotes learn to expect them, to maintain control of dogs even in off-leash areas, to know how to deter an approaching coyote, and to respect park closures associated with den sites.

This attitude of personal responsibility is similar to the expectations for recreating in natural areas outside of cities and is an essential part of fostering biodiversity in cities in general. Such attitudes support the ecosystem services that natural areas provide, including their restorative effects on people. Coyotes provide ecosystem services too, such as the regulation of rodents and hares, dispersal of plant seeds and pits, scavenging of carrion, and the aesthetic pleasure many people enjoy from seeing coyotes in natural areas.

If you would like to know more about the work my students and I have done on urban coyotes, I invite you to visit our website at **edmontonurbancoyotes.ca**, where you'll find some tips on avoiding conflict with coyotes, more information about current research, including the community-based aversive conditioning program, and links to publications from past research. An Internet search for "*Echinococcus multilocularis* Alberta" will provide information and advice from health professionals about this parasite. Finally, I invite your questions and ideas for coexisting with urban coyotes via email at **coyotes@ualberta.ca**. ■

Homeowner Tips for Reducing Conflict with Urban Coyotes

- **Remove or secure attractants in and around your yard. This includes all food consumed by either coyotes or their prey as well as any kind of shelter. Coyotes eat surprising amounts of bird seed, fruit, garbage, and pet food; anything available at ground level will attract coyotes.**
- **Control and protect your pets. Keep cats indoors or in a "catio." Leash dogs outside your own yard unless you are in a designated off-leash area. Maintain a six-foot fence around your yard to protect small pets and consider adding coyote rollers or fladry (flagging).**
- **Increase wariness of bold coyotes. Treat coyotes in residential areas aggressively to help them learn that people are best avoided. Anyone can do this by shouting, throwing things, waving sticks, and running towards coyotes. Carry a stick or umbrella on walks.**
- **Prevent denning in and around your yard. Coyotes are drawn to yards without complete fences and those that offer open sheds, open garages, or spaces under decks and additions. Very dense vegetation serves as shelter for resting and denning coyotes and their prey, which includes mice, voles, squirrels, hares, and ground-dwelling birds.**

Colleen Cassady St. Clair is a professor of Biological Sciences at the University of Alberta.The Edmonton Urban Coyote Project has garnered national attention from the CBC (bit.ly/cbc-coyote) and a light-hearted look from The Beaverton (bit.ly/beaverton-coyote).

Left: Another generation of urban coyotes. JOHN MCLAY

Above: Coyote pups playing with a discarded can in their den in Arbour Lake, northwest Calgary. KATHRYN KOPCIUK

The Road to 50

A Logo

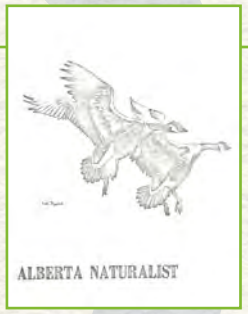
1971

The first "symbol," as editor M.T. Myres described it, to adorn the Federation of Alberta Naturalists' Newsletter and early letterhead was designed by Peter Karsten to encompass Alberta's many landscape features, including boreal forest, prairie foothills, and Rocky Mountains.

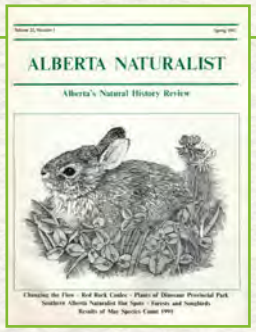
The third issue of the FAN Newsletter bore a new symbol, designed by A.B. Mied. Featuring a prairie rose, prairie falcon, and the Rocky Mountains, this "attractive, symbolic and compact" (Myres) design would serve as FAN's logo until 2011.

A Look

1973

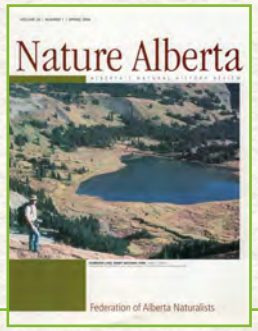


Vol. 3, No. 1 was the first newsletter to bear an illustrated cover (by Ludo Bogaert) and the title *Alberta Naturalist*, which the publication would go by for the next 30 years.



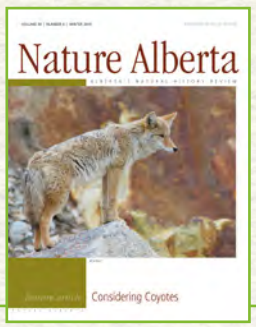
1992

With Vol. 22, No. 1, *Alberta Naturalist* grew to the 8.5"x11" magazine format.



2004

Vol. 34, No. 1: Introducing *Nature Alberta*! The name change is accompanied by full-colour front and back covers.



2010

Vol. 39, No. 4: Our first issue featuring full-colour interiors.

2011

In the current Nature Alberta logo, designed by Judy Fushtey, a stylized bird soars over the landscapes and waterways of Alberta. It appeared on the back cover of *Nature Alberta Magazine* as early as 2006, and was adopted as the organization's official logo in 2011.

NATURE ALBERTA

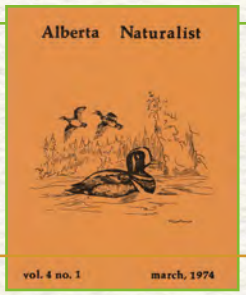
2020

For our 50th anniversary year, *Nature Alberta Magazine* underwent a complete redesign. A new design team took the reins as of Vol. 50, No. 2, and we're excited to continue to connect this community with informative articles from authoritative professionals and engaging stories of individuals exploring nature.

A Legacy

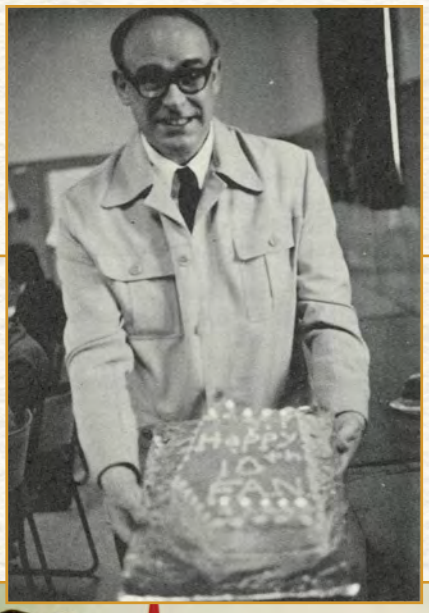
1971

The FAN Newsletter, Vol. 1, No. 1 started with a humble design but was packed with news and information compiled by Myres.



1974

With Vol. 4, No. 1 (cover by Peter Karsten), Alberta Naturalist was published as a 7"x8" booklet—its first step towards a magazine format.



1980

Tim Myres celebrates FAN's first decade. Photo: Mary S. Lore

1984

Vol. 14, No. 1 featured black and white photography on the cover (by Dick Russell) and interior pages.

1990

Loyd Lohr, Pat Clayton, Don Stiles, and Maryhelen Posey receive the Order of the Bighorn Award from Minister LeRoy Fjordbotten for 20 years of outstanding conservation achievement.

Nature Alberta's current focus is on outreach and education, to enhance knowledge and appreciation of Alberta's natural heritage. Through programs like Nature Kids Family Nature Nights, we pass on our love of nature to the next generation. Like the child who gave the pincherry she planted this summer at Lac La Nonne an auspicious name, we're "planting Hope."

2020

Birding the Badlands

Monitoring Raptors Along the Red Deer River Valley

BY RYAN WILKES WITH HEATHER BLANCHETTE

Southern Alberta is the site of Canada's largest concentration of badlands, the scars of a receding glacier whose meltwaters assisted in carving out the valleys some 13,000 years ago. The Red Deer River meanders below the famous layered cliffs, which offer a look into Alberta's prehistoric past. While many visitors look towards the ground during their visit to the region, we came here to look towards the sky.

Despite the barren landscape that is often associated with the badlands, the valley accommodates a lively riparian forest. This ecosystem makes the river valley a popular birding spot for local naturalists and visiting birders alike. Local birder Jim McCabe has observed an incredible 113 species since 2001 from his riverside backyard in Nacmine. Bald eagles build their nests in the giant cottonwoods that hang over the river and have been observed overwintering in the valley. The valley is home to populations of turkey vultures and prairie falcons, while the surrounding prairies are part of the summer range for red-tailed, Swainson's and ferruginous hawks. However, a survey of migrating raptors has never been attempted in the region. To our knowledge, the closest raptor migration survey is the annual Rocky Mountain Eagle Research Foundation (RMERF) survey in Canmore and Kananaskis. Establishing a raptor migration monitoring hot spot somewhere in the 1,300 km of prairies separating the Rockies and the Pembina Valley would be a worthwhile achievement.

Local biologist Tim Schowalter recognized the lack of data around migrating raptors in the region and brought us on board to do this preliminary research. Over the years, he had received several local reports of hawks soaring over the river valley during migration season. He realized that raptors may be taking advantage of thermal and wind-driven updrafts on the flanks of the river valley,

which runs 120 km north to south, to help them move south in the fall.

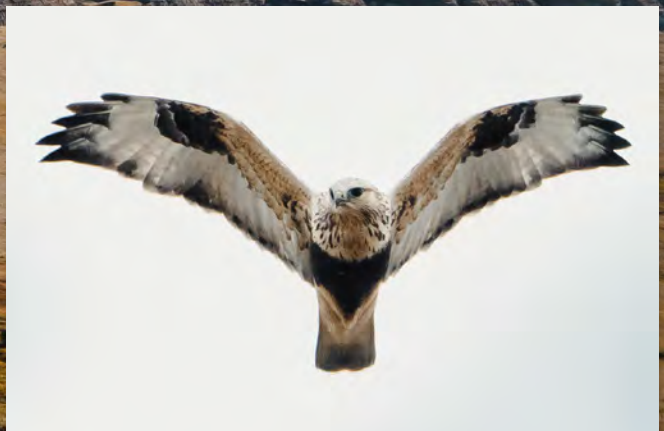
We were new to birding when we arrived, but after spending six weeks immersed in the practice of searching for, photographing, and identifying birds of prey, we feel that we are well on our way to becoming true birders. Tossed in the deep end, we quickly learned how to identify buteos at a distance, to recognize the flight pattern of an accipiter and the soaring silhouette of an eagle. We experienced the changing seasons from our perch overlooking the river valley, enduring sunburns in early September and occasional blizzards in October, recording the comings and goings of avian visitors. A number of birds went unidentified during our survey as a result of our inexperience. However, the photos that I took proved to be invaluable, allowing us to revisit observations at the end of each day and help us learn, reconsider, and confirm identifications.

Orkney Viewpoint offers birders the opportunity to see several species of raptor from a unique vantage point. Birds flying through the valley were often at or even below eye level, and sometimes passed within a few metres.

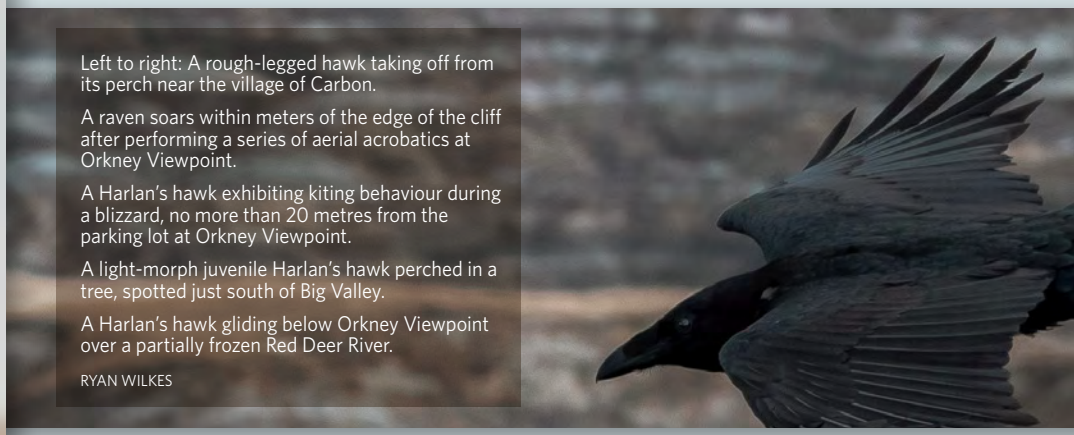
We were positioned at Orkney Viewpoint (OVP), located 18 km northwest of Drumheller and operated and maintained by Kneehill County. OVP is a popular lookout amongst both locals and tourists due to the beautiful, 180-degree panoramic views of the river valley. It is located near the south end of the 120-km north-south stretch of the river valley. The valley is about 1,800 metres wide here and the bank is steep, dropping 92 vertical metres to

The beautiful northern-facing view of the Red Deer River valley from Orkney Viewpoint. RYAN WILKES

A juvenile bald eagle flying northbound over Orkney Viewpoint. This bird is a suspected resident of the Red Deer River valley. RYAN WILKES



A curious rough-legged hawk deviates from its initial path to get a closer view of the surveyors stationed at Orkney Viewpoint. RYAN WILKES



Left to right: A rough-legged hawk taking off from its perch near the village of Carbon.

A raven soars within meters of the edge of the cliff after performing a series of aerial acrobatics at Orkney Viewpoint.

A Harlan's hawk exhibiting kiting behaviour during a blizzard, no more than 20 metres from the parking lot at Orkney Viewpoint.

A light-morph juvenile Harlan's hawk perched in a tree, spotted just south of Big Valley.

A Harlan's hawk gliding below Orkney Viewpoint over a partially frozen Red Deer River.

RYAN WILKES

the river, offering the potential for close viewing of passing raptors.

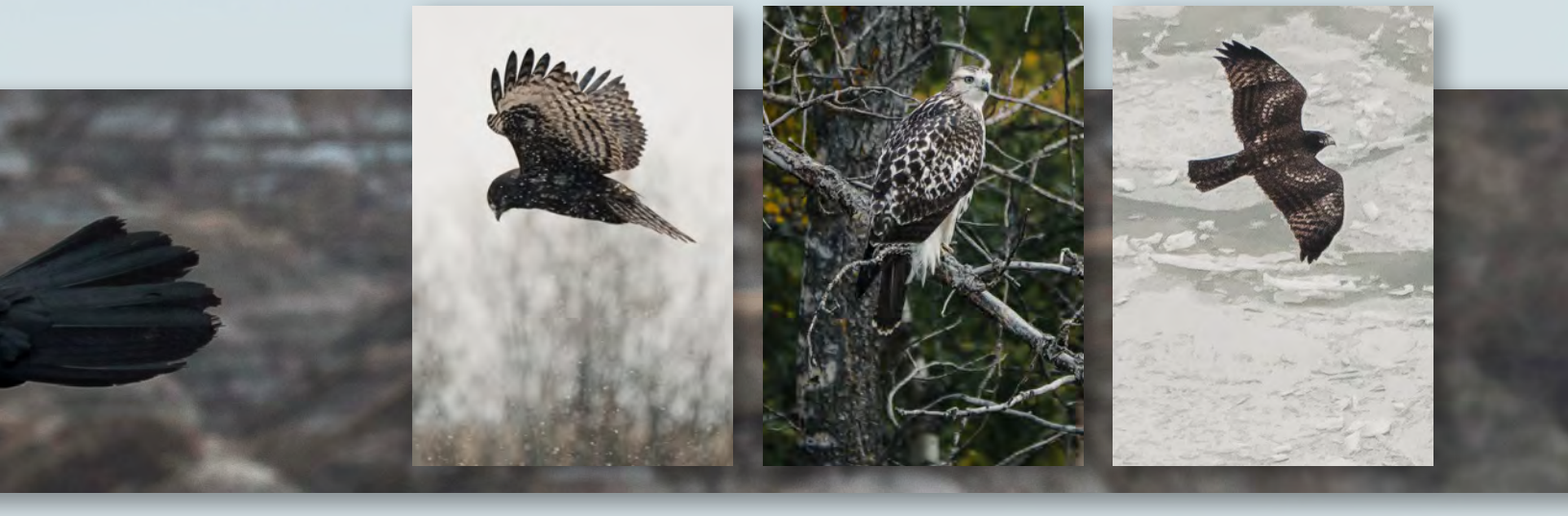
Our main goal was to collect data that could help us determine if migratory raptors are using the Red Deer River valley as a fall migration corridor — data that could motivate a more rigorous study in the future. The secondary goal was to collect data to share with birders so that they may have a better chance of observing a raptor in flight over the beautiful backdrop of the badlands. Observations were collected five days per week for six weeks between early September and late October of 2020. We also embarked on a 400-km drive once per week to the northeast of Drumheller to keep tabs on the movement of raptors over the prairies.

Notable Appearances and a Near Miss!

October 8 and October 21 were particularly noteworthy — we observed 41 and 43 raptors, respectively, on those two days. I vividly remember photographing a rough-legged hawk on October 8, as it passed overhead on its way south. When I took my eye away from the viewfinder, I had to pinch myself. Suddenly there were nine more hawks soaring far above us, just west of OVP. Unfortunately, we were unable to identify their species due to how distant they were, but we are confident they were buteos. In the 20 minutes prior, two smaller groups of three and four unidentified buteos had also passed us in a similar fashion, separated by closer flybys of soaring individual red-tailed and rough-legged hawks.

On October 21, following the passing of a cold front, a surprising number of bald eagles began to fly directly over us. At one point I was photographing a juvenile bald eagle that was soaring overhead, when out of nowhere, an adult came straight over a small patch of aspen trees and was forced to bank very abruptly to avoid a possible collision with me. What I would have given to have a film crew with us! We finished the day with 19 bald eagle sightings, 15 more than the next highest daily count for the species. It is worth mentioning that a family of bald eagles (two adults and one juvenile) nest about 5 km south of OVP along the river, and these birds may have been included in our counts. October 21 was also notable for a survey-high 11 sightings of northern harriers.

Interestingly, the RMERF survey at the Mount Lorette site in Kananaskis



recorded no raptors at all on October 21, while just 200 km to the east we observed 43 raptors at OVP. Observers at Mount Lorette reported their weather conditions as "Snowing and mountains lost in cloud and falling snow most of the day."[1] It is difficult to know if the lack of sightings was due to poor visibility, if the birds stayed put earlier in the day and waited for better weather, if they flew eastward through the prairies to find more favourable conditions to continue their migration, or a combination of these possibilities. All we know for sure is there were many more bald eagles moving south over OVP on October 21 than on any other day of our survey, and that raptors seem to take advantage of strong northerly winds and passing cold fronts.

One hawk that often stirs up excitement among Alberta birders is the Harlan's subspecies of red-tailed hawk. They pass through Alberta in the fall as they make their way from their breeding grounds in the Arctic to the central and southern United States. Schowalter warned us about these black red-tailed hawks and that we might have trouble identifying them at first. He was right! In true red-tailed hawk fashion, we quickly found out that Harlan's hawks come in a wide array of morphs. A juvenile light morph Harlan's we spotted near Big Valley spurred quite the identification debate on the Alberta Birds Facebook group. In total, we identified nine Harlan's hawks at OVP between October 8 and 23, including four during our road surveys and two in the river valley on our daily commute from Drumheller to OVP. It is interesting to note that our observations of red-tailed hawks (not of the Harlan's variety) during the road survey rapidly dropped off at the end of September and beginning of October, which coincided with an increase in Harlan's hawk observations.

On days when raptor sightings were scarce, we were often given a front-row seat to aerial acrobatics displays from ravens, and we watched chipmunks and thirteen-lined ground squirrels make preparations for the impending winter.

Another buteo that makes a brief but notable appearance during fall migration is the rough-legged hawk. Our first six sightings at OVP came on October 7 and we identified 27 birds in total between the October 7 and 26. A total of 16 rough-legged hawks were observed during our six road surveys, with a high of nine observations on October 14.

You never know what you're going to get when you spend a few hours at OVP. We regularly saw moose, mule deer, coyotes, and beavers in the valley below. It was not unusual to see osprey scooping fish out of the river throughout September, and we were visited by waxwings, spotted towhees, mountain bluebirds, and a variety of woodpeckers. On days when raptor sightings were scarce, we were often given a front-row seat to aerial acrobatics displays from ravens, and we watched chipmunks and thirteen-lined ground squirrels make preparations for the impending winter. On the other hand, while we regularly saw kestrels and merlins during our road surveys in September, it was uncommon to see falcon species at OVP. Similarly, Swainson's hawks appeared to be underrepresented at the viewpoint. Turkey vultures are a common sight over Drumheller and Nacmine, but we

A Harlan's hawk soaring straight overhead of the surveyors at Orkney Viewpoint. RYAN WILKES

didn't see a single one soaring near OVP, just 18 km to the north.

Our findings suggest that raptors use the Red Deer River valley as a fall migration corridor; however, the numbers do not appear substantial enough to warrant a more in-depth study. That said, OVP offers birders the opportunity to see several species of raptor from a unique vantage point. Birds flying through the valley were often at or even below eye level, and sometimes passed within a few metres. This location offers some great opportunities for the patient and dedicated birder looking for an experience that is hard to replicate elsewhere in southern Alberta. And if you're willing to pay close attention to the weather forecast and can be at OVP on a fall afternoon with a passing cold front, you may bear witness to a spectacle of dozens of raptors flying south throughout the day. ■

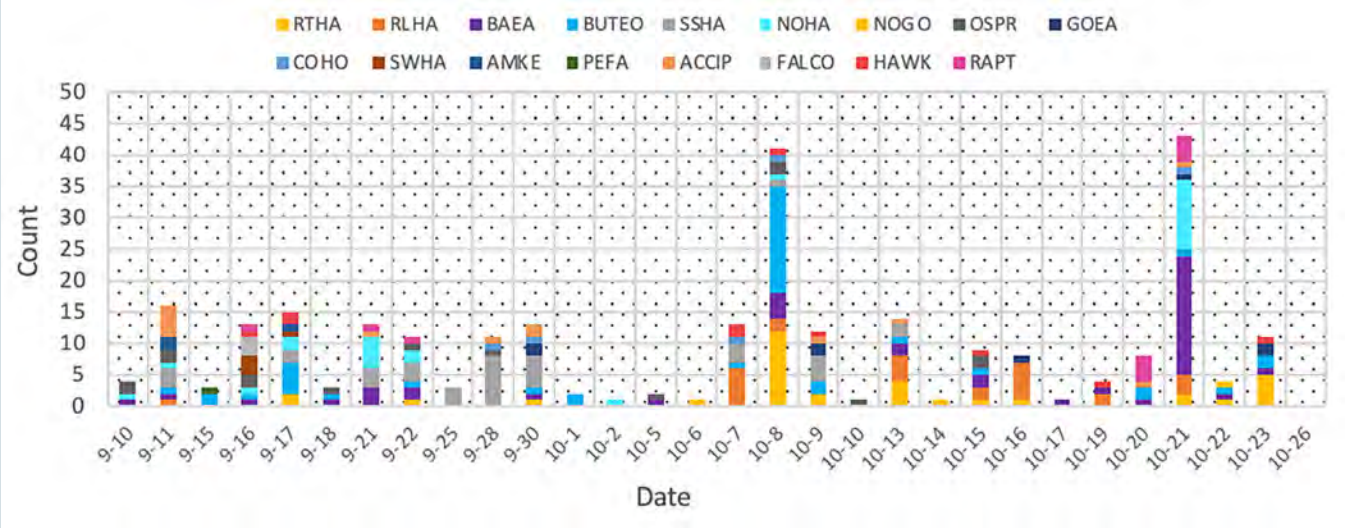
Looking south over the Red Deer River valley from Orkney Viewpoint. RYAN WILKES

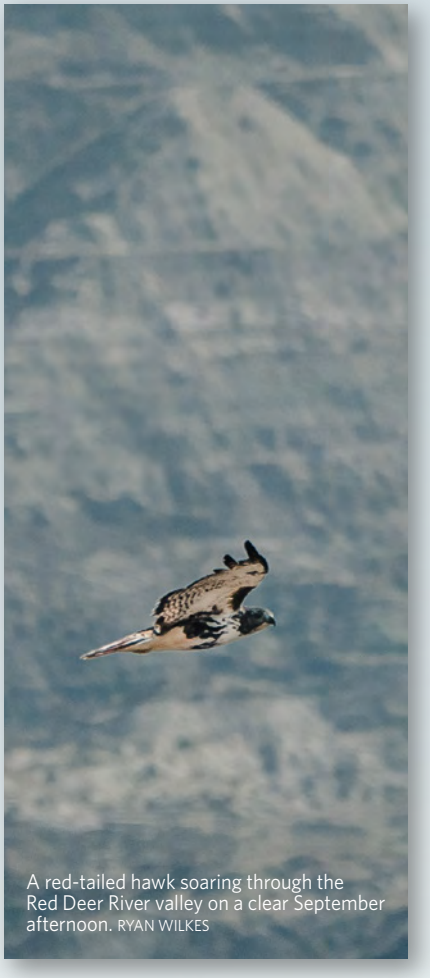
References:

1. Wilson, B. and C. Hansen. 2020. RMERF Count Summary 21/10/2020. eaglewatch.ca/rmerf-count-summary-2020-fall/ (2020).

Ryan Wilkes is a filmmaker, photographer, and PhD candidate in Biomedical Engineering. You can find out more about his work at **ryanwilkes.com**.

Heather Blanchette is an avid nature lover who is passionate about making conservation accessible to everyone.





A red-tailed hawk soaring through the Red Deer River valley on a clear September afternoon. RYAN WILKES

Name	Total Observations	Daily High	Date of Highest Count
Red-Tailed Hawk	43	12	Oct 8
Rough-Legged Hawk	27	6	Oct 7, 16
Swainsons Hawk	5	3	Sept 16
Sharp-Shinned Hawk	37	8	Sept 28
Cooper's Hawk	5	1	Sept 28, 30, Oct 7, 8, 21
Northern Goshawk	1	1	Oct 22
Northern Harrier	25	11	Oct 21
Osprey	15	2	Sept 10, 11, 16, Oct 8, 15
Bald Eagle	48	19	Oct 21
Golden Eagle	8	2	Sept 30, Oct 20, 23
American Kestrel	3	2	Sept 11
Peregrine Falcon	1	1	Sept 16
Unidentified			
Buteo	42	17	Oct 8
Accipiter	13	5	Sept 11
Falco	3	3	Sept 16
Hawk	11	2	Sept 17, Oct 7
Raptor	10	4	Oct 20

Acknowledgements

Ryan Wilkes and Heather Blanchette completed this work as part of Stage 2 of the Canadian Wildlife Federation's Canadian Conservation Corps program. The authors would like to thank Kim McGough from the CWF, Stan Solberg, the Town of Drumheller, and Kneehill County for making this work possible. Special thanks to Tim Schowalter for his supervision, guidance and expertise, and to Jim McCabe for sharing his knowledge of the area.

Stories in the Snow

BY MARGOT HERVIEUX

The woods and fields may seem empty at this time of year, but even a short walk through new snow reveals all kinds of activity. Reading the stories told by animal tracks is a great way to discover who is living beyond your back door. You can follow a grouse as it searches for food or spot where an owl has captured its prey simply by looking at marks left in the snow.

Many city and country residents, especially those with bird feeders, are likely to have red squirrels active in their yards. Squirrels usually leave tracks in groups of four with the slightly larger hind feet showing ahead of the front feet. Their trails are easy to spot as they run between trees and you can also find holes in the snow where they tunnel down to food stashes.

Snowshoe hare and jackrabbit track sets also show all four feet, but the furry hind feet are at least twice as large as the front feet. The hopping gait of these hares also results in the front feet landing behind the back feet. Hares are easy to track as they move about. Watch for hiding places and feeding areas where branches have been stripped of bark and twigs neatly snipped off at an angle.

Long, sleek weasels bound through the snow, leaving a line of paired tracks. By looking at the size of the footprints and measuring the distance between tracks, you can usually figure out whether the hunter was a short-tailed weasel, a mink, or occasionally even a martin or fisher. Also watch for places where the animal popped down under the snow to look for dinner.

During the winter, mice spend most of their time under the snow. Both deer mice and meadow voles will, however, come up to the surface to cross barriers or check their surroundings. Voles usually leave paired tracks that look like miniature weasels. In contrast, deer mice move more like squirrels and leave tracks in sets of four. In light snow, the long tail of the deer mouse may also leave a mark. Small, isolated holes in deep snow are actually air vents created by mice to bring fresh air into their winter chambers.

Hares' large back feet are at least twice as large as their front feet.

Deer mice and squirrels will leave tiny tracks in sets of four.

Larger animals also leave signs of their presence as they pass in the night. Coyotes and foxes leave a wandering trail as they check every sound and smell in search of food. Like all dogs, their feet have four clawed toes in front of a broad foot pad. The distinctive hoofprints of deer and moose are also easily recognized as they step lightly through the snow.

The morning after a fresh snow, I always scan my backyard from an upstairs window to check for signs left by unseen visitors. I'll notice where the deer have stopped to check my flower

The meandering tracks of a curious fox.

beds and sometimes see the zigzag path of a red fox circling through the yard. There may even be delicate wing-prints left by a chickadee as it took flight with a fallen sunflower seed. Without the stories left in the snow, I would never know who had dropped by. ■

Margot Hervieux is a founding member of the Peace Parkland Naturalists, an honorary member of Nature Alberta, and a longtime Nature Alberta board member. This article originally appeared in her "Naturally Yours" column in the *Peace Country Sun*, which she has been writing for 15 years. You can read more of her archived columns at peacecountrysun.com.

A silent lynx has stalked through the snow.

Nature Kids

My BIG Alberta Backyard

BY ZOE MACDOUGALL, NATURE KIDS PROGRAM COORDINATOR

Alberta is a great place to live. It's a big beautiful province full of all kinds of natural wonders. This is where we introduce you to the diversity of wildlife, and unique and interesting wild spaces, that are part of your Big Alberta Backyard. This time, let's explore the Grande Prairie Trumpeter Swan Important Bird and Biodiversity Area (IBA) located in Saskatoon Island Provincial Park.

What is an IBA?

The Important Bird and Biodiversity Areas program is a global initiative to monitor and conserve natural areas that are important for birds and biodiversity. This program was started by BirdLife International to recognize significant places for bird and biodiversity conservation around the world.

In Canada, Birds Canada and Nature Canada have partnered to provide information about ways that we can work together to keep these important areas wild and healthy for our furry and feathered friends! There are 325 IBA sites in the country and 47 of those are located here in Alberta. You can learn more about Alberta's IBAs and how to visit these sites by downloading our Important Bird and Biodiversity Areas Checklist at **naturealberta.ca/guides-checklists**

Saskatoon Lake within the IBA, which many birds call home. KELSIE NORTON

Grande Prairie Trumpeter Swan IBA

The Grande Prairie Trumpeter Swan IBA is located near the city of Grande Prairie in the Saskatoon Island Provincial Park, just a quick 25-minute drive from the city centre. It has several lakes that many species of birds call home every year — more than 150 species have been recorded here! It is a significant area for waterfowl and a special place for trumpeter swans. These wonderful birds migrate here in the spring to breed and stay until the fall when they migrate south. This area is especially important for trumpeter swans because over 100 years ago biologists thought that these birds had completely disappeared in Canada, but a small flock was found in this area in 1918. This led to Saskatoon Lake becoming a Federal Migratory Bird Sanctuary 30 years later, and the trumpeter swan numbers kept growing!

A family of trumpeter swans at Saskatoon Island Provincial Park. KELSIE NORTON

If you live in or around the Grande Prairie area or if you are visiting the area, Saskatoon Island Provincial Park, one of Alberta's first provincial parks, has lots for any naturalist to explore! There is a wide variety of plants and animals to see while you take a nature walk on the four kilometres of trails through the forests, wetlands, and native prairies! There is a viewing platform on Little Lake where you can watch the trumpeter swans in the summer. You can also camp and canoe, and cross-country ski and snowshoe in the winter! ■

Nest seen while walking the trails during the Great Backyard Bird Count event in February 2020. ZOE MACDOUGALL

Great Backyard Bird Count

Nature Kids hosted a **Great Backyard Bird Count** event in this IBA last year and hopes to host another one in **February 2021**, so keep an eye on our website, **naturealberta.ca** for more info (look for **Events** under **Experience Nature**). *Hopefully you can join us to explore this natural area!*

Nature Kids

Out and About

BY ZOE MACDOUGALL, NATURE KIDS PROGRAM COORDINATOR

Winter is a wonderful time to get outside and explore nature! All you need is a few warm layers and a Thermos of hot cocoa and you're ready for an outdoor adventure!

In this Out and About activity, we have gathered some outdoor winter sights and activities and put them in a word search. Words are hidden across, up-and-down, and diagonally. Once you have found all the words in the search, head outside on a scavenger hunt and see how many of the words you can find for real while out on a nature walk! Some will probably be easy to spot, while others are pretty rare and special. **Happy Exploring!**

Explore Winter!

W	U	U	X	S	W	T	G	K	W	C	O	R	I	K	R	S	P
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T	O	B	O	G	G	A	N	M	S	C	M	C	B	D	Y	O	S
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K	J	W	K	G	V	K	Z	P	R	I	K	L	U	K	N	Y	P
S	S	T	J	M	A	S	T	C	R	C	S	Z	E	S	H	O	Z
W	L	K	Y	S	B	Y	M	B	A	K	U	K	J	M	B	W	Y
G	Z	M	A	G	N	E	B	R	Q	A	N	A	A	D	Y	L	M
G	H	F	D	T	Y	O	T	A	Q	D	D	D	Y	S	D	D	D
S	N	R	O	N	I	L	W	V	K	E	O	R	X	B	S	H	S
K	O	O	A	B	A	N	N	S	U	E	G	F	S	H	L	H	M
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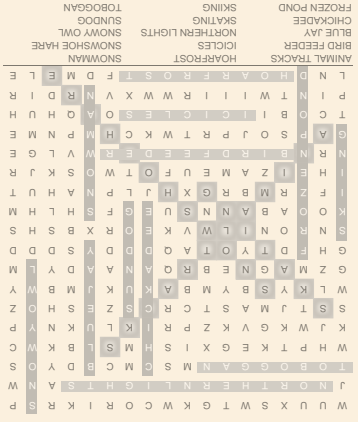
ANIMAL TRACKS
BIRD FEEDER
BLUE JAY
CHICKADEE
FROZEN POND
HOARFROST
ICICLES
NORTHERN LIGHTS
SKATING
SKIING
SNOWMAN
SNOWSHOE HARE
SNOWY OWL
SUNDOG
TOBOGGAN



Nature Kids

Ask Stuart

ZOE MACDOUGALL, NATURE KIDS PROGRAM COORDINATOR

Welcome to Ask Stuart, a regular feature in which Stuart, our Nature Kids mascot (who just happens to be a swift fox) responds to questions asked by kids across Alberta. From time to time Stuart will also ask local experts to help him answer these questions. If you have a question you would like to ask Stuart, send it along to our Nature Kids Program Coordinator at naturekids@naturealberta.ca and it may be featured in a future issue.

Q How do cold-blooded animals, like reptiles and amphibians, get through Alberta's frigid winters?

Have you ever wondered where the frogs, toads, salamanders, snakes, lizards, and turtles of Alberta go in the winter?

Alberta is home to ten different amphibian species — two salamanders, four frogs, and four toads — and nine reptile species — seven snakes, one lizard, and one turtle. Many people aren't aware of just how many amphibian and reptile species Alberta has and these little critters are very fascinating indeed! If you would like to learn more about the amphibians and reptiles of Alberta, check out the Alberta Amphibian and Reptile Conservancy's website: **savingalbertasherps.org/species**

Amphibians and reptiles are ectotherms, which means that they are cold-blooded and regulate their body temperature using outside sources such as sunlight. Because of this they are at a huge risk when the temperatures start to change and get colder. Reptiles such as snakes do something similar to hibernation called brumation, where their metabolism slows down and they decrease their movements to conserve energy. They find a place to nest, called a hibernaculum, and stay there for the winter, often with hundreds of other snakes. Terrestrial toads and frogs do something quite the same as snakes, where they find a log or burrow to stay warm in and slow down their metabolism to save energy. Aquatic species of reptiles and amphibians do things a bit differently. Frogs find a body of water that has lots of flow and oxygen and spend their winter on top of the mud in the water. The western painted turtle buries itself in the mud where it will not freeze and breathes through its skin! ■

Q Why do the days get shorter in the winter?

Winter in Alberta means the days get shorter and the weather gets colder. The closer we get to the winter solstice (the first day of winter, December 21, which also happens to be the Nature Kids Program Coordinator's birthday!), the earlier it gets dark outside. This occurs because the Earth is on a tilted axis (the imaginary line on which the earth rotates). During the winter months, as the Earth rotates around the sun, the northern hemisphere (the northern half of the Earth where Canada is located) leans further away from the sun, and the further away from the sun we are, the less sunlight we get and the shorter our days are. ■

Information gathered from:
loudounwildlife.org/2019/11/ectotherms-in-winter-how-do-reptiles-and-amphibians-survive/

MEET A MEMBER CLUB

BY RYAN JAMES AND LIZ WATTS

Alberta Mycological Society

The Alberta Mycological Society (AMS), founded in 1987, has a particular fondness for fungi and mushrooms. Our membership is large and stable with approximately 500 members provincewide. We hold an annual Mushroom Expo at the University of Alberta Botanic Garden where we introduce people to mushrooms with displays of currently fruiting fungi, provide mushroom tastings, and lead forays in the gardens. In 2019 we had our best attended expo ever, with 1,300 attendees, despite showery weather! Unfortunately, the 2020 Mushroom Expo and our Great Alberta Mushroom Foray (GAMF) were cancelled due to COVID-19.

GAMF is a citizen science initiative that surveys mushroom biodiversity in a different area of Alberta each year. Through GAMF we have developed mushroom collection, preservation, and DNA sampling practices and techniques that are being adopted by other mushroom clubs across North America. GAMF is a great way to learn to identify mushrooms, which is critical to knowing which mushrooms are edible and which are poisonous. We have a saying: "There are old mushroom pickers and bold mushroom pickers, but no old bold mushroom pickers." To help those new to mushroom identification we offer an "Introduction to Mushrooms" course at every GAMF. Our 2020 GAMF, which was scheduled for Zama City in northeastern Alberta, was cancelled due to public health safety concerns and travel restrictions preventing mycologists from the U.S. travelling to the event.

We hold regular mushroom forays for members throughout the summer. Our most active regions are Edmonton, Red Deer, and Calgary. The 2020 foray season was challenging, but we found responsible ways to continue these activities and give members an opportunity to get outside. We created a set of foray rules based on public health guidelines. Foray participants had to wear masks during check-in and check-out procedures, and during post-foray mushroom identification. Hands also had to be sanitized before touching any common surfaces. While foraying, participants were asked to stick with their travel cohort. We saw an increase in member participation, with many forays having waitlists due to participant number capping. The rules were well respected and led to a safe, socially distanced foray season.

Our Speaker Series moved online, with webinars on fungal reproduction, fungal conservation in Alberta, mushroom cultivation, mushroom identification, and being "bear smart" while foraying in the woods. Our delayed annual general meeting also went virtual in October. We emerged with a new board full of diverse experience and skillsets. We're in a good position to continue offering mushroom-themed nature activities.

Despite COVID-19, AMS has remained resilient by adapting to the new, challenging environment. We were successful in safely encouraging Albertans to explore the outdoors and engage with the natural world.

Please visit our website, **albertamushrooms.ca**, for more information about AMS, our activities, and membership options, or email **contactus@albertamushrooms.ca** ■

Ryan James is a Professional Biologist and the current Foray Coordinator for the AMS. Liz Watts is a microbiologist, clinical researcher, and AMS Board Member at Large in addition to her new role as President of Nature Alberta.

Alberta's Nocturnal Owl Survey

Participate in the 20th Year in 2021

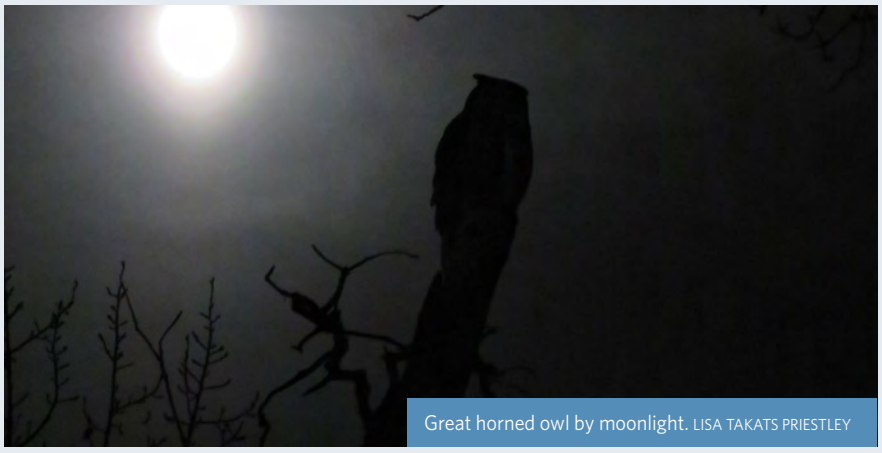
BY LISA TAKATS PRIESTLEY

The Alberta Nocturnal Owl Survey has been running for 19 years. The survey is coordinated by STRIX Ecological Consulting and was initiated in 2002 as part of a Canada-wide National Owl Survey program run by Bird Studies Canada. The help of volunteers has been crucial in helping determine owl population changes in the province. As part of a network of organizations from across Canada conducting nocturnal owl surveys, this citizen science program collects important long-term information on owl distribution, abundance, and population trends regionally, provincially, and nationally. The volunteer data has also been provided to various agencies to help inform survey designs in remote areas and help with habitat management considerations.

Raptors, such as owls, can be good indicators of the health of the environment because they respond relatively quickly to changes in habitat and food availability. Alberta is fortunate to have 11 commonly detected species of owls. Of these, only six are considered nocturnal: boreal owl, barred owl, great gray owl, great horned owl, long-eared owl, and northern saw-whet owl. All species have unique calls that help us identify them. Owls call to protect their territory from other owls or to attract a mate and begin setting up their territory.

Raptors, such as owls, can be good indicators of the health of the environment because they respond relatively quickly to changes in habitat and food availability.

Broadcasting recordings of owl calls can increase the number of owls you hear; therefore, roadside call-playback surveys are one of the most widely used and most effective techniques to survey owls.



Great horned owl by moonlight. LISA TAKATS PRIESTLEY

Northern saw-whet owl. LISA TAKATS PRIESTLEY

We have almost 200 volunteers surveying about 100 routes throughout Alberta, however we have many routes available across the province. The more coverage we have, the better our picture of nocturnal owl health. Surveys are run twice between March 20 and May 5. All you need is a reliable vehicle (it is a roadside survey); an MP3 player, CD player, smartphone, or other device to play owl calls; and lots of enthusiasm! We provide information on safety supplies to bring with you, and have a COVID-safe protocol for you to follow. If you would like to participate, please contact Lisa Priestley via email at **lisa@strixeco.ca** or by phone at **780-662-4909**. Please let us know a general area (around what town/city/region) you would like to survey, and provide a mailing address so we can send you a package and route. Survey packages are mailed in February. ■

Lisa Takats Priestley is a Professional Biologist with an M.Sc. in Wildlife Ecology and Management. She is the co-owner of STRIX Ecological Consulting. Her Master's thesis work led to her taking the lead on developing nocturnal owl monitoring guidelines now in use throughout North America.

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