A publication of Alberta Conservation Association

# Conservation

## Snakes ON A PLAIN
Myth vs reality

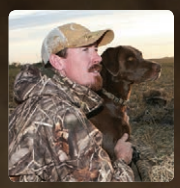
## Active in the Kakwa
In search of the holy grayling

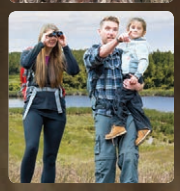
## Using their noses
Invasive species-sniffing dogs

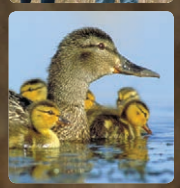
SPRING/SUMMER 2018

PM #41260556

# GAME ON!







Whether you're a hunter, hiker or birdwatcher, Ducks Unlimited Canada (DUC) conservation projects are your playing field. In Alberta, DUC has secured more than 2.3 million acres since 1938 and has 2,132 habitat projects. That's a lot of turf, so get in the game. **Wherever you live in Alberta, you're invited to get outdoors and play!**

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# content




Alberta Conservation Association

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# Edson Creek
## Conservation Site

photo: ACA, Stefanie Fenson

Alberta Conservation Association

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## Our Vision

**An Alberta with an abundance and diversity of wildlife, fish and their habitats; where future generations continue to use, enjoy and value our rich outdoor heritage.**

## Our Mission

**ACA conserves, protects and enhances fish and wildlife populations and their habitats for Albertans to enjoy, value and use.**

photo: Linda Zimmerling

# From the President

To say it has been a long, cold winter would be an understatement. We set all kinds of records this year, that none of us wanted. Edmonton was the City of Champions again by beating a 43- year-old record for the most days in a row with temperatures dipping below zero: 167! Calgary set several snowfall records, and across the entire province I am sure there were records for the number of curse words uttered by Albertans as they got dressed to go out and shovel snow again! But as is always the case, winter has finally relented and spring is upon us.

When the first warm sunny weekend of spring finally arrived, I rushed straight out into the fields to the east, dressed myself like a snow bank, and tried my luck at harvesting a snow goose or two as they made their way to their arctic breeding grounds. Although my snow bank impression didn't fool too many geese, there were thousands, even tens-of-thousands passing overhead.

As the spring snow goose season wraps up, I will be looking towards other warm(er) weather pursuits like fishing for walleye at one of our many productive lakes in central Alberta. If you are planning to take your boat out this summer, you'll likely be interested in the article on stopping the spread of mussels into Alberta's waterbodies. If you are into hiking the southern prairies, check out our articles on rattlesnakes and on burrowing owls. If you would rather spend some time casting a fly for a large brown trout, then you definitely have to read about the donation we have received on the North Raven River.

Regardless of what your snow-free passion is, now is the time to do it. Based on this last year you only have five more months before that snow shovel comes out again!

Enjoy your summer.

Todd Zimmerling
President and CEO
Alberta Conservation Association

## Conservation Magazine


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# workout
The latest from the field.

## -30° Won't Stop Us

Have you ever wondered where the fish go in the winter? ACA biologists in collaboration with Alberta Environment and Parks (and thanks to funding by Alberta Innovates and DFO) have been wondering too. And not just because they are merely curious but also in an effort to better understand the winter habits of mountain whitefish and ensure their habitat is protected.

In September 2017, radio tags were implanted into 54 mountain whitefish that were released back into the McLeod River. During monthly aerial surveys over the river, biologists used telemetry to determine fish locations. Most fish made their way downstream from where they were originally tagged, travelling longer distances from September to November than from November to March. Fish travelled an average of 20 kilometres, but the most adventurous fish traveled a total of 89 kilometres.

In order to determine the types of habitat whitefish prefer, biologists had to get on the river. Using snowmobiles, they travelled to known fish locations and sampled water quality, velocity, and habitat type. After all that outdoor fun, biologists are now crunching the numbers to see if mountain whitefish show a preference for one type of habitat over another. Stay tuned!

Says the lead Biologist on the project, Britt Schmidt, "We spent 20 hours in the helicopter, travelled over 600 km by snowmobile, drilled more than 400 holes through the ice, and worked in temperatures ranging from -34 to +8 to track these fish. It's been quite the winter but we are very happy with the success of the project."


photo: ACA, Scott Seward

## Grizzly Affairs

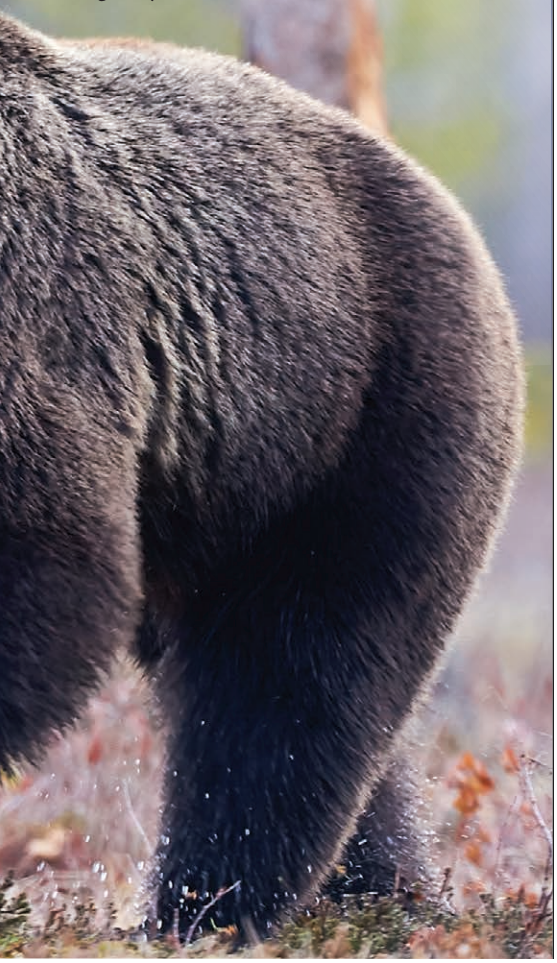
### How many grizzly bears are in Alberta?

As bears are not reliable at filling out census forms, we use different ways to count them. The province is divided into Bear Management Areas (BMA) and information is collected by the Alberta government to better understand grizzly bear populations, density, and distribution.

BMA1 covers a sizeable area in northwestern Alberta, mostly uninhabited by humans. Because this part of the province is difficult to access and it was traditionally not thought to have many grizzlies, very little research has been conducted in this area. That changed in 2016 when Alberta Environment and Parks (AEP), along with its partners developed a population monitoring program using non-invasive genetic tagging and spatially explicit capture-recapture techniques (SECR).

In the summer of 2017, ACA came on board to set up and collect hair samples from 252 lured barbed wire corral traps. Mike Ranger, ACA Technician explains the method: "We wrap a single strand of barbed wire around four larger trees at about 60 – 70 cm in height, creating a 'corral' then pour lure (a slurry of fish, meat from road-killed wildlife, and used cooking oil that has sat in buckets rotting for a year) in the middle." The sites were checked five times over the season, with hair being collected during the second through fifth round. At each visit, remmnants were burned off, and lure was re-applied. On the fifth and final visit the sites were torn down.

ACA monitored an average of 60 ground-accessible sites and 120 remote sites (accessed by helicopter) while AEP monitored the remaining sites. From there, hair samples were sent to a lab for DNA analysis. The results will tell us the species, gender, and total number of individual bears that have visited the sites. "Once the results are back," says Ranger, "an analysis will take place, and AEP will use the data to calculate a population estimate for grizzly bears in BMA1."



# kids can catch

Multiple **Kids Can Catch** events are held across the province every year. Kids (and adults, too) are invited to come out and drop a line. Volunteers are on hand to help participants learn how to bait a hook, handle the fish they catch properly, and answer any questions.

photo: ACA, Don Myhre

## Join us at one of these events:

**Lacombe Kids Can Catch**
Saturday June 2, 2018

**Lamont Kids Can Catch**
Saturday June 2, 2018

**Slave Lake Kids Can Catch**
Friday, June 8, 2018

**Fort Saskatchewan Kids Can Catch**
Saturday, June 9, 2018

**Beaumont Kids Can Catch**
Sunday, June 10, 2018

**Cochrane Kids Can Catch**
Sunday, June 16, 2018

**Stettler Kids Can Catch**
Saturday, July 7, 2018

**Yellowhead County Kids Can Catch**
Thursday, July 5, 2018

**County of Newell Kids Can Catch**
Saturday, July 7, 2018

**Coronation Kids Can Catch**
Sunday, July 8, 2018

Events are often added, check **ab-conservation.com/events/kids-can-catch** regularly and follow us on Facebook or Twitter for updated event listings.

## Internet RAPping

For over 20 years, you've been able to call 1-800-642-3800 to report any suspected poaching activity. As of fall 2017, it's become possible to report poachers online. Fish and Wildlife Officers still need the same information: date and time, description of what happened, community where violation occurred, location description, suspect's description, vehicle description, and any further information that might help make an arrest. Online reporting also allows you to upload any photos.


**Report A Poacher** covers more than just suspicious hunting or fishing activity. You can also report wildlife emergencies (e.g., bear encounters) and serious public land abuses.

# Some of ACA's most recent grant recipients

There are a lot of great ideas out there when it comes to conservation, and behind every single one is passion to work harder and do better. Our job? To help bring as many of those ideas as possible to life. Through Alberta Conservation Association's grant program (funded by hunters' and anglers' licence levies), we support education or research projects that benefit Alberta's fish, wildlife, and habitat. Take a peek at a few recipients who are turning big ideas into big change.


## Fresh air is better

We all know getting outside can make all the difference to our well-being (who doesn't feel better after a weekend spent outdoors?)—but the reality is, it's difficult for some families to make that happen. Nature Alberta's Nature Kids program helps families get outside and explore nature in ways that they may not have a chance to otherwise.

For many years, ACA has provided funding for Family Nature Nights in Edmonton. Wednesday summer nights bring us urban critters, fungi and lichen, and water as a few examples of themed events to come. Hundreds of people come check it out, and many families come back year after year.

ACA is now also funding Nature Alberta's latest project, BioBlitz. It takes nature exploration to the next level, with weekend BioBlitzes happening in local chapters—Grande Prairie, Athabasca, Edmonton, Morinville, Lakeland (St Paul and Bonnyville), Calgary, Red Deer, and Heartland (Erskine and Stettler).

Walking through nature with a guide, taking in fascinating presentations by local experts, and identifying species with biologists and nature nuts from across the province… the program is always offering new ways to connect with the outdoors. At the end of it all, families get to take with them pieces of knowledge they'll have forever. And of course, that fresh air just can't be beat.

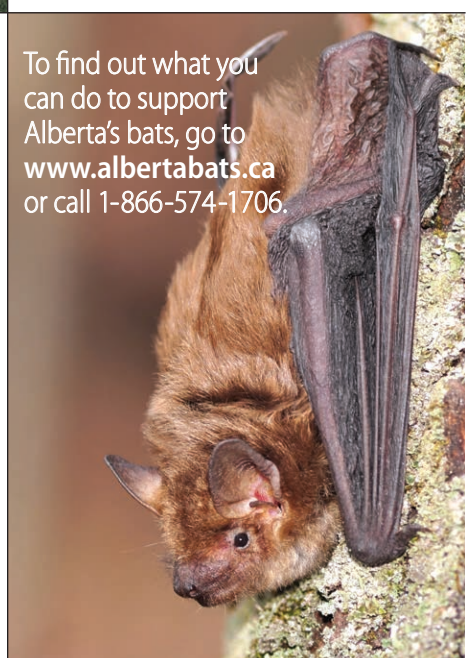
Check out **naturealberta.ca** for more information.

# The threat goes west

It's becoming common knowledge: bats are essential. But three Canadian bat species are *Endangered*, two of which are found in Alberta: little brown myotis and northern myotis. The culprit is White Nose Syndrome (WNS), a disease that emerged in 2006. Sadly it continues its rampage, causing widespread mortality and threatening species with extinction.

ACA funds a research project (*Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting Risk of White-Nose Syndrome to Guide Conservation Actions*) that will help forecast the impact WNS will have on our bats. As WNS spreads further westward, researchers are desperate to understand baseline data about Alberta's bats. Just think—if we can predict the severity of WNS and thus the likely reduction in bat populations when the disease arrives, we can develop strategies ahead of time.

So far, project leads hypothesize that northern bats could be adapted to colder and perhaps drier hibernation temperatures (i.e., have stored fat reserves and lower metabolic rates than southern bats). This means northern bats might experience reduced fungal growth. If that's the case, then more emphasis could be put on mitigating WNS in southern locations of the province.



For more information on grant recipients, visit:
**www.ab-conservation.com/grants-2018**

Since 2002 we've granted **$18 million** to conservation-related projects throughout the province.


photo: Alberta Hunters Sharing the Harvest program

# The power of protein

Can you imagine what 300,000 pounds of nutritious wild game looks like? We'll tell you—it looks like half a million meals. All donated and all feeding the less fortunate.

In Alberta, successful harvests mean successful food banks. Back in 1996, Alberta Foodbanks was desperate for high-quality food sources to help feed those in need. Since then, individual hunters and hunting organizations have stepped up through Alberta Hunters Sharing the Harvest, which partners with local food banks and Fish and Wildlife Officers. The program enables hunters to share their harvest through approved meat-processing venues with stringent handling processes. Meat processing is expensive, and costs for this program are covered by generous donations from various hunting organizations in Alberta. ACA has helped fund the program for most of its 22 years.

The general public have been on board since day one, and great support from Alberta's hunting community helps the Alberta Hunters Sharing the Harvest program continue to grow. "Funding has been the lifeblood of the program," says Jim Thomson, who leads the program. "Without it, we simply could not continue to operate."

Call 780-443-6006 to find out more about donation guidelines and participating meat processors.

► *by Ariana Tourneur*

# A pinch of salt

## The implications of nitrogen limitation in cyanobacteria in shallow lakes

► *by Susan Anderson*

Blue-green algae (also called cyanobacteria) grow as the result of eutrophication—when human activity contaminates rivers, lakes, and oceans with excess nutrients such as nitrogen and phosphorus. These excess nutrients predominantly come from fertilizer leaching from crops, effluent from municipal waste-water, and untreated sewage.

Cynobacteria change lake ecosystems because with excess nutrients, they can outcompete other types of algae resulting in blue-green algae "blooms" (meaning they form scums on the surface). In Alberta, we have blue-green algae blooms on shallow lakes, but when they bloom in Lake Erie or other large lakes and estuaries, the swirls of green growth can be seen from space. Algae are similar to plants, in that they form the base of the food chain. However, zooplankton (tiny "animals" such as water fleas) don't graze on blue-green algae as much as other types of algae, so when cynobacteria bloom, the energy doesn't transfer up the food chain from algae to zooplankton to water insects to fish. Instead, the energy is lost when the blooms decompose, and the decomposition uses up the oxygen dissolved in the lake, which can kill fish and threatens fish populations. Blue-green algae also produce nasty toxins that not only affect fish and wildlife, but humans as well.

Blue-green algae toxins create a public health concern because swimmers can get skin rashes, nausea, and vomiting from the blooms, and the toxins affect the liver and brain when accidentally consumed. Dogs, cattle, and other livestock can also get ill or die from drinking water from a toxic lake. Dogs are particularly affected when they swim in the lake and then lick the algae off themselves. The toxins lead to public health warnings and lake closures, which lowers the aesthetic value of a lake.

### From Hypothesis…

Often, the byproduct of results from one study can lead to new areas of research. While studying the structure of the ecosystems in shallow lakes, a PhD student found shallow lakes with a high range of saltiness, and others that had blue-green algae.

This lead to the question of how the salinity of a shallow lake would affect blue-green algae growth, and whether the algae would be able to get enough micronutrients in salty lakes. Shallow lakes in Alberta range in how salty they are because the water comes in through run-off bringing salts, and never flows out, only leaving through evaporation while leaving behind the salts. We further added sampling for toxins and nutrients to see if there are relationships between them. Scientists don't know why blue-green algae produce toxins—sometimes a bloom can be toxic, and sometimes it's not.

With funding from the ACA Grants in Biodiversity, we sampled 25 lakes through the summer of 2016 and visited each lake once a month for four months.

This study will help with our understanding of how salinity affects blue-green algae blooms, particularly if shallow lakes increase in salinity, and will help with understanding the conditions where blue-green algae produce toxins.

### …To Results

The results showed that there was a lot of cyanobacteria in shallow lakes in Alberta, and more blue-green algae growth when the nitrogen was limited. There was less blue-green algae growth when the lake was salty and the blue-green algae couldn't get enough micronutrients. Fifteen out of the 25 lakes exceeded the World Health Organization (WHO) drinking water guideline of one microgram per litre (µg/L ) of blue-green algae toxins (specifically microcystins), and five of the 25 lakes exceeded the Health Canada recreational guideline of 20 µg/L. One lake had an extremely thick cyanobacterial bloom—the sample had the consistency of a kale smoothie, and measured toxins equaled 5,688 µg/L!

Future studies could include looking at the genes that control toxins and nitrogen fixation. Hopefully this research will help with public health and watershed management of lakes with blue-green algae blooms in Alberta.

photo: Susan Anderson

# Second Cousins Once Removed

► *by Ashley Jensen*

photo: ACA, Ashley Jensen

## Ruffed grouse project results

Despite this bird species' familiarity, there has been a very limited amount of research focused on ruffed grouse in recent years. An area especially lacking in information is the population genetics of this species. Population genetics not only provides information about the gene pool of the study species, but more specifically, it can be used to assess the structure, size, and connectivity of populations. Genetic methods allow us to infer information about the overall population without sampling every single bird. This not only allows us to uncover interesting information regarding the evolutionary history of a particular species (or group of species), but it also provides important data that can aid in proper wildlife management.

If you read about my project in the Fall/Winter 2016 issue of *Conservation Magazine*, you may remember that the main goal of my research was to determine how much connectivity is occurring among the ruffed grouse populations of Alberta. After receiving many generous sample donations from hunters, I was able to examine the genetics of these samples, and make comparisons among populations of ruffed grouse throughout the province. I found interesting patterns from the data analysis. Potentially the most notable result in my study was the disconnect between the birds in the southwestern corner of the province and those occurring in central and northern Alberta.

It should come as no surprise that individuals that belong to the same genetic group are all genetically similar. As such, the results also tell us where population connectivity (or lack thereof) is occurring across the landscape. For example, if two sampling locations belong to the same genetic group, there is likely population connectivity between these locations, and the reverse is true if they belong to different groups. This information is important because it implies whether individuals are able to interbreed, and therefore, whether genes are exchanged among the populations in question.

I found that most of the populations belong to a single genetic group, and the individuals from the southwest corner of Alberta belong to a separate and very distinct genetic group. This leads to the conclusion that there is likely no, or very little connectivity between the birds in the southwest part of the province with those to the north.

This kind of disconnect among populations usually occurs because there is not a sufficient amount of appropriate habitat connecting the two populations. The loss of corridors among populations is a major problem for many species, and often occurs due to physical barriers preventing individuals from moving among the populations. This can be due to changes man has made to the landscape, or to natural barriers like mountains.

Interestingly, although the northern and southwestern grouse populations are separated due to the lack of appropriate habitat connecting them, it does not seem to be due to recent changes to the landscape. In fact, these two groups are so distinct that it's possible this lack of connectivity may have been ongoing since the last ice age, or perhaps even longer.

The other notably different area in the province is around Grande Prairie. Like the grouse further south, these birds belong to a different genetic group than those in the remainder of the province. Not nearly as distinct as the southwestern group, the birds from around Grande Prairie likely still have some connectivity with populations in the rest of the province. I speculate that the differentiation occurring in this area may be due to an influx of individuals from British Columbia. The Peace River Valley (very close to Grande Prairie) is the only uninterrupted valley in the Canadian Rockies that cuts all the way through the mountains. Due to the habitat preferences of ruffed grouse, individuals are unlikely to occur or move through vast stretches of coniferous forest or alpine habitats. Therefore, the mountains are likely acting as a barrier for grouse attempting to move between Alberta and British Columbia, leaving the Peace River Valley as the only major movement corridor between the two provinces.

The results of this research will be valuable to future management decisions for ruffed grouse, and they have also opened up further questions. The birds from the area around the Crowsnest Pass and Castle management area (where the southwestern Alberta samples came from) should be considered separately from the rest of the province when it comes to management strategies. The lack of connectivity with the rest of Alberta means the southwestern population may not respond in the same way to environmental change compared to other populations. They may also be more sensitive to changes because there is less gene flow, and therefore, fewer options for new adaptations as environmental conditions change. It is also perhaps not entirely surprising that grouse from this area are unique when considering this area is in many ways ecologically distinct from the rest of the province. Both the Crowsnest Pass/Castle area and the Grande Prairie area populations of ruffed grouse call for further research due to their distinctiveness. These results also beg the question of how many other species that inhabit Alberta have unique genetic groups in the Crowsnest/Castle/Waterton and Peace River Valley areas.

*This project was funded in part by an ACA Biodiversity Grant, and I want to express my gratitude to ACA for awarding me the funding for this project. I also want to express my most sincere thanks to all the hunters who donated samples. Your donations approximately doubled the number of Alberta samples! From 75 to over 150! Your help made this research possible.*

photo: Nick O'Neil

**Map of Ruffed Grouse genetic clusters.** Each colour represents a distinct genetic group. Black dots are sampling locations with a minimum of 10 individual samples from each site. Three groupings are shown: one including only birds for the Castle/Crowsnest area (blue), one containing only birds for the Grande Prairie area (yellow), and the remainder of the sampling sites all belonging to the same group (pink).

# The Burrowing Owls of Southern Alberta

► *photos and article by Sharif Galal*

There are 18 recognized subspecies of burrowing owls in North and South America and restricted to a very few remaining uncultivated prairies, the burrowing owl (*Athene cunicularia hypugaea*) is one of a handful of true Canadian prairie birds among all other Canadian birds.

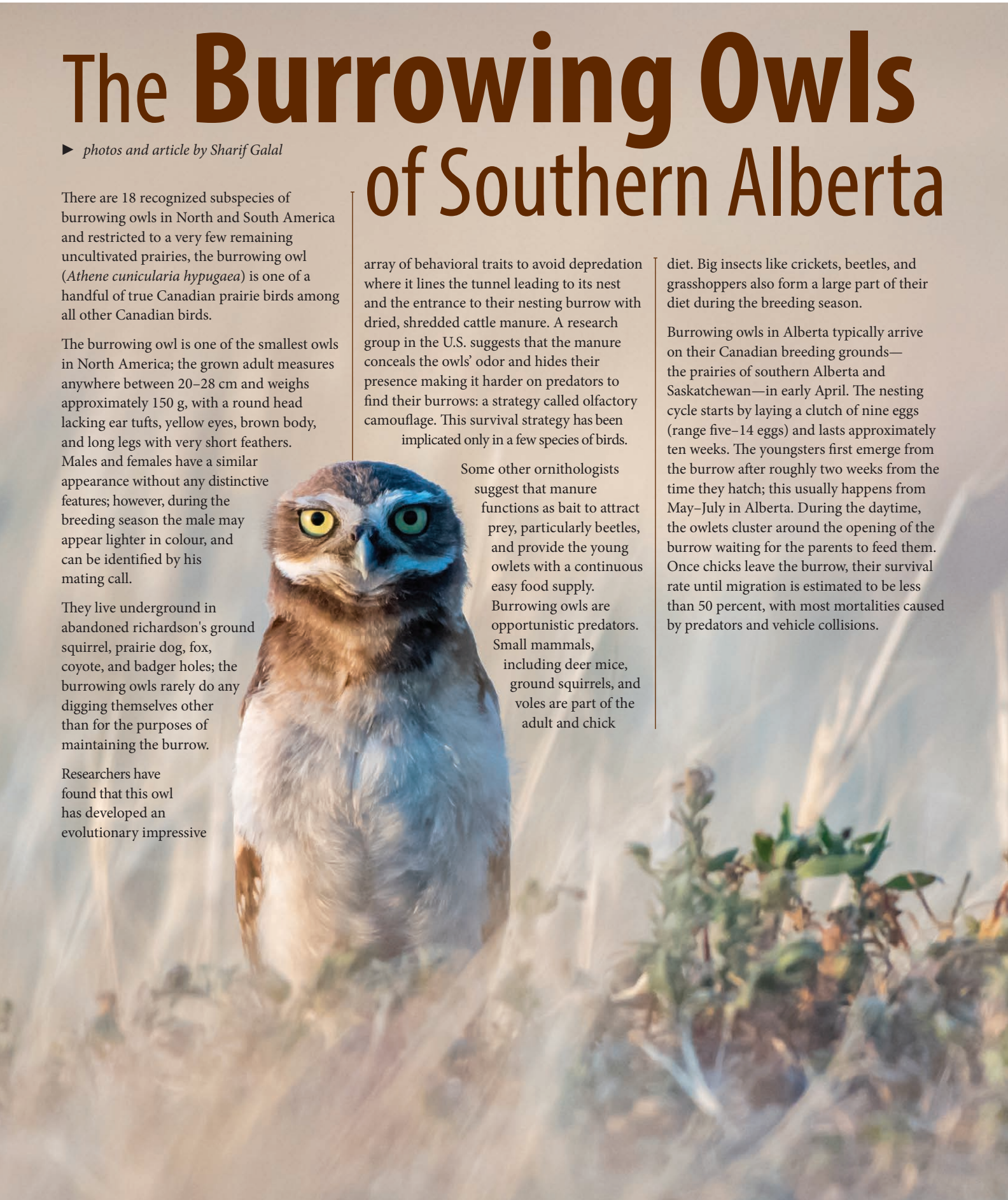
The burrowing owl is one of the smallest owls in North America; the grown adult measures anywhere between 20–28 cm and weighs approximately 150 g, with a round head lacking ear tufts, yellow eyes, brown body, and long legs with very short feathers. Males and females have a similar appearance without any distinctive features; however, during the breeding season the male may appear lighter in colour, and can be identified by his mating call.

They live underground in abandoned richardson's ground squirrel, prairie dog, fox, coyote, and badger holes; the burrowing owls rarely do any digging themselves other than for the purposes of maintaining the burrow.

Researchers have found that this owl has developed an evolutionary impressive array of behavioral traits to avoid depredation where it lines the tunnel leading to its nest and the entrance to their nesting burrow with dried, shredded cattle manure. A research group in the U.S. suggests that the manure conceals the owls' odor and hides their presence making it harder on predators to find their burrows: a strategy called olfactory camouflage. This survival strategy has been implicated only in a few species of birds.

Some other ornithologists suggest that manure functions as bait to attract prey, particularly beetles, and provide the young owlets with a continuous easy food supply. Burrowing owls are opportunistic predators. Small mammals, including deer mice, ground squirrels, and voles are part of the adult and chick diet. Big insects like crickets, beetles, and grasshoppers also form a large part of their diet during the breeding season.

Burrowing owls in Alberta typically arrive on their Canadian breeding grounds—the prairies of southern Alberta and Saskatchewan—in early April. The nesting cycle starts by laying a clutch of nine eggs (range five–14 eggs) and lasts approximately ten weeks. The youngsters first emerge from the burrow after roughly two weeks from the time they hatch; this usually happens from May–July in Alberta. During the daytime, the owlets cluster around the opening of the burrow waiting for the parents to feed them. Once chicks leave the burrow, their survival rate until migration is estimated to be less than 50 percent, with most mortalities caused by predators and vehicle collisions.



Owls migrate in fall. The migration routes and wintering grounds of Canadian burrowing owls are poorly understood despite several attempts to track owls during migration. There is some published data suggesting that Canadian burrowing owls typically winter in southern Texas, California, and northern and central Mexico.

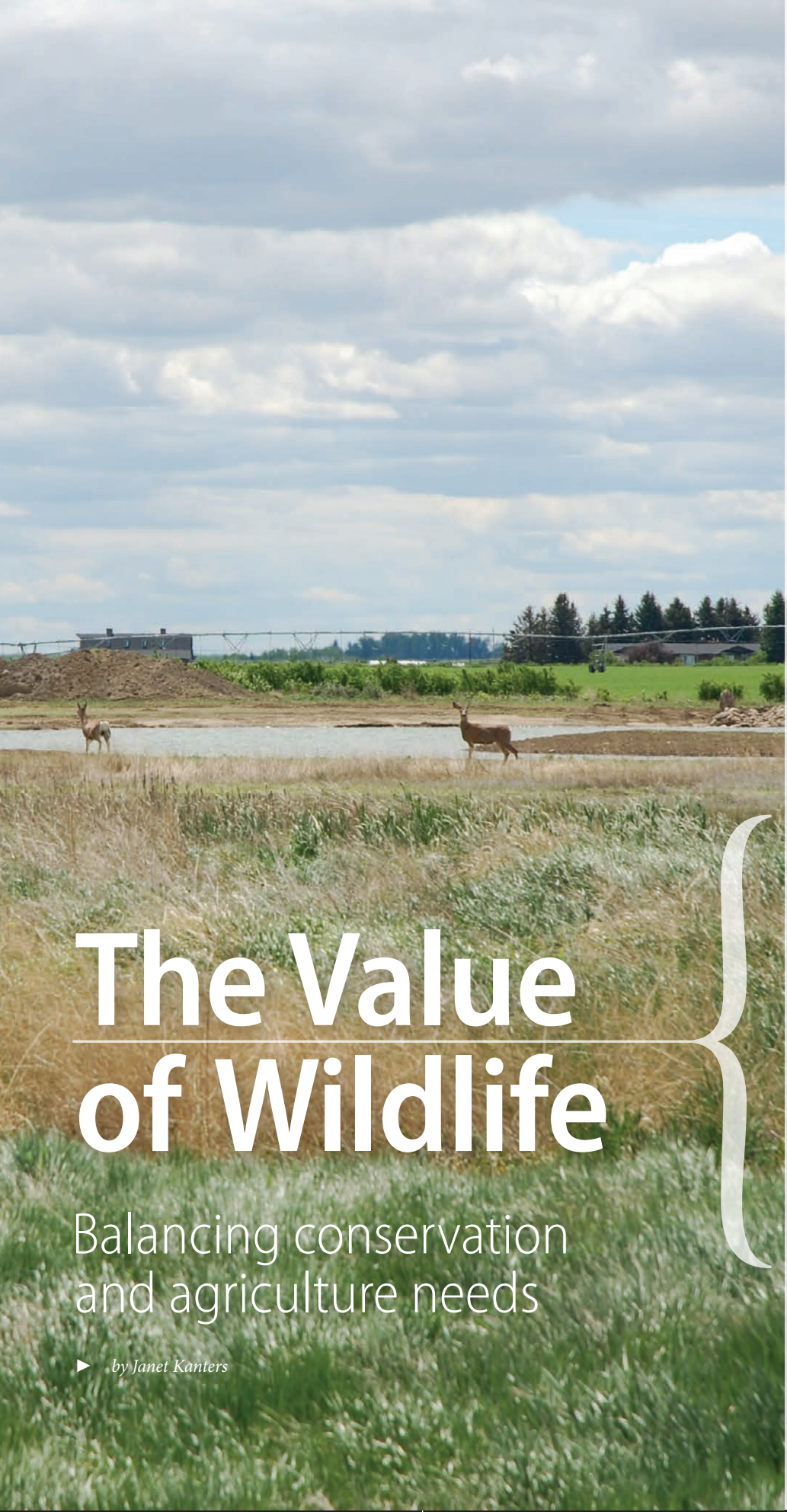
## Declining in numbers

The burrowing owl is currently listed as an *Endangered* species in Alberta under the *Wildlife Act*. It is also a federally protected species across Canada under the *Species-At-Risk Act*. The major contributing factor to the decline of burrowing owls is habitat loss due to expanding agricultural activities.

It is estimated now that only 20 percent of former native prairie remains undisturbed. As a result, burrowing owls are moving out of prairies to occupy sites such as ditches, railway allowances, and other sites that are exposed to traffic and other dangers.

The other main factor is the wide use of pesticides in agriculture. Spraying with some chemicals significantly reduces the breeding success of the owls, decreases the availability of their prey, and reduces the number of burrowing mammals. Pesticides sprayed over the burrows often kill the owls or lead to birth defects. When burrowing owls consume contaminated grasshoppers, they can die as a consequence of the poison, for example.

**If you spot a burrowing owl on your land or would like to be involved in protecting them, contact: Operation Grassland Community at 403-437-2342 or www.grasslandcommunity.org.**



# The Value of Wildlife

## Balancing conservation and agriculture needs

*by Janet Kanters*

Today's landscape is changing considerably due to urban encroachment and increased agricultural production—and an ever-rising human population. "This is a challenge and something we need to think about as a conservation organization," says Darren Dorge, Land Management Program Manager with Alberta Conservation Association (ACA).

"As the human population continues to grow so does the demand for agricultural lands for grazing and farmland. We need to think about how we can collaboratively work with the agricultural sector while still ensuring we can maintain and manage wildlife and their habitat."

photo: ACA, Budd Erickson

"We need to find a way to balance the needs of wildlife, while still maintaining a functional and profitable farming operation."

– Layne Seward

Many large-scale intensive agricultural operations in Alberta are becoming larger. But large operations can assist conservation groups by recognizing and providing areas on their farms that are considered more marginal for production, such as irregular fields, abandoned farmsteads, fence rows, areas around trees and shrubs, and wetlands.

"Many producers are great stewards of the land and they manage their land without receiving financial incentives," notes Dorge. "For the ranching community, most producers understand the philosophy that if you take care of the grass it will take care of you. For some farmers and ranchers, they can also be great stewards by leaving fringe areas and ensuring rangelands are managed for both livestock and wildlife.

"But to obtain buy-in, we need a variety of tools to offer, including education and information so that they will make management changes that will ultimately benefit their operation and have a conservation benefit. For others, it may require more of a financial incentive to make a change to their operation that may affect overall economics of the operation."

ACA recognizes the importance of working with agricultural producers, and as such, they have several programs and projects directed at working with private landholders, including MULTISAR, Landowner Habitat Program, Riparian Conservation Program, and the Upland Game Bird Enhancement Program. "ACA is also considered a landowner—we own over 30,000 acres across Alberta," says Dorge. "We work with neighbouring landowners on some of our conservation sites to meet our habitat management objectives which often involves grazing, haying, seeding, etc."

Layne Seward is a fourth-generation farmer in the Foremost area of southern Alberta who is cognizant of the value of maintaining and enhancing wildlife habitat on his family's farmland. The dryland farm produces cereal crops, oilseeds, and pulses, including peas, barley, wheat, durum, lentils, and canola.

"On our farm, we've put in shelterbelts for cover, probably about 20,000 shrubs. On our marginal lands, such as alkaline areas or less productive areas that won't grow crops, we've put permanent cover into that land instead of farming it," says Seward. "We've looked at spots that are hard to farm, for example between a roadway and utility lines (power poles); we can't get equipment in between there, so we've planted that to permanent cover. And we've established permanent wetlands on a lot of our land."

Seward, who also works as a Wildlife Biologist with ACA, says that as a biologist and a farmer, he can't approach farmers expecting them to take land out of production at a loss. "We need to find a way to balance the needs of wildlife, while still maintaining a functional and profitable farming operation. Newer farming practices, such as intercropping and direct seeding, are a step in the right direction, I think. These are good farming practices that help production, but also benefit wildlife. Advances in technology, such as disc drills, stripper headers, and GPS-controlled equipment all provide benefits to wildlife by either leaving more biomass on the landscape or by reducing the amount of chemicals being applied, which is also beneficial to the farmer.

"Currently, a lot of the answer is looking at marginal farm land, lands where farmers have input costs but they're not getting anything back out, like pivot corners or saline soils," adds Seward. "For me, those types of areas make sense, where we should be doing habitat work. It doesn't have to be huge tracts of land, but it all adds up."

In 2014, ACA established a partnership with a working farm in southern Alberta to evaluate approaches for re-establishing vibrant upland bird densities while maintaining a profitable farming operation. Enchant Farm is in a highly fragmented irrigated farming landscape. We are trialling a variety of enhancements to improve the resources important for key life stages of upland birds, including nesting, brood rearing, and overwintering.

"The farm has roughly 13 linear kilometres of edge habitat with defined shrub growth around fields that provides reasonable territorial habitat," says Doug Manzer, Wildlife Program Manager with ACA. "One of our initial targets is to increase the amount of this territorial edge habitat to allow the partridge density to increase. Since shrubs take at least five years to establish, we also trial annual seed mixes that mimic tall shrubs, providing taller escape cover (e.g., sorghum, millet, corn). These annual seed mixes are an alternative to shrubs, and for some farms this may be the most attractive option to creating edge habitat."

The initial two years of the project focused on collecting baseline data and is being followed by a suite of enhancements that are being trialled and monitored over another ten years. But results have already come in, with the density of grey partridge pairs increasing substantially over the four years from 2014 to 2017. "Spring pair densities are now roughly ten times greater than those compared to nearby sites without our suite of enhancements," notes Manzer.

Grey partridge pair
photo: ACA, Aiden Baitman

photo: ACA, Colin Eyo

"As the human population continues to grow so does the demand for agricultural lands for grazing and farmland."

– Darren Dorge


photo: ACA, Layne Seward

The project will also measure benefits to the farmer. "Many farmers value wildlife and will appreciate seeing more pheasants, partridge, and songbirds on their farm," adds Manzer. "But there may also be opportunities to reduce costs. For instance, there are low-lying areas on this irrigated landscape that produce inconsistent yields year over year. The farmer has relatively high input costs on this irrigated landscape, so minimizing waste is important. In this case, we're working with the farmer to take some of those low-lying areas out of production and keep them as perennial wetland. Then we'll measure the yield in the area surrounding those wetlands and, over about five years, determine whether or not their net yield in the surrounding area is actually greater than if they would have farmed it every year. So, they remove two acres of input costs with the re-established wetlands, but do they actually get a net benefit over five years on that same landscape by doing that?"

According to Seward, most farmers and ranchers enjoy having wildlife on their farms. "Pairing them together makes a lot of sense, and I think there is lots of opportunities in Alberta for that. I think a lot of it is convincing landowners they can still have habitat and a profitable farm. That has certainly worked for us on our farm."

Manzer agrees, and he points to the ACA MULTISAR program as one example of success. "The program focuses on the ranching community and native grasslands. It's all about sitting down with a ranching family usually—it could be a grazing reserve, it could be a corporate entity of some sort, but usually it's a family—and trying to establish very long-term planning objectives. In the ranching community and in grasslands management, there's a really strong overlap with what's good for cattle and being also really good for wildlife."

Going forward, Dorge says ACA, as well as other conservation groups in the province, need to be innovative and develop new projects and programs that provide value to agricultural operations as well as value from a conservation perspective. "In many cases the bottom line is economics. Incentives work but the issue is having enough financial resources to implement a program at a scale that can effectively make a difference."

Dorge adds that as the population continues to grow, there will continue to be increasing pressures on the landscape. "We likely will never experience what our grandparents experienced in earlier years, but I still think we can manage for both wildlife and agricultural production by working more closely in the future."


Sparrow Nest with Cowbird Egg
photo: ACA, Kris Kendell

# CITIZEN SCIENCE

by Nyree Sharp

There was a time when science was the domain of the "gentleman scientist"—someone with the wealth, education, and spare time to indulge in scientific pursuits as a hobby. By the mid-1900s, science was dominated by professionals employed by universities and government institutions, still with little room for broader general public participation. Citizen science, where volunteers work with researchers to address real-world science questions, can be seen as a democratization of science—anyone can take part! And there are many benefits to be reaped by volunteers and researchers alike.

For just about anything that interests you, from the smallest of critters to outer space, chances are that there is a citizen science project in which you could become involved. Volunteers monitor breeding bird populations across North America, measure and map precipitation in their communities, and help track the spread of spruce budworm. The effort involved ranges from submitting occasional observations to following strict protocols and even to getting involved in project design and data analysis in some cases. And the opportunities are increasing all the time.

Sometimes public interest itself is the inspiration for a project. For example, public interest in reporting grizzly bear sightings led to the development of *GrizzTracker*— a systematic way to collect information that had been pouring in without a comprehensive way to manage this data. Observations can now be submitted using a smartphone app and associated online mapping tool. This makes data submission much easier for the user, standardizes the format of the data received, and provides valuable insights into local grizzly bear habitat use across human-dominated landscapes. Ultimately, the database created can be used to improve safety conditions for those working on the land and to inform grizzly bear management.

## Benefits to volunteers and their communities

Most volunteer citizen scientists already have an interest in their environment that inspires them to get involved in a specific project. This is a great way for people to learn more and often makes a difference in the management of a species or an area that is important to them. Arguably some of the largest benefits for participants come with projects that connect them with their immediate environment, in a convenient and meaningful way. The Miistakis Institute documented 87 citizen science projects currently being used in Alberta; of these, 30 were both conservation-based and local or provincial in scale.

Particularly in the fields of conservation and biodiversity management, the benefits of citizen science extend beyond the immediate scope of the project. The more that people focus on their environment, the more likely they are to care, to be engaged, to notice changes in the environment, and to advocate on its behalf. Citizen science also increases scientific literacy, which in turn leads to more concern on behalf of participants, and more informed contributions to decision-making and public policy.

## Benefits to science

Some of the most critical science issues facing us today—climate change, shifts in ranges of species, the spread of infectious diseases—occur at large geographic scales and often over long periods of time, making them difficult to examine using conventional methods. Recruitment of citizen scientists is particularly beneficial for projects addressing these large-scale concerns. Having "eyes on the ground" over a wide area can also result in a more timely detection of rare events (e.g., disease in wild animals, algal blooms) and enable researchers to identify where further research efforts could be focused. For example, *PronghornXing* is a new app and online tool based on concepts from *GrizzTracker*, using volunteer sightings of pronghorns and other ungulates to identify common highway crossing points and locations with high levels of wildlife collisions. This information will help wildlife management as well as improve wildlife and human safety.

Through the use of volunteers, hundreds of millions of dollars in resources and person-hours are estimated to be saved globally through the use of citizen science. One Albertan example of cost savings is the management of moose populations. Traditionally, moose across the province have been monitored through aerial surveys, but the expense is such that each wildlife management unit (WMU) might only be surveyed every several years. Inspired by the success of hunter-based monitoring in Scandinavia, Dr. Mark Boyce of the University of Alberta developed a moose hunter survey app for smartphones. This app has the potential to be a much less costly (and safer) alternative to aerial surveys, when there is a sufficient number of users and submissions.

## Challenges

Knowing where and when public involvement can be effective is an important first step. If the methodology is too time-intensive or requires specialized training or equipment, citizen science may not be a good fit. Similarly, if the time commitment is too sporadic, or the subject matter does not grab volunteers' attention, recruitment may be difficult.

Once a suitable citizen science project is identified, careful planning is required to ensure that observation protocols are clear, and that data will be usable. Issues of liability and data ownership or sharing may also need to be ironed out. As the project progresses, communication with the volunteers is crucial,

to maintain interest and involvement. Posting results on an on-going basis can also help to recruit more participants, as some might not become interested until some outcome is realized.

Quality control of the data submitted can also be a challenge; however, careful project design, adequate training, and adaptability can address most concerns. For instance, drop-down choices for each field can eliminate errors in entering numbers.

## The role of technology

It is worth mentioning that the rapid evolution of personal technological devices has greatly increased the productivity and number of citizen science projects. The proliferation of internet access and smartphone apps has made data submission much easier for volunteers, even from remote locations, and made analysis easier for researchers. Sharing observation protocols and project results is also much faster and easier electronically. One ACA project that has lived through these changes is the Alberta Volunteer Amphibian Monitoring Program (AVAMP), which collects observations of amphibians and reptiles across the province. From its early days of paper publications and mail-in data forms, it now uses the internet to provide identification keys and range maps, uses online data submission forms with interactive map functions, and is moving towards providing recordings of amphibian calls online and an app for its volunteers to use on their smartphones.

With careful planning beforehand, and effective communication throughout, citizen science–based projects are playing an increasingly important role in the realm of science. We are living in an age of scientific evolution that is collaborative and rewarding where the benefits are huge and the prospects are exciting.

## For more information on citizen science projects in which ACA is involved:

**AVAMP**
www.ab-conservation.com/avamp

**Call of the Wetland**
www.callofthewetland.ca

**GrizzTracker**
www.grizztracker.ca

**PronghornXing**
www.pronghornxing.org

photo: AEP, Peace Region


photo: Riccardo Franzi

photo: ACA, Britt Schmidt

photo: ACA, Brad Hurkett


photo: ACA, Nikita Lebedynski

▶ *by Ariana Tourneur*

# Active in the Kakwa

## In search of the holy grayling

**A beautiful fish of vibrant colours—iridescent reds with aqua and purple spots—make the Arctic grayling a showstopper. They're easy to identify with their large sail-shaped dorsal fin, appearing to effortlessly glide instead of swim. "They deserve more recognition," says Scott Seward, ACA Biologist in Peace River. "But it's hard for people to get behind something they don't know or understand. They place less value on that."**

The grayling's value goes far deeper than striking good looks: similar to bull trout, an intact and robust Arctic grayling population represents a healthy watershed and aquatic system. Long ago, their range was the entire Peace, Hay, and Athabasca river basins. But the 2015 Arctic Grayling Status Assessment suggests their population has been reduced by 70 percent of historical levels.

### Where wild is, wild grows

"Relatively speaking, we could argue that the Kakwa watershed is one of the few remaining true refuges for the species in the Eastern slopes," says Paul Hvenegaard, ACA Biologist with immense experience in the Kakwa watershed. "With the exception of the Caribou Mountains and a few remote lakes and rivers in northeastern Alberta, the Kakwa Arctic grayling are one of the more northern populations in Alberta."

The big appeal of the Kakwa is how remote and wild it can be, with parts still accessed only by foot or horseback. "Long-term datasets for more 'intact' watersheds like the Kakwa can act as a baseline, or 'best-case scenario,' with which to compare other watersheds," explains Hvenegaard.

That said, the Kakwa isn't the perfect model to idolize. Issues in this watershed are too recent to show negative impacts, with accelerated industrial development happening in only the last two decades. "I've witnessed it go from a sleepy forest with the occasional drilling rig, to bumper-to-bumper traffic as endless workers make their way to the multitude of worksites in the watershed," says Hvenegaard. Even though we can no longer describe the watershed as pristine, it still represents one that is far less degraded and developed compared to many others in the province.

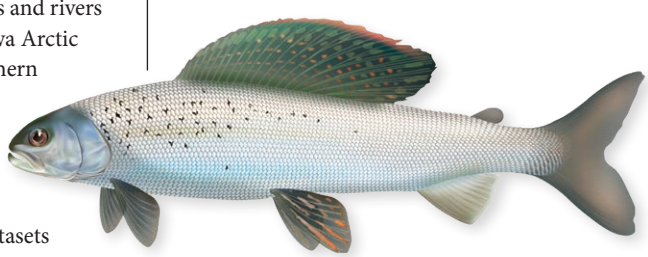



photo: Bill Patterson

## Keepin' on in the Kakwa

Industry, flood, or fire—Alberta's landscape is never at a standstill. Having long-term datasets for watersheds allows managers to monitor overall health of the ecosystem and then make informed management decisions. That's exactly why ACA has been very active in the Kakwa.

Our work in the area started with the Cooperative Fisheries Inventory Program (multiple groups worked collaboratively to collect and provide basic fish and fish habitat information for the timber harvest planning process to make sound land-use decisions). We also spent several seasons studying the Kakwa's bull trout population: identifying key spawning and overwintering areas.

In 1997, we estimated 482 Arctic grayling in a 32 km section of the upper river. Our stream crossing assessment revealed 57 percent of culvert crossings didn't provide adequate fish passage. And just recently, ACA conducted a watershed level assessment with Arctic grayling as the focal species. All of these projects contribute to an update of the government's Fish Sustainability Index (FSI) score for Arctic grayling at the Kakwa watershed scale.

Next steps by Alberta Environment and Parks (AEP), says Adrian Meinke, Senior Fisheries Biologist with AEP, "include continued fish population assessments, water temperature assessments, and angler surveys. In addition, efforts will be made to inventory and remediate road stream crossings in partnership with Alberta Energy Regulator and Foothills Stream Crossing Partnership. OHV trail and crossing inventory will also be occurring over the next few years to prioritize problem areas with the ultimate goal of developing and implementing remediation plans."

## How to surprise a biologist

Remarkably, there are large areas of the Kakwa watershed that do not have fish despite being in protected park areas where there is a complete lack of an industrial footprint—virtually no access and zero fishing pressure. "In this case, not all pristine wilderness settings or watersheds necessarily mean abundant fish populations," says Seward. The fish are absent because of natural barriers (i.e., waterfalls). "Seeing places of great habitat void of all fish has challenged some of my preconceived notions and made me realize that a lot of things need to come together for an animal—let alone an entire species—to live in a certain area."

## Protect the pristine

Identifying critical habitat and protecting it are still the sweeping essential steps. "We see a huge watershed—over 3,500 km$^2$—that can withstand a little bit of habitat loss here and there," says Seward. "But in reality, if we lose the wrong piece of habitat within that watershed, we potentially could have dire impacts on the overall health of the fish population. Paul and his team did great work on getting critical bull trout spawning habitat recognized and protected within the Kakwa watershed for reasons like this." While that hasn't been ACA's specific goal with the fish indexing work, the data we collected could eventually be used to find these areas for grayling too.

It seems history says it's so, species in peril have to suffer greatly before real and all-inclusive conservation action happens. Arctic grayling are magic, and the true wilderness they thrive in cannot be taken for granted. The hope in the Kakwa is that all the collective data create both a species profile and widespread recognition like the westslope cutthroat and bull trout have gained.

After all, anglers today think of fishing for Arctic grayling as something their fathers or grandfathers reminisce about. "I would like to see Arctic grayling fisheries developed for the angling public to enjoy and appreciate," says Hvenegaard, "because people need to experience the creature if we wish to hold them in high regard."

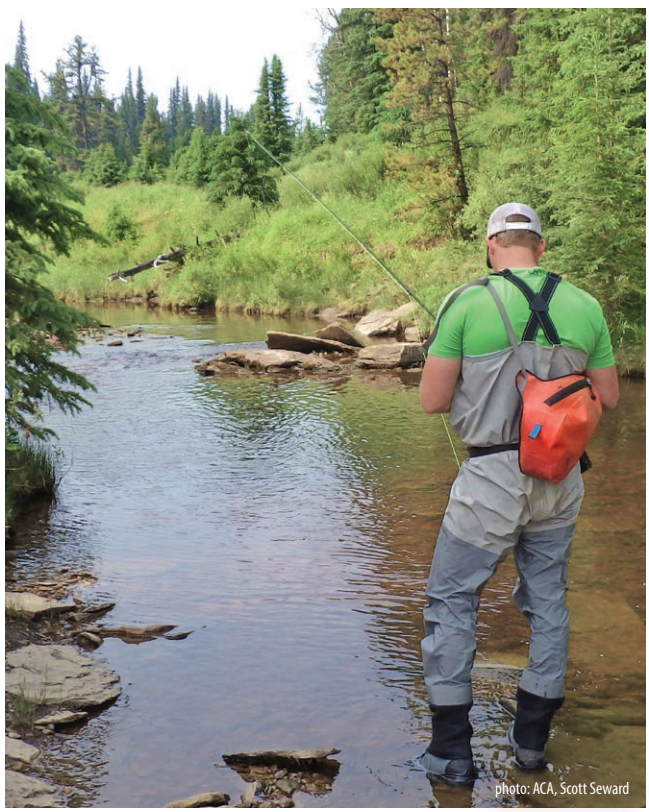


photo: ACA, Scott Seward

► *by Kevin Gardiner*

# Gracious Donation

## on the North Raven River

In the early 1970s, Frank and Lillian Coulson desired to leave the hustle and bustle of Calgary city life for the peace and quiet of Clearwater County. They were fortunate enough to find and purchase a property with the beautiful North Raven River (Stauffer Creek) flowing through it. Here they built their retirement cabin and for many years enjoyed the abundant wildlife that also called the property home.

Lillian and her mother, Tootsie (Emily), spent countless hours walking the property and sitting on the river's edge, enjoying the solitude. Lillian treated the property as her personal wildlife sanctuary—she was very protective of their piece of paradise. She enjoyed watching deer as they moved along the river corridor or moose as they munched the abundant willows.

As years went on, Lillian realized that she was going to have to make some tough decisions about their land. With no immediate family, she wanted to ensure that the pristine river habitat would be protected after she and Frank were no longer able to take care of it. Lillian (then in her 90s) learned about Alberta Conservation Association (ACA) and how it conserves important habitat to maintain wildlife and fish populations. With the assistance of some close neighbour-friends, Robert and Doris Nanninga, an agreement was reached between Lillian and ACA. Twelve acres of beautiful river habitat was donated, protecting it for eternity.

Unfortunately, Lillian passed away before the deal was completed. However, her dying wishes have now come true.

According to Robert: "Every time the subject of donating the land to ACA came up, she grinned from ear to ear." The Coulsons felt honoured to be able to donate their piece of paradise for all to enjoy.

In the future, ACA will evaluate any changes to provide outdoor enthusiasts with easier access and amenities.

photo: ACA, Kevin Gardiner

*Lillian & Frank Coulson*

photo: Robert Nanninga

# Ensuring the future of **Rocky Mountain BIGHORN SHEEP**

► *by Janet Kanters*

With an Alberta population of about 11,000, the Rocky Mountain bighorn sheep is an iconic figure in the province. That's readily evident, because as everyone knows, the Rocky Mountain bighorn sheep is Alberta's provincial mammal.

The importance of the species is first and foremost to Wild Sheep Foundation, Alberta (WSFA), a nearly 20-year-old association tasked with the positive management of wild sheep in the province. "In simple words, we put and keep sheep on the mountain," says Rob Kopecky, president of Wild Sheep Foundation Alberta (WSFA). "There's a recognition that the animal is important. It's majestic and it's an indicator species, and that demonstrates true wilderness."

The Rocky Mountain bighorn sheep is the only species of wild sheep in Alberta, and to have a group specifically tasked with its monitoring and enhancing its survival is awe-inspiring. While the provincial group is relatively young, the national Wild Sheep Foundation, based in the U.S., has been decades into its mission of ensuring that wild mountain ungulates and their habitats worldwide are effectively managed, utilized, made accessible, and supported by interested stakeholders.

"Essentially, we are a volunteer-run organization dedicated to the promotion and funding of sound wildlife and habitat management practices necessary to maintain viable bighorn sheep populations in our province, and ensuring the preservation of our hunting heritage for today's youth and tomorrow's hunters," says Kopecky.

## Getting it done

According to Kopecky, WSFA has three main areas of focus: one, if possible, manage disease amongst the province's herds; two, manage and increase habitat for wild sheep; and three, monitor, measure, and manage predators.

"Wild sheep are susceptible to die-offs around the continent, with disease encroachment from domestic sheep herds," notes Kopecky. "Although we don't have a lot of domestic producers in Alberta that overlap into wild sheep habitat, it is still something we need to keep a focus on.

"Die-offs due to disease transfer from domestic sheep to wild sheep continue to happen even in modern times with everything we know," he adds. "Some recent examples out of the U.S. include Nevada and Montana. The last die-off we're aware of in Alberta occurred in the 1980s in southern Alberta."

To manage and increase habitat, WSFA contributes funding to Alberta Environment and Parks to do aerial surveys and counts of bighorn sheep in different parts of the province.

"This year, we directed some funding towards work in the Crowsnest Pass area. There's a section of that highway where there's a number of vehicle mortalities on bighorn sheep," notes Kopecky. "Our funding towards that project will help to try and find ways to reduce that mortality. The study is being done by Alberta Transportation with the Hillcrest Fish & Game Association leading the work. They're looking at whether fencing is working to keep the sheep off the highway, or if there are other things that need to be done to keep bighorns safe in that area."

Between disease, habitat loss, and predators, WSFA works hard to ensure this important species thrives. To do this, they partner with several other groups on various projects. For instance, WSFA provides funding to University of Alberta's (U of A) graduate students to do studies on the abundance and distribution of cougars—what they prey on, and how often they kill to eat.

"One of their researchers is looking at whether cougars can become specialists at killing and eating a specific animal species," says Kopecky. "We're trying to find out if there are specific cougars out there that target bighorn sheep as their primary diet versus mule deer or elk or other prey.

"We also recently funded a scat collection study, also through U of A; they're doing DNA analysis to determine the frequency and timing of bighorns as a prey species. So that would include predators such as cougars, bears, and wolves. This study will then provide information on predator impacts on bighorn sheep."

With these two studies as examples, the end goal the WSFA is hoping for is that a management strategy for cougars, and predators in general, is developed and implemented.

photo: ACA, Darren Dorge

photo: Jim Potter

## Youth and the future

Managing the species is not the only goal WSFA has. Every year they hold a youth hunter camp, which usually takes place in June in a different area of the province. In 2018, the camp runs from June 8 – 10. Youth aged 11 – 17 take part in this weekend camp featuring volunteer professional instructors who provide opportunity for the kids to learn skills and knowledge regarding sheep habitat, fly fishing, firearm use and safety, hide preparation and caping, field care of trophies, taxidermy, setting up camps, cooking, wilderness survival and packing, and horsemanship. Youth involvement and the preservation of our hunting heritage is part of WSFA's mission. For more information on WSFA's youth camp, please contact Brenda Erickson at 403-638-4105.

photo: WSFA

# Snakes ON A PLAIN

► *photos and article by Sheri Monk*

## Prairie rattlesnake: *(Crotalus viridis)*

**Length:** Average 3.3 feet, record 4.97 feet.

**Colouration:** Yellow, beige, green, brown, olive with blotched patterning.

**Lifespan:** Up to 20 years in the wild, but many rattlesnakes die by humans or traffic long before that.

**Diet:** Rodents, birds, insects.

**Mimics:** In Alberta and Saskatchewan, you may also encounter bullsnakes and plains hog-nosed snakes. Both are non-venomous, but occasionally mistaken for rattlesnakes, thanks to their colouration and patterns. Both will even rattle their tails as part of their defense display. (The plains hog-nosed is not considered venomous, but it does possess an irritating saliva, so it's best not to handle them.)

**Conservation status:** *Sensitive.* Den sites are protected throughout the year, and as a non-game animal, prairie rattlesnakes may not be killed, possessed, bought, or sold.

**The unmistakeable sound of a rattlesnake is ubiquitous with our collective perception of the Wild West. It is not what most people, or even the average Canadian, would identify as a symbol of the Great White North. But perhaps it should be. There are very few creatures that have fought as hard to survive such inhospitable conditions as Alberta's resident rattlesnake.**

The prairie rattlesnake, *Crotalus viridis*, ranges along the river valleys of southern Alberta, and in two separate populations within southwest Saskatchewan. It extends southward through the U.S., and into northern Mexico. It has one of the largest ranges of all of rattlesnake species, which debunks the most commonly repeated myth about this shy reptile.

**There are, in fact, so many myths about rattlesnakes (and snakes in general) that it's hard to know what's true and what isn't.**

### Myth: Canadian rattlesnakes are not as venomous as their more southern counterparts.

**Reality:** Canadian rattlesnakes are just as venomous as all other members of their own species, regardless of where they live. Would a grizzly bear be more dangerous in Montana than Alberta? Perhaps, if it was rabid.

It is the same with snakes. A prairie rattlesnake in Alberta likely poses the same risk as one in Colorado where last year, a 31-year-old hiker died after being bitten. However, most envenomations do not result in fatalities, thanks to anti-venom.

### Myth: Rattlesnakes will chase you if you encounter them.

**Reality:** Rattlesnakes don't even chase their dinner. These large-bodied snakes simply aren't very fast. They rely on impressive defensive displays and camouflage to protect them. In almost every encounter, they will assume a defensive posture while trying to retreat. If you encounter a rattlesnake, simply take a few steps back, snap some awesome photos, and carry on.

### Myth: Rattlesnakes prefer hot temperatures.

**Reality:** While they rely on the environment to govern their temperature, they don't like it much hotter than you. Staying in the heat for too long causes ill effects. You are very unlikely to encounter a rattlesnake in direct sunlight for long in temperatures above 25 degrees Celsius. When it is hot and sunny, they seek refuge in holes or in cool shady spots.

### Myth: Rattlesnakes lay eggs and are prolific breeders.

**Reality:** Many snakes do, but rattlers give live birth, typically in late summer. A clutch of young usually numbers between four and 13, but many do not survive. Additionally, females may only reproduce once every two or even three years, and it takes several years for individuals to mature sexually. As a result, the reproduction rate is low.

### Myth: If bitten, suck the poison out.

**Reality:** **NO.** Like most rattlesnake venom, prairie rattler venom predominantly affects and destroys tissues like skin and muscle. Sucking the venom out has never been demonstrated to improve outcome, and may magnify tissue damage. Do not use a tourniquet. If bitten, remain calm and call 9-1-1.

Research has shown that nearly half of all defensive bites from rattlers are "dry" and no venom is injected. This is because venom production is resource-intensive and takes approximately three weeks to replenish after being used. Rattlesnakes hunt in ambush, they strike their prey quickly, and then slowly follows it as it dies. They do not constrict their prey, so if they're out of venom, it's like hunting without arrows or ammo.

### Myth: Rattlesnake populations can grow and spread anywhere.

**Reality:** Rattlesnakes are very closely tied to our river valleys because of the type of earth they need for adequate dens to overwinter in. In fact, individuals have a high fidelity to the den they were born near, and when dens are destroyed naturally or by man, entire populations may be lost.

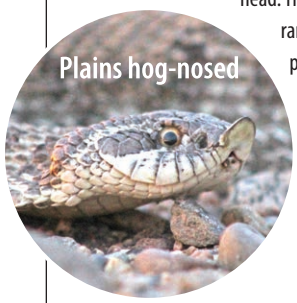
### Myth: Baby rattlesnakes are more dangerous than adults.

**Reality:** Venom composition can change during different life stages, but while you don't want to be bitten by any rattlesnake, the larger the snake, the larger the venom yield.

### Myth: Rattlesnakes are evil.

**Reality:** Historically, snakes have gotten a bad rap, but they're no different from any other animal. In fact, there is more and more research being done that demonstrates social behaviour among rattlesnakes, including protecting unrelated young from possible threats by ushering them down the entrance of a den.

The prairie rattlesnake is a unique and important part of the grasslands ecosystem. There aren't many regions left that still host this species along with other prairie wildlife like pronghorn, black widows, scorpions, cacti, sagebrush, and mule deer—and this habitat is shrinking every year. We can all play a role in conserving this species by understanding it, and educating others about their special place on the prairie.



## Look-alikes

The bullsnake has round pupils, a narrow tail, and a small head. The plains hog-nosed snake is rarely encountered, but does a pretty good job of mimicking its venomous relative at first glance, but look at the upturned nose, which the hog-nosed uses to burrow into the ground. Note that both bullsnakes and hog-nosed snakes have round pupils while the rattlesnake has elliptical pupils, and a heat-sensing pit just below the nostril. The rattlesnake also has a triangular-shaped head, whereas the other two do not, though the hog-nosed will try its best to flatten and triangulate its head similar to a rattlesnake as part of its defense posture.

# BUNDLE UP TO KEEP WARM

Hibernacula (aka dens) provide snakes with shelter from freezing temperatures and, for some snake species, also a place to mate. Snakes are known to go back year after year to the same hibernaculum; unfortunately, some hibernacula are inadvertently (or sometimes purposely) destroyed. Though the sites are protected under Alberta's *Wildlife Act,* there are still a variety of threats like expanding human development and climate change.

Alberta Conservation Association (on behalf of Alberta Environment and Parks) will be conducting a snake hibernaculum survey over the next couple of years to determine the occupancy of known hibernacula and look for signs of snake fungal disease. Each known hibernaculum will be surveyed up to two times—if snakes are found the fist time, there will be no need to check again. If they are not found the first or second time, the den will be marked as unused (for the purpose of this study).

ACA also runs the Alberta Snake Hibernaculum Inventory, a citizen science project that asks for information from the public on the location of snake hibernacula as well as general reptile sightings. To find out more about this inventory, please go to www.ab-conservation.com/hibernaculum

**For more information on other citizen science opportunities, see page 20.**


**Any guesses on how many chicks will get the nudge this season? Last year 13 chicks made the leap!**

Follow our peregrine cams and learn about life on the ledge—nesting, caring, and killing prey to raise a thriving peregrine family.

**Streaming 24/7 at www.ab-conservation.com/peregrinecam**

**TransAlta** is proud to be a major sponsor of the **peregrine falcon camera** initiative, helping Alberta Conservation Association to raise awareness on this Species at Risk through live web camera streaming.

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# A Bird's Eye View

► *by Kelley Stark*

Conservation mostly takes place in rural areas—where most wildlife lives. Occasionally, conservation is found smack-dab in the middle of the city. Peregrine falcons travel from South and Central America every spring, many to find homes in urban centres. ACA cameras are on some Edmonton buildings to keep us up-to-date on what peregrines do during their breeding season.

Watch ACA peregrine cameras and read updates at **ab-conservation.com/peregrinecam**

Marge Krowchynski, a peregrine enthusiast, volunteers her time with Edmonton Peregrine Falcon Fledgewatch, a group of volunteers watching the chicks as they learn to fly. Marge has gone from knowing nothing about peregrines to being able to recognize individual birds at a distance. She also provides a wonderful service to all of our cam watchers: she's the person that supplies the written updates that explain what we're seeing.

### ACA: What does volunteering entail?

**Marge:** In the broadest sense, mostly keeping an eye on the birds. A lot of it is just monitoring when they arrive, if they're adding any new hangout spots to their territory, and when they start laying eggs.

### ACA: What about when the chicks are ready to leave the nest?

**Marge:** We have our core group of people, but it's always good to have more, especially if we've got more than one fledgling. We want to have as many eyes as possible watching them; they can get into some interesting situations here on [the University of Alberta] campus.

We have dawn-to-dusk shifts for about two weeks from Day 38 after hatch, when they start to fledge. We have three- to four-hour shifts. People sit on top of a parking garage watching the nestbox and the surrounding area making field notes—it's kind of like citizen science. The notes are collected by Alberta Environment and Parks so the population can be monitored.

### ACA: What are they watching for?

**Marge:** We watch for when they're fed, what the adults are doing, how much flapping the fledglings do, and then when they actually start flying. That's when things start getting interesting and you're running around all over campus trying to find out where they are and make sure they're not getting into trouble. [For example], they've landed too low and they need to be rescued which has happened several times.

### ACA: What challenges do the volunteers face?

**Marge:** The Mazankowski [Alberta Heart Institute] is a nightmare for Fledgewatch. Chase and Radisson [a couple of peregrine parents] hang out on the top of the Mazankowski, this great, big glass building and the young birds who are trying to get to them can't get high enough.

If we're lucky they just pancake flat against the building and slide down and get their wings under them. So far, I have not been involved

# About peregrine falcons

Peregrine falcons *(Falco peregrinus)* arrive in Alberta in mid-April. They spend a few months here, breeding, laying eggs, and raising their chicks before flying back to Central and South America in September and October. These fast-flying birds (diving at over 300 km/h), are listed as *Threatened* in Alberta with only 50 to 60 breeding pairs across the province. In other parts of Canada, the birds may soon be removed from the *At Risk* list. Numbers have increased due, in large part, to the ban on DDT, a toxic pesticide. The birds are mainly monogamous and parent peregrines return to the same area—often the same nest—every spring.

## About the cameras

The ACA peregrine cam program, sponsored by TransAlta, is responsible for operating six different cameras in Edmonton. You can also watch a ferruginous hawk family via photos from an ACA trail cam.

## How to get involved

There is a closed group on Facebook called the Edmonton Peregrine Falcon Fledgewatch. Interested volunteers can message Marge to be included. No experience required.

in anything bad where you're picking up remains. Nobody wants to pick up remains.

Basically, it involves sitting outside in the summer in the city, and watching a bunch of beautiful birds hunt and fly. And of course, as you're making these notes, you can't help but learn stuff.

### ACA: What kinds of things have you learned?

**Marge:** You can tell from the way Green Girl and B72's chicks learned to fly that Chase taught both their parents. They're crazy and do super-daredevil stuff—good, but very, very daring.

[The birds] are not people; they don't have the same reactions that people do, they don't have the same emotions that people do, but they do have their own unique characteristics. Radisson has a way of doing things that when you see her in the nestbox you know that's Radisson. You can tell by the way her and Chase interact. You can totally tell Chase. They have their own characteristics.

I had no knowledge of peregrines when I saw the [peregrine cam] for the first time. And that's where my interest started. I'm looking at this information that you have on your site about peregrines, about their dire situation back in the '70s and how much brighter it looks now. Any kind of education like that definitely feeds into conservation.

### ACA: How do these cameras fit into conservation?

Marge: People are more aware. Lots of people don't even know that we have peregrine falcons in the city. And that they've become an urban bird. Having the cams there is sort of a gateway for people to learn more. If you're having some problems with some pigeons, don't poison them because in the city, pigeons are a major food source for the peregrines. Peregrine population is much better than it was in the '70s but I wouldn't exactly call it robust. You don't want to be responsible for killing them. We get that exposure with those cams.

**You can learn so much; you can actually help, even if it's just in a small way. You can be part of a solution. I think that's a good thing.**

photo: Genesee Power Plant

Marge Krowchynski, peregrine enthusiast

# Yippee kayak...

photo: ACA, Gary Erickson

► *by Budd Erickson*

Waterfowl hunters often set up in a field or near a waterbody, some using a blind and others camouflaged with fall leaves. But some hunters set up on a waterbody using a kayak. Kayaks are light enough that a single person can carry or drag one; they are easy to control and narrow enough that they can get into many places that other watercraft can't. Hunting from a kayak requires a bit of equipment and skill but show me a hunter who doesn't love a challenge.

## Equipment

- Obviously, you are going to need a kayak. Find one that is wide, stable, and has a large opening in the sitting area. Many beginner kayaks usually have these qualities. Although not absolutely necessary, built-in dry storage behind the seat is very useful. You can leave the lid to the storage behind so you always have easy access and aren't fiddling around with the lid on the water. At the rear end of the kayak, there needs to be something that can you can attach a decoy bag to.
- There are different factors to consider when buying a paddle: what you'll be using it for (in this case, hunting), length, paddling style, what it's made of, and the design of the blade. It pays to do a bit of research to figure out which one will work best for you.
- Camouflaging the kayak can be approached in a few ways. Sew elastic cords into a camouflage sheet to create an easily removable camouflage "sock" for the kayak. You could also paint camouflage on or use a temporary cover once you become situated. Don't fret too much about this aspect; lots of waterborne hunters still have success with no camouflage at all.
- Every waterfowl hunter needs decoys. Unfortunately, this particular piece of equipment is bulky and works against the kayak's greatest weakness—storage capacity. Luckily, decoys float. Fill a mesh bag with decoys and attach it to the rear end of the kayak. This technique almost demands that you go with another kayaker so you can easily access each other's decoy bags. When going alone, build a rig that allows you to slide the decoy bag up to yourself. Many kayak anglers use a similar system to deploy and recover an anchor with the attachment point at the back. You can also use your dry storage for more decoys, but be sure to have spare storage for the harvested game.

photo: ACA, Budd Erickson

## Essential Extras

- An automatically inflating low-profile life jacket (see left photo) is relatively expensive compared to standard life-jackets. These vests only inflate when they become submerged. They are slim, fit over warm clothes, and don't get in the way when handling a gun. There is even a camouflage option.
- A powerful headlamp can become a necessity if your hunt takes you into the evening and the sun is gone when you are trying to collect your decoys.
- Bring a toothed knife so you can slice a few cattails to prop up in the kayak for extra cover.
- A thick rope to tow the kayak when it's too far or too heavy to carry will come in handy. Attach the rope to the front of the kayak and make a loop around your waist. This way you are dragging it straight forward with your core instead of awkwardly dragging it with one numb hand. Store the rest of the gear in the body of the kayak.
- Rubber boots can be good for getting into tricky spots to launch the kayak. Elastic cords on the top of the kayak can give you a place to store your muddy boots. The cords aren't necessary but if you can avoid getting mud and water in your kayak, you are going to have a better time.

## Safety

- Load your gun when you are set up and in cover. If you have a soft gun case, keep it in the kayak so you can completely put your gun away while in travel mode. This also prevents any mud or water on the floor of the kayak from getting on your gun.
- Be cautious of the size of waterbody and the weather. Don't take your kayak out on big water in high wind. Hunting from a kayak is best suited for smaller, twisting wetlands with a lot of cover.
- Tipping over from the recoil shouldn't be a problem with a wide and stable kayak. Although a shotgun blast while aiming completely sideways on open water will cause your kayak to wobble a bit, it's unlikely to tip over.

photo: ACA, Budd Erickson

## Approach and Setup

- Half the battle of waterfowl hunting is simply finding the birds. Once you spot a shoot, take a moment to examine the area with your binoculars to locate a corner of the waterbody that has these three essential elements:

photo: ACA, Budd Erickson

1. Good cover that you can wedge your kayak into; tall cattails work well.
2. The ducks seem to like hanging out there.
3. The wind is at your back.

- To set up, find the wind direction and let it push you along while you toss decoys. Don't set up decoys that are farther out than you can shoot from the cover.
- Don't worry about birds leaving the area when you're paddling to your chosen spot; the birds will be back once you disappear into cover.
- Bounce and push with your paddle to get wedged in among cattails or other wetland plants along the shore. It is best if you can beach yourself a little bit. This will essentially anchor the kayak so you can stash your paddle behind you and focus on gun management. You will also be much more stable while shooting.

## Technique

- Designate a retriever rather than have everyone haphazardly paddling out after their own fallen ducks. You can delay your retrieval if another flight is coming in.
- Only shoot at birds that you know are going to land in the water. Dogs can be excellent at finding lost game in tall grasses, but kayaks don't have noses.
- Don't set up too close together. You want each hunter to have a designated side to shoot on, with some crossover in the middle. Each hunter should target the birds on their side as they come in.

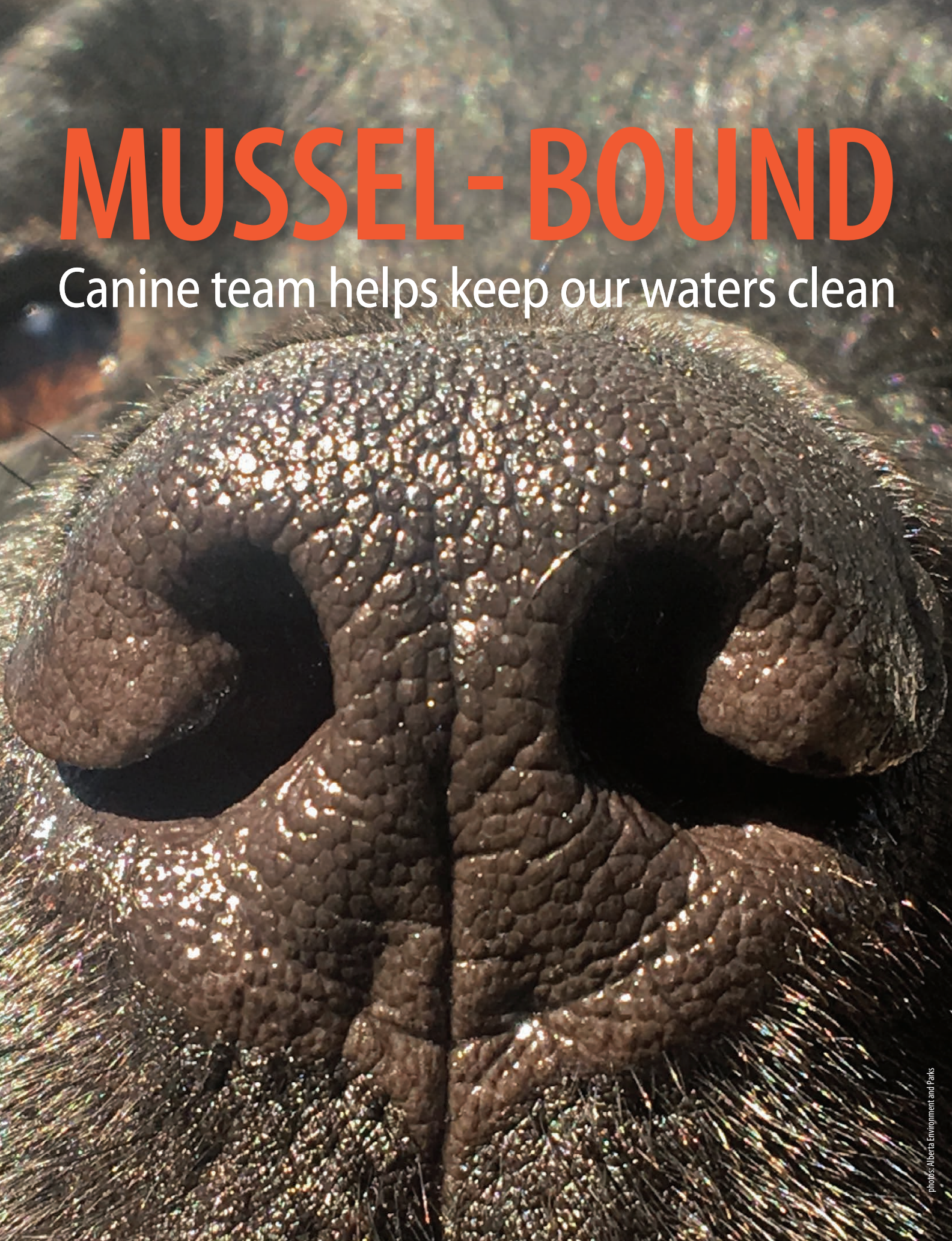
photo: ACA, Budd Erickson

**[You will need] good cover that you can wedge your kayak into; tall cattails work well.**

photo: ACA, Budd Erickson

# MUSSEL-BOUND

## Canine team helps keep our waters clean



photos: Alberta Environment and Parks

▶ *by Karen D. Crowdis*

Protecting Alberta's water and recreation opportunities from aquatic invasive species is an immense undertaking. Zebra and quagga mussels quickly wreak havoc once introduced to a waterbody. Fortunately, the Alberta Aquatic Invasive Species K-9 Program is ready to sniff out the enemy and keep our water clean.

Invasive mussels were introduced to Canadian waters in the 1980s. Out of water they live 30 days. Once introduced, they quickly colonize and devastate biodiversity, native species, infrastructure, and recreational opportunities. The Alberta government estimates a cost of over $75 million annually to battle a mussel infestation.

In 2015, Alberta launched the first canine watercraft inspection program of its kind in Canada. With funding from the Alberta Irrigation Districts, Hilo, Seuss, and Diesel became full-time, furry ambassadors of education, complete with "You've Been Sniffed" collector cards.

"This program is a shining example of partnership of stakeholders and government working together," says Cindy Sawchuk, Lead Aquatic Invasive Species Operations and K-9 Program, with Alberta Environment and Parks. "They funded it, but then have let us find the best way to make the program work."

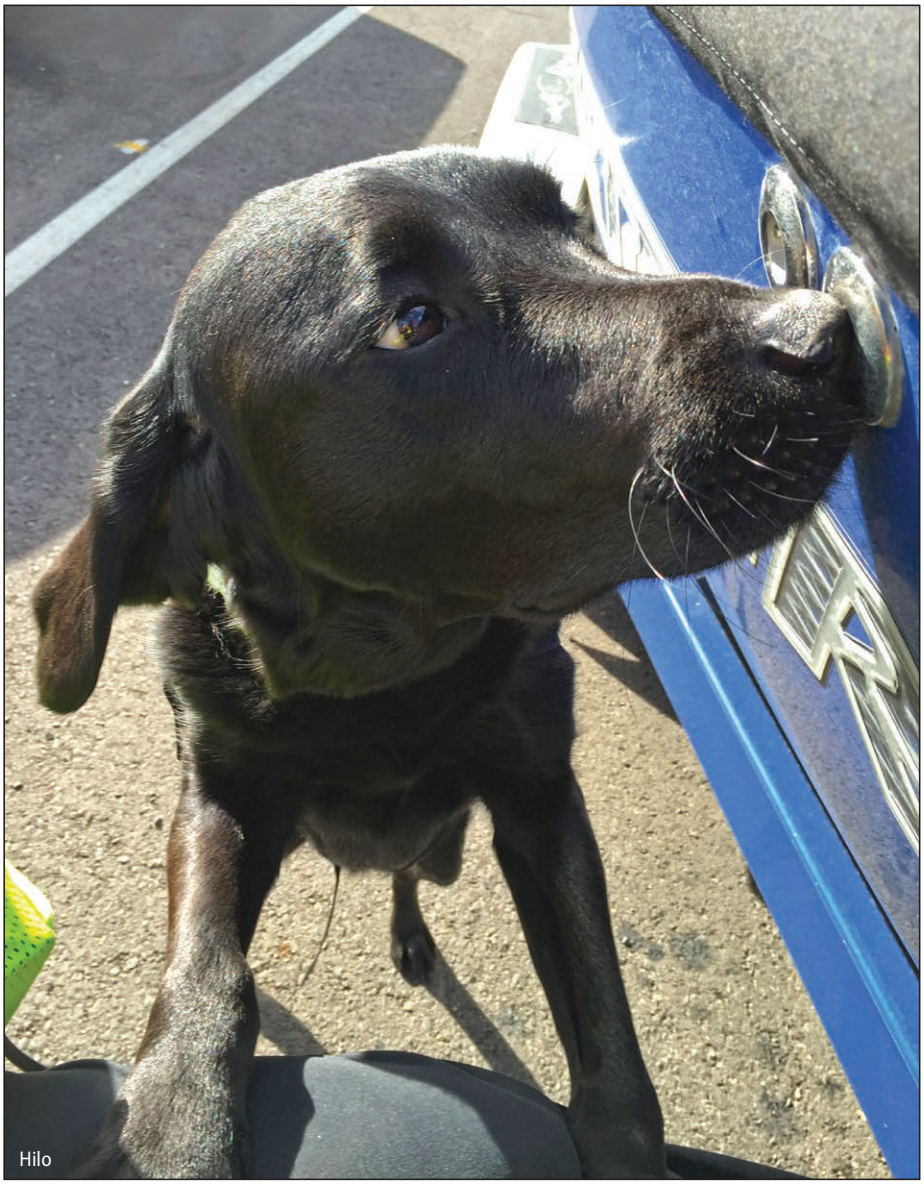
Hilo, Seuss, and Diesel were sourced and trained through the Montana-based Working Dogs For Conservation, who train dogs for different programs worldwide. Rescue dogs are selected for particular character criteria.

"It's not about breed, but about strong interest in toys," notes Aimee Hurt, Co-Founder and Director of Working Dogs For Conservation. "A desire to do the searching and good nerve strength for new places and sounds is important. Then we match dogs to handlers."

Sawchuk emphasizes correct match is important "because most rescue dogs come with some challenges the handlers have to work with." Dogs stay with the handlers 24/7 to bond effectively.

Part of training the dogs involves evaluating if the dog wants the job. "It starts out fun, then we see if they are in it for the long haul," adds Hurt. "Prey drive can be a big distraction and can take a dog out of the running."

Opposite: Hilo, super close-up  Below: Seuss at work



Hilo

Heather and Diesel

Initial acquisition and training can take four to six months. For the dogs, the game is to find the target. When a target is located, the dogs give a passive alert by sitting down. The find is verified and then it's a party with a toy reserved only for work. Hurt indicates that once the game is known, "dogs can learn a new target in a matter of weeks or even days, meaning a dog could be trained in several specialized targets."

"Training for our dogs is ongoing for a lifetime," notes Sawchuk. "They know the game now; find 'X', get the special toy. New odours will progress quickly. Keeping the work the most fun thing for the dogs will keep them happy and productive."

## No Small Task

Alberta currently monitors more than 70 lakes and reservoirs annually. Inspection stations run March through October at 11 high-risk locations. Decontamination requires high pressure and high heat of 60 degrees Celsius to kill the mussels and remove them from the boat.

Both the "Clean, Drain, Dry" program and the 2016 "Pull the Plug" legislation keep the mussel threat front of mind. Education is important to prevention. "The dogs help with public education," says Sawchuk. "They draw people out and engage with them. It's a great way to interact with people."

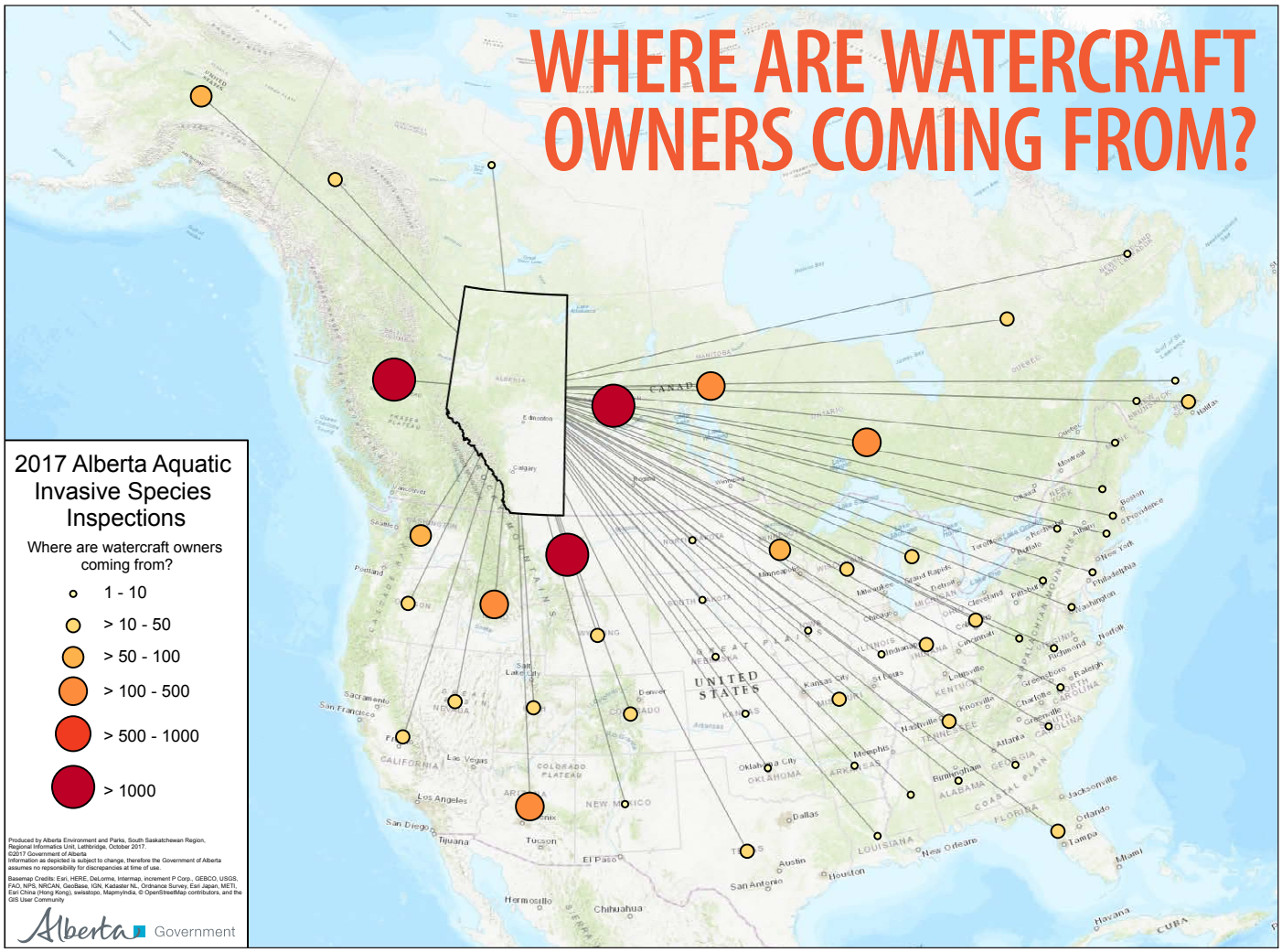
She notes that returning boaters ask about the dogs. When people get impatient with inspections, the dogs can help ease the situation. They complement the hard-working humans running the stations all summer.

The crux of the program is inter-provincial and international collaboration. Alberta and British Columbia have passport programs to streamline inspections. To date, Alberta has 438 passport registrants. Hilo, Diesel, and Seuss have travelled to Manitoba and Montana to participate in shore searches. In water samples, dogs have been able to detect veligers, immature mussels that are too small to detect visually.

In the 2017 season, human and canine inspectors examined almost 31,000 boats that entered Alberta from 11 provinces and territories and 45 states. They successfully intercepted 19 boats that had been fouled with mussels; 18 from Eastern Canada and one from the United States.

"Since there is no way to inspect every single boat, we need boaters to do their part to be successful." adds Sawchuk. "We all have a part in preventing invasive mussels in Alberta." Creating awareness and education help prevent a mussel infestation in Alberta. With Hilo, Seuss, and Diesel ready to sniff out the invaders, our province has furry help in both education and detection. Watch for them at inspection stations all summer!

# WHERE ARE WATERCRAFT OWNERS COMING FROM?





## EXPECT TO BE INSPECTED!

Watercraft Inspections Are Mandatory

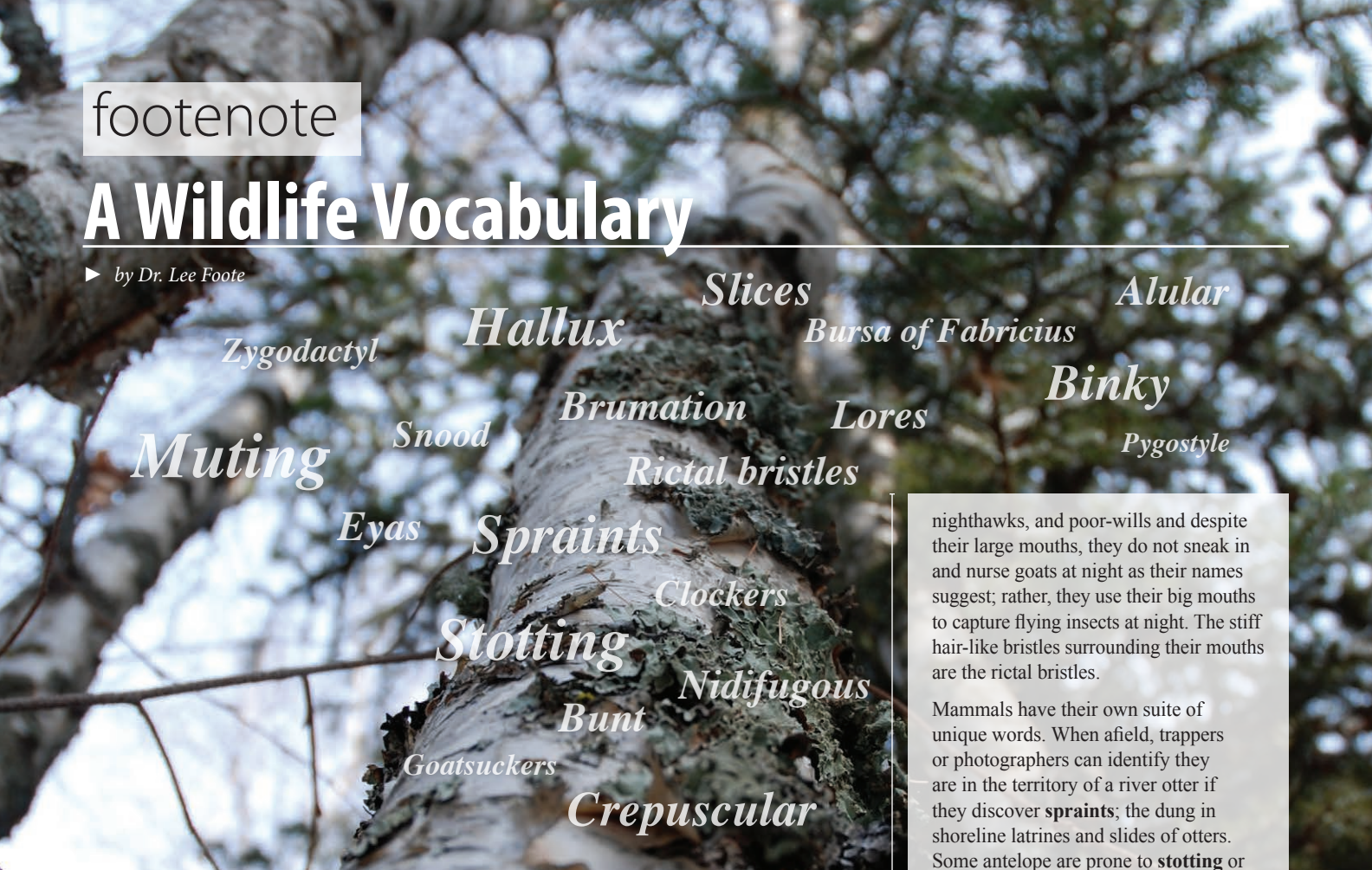
CLEAN + DRAIN + DRY YOUR BOAT

Alberta

footenote

# A Wildlife Vocabulary

► *by Dr. Lee Foote*




Wildlife ecology has its own jargon and unusual technical terms including some of the weirdest and most fun to say. I challenge you to work a few of these into a conversation.

The bird world is particularly entertaining. Don't ever try to tango with an owl due to its **zygodactyl** toes arranged in an X-shape. Most birds have a **hallux** or backward-extending toe where the heel would be for gripping limbs and for balance on flat ground. The well-developed **snood** of a wild turkey is one easy way to tell you are viewing a gobbler instead of a hen. Oh, snood? That is the fleshy tube of skin that flops over the side of the beak right next to the fleshy **cere** near where the beak meets the face and just ahead of the **lores** or cheek feathers.

If you want to determine the sex of an American woodcock, check the sex-distinctive shapes of his or her **alular** feathers on the front edge of the wing. Want to age a Canada goose after its feather moult makes it almost identical to older birds? Simple, just check its **bursa of Fabricius** for the depth of an antibody-producing pocket on the upper edge of the lower intestines. The bursa is the size of a cigarette filter in first-year birds, and disappears with age. Many people love to eat the **pygostyle** of turkeys and chickens, that fatty joint where the tail feathers attach. You may know it as "The Pope's nose."

Want to know what to call a nestling peregrine falcon? Just say **eyas** and the falconers will nod with approval. Eyas have a skill in **muting** their **slices** out of the nest too, which is to say they can squirt their poop in a jet of waste. There is no eyas in a ruffed grouse life, however, because they are **nidifugous** or nest-fleeing shortly after birth. Some human parents may wish their teenagers were a little more nidifugous. Grouse biologists can tell when they are near a sage grouse's nest when they find the large and distinctive **clockers**, which are simply a mashed-up combination of waste pellets only produced by nesting hens and deposited near their ground nests. And did you know that the **goatsuckers** have **rictal bristles**? Well, first off, goatsuckers are members of a group of insect-eating birds such as whip-poor-wills, nighthawks, and poor-wills and despite their large mouths, they do not sneak in and nurse goats at night as their names suggest; rather, they use their big mouths to capture flying insects at night. The stiff hair-like bristles surrounding their mouths are the rictal bristles.

Mammals have their own suite of unique words. When afield, trappers or photographers can identify they are in the territory of a river otter if they discover **spraints**; the dung in shoreline latrines and slides of otters. Some antelope are prone to **stotting** or dramatic aerial leaps and rabbits will **binky**, or leap and twist in the air—presumably to demonstrate their vigor, strength, and maybe un-catchability to would-be predators. Lions, as well as house cats, occasionally **bunt** by bumping their heads into things they want to scent-mark in a very rubber-stamp manner.

Some descriptors we share with wildlife; as I have gotten older, I find myself becoming more **crepuscular**— a creepy sounding word that simply means active in the twilight periods before sunrise and after sunset. I am not alone in this; as anglers and hunters know, many game species are crepuscular too. One of my favorite words of late is **brumation** which is a sluggish, inactive state almost like hibernation in lizards. I think I could perfect that. And last but not least, to my wife's eternal dismay, like elephants and cattle, I am particularly adept at **borborygmus**, or the abdominal rumbling associated with food and gas passage. What could be nicer than a succulent Pope's nose in a crepuscular meal that causes borborygmus in the middle of my sunset brumation?

photo: ACA, Budd Erickson

# Nature is waiting!

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# Seeing the Forest for the… Fish

**Sundre Forest Products**, a Division of West Fraser Mills Ltd., is a founding industry partner in ACA fishery inventories, supporting various projects since 1998. Through inventory field work, ACA biologists collect critical information on fish abundance, species distribution, and fish habitat—vital data for land and species management.

Sundre Forest Products is currently supporting inventory field work in the Red Deer River watershed, enabling ACA to collect information on the distribution and abundance of bull trout, a native sport species classified as *Threatened* in Alberta.

"We always appreciate support from our partners," says Mike Rodtka, Fisheries Biologist with ACA "but it's rare for the connection between data gathering and conservation to be so direct; I know Sundre Forest Products uses our data to conserve fish habitat."

**Program Sponsor:** Sundre Forest Products

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# Conservation

## Up the Kakwa

## Snakes ON A PLAIN

Myth vs reality

## Using their noses

Invasive species-sniffing dogs

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