A publication of Alberta Conservation Association

Conservation

The Hated 8

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SPRING/SUMMER 2016

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Alberta Conservation Association

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photo: ACA, Colin Eyo

From the President

Spring has finally sprung in Alberta, and I for one couldn't be happier. I don't know about you, but for me this winter seemed to drag on forever, which is odd given that the winter was fairly mild (by Alberta standards) and spring actually came fairly early. I think it was the lack of the really cold temperatures that made it seem longer. Since January it has felt like spring was on its way, but every week we did not seem to get any closer. Spring is here now, though, and it is time to get outside to do spring things!

In this issue, you will find information on one of our member groups, Trout Unlimited Canada, and how you can get involved with some of their projects, and we profile Len Thompson Lures, just to remind you that fishing season is here. The spring snow goose season is on once again in Alberta and we have an excellent article providing you with great information on white geese and why we have a spring season.

Perhaps most importantly to me, before you head out on your outdoor adventure this year, please take a moment to read the articles on invasive species in Alberta. This is a serious issue that most of us don't take enough time to consider. Invasive species have the potential to rob all of us of the wonderful experiences we have today. Find out how to identify and prevent the spread of invasive species. The future outdoor adventure you save may be your own.

Spring has indeed sprung in Alberta, and despite an economic downturn we still have unlimited natural beauty and wonder to explore in this province. Take some time this weekend to head-out with family and friends and take advantage of Alberta's Wild Side.

Todd Zimmerling

President and CEO
Alberta Conservation Association

photo: ACA, Mike Jokinen

workout
The latest from the field.

RUB Trees

This project aims to determine bear populations by collecting DNA data from hair samples left by bears on rub trees. Determining the population of any given species is a difficult and labour intensive task, but at least the trees do some of the work for us.

Bears are known to rub on the same trees, and when they rub their massive rear-ends or powerful backs on a tree, the tree bark is ripped off and characteristic markings and hair samples are left behind. Because of this, researchers are able to identify rub trees and collect samples. They will return to the same tree over and over again in order to repeatedly collect clumps of bear butt hair. Being a biologist can sometimes be really glamorous.

Contrary to popular belief, bears do not rub trees because their backs are itchy. The most current hypothesis for why bears rub trees is that it is a way for them to communicate to their local bear community.

FLYING Poachers

If there is one kind of angler that causes us the most grief, it's the kind that doesn't follow the rules. We've documented these poachers on a few of our stocked ponds, catching and eating trout after trout; they simply refuse to stick to the posted limits.

The most notorious of these anglers are known as cormorants, gulls and pelicans. Since it's obvious these freeloaders are never going to get a job and buy a WIN card, we are forced to change strategies.

Up until now, we've overlooked their freeloading lifestyle and looked the other way while they grabbed a couple easy meals after a lake has been stocked. But the masses are clueing in, the word is spreading, and

stocked ponds are turning into feeding troughs for the local beaked community.

The fish have been conditioned to look for food at the surface, exposing themselves to the hungry, winged predators. At the moment, the Stocked Trout Survival project is new, but there are plans to deploy different predator control measures and surveillance systems. One day soon, we hope to keep a majority of the fish alive and catchable for the honest anglers.

photo: ACA, Mike Jokinen

ROCK **Lollipops**

Mineral licks play an important role in the life of all ungulates in North America. It might seem that a mineral lick is just a yummy treat for animals, like some kind of ugly dirt candy, but as it turns out, this salty treat is more than just a delicious rock. The mineral deposits contain nutrients that allow animals to change their diets from season to season.

After winter, all of the ungulates dive mouth-first into nature's spring salad buffet. Unfortunately, this type of food reduces their digestive efficiency and impairs their ability to absorb nutrients. Licking salty rocks can stabilize their ability to digest the mixed greens.

The location of mineral licks is important for the distribution and movements of ungulates in Alberta. As such, current guidelines suggest at

photo: ACA trail cam

least 100 metres of forest between a mineral lick and industrial activity, but based on our new data, this buffer zone is inadequate in many cases. After studying mineral lick activity for over two years, we've begun to demonstrate why mineral licks should be identified as a special management concern and not covered by a generalized industrial guideline. The long-term health of alpine ungulates throughout North America would greatly benefit from mineral lick-specific guidelines.

PLANTING **Sticks**

Although the photo may look like confused people jamming broken sticks in the dirt, it's actually a photo of biologists and wonderful volunteers leading the charge to restore biodiversity and wildlife habitat by planting live willows. In the coming years, these "sticks" will mature and provide shelter and food for native wildlife.

Willow whips are being planted at our recently purchased Junction Lake property. The site is beautiful, with rolling grassy hills that surround waterbodies with pebble shores. The land, kept short by grazing cattle, looks like a great place to have a picnic. However, just because an area is pretty does not mean it's healthy. To begin the restoration process, willows and a variety of other species are planted so that, in the next few generations, this land will go from a pretty feeder for cattle, to a thriving, diverse refuge for Alberta's wildlife.

photo: ACA, Roy Schmelzeisen

GROUP OF POACHERS **Hit Hard**

In January 2016, six poachers were handed one of the most severe penalties ever given under the Wildlife Act as result of their disturbing "booze-filled killing spree" during the autumn of 2013 near Edson.

While drinking, the group drove around in a truck shooting and wounding animals out of their truck windows at night. One could argue that this activity is quadruple illegal.

Unfortunately, there were 37 animals hit: 26 deer, five moose, four elk, one black bear and one beef cow. Occasionally, the poachers would forgo their guns in order to chase animals down in their truck and run them over. One deer was confirmed to be killed using this method. Eventually, the poachers rolled their truck… and then lit it on fire, because apparently that seemed like a good idea as well.

The penalties were as follows:

Colton Campbell - 3 months jail time, $45,000 fine, banned from hunting for life.

Derek Brown - 3 months house arrest, $45,000 fine, banned from hunting for life.

Tayler Brown - $25,000 fine, banned from hunting for life.

Devan Dozorec - $10,000 fine, 10 year hunting ban.

Michaela Scott - $10,000 fine, banned from hunting for life.

Unnamed youth - 200 hours community service, 5 year hunting ban.

REPORT A POACHER
www.reportapoacher.com
1-800-642-3800

Carrying Capacity over Coffee

► *by Dr. Lee Foote*

A Tale of Wildlife Losses

Earl sat in the café flirting with Miss Edna, the waitress, as he watched the feed mill across the street fill his 50-bushel truck with 51 bushels of oats. The extra bushel that dribbled out of the auger was typically wasted because it blew out over the tailgate on the drive home so Earl offered to let Miss Edna scoop out a bushel for her bird feeder. Heck, it was going to be lost anyway. Edna's bushel represented a "compensatory loss"; that is, oats Earl would lose anyway and wouldn't miss at the farm.

One grain haul day as Earl returned home he realized he had forgotten his café stop so he drove his load back to visit with Edna over coffee. When he arrived, she asked if she could get her bushel of oats. Earl said "No, the excess has already blown out and your bushel now would represent "additive loss" meaning I would arrive home with only 49 bushels.

Wildlife populations experience compensatory and additive losses. Only so much wildlife can be carried over through the year. Like Earl's truck capacity, there is a limit to the numbers of pheasants, bull trout, moose or black bears that their habitats can support throughout the annual cycle. We can stock and supplement more fish or pheasants or bears but the excess will assuredly be gone within a year. We can't swell most game animals' populations above some invisible population threshold called a "Carrying Capacity."

In years of very abundant deer such as the glory years of Alberta in 2002-2012, hunters were largely killing the surplus numbers that would have "blown over Earl's tailgate" anyway and springtime survivor numbers reflected no real effect of hunter harvest. Hunter kill was largely compensatory and, in fact, the hunter off-take may have resulted in better health of those deer surviving hunting season due to less competition. However, when deer populations are low and below habitat carrying capacity, predation and hunter kills may become additive, thereby driving springtime populations noticeably lower. This is why annual harvests are adjusted each year via season lengths, supplemental tags, WMU allocations, weapon restrictions and access.

There is little risk in moderate over-hunting on species such as mallards, ring-necked pheasants, coyotes, wolves or white-tailed deer because their reproductive rates (called fecundity) are so high. They produce large numbers of offspring when conditions are favorable, thus, they quickly replace losses regardless of cause.

Other game species such as caribou, grizzly bears, and tundra swans, where they are hunted, require more conservative harvests because, although they are capable of filling habitats regionally, their reproductive rates are lower and they don't bounce back from population-wide reductions as readily. These species already give up their "additional bushels" of individuals to other habitat features. For example, caribou predation is elevated in fragmented habitats; grizzlies are killed by trains and where they threaten human livelihoods; tundra swans collide with powerlines, flee boat disturbance or lose nests to predators.

THE MORAL: We can't use stocking or complete protection to maintain excess wildlife populations. Nature's carrying capacity will trim the herds even if hunters or anglers don't.

A Tale of Habitat Crowding

Earl's 1,000 acre ranch has enough grass for 200 head of cattle but his herd has swelled to 220 head. He must either add more land or sell 20 cows to keep the herd number balanced with his grass growth. The individual cows can't tell the difference in food availability if Earl adds more land or decreases the number of cows on his ranch. The resource-to-animal ratio is the same. For the individual's welfare, reducing stocking density has the same general effect as adding

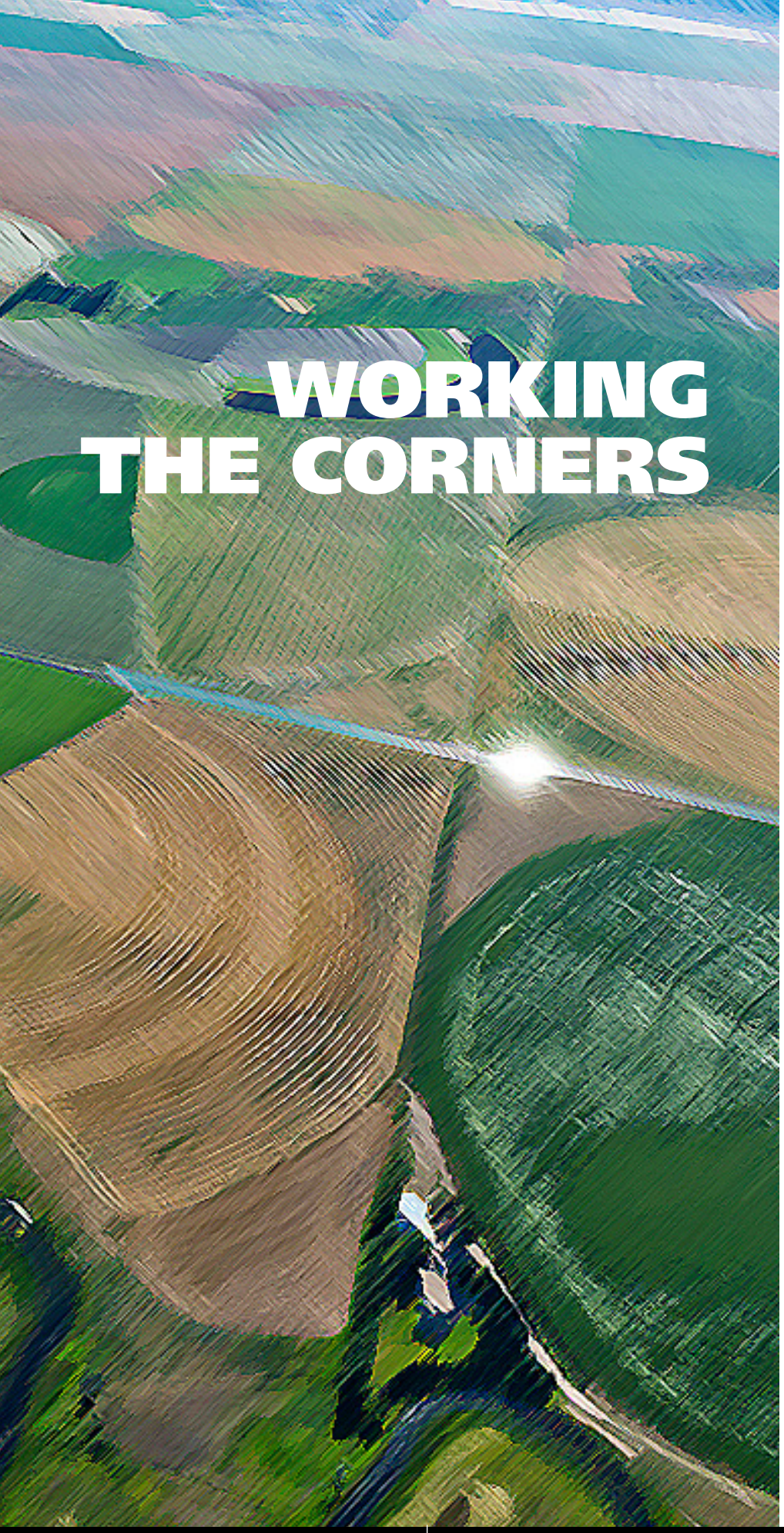
more habitat for the species. The number of healthy animals that can be maintained indefinitely on a finite area of land is sometimes called "carrying capacity" though truly, carrying capacity is a more complex concept that incorporates time and weather too.

Wildlife populations run into similar situations of "exceeding carrying capacity and eating themslves out of house and home" as we saw in Elk Island National Park and Canadian Forces Base Suffield where un-hunted elk populations swelled to threaten the health of habitat and animal disease transmission. If the park or base size could be doubled, that pressure would disappear… for a while. Because doubling the area of Elk Island or CFB Suffield is impossible, elk were trapped and translocated from Elk Island, where they were hunted on the Suffield Base, two different ways of balancing animal numbers with range.

While it is too simple to say "If we don't kill them they will overpopulate and starve," indeed there is often a significant annual surplus of game species that can be turned into human food, hides and trophies while leaving plenty of individuals to refill the gaps created by hunting. This is the essence of a renewable healthy wildlife population over the long term. Wildlife managers use different levels of hunter harvest as one tool of management.

THE MORAL: Wildlife populations are most often adjusted through liberal or restrictive seasons for hunters and anglers.

Dr. Lee Foote is a professor of Conservation Biology in the Faculty of Agriculture Life and Environmental Sciences at the University of Alberta, a hunter, an outdoors enthusiast and a 5-string banjo player.



WORKING THE CORNERS

The Enchant Project

Strong Farmlands. Thriving Habitat.

► *by Karen D. Crowdis*

The Challenge

Food producers face many challenges to maintain profitable operations, making every square metre of land the potential difference between break even or bust. Simultaneously, wildlife is under pressure to find suitable habitat, often in the same areas where crops are being grown.

According to United Kingdom Agriculture, 75 percent of the land there has been used for agriculture for thousands of years and yet they face increasing societal pressure to ensure farmed areas also benefit biodiversity.

In the U.K. and across the European Union, programs compensate farmers who improve wildlife habitat on marginal land. Alberta is just moving into this arena but no such programs exist here yet, making it difficult for farms to give up income-producing land for habitat.

Doug Manzer, Wildlife Program Manager with Alberta Conservation Association (ACA) explains that as food becomes more valuable on the world market, farmers will need to optimize their yield. They may farm to the very edges of their land, eliminating the space and resources needed by all but the most adaptable wildlife generalist species. "We are trying to find ways that allow farmers to be profitable, while at the same time optimizing areas on the farm for game bird abundance and biodiversity," says Manzer. At first glance, you might think that forsaking seeding any amount of land in order to dedicate as habitat seems counter to maximizing production and profitability on a farm. No one is suggesting an all or nothing approach. A small percentage of land will make a big difference. "We're talking about small changes—metres of land," says Manzer.

For example, traditional centre pivot irrigation practices create a large circular crop within a quarter section but leave unused portions of land in the corners where the irrigation equipment simply does not reach. It's these small corners that Manzer is talking about.

Farming and Habitat Partnership

A multi-faceted issue requires a unique partnership so a landowner, family farm and ACA have joined together to determine how farming and conservation can coexist.

In 2001, the Haggins family purchased land near the town of Enchant, believing they could improve existing farmland use while creating compatible areas for wildlife. Working with local operator Rick Stamp, they set in motion various improvements to operations and productivity on the farm, which continues today.

Stamp's roots in farming were forged nearly a century ago when his great-grandparents homesteaded nearby. Rick, and his wife Marian, run Stamp Farms, a seed farming operation on the parcel of land they bought in 1978. And now that the three Stamp sons have finished university, they have joined the family business and are raising their families there as well.

In his near forty-year agricultural love affair, Stamp has learned a lot and has been tested more than once. The biggest lesson he's learned is that success is tied directly to adaptability in everything, from management to equipment to soil conservation. So merging Stamp's insight and experience with the Haggins' vision for the land has made balancing farm profitability and environmental needs achievable. Now they're going further by partnering with ACA.

ACA brings extensive science-based knowledge of habitat and wildlife requirements to the partnership, and will focus on solutions to fit Alberta's distinct growing climate. ACA has experience working with ranchers to determine best practices to benefit cattle and conservation through its long involvement in the MULTISAR program.

It All Comes Down To Teamwork

The Enchant Project will develop both habitat improvements and modern farm management practices that maintain profitability. "Our relationships with ranchers exemplify good working partnerships. With this project, we are collaboratively creating a management plan for the farm with Haggins and Stamp," said Manzer. "They're a good fit because of their openness to adapting new approaches and our overlapping interest in seeing farming and wildlife on the same landscape."

Recognizing that lack of funding and additional use of resources could negatively impact farm operations, both the tangible and intangible costs like volunteered time and effort need to be considered. "The project has the intent to measure labour, equipment and resource costs," says Manzer. "We want to understand the true cost of what we want to achieve."

Some would argue that the land should be returned to its original state from a century ago. It's not practical considering the increasing global demand for quality food. "The intent is not to mimic what was there originally," Manzer explains. "Cropland is a highly valued part of our economy. Rather than trying to reinstate an untouched native prairie system, we want to optimize the habitat for a suite of species that can thrive in and around the edges."

First Steps

Time is on their side. The project's expected life span is 12 years, including baseline surveys already completed in 2014 and 2015 to fully understand what is being measured. Knowing what is currently on the farm and on selected control sites farther away builds a comprehensive base for evaluating the success or deficiency of any particular treatment.

The project has already taken the next step, selecting treatments that will benefit game bird densities, like grey partridge and pheasants, as well as songbirds and amphibians. Because different species require different habitats to thrive, it's important to measure how the first improvements affect other species over time too. The outlook is already positive.

"I am surprised at how much more wildlife we are seeing on the farm now. We've had a moose go through this year—we've never had a moose

photos: ACA, Kris Kendell

before—and an elk. We have songbirds, just from what we have done. It's exciting to challenge ourselves and be adaptable," says Stamp.

Still, there are drawbacks that can come from increased habitat and wildlife on crop-producing farms. When your livelihood depends on selling a clean, weed-free product, weed pressure from planted trees and shrubs becomes worrisome. "They grow fast and they spread," says Stamp. "How do you keep the crops clean? You can't spray certain chemicals. You have to think differently and be patient."

Another significant consideration is insect populations. Typically insects and crops don't mix, but they are vital for bird survival. The project proposes specific vegetation around the crop edge to benefit insect abundance and provide escape cover for birds. Trials of chemical application on the crop should allow some insect species to survive for feeding chicks. To encourage pollinators, ACA sees an opportunity to trial early flowering shrubs.

Stamp concedes that increased wildlife in certain areas can negatively impact crops and cost farmers. "We have to determine how to deal with that when it happens. Additional game harvesting opportunities may become available with both pheasants and large game. That would be a perk."

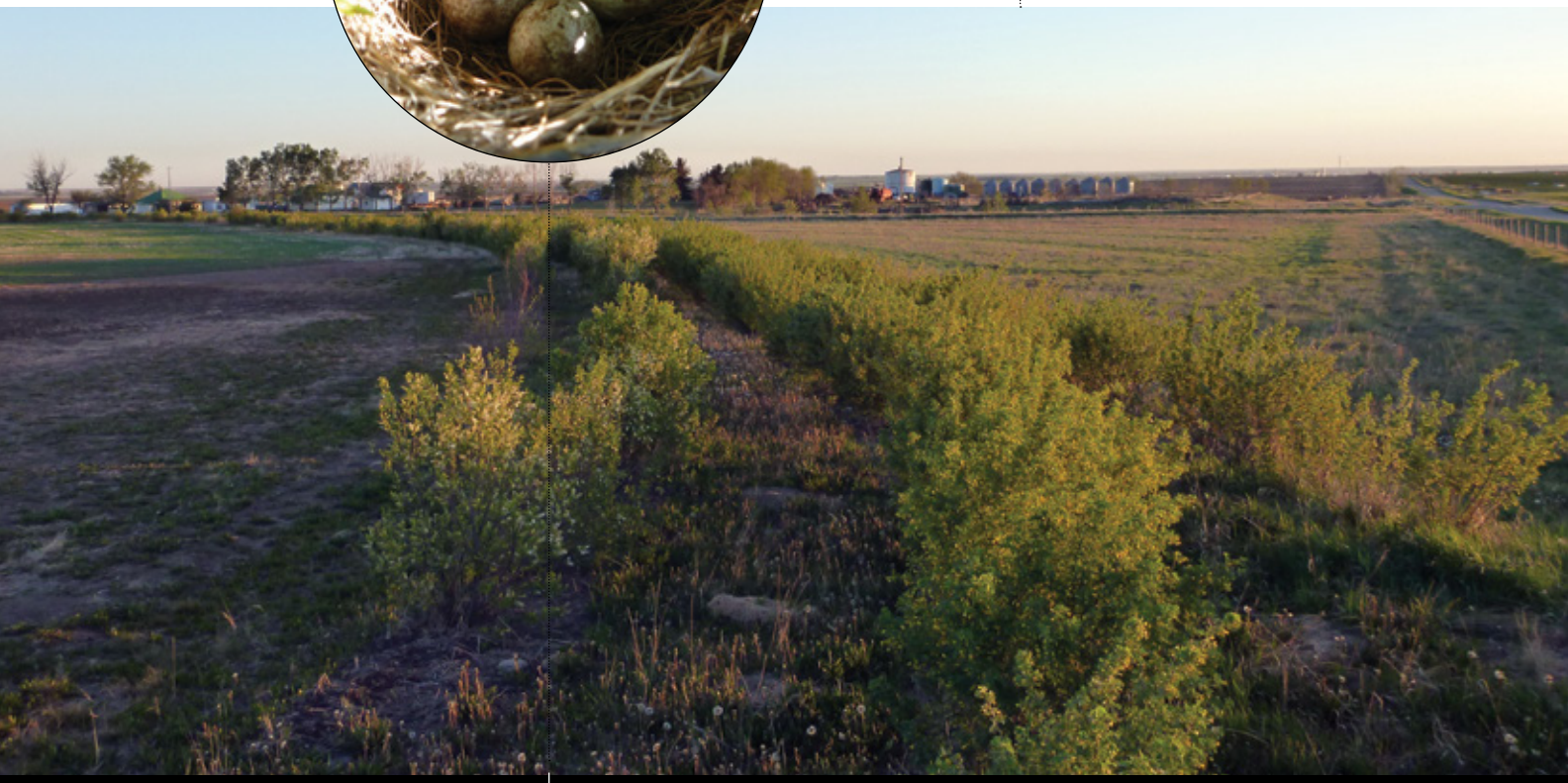
Only in its infancy, the project has met negative review from some who believe the land is being wasted. But Stamp remains optimistic: "The world is going to keep changing. We need more partnerships like this and will have to think differently going forward. Every generation will have to change." He wants the public to know: "We have a well-educated, professional group of business people who produce food. The food supply is in very good hands." He hopes the Enchant Project—ultimately pinpointing the best scientifically supported practices for modern farms—will inspire others in their efforts.

Wait to till, wait to seed, wait for rain, wait for sun: farmers are a patient lot. They plant seeds and have faith they will grow. Mounting pressure for sustainable food supplies and improved biodiversity will push farmers and practices to their limits. Patience and faith will be required to see the long-term benefits for both them and wildlife. Just like a good hockey team wins a hard-earned victory, this partnership will find success by grinding it out in the corners. It may not be easy, but no one ever said farming was.

The (EFP) is developing a project to help producers learn about information and resources regarding species at risk (SAR) on their farms. The three year initiative, funded by Environment and Climate Change Canada, will enable landowners to assess whether they meet sustainable sourcing standards. "The main benefit in adding SAR to the EFP," according to the EFP media release, "is to help prepare producers for the market demand for sustainably sourced products." But there are some other benefits:

- "Maintaining the integrity of the prairie ecosystem: native grasses, plants, insects, reptiles, birds and mammals are interdependent—losing one species will affect others
- Protecting our prairie heritage and western identity
- Helping with pest control: birds of prey, snakes, badgers and weasels eat gophers, mice and other rodents; other species feed on grasshoppers and mosquitos
- Demonstrating good land management"

For more details, visit www.albertaefp.com.
To register, send an email to info@albertaefp.com or call (780) 612-9712.



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► *by Ariana Tourner*

Brad Pallister, president of Len Thompson Lures, tells us a bit about the family business and how its longevity has played into his outlook on conservation.

photos: Courtesy of Len Thompson Lures

Len Thompson Lures is a family business with deep Alberta roots and a product still standing the test of time. With over 70 years of production, the company's versatile spoons continue to dominate the marketplace across the Canadian Prairies and Arctic. Len Thompson's grandson Richard recently went into semi-retirement after 40 plus years in the company. He's leaving the day-to-day operation to his son, Brad, and daughter, Jessica, the fourth generation.

Conservation: I think that sometimes people think the word conservation means not to fish, not to hunt. That's not true. Conservation is not to *overfish*, not to *overhunt*; not to overpollute or overdevelop. Conservation is to conserve, and I think although simple, it's an important definition. Some conservationists who are almost militant in their attitudes don't help. People shouldn't have to feel guilty for stepping on some wildflowers when out for a hike. They shouldn't feel guilt, period. What should they be doing? Enjoying the outdoors.

Younger generations: Alberta's Special Fishing Days and Kids Can Catch are fantastic because they promote engagement. That's why we are so strongly focused on that side of conservation—if we can help influence the younger generation to spend more time outside instead in front of their TV or computer, we've done our job. That's where respect begins to build. Alberta is great at engaging its young people.

As the president, I need to focus on the sustainability of the business. And in order for us to sustain the business, it makes sense for us to help sustain conservation initiatives. To continue to thrive in the long term, we need the next generation to *want* to go fishing: not have their dads or grandpas drag them out. They need to pick up the fishing pole themselves, and decide "I'm going fishing this weekend."

Advice: I try to remember the little things, and practice what I preach. Don't leave your vehicle idling. It needs to warm up for five minutes, not half hour. See a pop can on the side of the road? Pick it up. You don't need to travel to the deep wilderness to enjoy nature; go for a walk in a nearby local park or river valley. Sure, maybe it's oversimplifying it. But the little things do matter—right now and forever.

Final thoughts: Don't be scared! No guilt. No fear. Get out there and enjoy everything Alberta has to offer.

Visit www.lenthompson.com/our-history.html to watch the video of how Len Thompson lures are made by hand.

Taking Stock in the Local Pond

Partners coming together for the community

► *by Kelley Stark*

Len Thompson is a well-known name in the fishing world. He developed his first fishing spoon in 1929 and four generations of descendants later, approximately 45 million of the lures have been produced. So it only seems fitting that his name should be given to a fishing pond in Lacombe, home to Len Thompson Lures since 1958.

The pond started as a stormwater pond in 2001. Dave Powell, who was the town superintendent at the time, had the forethought to make sure the pond was dug a little deeper than stormwater ponds need to be. He was also the president of Alberta Fish & Game and his two titles worked together to provide a stocked fishing pond for the community.

Since then, the City of Lacombe, the local fish and game association, Co-op Community Spaces, Alberta Conservation Association (ACA), Dow, Len Thompson Lures and a few other partners have gotten involved to make this pond into a place where all families can go. "The little fellas can go fishing and mom can read a book on the bench and the other kids can play in the sandbox," explains Powell. "We've put up a gazebo, we've improved the parking area, we put in a feature retaining wall coming into the property; we have a bunch of trees being planted, some casting platforms and we've put in a bit of a playground."

June 4th will be the Grand Re-opening of the Len Thompson Fish Pond. It will also be the location of the annual local Kids Can Catch event. Sandi Stewart, Recreation and Culture Manager with the City of Lacombe plans to make it a big celebration. "This year even more so than most years. We'll have a barbecue and refreshments, the kids bring their own fishing rods, there'll be someone onsite with sparkle tattoos and we'll have a trail mix bar (like a candy bar at a wedding but with trail mix). Dow will be there with Frisbees to hand out, we'll have 250 lures from Len Thompson to give away and we'll make use of Fountain Tire's big barbecue."

But the best part, the part that is the most popular with all the kids, is when the fish stocking truck comes and they all get a bucket of water with one or two fish in it that they get to release into the pond. "We may need more fish," says Stewart, "because the thing that really brings a smile to the kids' faces is releasing the fish. It's definitely the highlight of Kids Can Catch."

Thanks to a bunch of partners coming together to invest in a municipal pond, a town superintendent with a plan, and Lacombe Fish & Game and ACA stocking the fish, the pond has been a great community project. "The best way I can describe it," says Powell, "is how proud you feel when you're driving up to the railroad tracks and over the tracks you see four kids with fishing rods strapped to their bikes. Going to the pond to go fishing."

Len Thompson Lures is doing what they can to help those affected by the fires in Fort McMurray. They made a commitment to sell 1,000 lures featuring the words #AlbertaStrong and donate 100 percent to the Canadian Red Cross. All 1,000 lures were sold within 16 hours of launching the campaign and a donation of $10,512 was made to the Red Cross.

But the management and staff at Len Thompson still felt like this wasn't enough. So they are continuing the #FishingForFortMac fundraiser until the end of May. They will be selling the custom made #AlbertaStrong lures on their website and 50 percent of all proceeds from now until then will continue to support the evacuees of the Fort McMurray fires.

Len Thompson Lures plans to raise $40,000 for the Canadian Red Cross (which is then matched by both the Alberta and Canadian governments). You can find more information on the Len Thompson Fishing facebook page or their website. (lenthompson.com)

DON'T LET IT LOOSE

► *by Kate Wilson & Gavin Berg*
Fish & Wildlife Policy – Alberta Environment & Parks

So you got a goldfish and an aquarium for your kid. It's been six months and he has completely lost interest in "Goldy." The algae is building up, the fish is swimming with a limp and the only one that really seems entertained is the cat. How can you get rid of the pesky thing without killing it? Perhaps the neighbourhood pond? It's a perfect solution to your problem.

Only it isn't. Dumping Goldy can cause a lot of problems. Most "neighbourhood ponds" are stormwater ponds that were built for specific functions, none of which include being a goldfish kennel. They are often connected to flowing water and any diseases or parasites that were in your aquarium will go to the river with her. And, it turns out that Gordon, released by a kid down the street, will take a big interest in Goldy and together will compound the problem by having lots of baby goldfish.

Releasing pets into the wild, which includes any public waters, is illegal, dangerous to the native species that live there and cruel to your pet.

People need to understand that it is never appropriate to "free" their domestic pets. Being a responsible pet owner means **DON'T LET IT LOOSE!** The release of fish into public waters is an offense and individuals face penalties up to $100,000 and a year in prison.

Last year, over 40 goldfish were removed from a stormwater pond in the Regional Municipality of Wood Buffalo. These fish were comprised of four age classes, suggesting that they had been there for some time—at least one winter even. They ranged in size from fingerling to "Granddaddy Gold," the size of a dinner plate. If species as benign as goldfish can survive a winter in Alberta as far north as Fort McMurray, they certainly will thrive in all of the other parts of Alberta. To date, we have had reports of goldfish in urban stormwater ponds in Edmonton, St. Albert, Calgary, High River, Red Deer, Sylvan Lake and Coaldale. Many municipalities have been partnering with the province's Aquatic Invasive Species Program to respond to these introductions—but until people stop intentionally stocking ponds, management options are limited.

Goldfish are able to tolerate fluctuations in water temperature and low levels of dissolved oxygen. While the impacts of introduced goldfish have not been widely studied, it is known that they reduce biodiversity through their negative effects on native species. Goldfish eat snails, small insects, plants, fish eggs, larvae and young fish, making this species both a competitor to and predator of native fish. They stir up mud when they feed, which increases the cloudiness of the water and affects the growth of aquatic plants. They also have the potential to produce large populations, and can carry diseases that can harm local fish populations.

The Prussian carp, essentially a wild goldfish, is currently found in Alberta waters as well, and is growing in population. It's found in the main stem of the Bow, South Saskatchewan and Red Deer and many of their tributaries. It is believed that people are deliberately moving them from one waterbody to another. Because they are so closely related genetically, there is no question that domestic goldfish could thrive just as heartily as these Prussian carp in flowing water. Once a problem is this widespread, in so many great big rivers, it becomes almost impossible to eradicate them.

"The release of fish into public waters is an offense and individuals face penalties up to $100,000 and a year in prison."

WHAT SHOULD YOU DO WITH GOLDY THEN?

You can't just kill her as your children will have a meltdown large enough to implode a Geiger counter, so your possible options are:

1. **Fake their death**
(Oh no! Fluffy the cat got into the aquarium)

2. **Give them away**
(Nothing solves a problem like passing it to somebody else)

3. **Return them to the pet store**
(only slightly used)

4. **Donate them to a frat house for the initiation activities** (Dude….Bro…Dude)

5. **Get creative** (that senior residence down the street could really use some ambiance)

Whatever solution you find works for you, do not flush your fish down the toilet. Goldy won't survive the ride and flushing fish can spread disease throughout our waterways.

Releasing your pets is a horrible idea. Just don't. And tell your friends not to either. Together we can easily prevent goldfish from taking over our ponds and rivers.

FOR MORE INFORMATION
on this and other elements of our provincial Aquatic Invasive Species Program or to report AIS, see our website (aep.alberta.ca/recreation-public-use/invasive-species/aquatic-invasive-species) or call our AIS Hotline (1-855-336-BOAT [2628]).


WHIT


EOUT

Witnesses say that if you're lucky enough to experience thousands of geese lift off in migration, you may momentarily forget the frenzied snowstorm blocking the sun. It's the sound and power of a million wings that will never leave you.

Perhaps too smart for their own good, these skittish birds are multiplying so quickly that many populations are actively destroying their own habitat, possibly beyond the point of recovery. The question is, can they outsmart us too?

As lesser snow geese and Ross's geese continue to deke hunters and eat like kings, their numbers surge: nearing 15 million in North America. With over 400,000 snow geese passing through Alberta alone and touching down in the western Arctic to graze and breed, the plants they depend on suffer. Some ecosystems are already damaged, and other species may soon feel the reverberations.

It's not being taken lightly: Canada continuously monitors geese, researching and working with international partners to take on the population plight. Environment Canada has published the 2014 *Population Status of Migratory Game Birds in Canada*, and along with a multiple of biologists working for the organization, they are trying to make some headway on the overabundance situation.

photos: Jim Kroshus

▶ *by Ariana Tourner*

Meet the geese

Geese are found everywhere in North America, though very few spend the entire year in Canada. Most migrate north–south and share time between Canada, the United States and Mexico, while some visit Russia, Greenland and northern Europe. Six species of geese nest in Canada: snow geese, Canada geese, cackling geese, white-fronted geese, Ross's geese and brant geese. Environment and Climate Change Canada (ECCC) handles the conservation and sustainable hunting of these birds.

Vast portions of the North American landscape converted into agricultural cropland and changing farming practices have created a superabundant, highly nutritious food source for these migrating geese. In particular, snow geese and Ross's geese have feasted well over the last 60 years, and humans are to blame. Mechanized harvesting spills millions of bushels of waste grain ready for the taking. Combined with safety found in refuges along their migratory path, goose survival keeps on climbing—possibly to the detriment of some Arctic and subarctic ecosystems.

Duck, duck, GOOSE!

The breaking point came in 1999, when greater snow geese and the mid-continent population of lesser snow geese (the western Arctic and Wrangel Island populations being the others) were designated as "overabundant" in the United States and Canada. This spurred serious, unprecedented action by ECCC, especially knowing that of all potential management techniques available, reducing survival rates for adult geese through increased hunting was likely to be most successful. And so the Migratory Birds Regulations were amended—allowing spring harvest outside the traditional hunting period, higher bag limits, and the use of special hunting equipment for both fall and spring harvests in Quebec, Manitoba, Saskatchewan and Nunavut.

Every year ECCC assesses the population status of migratory game birds to ensure regulations are still appropriate, and makes any necessary amendments every two years. Both the U.S. and Canada maintain liberal hunting regulations for these populations, hoping to reverse their rapid population growth. But from an average of two million midcontinent lesser snow geese in the '70s to around 13 million today, time isn't turning back.

Is Ross the new boss?

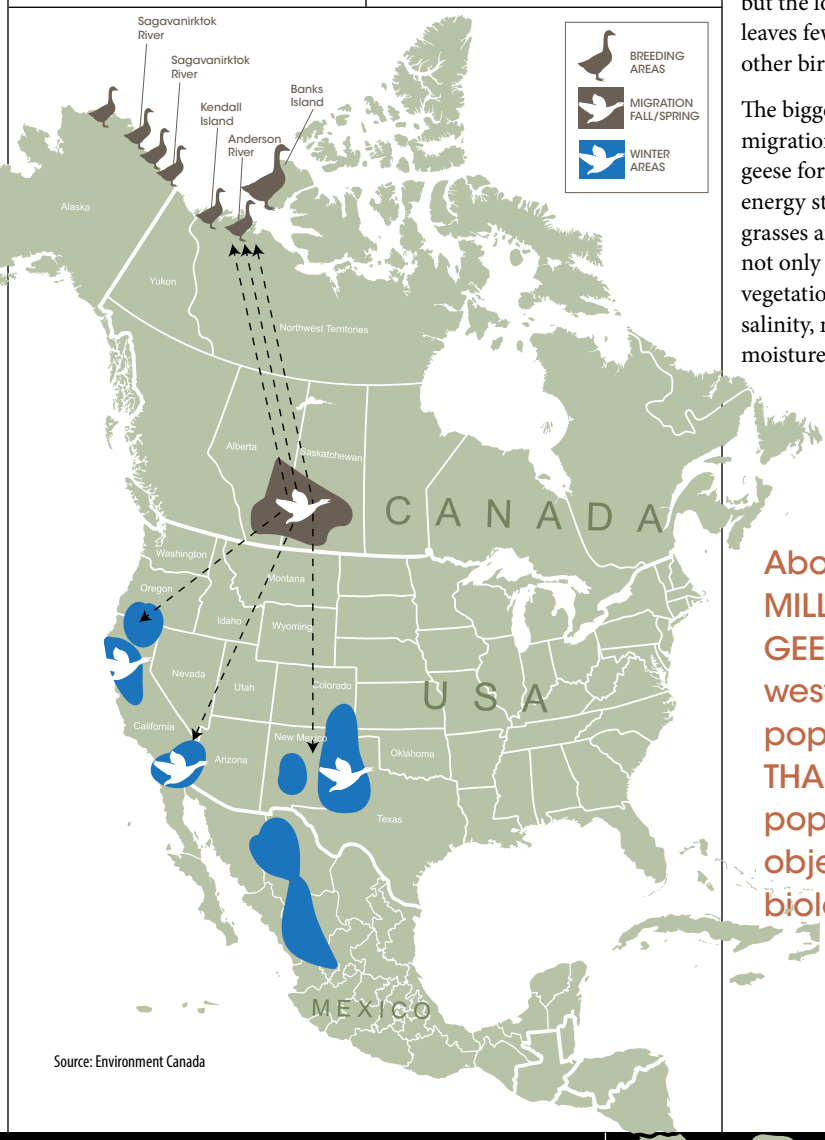
Closely related to lesser snow geese, Ross's geese co-occur with them throughout the year and are managed in the same way. Though snow geese get the most attention, Ross's geese were also designated as overabundant in the U.S. in 1999, and have been included in spring conservation harvests there since then.

In fact, population growth rates of Ross's geese have surpassed those of lesser snow geese since the introduction of the spring conservation hunts in 1999. Biologists predict continued high growth—incredible really, considering Ross's geese were relatively rare in the early part of the last century, at a mere 5,000 birds. Banded annually since 1989, in numbers sufficient to estimate their rapidly increasing population size, these birds are now estimated at about two million adults.

Gaggle of destruction

Goose populations have been carefully monitored for over 50 years—to the point some may wonder why all the trouble. How much damage can a bird do? One bird doesn't cause problems, but snow geese and Ross's geese can nest in large colonies, with hundreds of thousands tearing up tundra vegetation during nest-building. After hatch, they disperse with their goslings, scouring the Arctic tundra up to 60 km away for grasses and sedges. On its own, grazing doesn't typically destroy plants, but the loss of vegetative cover leaves fewer nesting sites for other bird species.

The bigger problems come with migration and pre-nesting, when geese forage below ground for energy stored in the roots of grasses and sedges. "Grubbing" not only permanently removes vegetation, but also changes soil salinity, nitrogen dynamics and moisture levels that can lead



Source: Environment Canada

About ONE MILLION SNOW GEESE make up the western Arctic population—MORE THAN DOUBLE the population objective set by biologists.

to profound changes in plant communities. This causes the most concern among biologists, mostly because the scale and severity of the effects on other species are not well understood. At some large colonies, predator species have increased in response to the abundance of nesting geese, while numbers of nesting shorebirds and small mammals have declined. Although the Arctic is vast, areas that can support geese and other species are limited.

Even more complex, Ross's geese sometimes nest on areas already degraded by lesser snow geese (e.g., the west coast of Hudson Bay). The Ross's smaller bill allows them to crop vegetation closer to the ground—upping grazing pressure even more. Their smaller body has another benefit: they require less food than snow geese from hatching to adulthood, and have actually outcompeted snow geese in areas where the two co-occur.

In the spring of 2016, the lesser snow goose and Ross's goose are on the list of huntable waterfowl in Alberta for both spring and fall seasons. Hunters in Alberta will be able to partake in a goose hunt this spring between March 15th and June 15th.

photo: Brad Fenson

Round two

As the latest to be designated overabundant in 2014, the western Arctic population of lesser snow geese could be history repeating, another pattern of rapid growth tailing the mid-continent's woes. The difference? There still might be time to control this population through increased harvest along migration routes, extending through Alberta and western Saskatchewan. Similar efforts to stabilize greater snow goose numbers in eastern North America have been effective because numbers were still relatively small when conservation seasons began. Recovering goose populations from low levels is much easier than reducing them after runaway growth.

About one million snow geese make up the western Arctic population—more than double the population objective set by biologists. Tackling the second year of the spring goose hunt, hunters in Alberta and the Northwest Territories have their work cut out for them. (For tips on the spring goose hunt, check out Conservation Magazine, Spring/Summer 2015, "Get Your Goose").

Fate in hunters' hands

Geese are wary, and hunters must be extremely committed to see success. And while they're trying, permitted to bag 50 birds a day in the spring in Alberta (20 in Saskatchewan), hunters aren't getting anywhere even close. Based on band return data, lesser snow geese from the western Arctic population have an 85 percent chance of surviving from one year to the next. Recent recovery rates for banded adult birds were between two and three percent, suggesting that most adult mortality is not due to hunter harvest.

On the prairies overall, hunters are bagging more birds and helping to slow growth, but harvest rates (the proportion of birds shot by hunters each year) have still declined. Hunters harvest only about two percent of adult Ross's Geese and snow geese annually—not enough to make a dent in the burgeoning population. While tough to acknowledge, it's very likely that the mid-continent population of lesser snow geese can no longer be controlled through hunting. It remains to be seen what might eventually limit their number.

Heads together

The Arctic Goose Joint Venture (AGJV) hopes to figure that out. As a multi-agency partnership established under the North American Waterfowl Management Plan that advances the scientific understanding and management of North America's geese, it's co-chaired by ECCC's Canadian Wildlife Service and the U.S. Fish and Wildlife Service. AGJV recently released a statement outlining the issue of overabundant snow geese and Ross's geese (see the statement at www.agjv.ca).

"One goal of this statement was to tone down the rhetoric in the media about 'destruction of the arctic,'" says Jim Leafloor, biologist with ECCC. "It has to be made clear that we do not know the seriousness and extent of habitat damage caused by geese, especially in Arctic habitats. We do not know the carrying capacity of Arctic habitats for geese and other species, and we do not know, beyond the local scale, the impact of habitat changes caused by geese on other species that share their habitats. Extreme methods—essentially eliminating millions of geese, over and above what hunters already take—would need to be carefully considered, because at this point we don't know if the cumulative impacts on Arctic and subarctic habitats represent a large-scale ecological issue that would demand such a response."

ECCC is documenting habitat use, the magnitude of cumulative habitat alteration by the geese, the availability and sustainability of Arctic and subarctic freshwater habitats, and possible impacts on neighbouring species. As federal biologists search for more answers, hunters contribute to population management through annual harvest, and widespread surveys and banding continue to assess population size, survival and harvest rates. Undoubtedly it is a complex issue and, in Canada, the research is ongoing.

ALBERTA'S INVASIVE SPECIES

8 THE HATED

by Kelley Stark, ACA

Imagine taking a crocodile out of its natural habitat and dropping it into an Alberta lake. "It's not that crocodiles are bad, it's that they're bad here because they're not controlled," says Don Hare, Alberta Invasive Species Council (AISC) Program Coordinator. "The whole story of what makes an invasive species invasive is that it probably didn't start here and has no natural predators. It doesn't have a conscience, it doesn't have any morals, and it doesn't have any ethics; it's just going to take everything and it won't stop."

AISC has a long list of species that have made their way to Alberta. A couple have been stopped at the border and others are being targeted for control and possibly eradication. Eight are highlighted in this article.

WE DON'T HAVE THEM YET

Zebra and quagga mussels have been trying to get into Alberta for a while now but so far we've stopped them at the border. You can read more about them in our Spring/Summer 2014 issue of Conservation Magazine.

Please continue to follow the Clean. Drain. Dry. initiative so they don't become one of Alberta's Invasive Species.

Rats

Alberta prides itself on being the largest rat-free population in the world. "We get them all the time," explains Phil Merril, Rat and Pest Specialist with Alberta's Agriculture and Forestry, "…but we don't have a population here. We don't let them stay."

Twice a year, pest control specialists search the Saskatchewan border and about 30 kms in (residences, barns, haystacks and other places a rat might go). Landowners are also supplied with bait.

In the interior, calling 310-RATS will bring local pest control officers to dispose of a rat. It's a quick process but occasionally, one prevails. A large-chain grocery store in Southern Alberta was delivered a shipment of produce—and a wily rat. It took pest control six months to get rid of it. "He was tricky," says Merril. "He could eat all the fresh produce he wanted; he had the run of a grocery store; why would he take our bait?" The store was forced to throw out a lot of food.

One rat is bad enough, more can cause untold damage. "They contaminate the grain with feces and urine and that's the greatest damage," says Merril. "If you multiply that by every farm, it's a terrific amount of money that we don't have to spend."

photo: Alberta Agriculture and Forestry

photo: Rebecca Baldwin, AEP

Black Bullhead

While the black bullhead can be imported into Alberta, it must be dead according to Alberta Environment and Park's (AEP) list of prohibited aquatic species—not like the ones found in a small, stocked trout pond near Fort McMurray in June 2015.

The fish is native to areas east of Manitoba, so Kate Wilson, Provincial Aquatic Invasive Species Specialist with AEP, can't be sure how the fish got to Alberta. But she has her suspicions: someone had to have caught (at least two) black bullhead and transported them all the way to Fort McMurray alive with the intention of illegally introducing them in Alberta waters.

Because of the impacts black bullhead pose to native species, literally eating anything they can fit in their mouths, AEP decided that something must be done. In September, an expert from Montana was brought in to help treat the pond with Rotenone, a fish toxicant that does not affect plants or water and biodegrades within 72 hours. The treatment is believed to have been successful to date, as no black bullheads have been detected in monitoring efforts, but Wilson explains even though there were many floating black bullheads after treatment, one in five was still kicking.

"This just goes to show you how robust the black bullhead are," she says. "That's going to be the trademark of most invasives: they're going to have that edge over the native species."

Prussian Carp

Prussian carp has invaded most of Europe and Asia and some of Alberta. Luckily, we can study how other places have handled it. The Czech Republic released a naturally occurring herpes strain into their waterways, and it wiped out whole populations without affecting other species.

But, explains Dr. Mark Poesch, assistant professor of conservation ecology at the U of A, "You don't want to jump too fast into a solution and then have an unintended consequence. We've done that in the past in the invasive species world, where we've introduced a known predator from its native range and then the predator itself becomes invasive. The virus in the Czech Republic didn't have an impact but maybe it will here so it has to be thoroughly vetted."

Prussian carp alter the habitat of native fish by feeding off the bottom and creating likely harmful sediment in the water. They also cause competitive displacement, using sperm from other fish. This decreases native fish populations because the sperm is not available.

Poesch warns the danger is that they're one of the most prevalent invasive species in the world, able to live in all sorts of environmental conditions…and people are moving them from pond to pond.

Flowering Rush

Doug Buchholtz has visited Lake Isle for over 50 years and is desperately hoping his grandchildren will be able to enjoy it as much as his previous generations and kids have. But he's not sure that's possible.

Lake Isle has been hit with an infestation of flowering rush that has him questioning if there'll be any lake left to enjoy. "The flowering rush formed a kind of mat so heavy that, in places, I could walk on it and it actually formed a shoreline out into the water," says Buchholtz. "We're talking 40 feet from the shoreline and in a mass so thick and so dense that not a reed can survive and not a duck can swim through it."

Using tractors, trailers, dump trucks and hundreds of people, a volunteer team removed a tonne of the invasive plant. They had mountains seven feet high, but, unfortunately, it's not that easy. It came back in one year.

AISC is planning trials to see what will work best to stop the growth, trying everything from mechanical and chemical removal to tarping the area to block the sunlight.

photo: Tanya Rushcall, AEP

photo: Mark Poesch, U of A

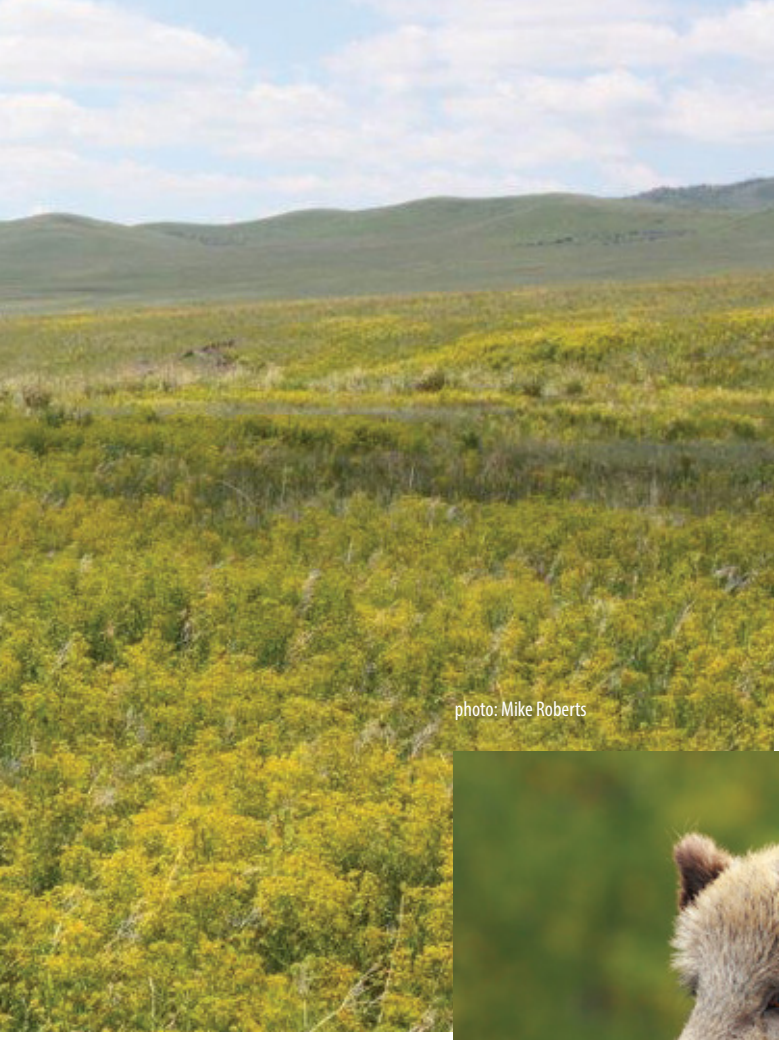


photo: Mike Roberts

Leafy Spurge

Flea beetles and sheep might be an answer to Alberta's leafy spurge. Or at least that's what one ranch in southern Alberta is trying. The beetles are a natural predator imported from the Mediterranean after being put through rigorous testing. The program takes a decade and a million dollars. Researchers study the weed and its predators in a natural habitat, then test the predator on native plants to make sure it's not interested.

Oscar Anderson, chair of AISC explains: "If they start eating the native plants then that bug is crossed off the list." The last thing the AISC wants is another "mongoose in Hawaii" story. Mongooses were brought into Hawaii years ago to control rats but instead ate all the native birds.

Leafy spurge is mildly toxic to cattle, so sheep were brought into graze. Not only do the sheep seem to enjoy the weed but they are also useful for transporting the flea beetles. Unlikely that leafy spurge will truly disappear from Alberta, the sheep-and-beetle method is possibly the best non-chemical way to control it.

"Feral wild boars are bullies and thugs, harassing livestock away from feed."

Wild Boar

It's been over 25 years since producers started diversifying their livestock in Canada and wild boar breeding began. "But nobody really appreciated the potential for them to escape," says Perry Abramenko, an inspector for Agriculture and Forestry. "And it was thought that if they did escape, they wouldn't be able to survive our winters."

Surprisingly, they did escape and they can survive Alberta winters.

Feral wild boars root through crops with a cartilage disk in their snouts looking for bugs, roots and worms. When they're done, "it looks like someone has taken a rototiller to the field," says Abramenko.

Feral wild boars are bullies and thugs, harassing livestock away from feed. They damage stored feed too, defecating on anything available to eat so everything is unusable for the producers. Boars prey on nesting birds, and if cornered (say, by the family dog) become quite aggressive and use their remarkably sharp tusks to attack. On top of it all, they love to wallow in Alberta's spring banks causing erosion and contaminating water sources.

The biggest problem with the wild boars is that they're smart. They'll change their habits, become nocturnal or move to a different area, making them extremely hard to catch. Outsmarting wild boar can definitely be a challenge.

photo: Daniel Laubhann

Himalayan Balsam

Himalayan balsam, boasting beautiful pink flowers and lush green foliage, was brought in from Asia as an ornamental plant by the horticultural industry. It has since joined the Prohibitive Noxious Weed list.

Daniel Laubhann, an environmental technician with the City of Edmonton's Neighbourhoods Strategy and Supports explains: "It create monocultures around the shorelines, displacing native vegetation. There are several fish species that need that variety of plants growing along the shoreline, to feed and to spawn, so changing the structure of the shoreline has an impact on aquatic species."

Bumblebees love Himalayan balsam. Laubhann says native species get pollinated less than invasive species, decreasing the pollination reproduction of the native plants. "Having a plant that is good for bees doesn't mean it's a positive thing in the bigger picture."

To remove the plant, catch it right after it flowers but before it produces seeds. Remove it with the roots, and throw it into the garbage, not the compost. Never the compost.

On public land, Alberta Agriculture is trying to get rid of it mechanically, rather than chemically. Three community weed pulls were organized for Edmonton's Kennedale Ravine in 2015. In denser areas, the city mowed. Doing this a few years in a row should ensure seeds left in the soil are destroyed.

Goldfish

In June 2015, a St. Albert resident called the city to say he'd seen a goldfish in a neighbourhood storm water pond. The city went to verify and didn't find a single goldfish. Instead they found all colours and sizes of goldfish, where goldfish shouldn't be!

Goldfish are being found in storm water ponds all across Alberta, from Lethbridge to Fort McMurray, ranging in size from the kind swimming in bowls to the size of a dinner plate! Because these ponds eventually flow to the river, an infestation is possible.

Goldfish, like any invasive species, can make life harder for the native species by transferring disease, stirring up dirt affecting native eggs, and competing for food.

See "Don't Let It Loose" on page 18 for more.

photo: Sarah Cicchini

Grants in Biodiversity

Never taken for Granted.

► *by Nicole Nickel-Lane*

Last spring we brought you a story profiling the history of ACA's Grants in Biodiversity program. Over the last 20+ years, this program has funded hundreds of influential, home-grown research studies across Alberta, covering a huge swath of species from fungi all the way up the food chain. The pattern that's emerged over time is that the small creatures are most often our best sentinels—if we pay attention to variances among the little things, we have the best shot at maintaining healthy ecosystems. Here are two more examples of Alberta graduate students who have tuned in to the smaller, overlooked, or taken-for-granted species, and what their findings could indicate for the future.

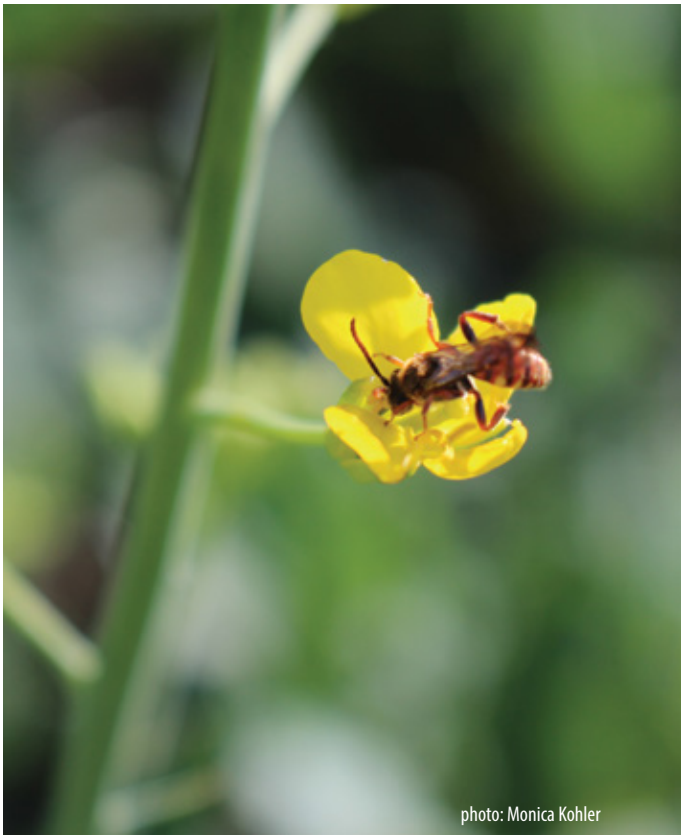


photo: Monica Kohler

Aliens on the Prairie

"Everyone loves big mammals, but a lot of the time we forget about our insects," says Ashton Sturm, Masters student with the Faculty of Agricultural Life and Environmental Sciences at the University of Alberta. So Sturm has taken it upon herself to tally Alberta's bee population from Grande Prairie clear on down to Cypress Hills. "We've put a lot of miles on our trucks," she jokes.

Integral as pollinator species are to every facet of life, Sturm's study will be the first to help establish a comprehensive baseline bee population for these areas. With an estimated 80-100 species of bees in Alberta, collecting and analyzing sufficient samples for such a study would be extremely time-intensive. But she's deployed a unique approach to the counting, using other sub-species of bees to reflect the true population density of native bees.

These sub-bees are called "cleptoparasites," naturally occurring organisms that look like bees, buzz like bees, and more or less behave like bees. But instead of contributing to the colony, cleptoparasites will lay their eggs in native bees' nests, feed off the nutrients, grow bigger faster than native bees, and ultimately consume the host eggs. And that's a good thing, as an indicator of overall bee population health: the more cleptoparasites that exist, the better the food and nest availability there must be for native bees.

What's important about Sturm's study is its scope: she's collected some 200,000 individuals in rangelands and canola fields across 75 sites. Back at the lab, Sturm and her grant-funded research assistants spend hours each day at the microscope identifying the cameo bees from the real ones. With baseline models in place, future monitoring programs can be better established—information that will be increasingly important as conservationists work to slow the decline of bee populations.

We know pollinators are critical to agricultural crops but have yet to arrive at a dollar value for pollinator services. And in the absence of any previous benchmarks, Sturm admits there will need to be some assumptions. But in areas where there is less population density, a good first step to landowners will be to recommend planting hedgerows and different species of plants and grasses to help boost bee population and biodiversity.

Stressed Fish

The average household has dozens of soaps, cleaners and personal care products that get lathered up and run down the drain every day. But not all pharmaceuticals and personal care products (PPCPs) are eliminated during wastewater treatment before the drainage enters our waterways. University of Calgary Masters student Analisa Lazaro-Cote has set out to determine what the cumulative effect of this residual chemical cocktail is on resident fish populations.

Pollutants are often measured in isolation in controlled laboratory settings, which does not tell the full story of how these compounds interact when mixed together and let loose in our waterways. Turns out, fish that are exposed to PPCPs from municipal wastewater day after day are quite simply stressed out. Lazaro-Cote found that these fish had, among other biomarkers, elevated levels of cortisol—the same hormone that spikes in people when we experience periods of high pressure and stress.

For her study, she chose a lesser-known resident of the Bow River, the longnose dace. This native, abundant species tends to inhabit a small home range, reflecting the state of the Bow in distinct areas and is a good indicator of any environmental impact.

Lazaro-Cote's hypothesis is that the chronic stress experienced by the dace can diminish their adaptive response to a secondary stressor—in other words, if these fish spend a disproportionate amount of energy coping with contaminants in their environment, they may not be as able to cope with secondary stressors such as predators or even growth, which may translate into changes to overall population.

To test these effects, Lazaro-Cote has focused her research on areas downstream of two Calgary municipal wastewater treatment plants. "First, we electrofish an area, then create a second artificial stressor (exposure to air for one minute), measuring the physiological response of each fish before and after," she explains. It's a highly labour-intensive field exercise, requiring at minimum four people to set up, test, and process the specimens—which is where the funding for her research is critical.

With baseline knowledge of the effects of municipal wastewater on native fish species, Lazaro-Cote hopes new treatment technologies can be developed to better protect ecosystem health and biodiversity for future generations of longnose dace and their fellow river inhabitants.

Research on the Bow River.
photo: Andrew Dyck

ACA is pleased to be working with Syncrude Canada Ltd., which has pledged $250,000 over five years (2014-2018) to support the Grants in Biodiversity program.

Get Grounded

► *by Ariana Tourneur*

When we work with our hands to make something better, we reap the reward of whatever it is we improved. Not as palpable, is how we change. That's the way Trout Unlimited Canada (TUC) works: their hands-on cold water conservation has a million success stories to tell. But behind controlling erosion, protecting native species-at-risk, reconnecting waterways, rehabilitating streams and so much more are people. People who commit, and can't wait to do it all again.

Initiated over 40 years ago by concerned fly fishers, TUC has put more work on the ground than any other national water conservation organization. Their science-based approach has made it a frequently tapped resource when it comes to Canada's freshwater resources and habitat (including providing valuable policy and program insight to federal and provincial ministries and the federal Department of Fisheries and Oceans). It aims for a clear conservation strategy: rehabilitate damaged streams and their watersheds, creating healthy cold water resources for all. TUC says their people craft solutions, designing rehabilitation projects that address causes of issues, not simply treating effects.

People > Projects

Planning is crucial and science must always guide, but it's the volunteers and staff who truly fuel the fire. Their passion creates a ripple effect of stories and education: work that keeps on working. With more than 5,000 volunteers contributing 30,000 volunteer hours a year on hundreds of distinct projects, TUC relies "on our well-informed volunteers to be our eyes and ears across the country, alerting us to important issues as they arise," says Silvia D'Amelio, TUC's chief executive officer. Enthusiasm and hands-on action boosts both the scope and volume of work. Simply put, TUC wouldn't be without its volunteers.

Break it down now

It's a successful model—breaking down a commendable yet nearly boundless endeavor into tangible, smaller chunks. Those manageable chunks are what TUC calls chapters. There are 22 chapters from British Columbia to the Maritimes, and the Niagara Peninsula to the Northwest Territories. At this chapter level, members volunteer their time and effort to care for cold water habitat right at home. Work happens on the ground, rebuilding the health of local rivers and streams bit by bit.

Each chapter delves into proactive, science-based conservation projects, supported by research and planning from TUC's fisheries biologists. It's the norm for governments, foundations, corporations, landowners and conservation-minded people to step in too. And when that isn't enough, chapters get creative. When funding fell short in 2015, TUC's first-ever crowdfunding campaign (anyone can donate money from anywhere via the internet if they feel the cause is worthy) helped cover irrigation canal fish rescues in the Western Headwaters Canal near Calgary and the Lethbridge northern canal near Fort Macleod.

"TUC has put more work on the ground than any other national water conservation organization."

Trout Unlimited Canada

Chapter members connect with their communities and interact with people of all ages, who then can volunteer with any local, regional and national initiatives they'd like. Where there are a sufficient number of members, Provincial Councils are formed, able to address issues affecting a broader portion of the province.

photos: Trout Unlimited Canada

Action for satisfaction

Full-time staff handles the day-to-day business of the entire organization at the national office in Calgary. The Board of Directors, made up of volunteer representatives from across the country, ensure TUC's mission is being met. They have directed millions of dollars in improving rivers and streams for the animals that live in them and the communities that rely on them, with plans to do more: TUC just announced, in a media release, a significant change to the membership package. "Historically, less than five percent of TUC's membership dollars were put toward work on the ground. It's time to put 100 percent of these funds to work."

Response is enthusiastic, especially here in Alberta. "It's wonderful news for a project-driven chapter like ours," says a volunteer from the Oldman River Chapter. "We have some great projects planned and some great people are stepping up to get involved. All three of our native fish—Bull Trout, Westslope Cutthroat Trout and Rocky Mountain Whitefish—are in trouble due to many, many issues and can use all the help they can get. We're doing our part by raising awareness and getting boots on the ground to really make a difference where it counts: on the water."

Paint it yellow

TUC's national-level projects include educating Canadians through the Aquatic Renewal Program—a comprehensive course in stream restoration. Perhaps the most popular of all, at least with the younger crowd, is the Yellow Fish Road Program™. Launched in 1991, it teaches young people about protecting their local waterways from hazardous wastes (often carelessly introduced into rivers and lakes through storm drains on residential streets). The fun part for the kids is painting bright yellow fish on the roads near storm drains, and handing out fish-shaped pamphlets to remind their neighbours and friends that improperly disposing of contaminants, like household chemicals, is dangerous.

Whether it's pulling aquatic weeds all weekend, collaborating in a boardroom over fisheries policies, or teaching groups about stream restoration, the truth is…this work will never end. But Canada's water is worth fighting for, and TUC is working to make something really good even better.

Visit tucanada.org to find out how you can help too.

photo: Roth and Ramberg

From Game to GOURMET

photo: Mark Mahaney, Cook it Raw Alberta

Scott Pohorelic, Chef and SAIT culinary instructor

Scott Pohorelic is a culinary instructor for SAIT. His first restaurant job was washing dishes when he was 16. Later, he worked for the Yonge Street Café for three months when the current chef walked out. The owner asked Scott if he was interested in being the new chef and a career was born.

Scott stayed there for over a decade and, despite beginning at 19 and knowing everything, he made all the mistakes that it takes to learn. He attended SAIT one day a week in 1998/99 and branched out to a different restaurant to learn even more.

"Dwayne Ennest was the chef at River Café when I started there. My first day on the grill was their busiest day ever. But after a while, I realized that no other restaurant could offer the same opportunity for learning— even when I became the chef, I still felt that I was learning more there than anywhere else."

As chef, Scott has always tried to help troubled youth. Both at Yonge Street Café and River Café, he hired a lot of teenagers, "kids in high school that had lost their way. I wrote a lot of letters to the judge." It was logical that he would eventually become a culinary instructor.

Scott Pohorelic, fly fisherman

"I have always had a bit of a fascination with fish. While I was at River Café in the late '90s, a friend took me out and lent me a rod. It changed my life, it was that dramatic, and very quickly turned into an obsession."
Scott goes pike fishing often and finds them easy to cook. "You can dredge it in flour and serve with a simple caper, butter and lemon sauce or hollandaise." He likes to fillet pike and prefers the size to yield about four to six portions, though he once fed 21 people from a single pike caught in Saskatchewan.

PIKE GREEN CURRY

I like to make a batch of this and portion into freezer bags to take camping. Having some green curry makes dinnertime easy to do in the dark, and no dishes to wash either.

Ingredients:

450g (1lb) Pike Fillets

20g (4 tsp) Table salt

10g (2 tsp) White Sugar

250ml Cold water

15ml (1 Tbsp) Vegetable Oil

60g (4 Tbsp) Shallots, minced fine

60g (4 Tbsp) Green Curry Paste

3x400ml cans Coconut Milk

3g (4-5pc) Kaffir Lime Leaf, sliced very thin

45g (3 Tbsp) Fish Sauce

450g (3 cups) Baby Potatoes, cut into halves

200g (2 cups) Green Beans

200g (2 cups) Snap Peas

1pc (150g) Green Pepper, diced 1 cm

1pc (150g) Red Pepper, diced 1 cm

1 pc Juice from Lime

250g (1 cup) Fresh Thai Basil

Preparation:

Take your time to fillet the pike. It is possible to cut away all of the bones but it does take some effort.

Dissolve the salt and sugar into the water to make a brine. Let the pike fillets sit in the brine for 30 minutes in the fridge. Drain well, discard the brine and pat the fish dry with a paper towel. Let stand in the fridge for at least another 30 minutes.

In a pot over medium heat; combine the oil and shallots, sweat until translucent, about 10 minutes. Add the curry paste and continue to cook while stirring for a minute or two.

Add the coconut milk, lime leaf, fish sauce and potatoes. Let simmer for 15 minutes or until the potatoes feel about 80 percent cooked.

Add the green beans, snap peas, and diced bell peppers. Let simmer another 10 minutes.

Cut the fish into squares that are about 2cm square. Add the fish to the broth and turn the heat down low. Let the fish poach until cooked, about 5 minutes. Fold in the lime juice and basil.

Serve with jasmine rice and fresh cilantro.

Makes about 6 portions.

STINGING NETTLE

"Stinging nettle is my favourite spring ingredient. I have cooked within the seasons for so many years, and nettles are the first green thing we see. Well, and dandelions, but you can only eat so many dandelion leaves."

Stinging nettles are planted in SAIT's student garden so they always have access to young tender leaves. In the wild, you'll find stinging nettles growing around rivers.

The plant is very versatile: "To cook, blanch and shock then do anything you want—put in a soup, puree it, chop cooked leaves into a risotto." The options are endless.

What is stinging nettle?

Stinging nettle is a perennial edible plant with hairy tapered leaves and undistinguished white flowers. It gets its name from the sharp hairs that contain formic acid. They break easily and can be quite irritating to the skin. Wear gloves while picking and be careful. Cooking the leaves takes the sting out. The leaves are best eaten when very young and soft. The plants are grown commercially in Europe for the chlorophyll and the plant has been used in folk medicine for centuries.

STINGING NETTLE CHIMICHURRI

Serve as a sauce for grilled meats.

2-3 pieces Dried Chipotle Chilies

1 cup White Wine Vinegar

2 cups Stinging Nettle

½ cup Fresh Parsley

¼ cup Fresh Mint

1 Tbsp Fresh Garlic

1 Tbsp Grainy Dijon Mustard

1 cup Extra Virgin Olive Oil

2 tsp Kosher Salt

Preparation:

Break up the chilies enough that you can remove the stems. Grind the chilies into a fine powder. A mortar and pestle will work as well as an electric spice grinder or blender.

Heat the vinegar, pour over the chili powder and let stand at room temperature until cooled.

Be careful with the nettles. Wear thick gloves or use tongs to handle them until they're cooked. The best nettles are the young tender ones; the first in the spring or later in the summer after they've been cut back.

Blanch and shock the nettles by placing them into a pot of boiling water until they darken in color, about 2 minutes. Strain and then submerge in a boil of ice water until they're cold, about 3 minutes. Drain well and shake out as much water as you can. The nettles don't sting anymore so now is when you want to remove the large stems. Chop the remaining leaves quite fine.

Chop the parsley and mint fine, mince the garlic fine. Combine with the chopped nettles, mustard, olive oil and salt. Mix well.

NETTLE TEA

Nature's spring tonic

Stinging nettles contain quercetin, Vitamin C, Vitamin B, Vitamin K1, triterpenes, sterols and minerals. Ten grams of nettle has 290 milligrams of calcium and 86 milligrams of magnesium.

Steep approximately 1 cup of nettle leaves in two cups almost boiling water. Add honey to taste if desired. Drink warm or chilled.

River Café

"Sal Howell's original concept was wood-fired Pacific Northwest cuisine; farm to table came from that. It was an evolution. The great thing about that restaurant is that everybody believed in the same thing: sustainable and local."

The River Café is a leader in sustainability and farm to table cooking. The restaurant, set into a bucolic landscape in the Bow River, steps away from downtown Calgary, evokes the outdoors with an attractive assortment of animal hides, canoes, fishing paraphernalia and a welcoming wood-burning fireplace. Beloved of critics and diners alike, River Café celebrates its 25th birthday this year.

River Café, 25 Prince's Island Park, Calgary, 403-261-7670, www.river-cafe.com

Munchable Mushrooms

► *by Budd Erickson, ACA*

Alberta's friendliest fungi

photo: ACA, Budd Erickson

Edible Fairies

Fairy Ring Mushroom / Scotch bonnet (Marasmius oreades)

Fairy ring mushrooms are fairly common. In fact, they are so common that many people angrily try to annihilate them from their yard. Feel free to keep doing that because you really shouldn't pick them from your lawn anyway.

Since mycelium (basically, mushroom roots) live a long time, they can accumulate pesticides, herbicides, heavy metals, and other nasty things that end up in the mushroom. Thankfully, mushrooms are common outside of the city as well and there are many to be picked in grassy areas on our Conservation Sites, where they are perfectly safe to eat, as long as you've picked the right ones.

There are a few different species of mushrooms that grow in fairy rings, but there is only one edible species: the Scotch bonnet (Marasmius oreades). Although the scotch bonnet looks like any old mushroom, it has some very distinguishable characteristics that separate it from other fairy ring mushrooms. For one, it is a soft tan colour (never white) and the cap usually has a bump in the middle that is a bit darker. The easiest feature to remember is that the stem very pliable and tough. So tough, in fact, you cannot eat it—so only collect the mushroom caps.

Although it is easy to find and pick fairy rings, there is one major annoyance: bugs. It depends how long the mushrooms have been there, but in roughly half of the caps you pick, there will be worms inside. Every time you pick a cap, break it in half, check for worm holes and if you see a single hole, discard it. Even if you throw out half of the caps, it's possible to fill a basket with wormless mushroom caps in an hour or two.

There are many ways to eat fairy rings (mushroom pizza, mushroom pasta, mushroom sauce, mushroom soup…), but if you fry the mushrooms caps in some butter and onions and put them on a burger with swiss cheese, it will be the best mushroom burger you've ever had.

Summer Icicles

Comb Tooth Mushroom (Hericium spp.)

This mushroom is seriously easy to identify. It looks like a giant cluster of brilliant white icicles cascading down a rotting log. It doesn't have any gills or caps, just bundles of little spikes. There are other fungi known as coral fungi that look somewhat similar, but none that have spikes pointing downward and that are so pearly white.

One huge plus to picking this mushroom is that, for whatever reason, bugs really don't like it. Maybe because for bugs, the huge ominous spikes are too scary, or maybe it's because the mushroom is so hearty and

photo: ACA, Budd Erickson

dense that it's too hard to eat raw. Whatever the case, I've picked buckets of them without a single bug to be found.

Alberta is a great place to pick comb tooth mushrooms because they like to grow on decaying aspen logs and Alberta is pretty good at growing aspen trees. In a single afternoon, at one small 80-acre Conservation Site, a friend and I filled two backpacks and a spare box.

Comb tooth mushrooms don't like the sun, so you will need to look under and around decaying logs, especially ones that are covered by foliage. This can be a bit messy and also prickly due to rose bushes, so wearing long sleeves and leather gloves for pushing aside bushes is a good idea. Sunglasses or eye protection is necessary too as they can save you from the ol' pushed-aside-branch-becomes-a-flying-stick-to-the-eye-for-the-guy-behind-you.

Once in the kitchen, there is no need to use a knife. Pinch a small group of spikes and peel them apart by pulling them in the opposite way that the spikes are pointing. It's super easy and very quick to get them to bite-size pieces without a knife. I like to fry them in garlic butter until golden brown and eat them with wild meat.

Hollow Honeycomb

Black and Grey Morels (Morchella spp.)

One of the most compelling characteristics of the true morel is the honeycomb-like pattern on its cap. Despite its unique texture, people have poisoned themselves because they have confused this honeycomb pattern with the somewhat similar pattern in false morels. Known as verpas or gyromitras, false morels may look similar, but are more wrinkled looking and not pitted. Further, verpas are often smaller, with a strange cotton-like substance inside the stem, while true morels are hollow on the inside. The cap of a toxic verpa is also only connected to the stem at the very top so the cap can be pulled off quite easily, while the cap and the stem of a safe and yummy morel are integrated together, so they're difficult to separate.

Generally, false morels are not "deadly" toxic (unless you eat a lot of them)—you won't buckle over and die the moment you eat one. In fact, some people eat false morels regularly and claim no ill effects, while others will get an upset tummy. But, as you probably already know, it's best to avoid eating toxins.

In Alberta, morels are a spring mushroom. It is best to look for them around May and early June. If the mycelium gets a large dump of rain early in the spring, there is a good chance of a morel harvest. Alternatively, you can look for morels during the spring after a forest fire.

Morels can be a bit finicky; they don't appear every year and they need a perfect mix of heat and moisture. And then we're lucky if they stick around for more than a month. There are indicator species (like a small, blue violet) that will signal the possibility of morels in the area but since morels are black and grey, they can be pretty hard to spot on the ground.

Once you find your first one, look carefully in that same spot or in a similar type of area. Don't give up easily, you usually have to cover a lot of ground before you find a good area or patch of morels. Not only are morels worth the trouble taste-wise, but the sense of accomplishment you'll feel if you actually find them is unrivaled.

Morels can be cooked just like the store-bought mushrooms: fried in butter and garlic and served with anything that goes well with mushrooms. Which, in my opinion, is pretty much everything.

photo: ACA, Len Peleshok

footenote

Of Fear and Habitat

Piping Plovers nest
photo: David Fairless

► *by Dr. Lee Foote*

The word "habitat" is confusing when we don't specify what animal, plant or person will be occupying that area. It is like going to the pet store and purchasing a bag labeled "FOOD" without specifying the animal for which it is intended. When we say "habitat" we need to include a species or group of organisms that will occupy, use or benefit from that real estate. Furthermore, each plant, animal and microbe has specific habitat needs and each element can be ranked in a descending order from Highly Suitable→ Suitable→Neutral→Unsuitable → Highly Unsuitable/Lethal. More advanced animals are drawn to some elements and live in fear of others. Interestingly, some of these fears seem deeply instinctual, for example, pronghorn typically avoid dense timber while cougars typically avoid expanses of flat shortgrass prairie.

If they are to survive very long, all organisms, people included, must be sensitive to the constant flux of attraction toward positive habitat components and repelled from negative components. Imagine yourself being drawn to a milkshake and a comfortable chair overlooking a view of Niagara Falls while simultaneously being repelled by the precipice and frothy water below. It is often hard to decipher why wild animals strenuously avoid certain things but clearly, they experience and respond to aversions, making millions of little decisions about where to be at any given time based on fears and attractions. This behavioral pattern is described by a concept in scientific literature catchily called the "landscape of fear."

To complicate all this, habitats of various animals change over time. Using Calgary as an example; what was once prime foothill grizzly habitat replete with the Bow River, bison carrion, grassy hillsides and moist bottoms was transformed into deer and ruffed grouse habitat through agriculture, livestock use, fencing and settlers. Later, buildings emerged and deer and ruffed grouse were replaced by pigeons, dogs, house sparrows, mice, and the occasional feral cat. Generic "habitat" is not really eliminated; rather, it is greatly altered to favor different species. Furthermore, animals change over time as coyotes learn to use urban areas, elk migration patterns shift around parks and Canada Geese flock to golf courses and city-scapes.

We, however, want to protect and manage habitats of desirable species or groups of species that have lost too much living area to persist on our landscapes. Thus, when conservation organizations focus on protecting and managing the very specific nesting habitat needs of the dressy little sandpipers called Piping Plovers, the biologists need to know that small cobble at the edge of drying wetlands are the primary habitat need. The conservation prescription is to protect nests by reducing cattle trampling, restricting seasonal ATV use and not flooding the basins too early. Walleye spawning habitat in Lac La Biche has been improved with shoreline stabilization and removal of barriers to spawning fish in the Owl River. Caribou, wood frogs, buffleheads and long-eared owls have benefitted from partner-funded land purchases in Alberta's boreal zone. Securing the future of wildlife and plants starts with securing their respective habitats.

IT'S TIME TO RESCUE OUR WETLANDS. TOGETHER WE CAN.

With more than 2,000 projects covering 2.3 million acres, Alberta is home to Ducks Unlimited Canada's largest concentration of wetland and upland habitat projects. These projects play an important role in safeguarding our land's natural function and ecological benefits which include improved water and air quality, reduced harm from flooding and drought, climate change management, and greater biodiversity.

By collaborating with landowners, volunteers, industry and government to protect, conserve and restore Alberta's wetlands, we're bringing many natural areas in Alberta back to life. But there is more work to be done. You can help.

Please support our *Rescue Our Wetlands* campaign. Together, we will be able to make even greater strides to create a better quality of life for all Albertans.

Water. Wildlife. You. Make the connection.

TO LEARN MORE, VISIT DUCKS.CA/RESCUE-OUR-WETLANDS

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