VOLUME 49 | NUMBER 3 | FALL 2019

SUGGESTED RETAIL: $10.00 CDN

Nature Alberta

CELEBRATING OUR NATURAL HERITAGE

NEVER GIVE UP HOPE! FEATURE ARTICLE STARTS PAGE 20. MICHAEL RUDY

feature article

Imagine! The Story of Five Needle Pines

A MORMON CRICKET; SEE "ON THE COVERS" PAGE 3. TED CAMERON

BURROWING OWL AND A PIPE! SEE THE STORY, PAGE 8. MYRNA PEARMAN

Nature Alberta:
Celebrating our natural heritage

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PUBLISHED QUARTERLY BY NATURE ALBERTA,
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THANKS TO THE PROOFREADERS WHO ASSISTED IN PRODUCING THIS ISSUE: SANDRA FOSS, TED HINDMARCH, SARAH LEETE, VAL SCHOLEFIELD.
MANY THANKS TO THIS ISSUE'S CONTRIBUTORS

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SPRING ISSUE.**FEBRUARY 28**
SUMMER ISSUE.**MAY 31**
FALL ISSUE.**AUGUST 31**
WINTER ISSUE.**NOVEMBER 30**

Nature Alberta is composed of natural history clubs from across the province. The aims of the Federation are:

(a) To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;

(b) To promote an increase in the exchange of information and views among natural history clubs and societies in Alberta;

(c) To foster and assist in the formation of additional natural history clubs and societies in Alberta;

(d) To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;

(e) To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;

(f) To provide the naturalists of Alberta with a forum in which questions relating to the conservation of the natural environment may be discussed, so that united positions can be developed on them, and to provide the means of translating these positions into appropriate actions.

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50 YEARS IN 2020!

NATURE ALBERTA

Brook Skagen

Editor's Page

BY BROOK SKAGEN, ASSISTANT EDITOR

Habitat Modeling Explained: Resource Selection Functions

The need to conserve our wild spaces and preserve our biodiversity is ever-increasing. However, for decision makers, knowing where to act, how, and what the resulting consequences on wild species and their spaces might be, may seem a daunting task.

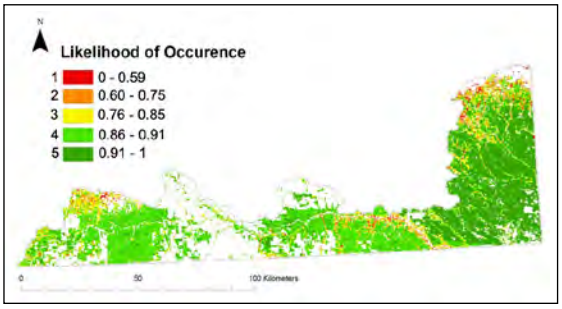
Habitat modeling may aid in the development, implementation, and prioritization of wildlife conservation efforts by providing valuable insight into these and other uncertainties.

DESPITE OF ITS COMMONALITY IN SOUTHERN ALBERTA, THE HORNED LARK HAS EXPERIENCED A DRAMATIC POPULATION DECLINE IN NORTH AMERICA OVER THE LAST 50 YEARS, THE MECHANISMS OF WHICH ARE NOT YET FULLY UNDERSTOOD. ALAN VERNON 2008 (WIKIMEDIA COMMONS)

Habitat models are statistical tools that predict the habitat associations of species across landscapes. They may be used to facilitate the identification of key habitats, better understand the habitat requirements for select species, habitat suitability of an area, or to predict the distribution of species in response to environmental changes, among many other applications, so long as their limitations have been accounted for.

There are as many model types as there are applications. However, Resource Selection Functions (RSFs) have become an increasingly popular tool in modelling the habitat associations of flora and fauna in research and conservation efforts worldwide. RSFs are statistical models that yield values for the probability or likelihood of a species occurring within a given area, based on the resources available [1,2]. When combined with geographic information systems (GIS), programs which map data sets in real-world locations, such predictions can be used to characterize the distribution and diversity of species across landscapes [2,3,4,5].

For example, the location of a Horned Lark (*Eremophila alpestris)* observation has corresponding habitat information, such as terrain, vegetation, and climatic characteristics that, when combined, influence the likelihood of a Horned Lark occurring in the area. By comparing the habitat information of numerous locations where the bird was observed, we can begin to discern the relationship between these habitat characteristics and



AN RSF FOR THE HORNED LARK WITHIN ALBERTA'S MILK RIVER WATERSHED WAS DEVELOPED BY COMPARING THE AMOUNT OF GRASSLAND COVER, LITTER, VEGETATION DENSITY, TOPOGRAPHY, AND PRECIPITATION RECEIVED 1 YEAR PRIOR, 2 YEARS PRIOR, AND DURING THE NESTING SEASON, ALLOWING THE MODEL TO CHANGE OVER TIME. BROOK SKAGEN

the presence of Horned Lark. In the end, each habitat characteristic selected for use in the model has a positive or negative effect on the likelihood of the species occurring in that area, which can then be used to predict the species occurrence in similar or dissimilar environments.

Though RSFs can be powerful tools, they are not without their limitations. It is important to note that the distribution and availability of resources in an area can change over time, and as a result, so too can the accuracy of these models. An example of this would be the change in annual precipitation received in an area: as the amount and location of precipitation changes, so too does the growth of vegetation. Looking at the Horned Lark, which typically prefers areas of short, sparse vegetation, this may mean that areas which are sparsely vegetated in one year may become overgrown in another, decreasing the habitat suitability for the species, and lowering the likelihood of it occupying that space.

Still, RSFs are but one of many modeling tools in a researcher's toolbelt, the versatility of which can aid

On the Covers:

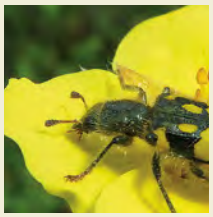
FRONT COVER

The five needle pines may be starkly beautiful even when dead, but they are still dead! Michael Rudy tells the story of living Limber and Whitebark Pines - their tremendous value to us, to wildlife and to ecosystems. In fact, as Michael states: "They are so important that their influence ripples outward throughout the mountains and foothills, sustaining entire ecosystems." The Feature Story begins on page 20.

INSIDE FRONT COVER

Ted Cameron took this image of a Mormon Cricket at the Buffalo Lake Moraine. Said Ted: "That long sharp thing at the back: an ovipositor, for laying eggs, not a stinger. I knew this, or I would never have picked it up!" Ted is a member of the Public Group Facebook page "Alberta Bugs and Insects" which has many fascinating and interesting photos and descriptions of our insect and spider wildlife. It is well-worth it for naturalists to join the group.

There is a wide variety of nesting structures used by birds, as Myrna Pearman describes in her most recent article for *Nature Alberta*. Included is the somewhat unusual "pipe" for Burrowing Owls. Read Myrna's article on page 8 and discover the myriad structures that birds turn into their nurseries.



INSIDE BACK COVER

Good timing! Brian Genereux just happened to be there in the proverbial "right time and right place" to see a Black-necked Stilt and American Avocet in the process of pre-mating. The full story is on page 27; the act was captured in photo on the inside back cover.

Linda Fisher tells the story of a fortunate young Swainson's Hawk – fortunate that Linda was there at the time to rescue it! Read the story on page 28.

Elizabeth Boileau likes insects. She'd like us to like them, too – and she is working hard towards that end. After all, as Elizabeth says: "In Canada, insects are the most diverse group of animals, making up about 70 percent of known species." She also takes photos of them, as you can see with this Ornate Checkered Beetle and the others accompanying her story on page 14.

BACK COVER

Sara Jordan-McLachlan said: "Made a new friend with this beautiful Red Admiral spending a lot of the day hanging out around the coneflowers. (I guess there are 2 friends, not sure who the other one is!)" The second friend is the insect on the petal to the left of the butterfly…maybe a beetle? Can you guess?

in conservation and multitudinous other applications.

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LETTER TO THE EDITOR

Abandoned Farmyards Nostalgia

First, I would like to say what a superior Magazine you have here. My only comment may be: Does the magazine get out to as many people as you should for the product you produce here? We receive the magazine because we are involved in clubs, activities etc. I hope it gets to others who are starting to learn about Nature, or the young people who are our future.

I was very interested this month in "Abandoned Farmyards" by Myrna Pearman. It brings back to me so many memories about my first year in Canada back in the 60's. Abandoned Farmyards gave me one of my first views of Northern Alberta. Let me explain.

I had come to Canada from England, as I had been hired by a large beekeeper in Ontario. The bee company I worked for had a large operation in Ontario but was being pressed by more intensive farming practices, along with the larger use of herbicides and pesticides. The owner of the Company was looking for another area to expand his operation. He tried South America but got wiped out by hurricanes and country unrest.

He then saw the potential of the agricultural growth in Northern Alberta. We hauled many 1000's of beehives with bees from Ontario to the Alberta Peace country, an experience in itself (no mechanical equipment in those days). The bees were primarily for pollination of the Alfalfa and seed clover crops that were being grown in those days to 'break' up the newly cleared land. We were part of the large honey and bee pollination industry that prevails today.

We were always looking for new locations for our hives - mostly 20 - 30 hives per bee yard. Somewhere sheltered, accessible, and close to crops. The Pioneers of the country provided the ideal spots, where they had put down roots many years before, setting up their homesteads. etc. They built their homesteads in sheltered areas, and developed homes from where they grew their food for their families, and built barns for their animals etc. Even in the 60's many of these homesteads had been abandoned to the advancement of agriculture, but they left behind a jewel.

I loved to go into these 'abandoned' areas, often not visible from any road. As we worked the bees all summer, the abandoned gardens were full of flowers planted many years before by loving families. What a wonderful backdrop to our daily work.

Myrna, you brought back many memories for me. Memories I will never forget and often talk about. Thank you for this.

Sadly, as Myrna mentioned many of these 'jewels', are being ploughed under today for the advancement of more crop production, and food for our hungry world. The backdrop for the bees today is the corner of a field, not the multicolours of garden perennials. Sadly, another part of our history is disappearing.

BRIAN LAVER

ALBERTA ISSUES IN BRIEF

New Funding for Conservation Projects

GRAHAM SAUL, EXECUTIVE DIRECTOR, NATURE CANADA

On August 19, the federal government announced a massive injection of new funding for conservation projects across the country aimed at helping Canada meet its commitment to protect 17 percent of terrestrial areas by 2020.

Your generous support to defend nature and protect wildlife in Canada has been echoed across Canada today. Thank you for standing with us to protect Canada's land and waters and save species from extinction. The announcement commits $175 million to help support 67 conservation projects over four years as part of the Nature Fund Challenge.

Nature Canada congratulates all the partners who proposed over $800 million in conservation projects as part of the Canada Nature Fund Challenge. The range and sheer number of proposed projects demonstrate that it is possible to meet and exceed Canada's protected area commitments.

Not Just Bees!

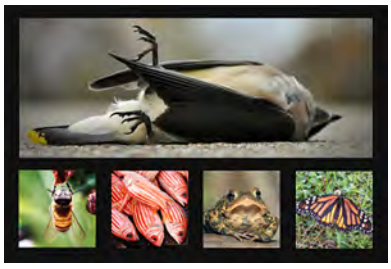
A new study shows neonicotinoid pesticides can not only affect all bees but also directly harm seed-eating birds that migrate during spring planting season.

White-crowned Sparrows that ate a tiny dose of the neonicotinoid imidacloprid — equivalent to a just a few coated seeds and far below the lethal dose — lost their appetite, quickly lost weight at a time when they should be fattening up and delayed their migration to their breeding ground by several days, report researchers at the University of Saskatchewan and York University in the journal *Science*. That delay could potentially reduce their success at breeding at a time when bird populations are falling across North America.

"Just a few days can have a significant effect on their future reproduction and survival," said Margaret Eng, lead author of the new study. Eng is a postdoctoral researcher working with Christy Morrissey, an ecotoxicology professor at the University of Saskatchewan. The study also suggests that neonics may not be as harmless to vertebrates such as birds as previously thought.

Bridget Stutchbury, a professor of biology at York University who also co-authored the study, said: "That's kind of alarming. If this is bad for birds, what does it mean for people?"

Neonicotinoids end up in the entire plant, including the leaves and flowers, as it grows, warding off insects - both pests and beneficial ones. Many studies have shown the pesticides can harm insect pollinators such as bees. Impacts on birds haven't been as clear. But the new study is the first direct evidence that neonics can directly harm wild seed-eating birds.



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Nature Alberta NEWS

thank you

Once again, a great big thank you to everyone who gave to Nature Alberta. We are, of course, completely dependent on your generosity, whether that is in time volunteering or in financial assistance. Here are the names of our wonderful donors so far in 2019!

Caroline Lambert (monthly donor)
Kath and Don Lee
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Nature Alberta & YouTube

Nature Alberta wants you to know that Nature Alberta has its own YouTube channel now. All kinds of "good stuff" is there for you to view. Visit:

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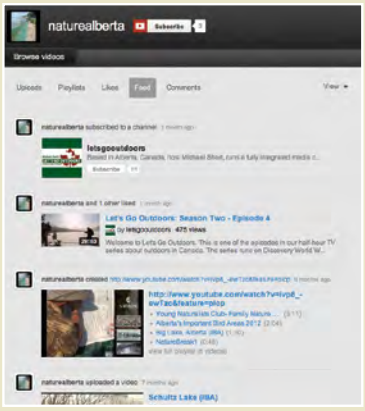

Fall Nature Night

Thank you to our experts, volunteers and participants for coming out to our Beautiful Bugs Family Nature Night at the end of August! We learned so much about spiders, beetles and butterflies and gained tons of new knowledge on these crawly critters!!

Thank you also to ALL of our experts, volunteers, participants and partners for another amazing Family Nature Night season!! We couldn't offer these events to our families without your extensive knowledge, involvement, and dedication so thank you very much! And a big thanks to our funders as well for supporting us with these events! Alberta Conservation Association, Alberta Science Network, Alberta Biodiversity Monitoring Institute, City of Edmonton.

Speaking of "Bugs"!

Your Editor recently came across an extremely interesting Facebook page: "Alberta Bugs and Insects". Just two examples of the photos are on the inside covers. It's a great site to show off that "creepy crawly" you've spotted, have that insect or spider identified of which you've snapped a photo or just to appreciate Alberta's wide diversity of Insecta or Arachnids.

If you have an Alberta photo of a "bug" you'd like to share with everyone, just send it along to na@naturealberta.ca along with a brief explanation (eg where it was found, what it was doing if anything, etc.) Even if you don't know what it is, we'll ask the membership for their input. We hope to have at least two per issue. Two things to keep in mind: make sure the size is large enough; and, the only payment we can give you is a complimentary copy.

FROM THE PRESIDENT

From a President's Perspective…

BY LINDA HOWITT-TAYLOR

I was out checking on our beehives earlier this fall. At the end of a terrible summer for bees in Alberta, I wasn't expecting much. One hive is weaker than the other and they seemed to have depended on what honey and pollen they had gathered to keep feeding the young and themselves.

It could be said that they have been surviving "hand to mouth" and it became obvious to me that if we expected both hives to survive through another winter, they would need extra resources. But what really struck me was that all the bees continued their work, carrying on stoically, even enthusiastically when the weather and wind allowed, to fulfill their individual roles and tasks keeping everything in the community "humming" as best they can. It also struck me that the beehives are like an allegory regarding the functioning of Nature Alberta and each of our member clubs.

We are all subject to the whims of our environments, political or circumstantial. Wonderfully, Nature Alberta (Federation of Alberta Naturalists) continues to function 50 years after its inception. Like the bees, who aren't paid to do their jobs on behalf of their organization, all of us are volunteers who carry on with the work of ensuring the continuity of what we value. How does this happen? Our "worker bee" members in the field along with friends and family, participate in species counts, work in the heat or rain to pull weeds, ask local governments and provincial bodies for policies and actions to protect habitat.

They put on the coffee, ensure there are treats at meetings, book meeting times, join their relevant club boards and committees, volunteer for Nature Kids events, organize events and contact members by phone or email. They keep track of entries and records of species and places. They show up to requests to work casinos even if it means driving to Edmonton and working a late shift. In the past volunteers committed to standing in very cold temperatures to assist in mounting the Running Room Hypo-Half on behalf of the NA "hub" to provide a little more cash in the kitty that was unmarked and available for any purpose. And of course, there are the volunteers who contribute to this magazine with articles and pictures, those who do the proof reading and provide feedback to the Editor and co-Editor and any others who assist in putting the publication together as well as ensuring delivery to the rest of us on line or by mail.

All in all, I cannot imagine a more committed group of disparate people committed to the same cause. Our volunteers are the heart, body, warp and weft of keeping this organization alive. Together we are all volunteer "worker bees," effective in not only promoting the enjoyment of nature now and sharing the joy of being together but of ensuring that Albertans, our neighbours, friends and strangers alike, embrace the gift we have in this province and join us in protecting it for the future.

We owe a deep debt of gratitude to each other, to all who had a vision of a nature network 50 years ago and to all of us who continue to do the work to keep the hives humming. Thank you!

NORTHERN FLICKER. MYRNA PEARMAN

Lending a Helping Hand: Nesting Structures

BY MYRNA PEARMAN

In my previous two columns, I highlighted some of the wildlife species that will take up residence in or around abandoned buildings and farmyards. In this, the last installment, I would like to share a few images of bird species that are attracted to human-made nesting structures.

Nesting abodes can also be built for other (more difficult to photograph) wildlife species, including bat houses for Big- and Little-brown Bats, toad houses for toads (or in my yard, slugs), bumblebee houses and bee abodes/hotels for various species of solitary bees.

A wide variety of nesting structures have been designed for birds: hay bales and other nesting platforms for Canada Geese and Osprey; hen houses for ducks; nesting shelves for Barn Swallows, American Robins and Eastern Phoebes; and nesting boxes for a variety of cavity-nesting birds ranging from artificial burrows for the ground-dwelling Burrowing Owl to baskets for Mourning Doves, Great Gray Owls and Great Horned Owls.

Myrna is a very well-known author, photographer, biologist and naturalist. She is the Biologist and Site Services Manager at Ellis Bird Farm (ellisbirdfarm.ca). She can be reached at mpearman@ellisbirdfarm.ca.

HOODED MERGANSER IN BOX. MYRNA PEARMAN

Large boxes are used by ducks (especially Common Goldeneye, Hooded Merganser and Bufflehead), owls (Saw-whet, Barred), American Kestrels and Northern Flickers.

Purple Martins have been nesting in artificial structures near humans for so many thousands of years that they no longer nest in the wild. At Ellis Bird Farm, we have them nesting in both apartment-styled houses as well as in retrofitted natural gourds. Several smaller bird species -Tree Swallows, Mountain Bluebirds, House Wrens, Red- and White-breasted Nuthatches as well as chickadees (especially Black-capped and Boreal) - have also benefited from the provision of nestboxes and the establishment of nestbox trails.

HOUSE WREN. MYRNA PEARMAN

OSPREY. MYRNA PEARMAN

NORTHERN SAW-WHET OWL. MYRNA PEARMAN

DUCK IN NESTING TUNNEL. MYRNA PEARMAN

WHITE-BREASTED NUTHATCH. MYRNA PEARMAN

CANADA GOOSE WITH FRESHLY HATCHED YOUNGSTER. MYRNA PEARMAN

Public Land - Alberta's Best Idea

BY LORNE FITCH, P. BIOL.

Sometimes, you need to be far from your mailbox to acknowledge a good idea in your own backyard. Such is the case with Alberta's public lands. Public lands are those lands vested to us, the people of Alberta. In other words, these are our lands, in shared ownership, held in trust for us by the government of the day.

This good idea, public land, became clear to me while travelling through Texas, a place where a paltry 1.5% of the state is public. Imagine a jurisdiction with so little public land it hardly registers in the psyche of its citizens. In a recent issue of Texas Monthly, the state magazine, was an article on "75 Reasons to Love Texas". Amid BBQ, cowboys and country and western music there were only two references to use of public land, and both were for federal parks.

Large portions of Texas seem like the land Cain was willed, where a cow has to pack a lunch to cross. Why it is in private hands is history, a perplexing conundrum in today's world of expanding population, with recreational and ecological expectations to be met.

Contrast the Texas situation with Alberta where about 60% of the province is public land, private land is 28.5% and federally owned lands make up about 10%. What the remaining 1.5% are is unclear.

Alberta and Texas are roughly the same size. If we were to follow the example of Texas related to public land, as some politicians are suggesting, we, the Alberta public would be left with less than 10,000 km^2. That's not much more than the current combined size of all First Nations reserves in the province, where the burgeoning population is stretching the limits.

We don't have a Parthenon, an Acropolis or ancient palaces in Alberta. What we have is wild space, a natural heritage that has remained in public ownership and is bequeathed to us by past generations. This is an uncommon treasure, given the situation in much of the world. To say public land is part of our heritage is a point lost on some, especially those who see these lands as mere commodities, to be exploited for private or political gain. We might take pride in being Texas-sized but not in wholeheartedly embracing the Texas ideal of having all our land in private hands.

Some Albertans do propose converting the commons- public land- to private property, including newly elected politicians. The tug of war is repetitive between those who wish to maintain public land for the public good, and those who see sales as a get-rich-quick scheme. Sale of our natural heritage provides government a quick, one-time only influx of revenue. Selling public land, a continual generator of public revenue, means Albertans lose in the end.

Alberta's public lands provide common space, particularly in densely populated central Alberta where these lands are islands in a sea of private ownership. In the grasslands, the foothills and the

Lorne Fitch is a Professional Biologist, a retired Fish and Wildlife Biologist and an Adjunct Professor with the University of Calgary.

boreal forest, public land provides big space. In conservation of native plants and animals big often trumps little, so the vast space afforded by public land is a bonus.

The story of the Attwater Prairie Chicken is a cautionary tale about the loss of public land and the space it affords. This bird, a subspecies of the now extinct Heath Hen, historically ranged over the coastal plains of Louisiana and Texas, by the hundreds of thousands. Now the species teeters on the edge of extinction, with about a hundred birds left in the wild. Of the original six million acres of coastal plain that formed grouse habitat, less than one percent is left. Virtually none of that is public land and restoration efforts are stymied by the cost of acquiring private holdings and the reluctance of landowners to implement land use changes that favor grouse.

Contrast that situation with our own imperiled bird, the Sage Grouse. In our favour, and pivotal to restoration efforts for Sage Grouse is the vast swath of public owned native grasslands in southeastern Alberta, within the range of the grouse (and many more species we don't want to see disappear). If we dial back industrial disturbance, Sage Grouse are likely to thrive here again. Public lands provide Alberta a unique option for recovering the species, quickly,

SAGE CREEK, LAND THAT BELONGS TO ALL ALBERTANS!. AWA/NATURELETHBRIDGE.CA

at low cost, one unavailable in Texas.

Instead asking what good are public lands to Albertans, economically, ecologically and socially, we might better ask, where would we be without them? In the face of an uncertain future we don't want to preclude options, to fail to have buffers and hedges against changes we can't yet identify. Hanging onto public lands ensures we don't sacrifice options for the future.

History shows how private ownership, even when tempered by public regulation falls short of keeping landscapes healthy. The capitalist tendency to privatize, as the answer to a question unasked, has stumbled badly, producing degraded lands, lost opportunity, and increased public costs to mitigate bad decisions.

History has locked us into a legacy of past decisions. The Canadian government, in a bid to thwart American expansion and expropriation of the west- the Prairie Provinces in particular- developed plans to dispose of great tracts of public land for settlement. This included the lands provided to railroad companies to underwrite the costs of transcontinental railway construction, a method of binding together the disparate parts of the nation.

Mostly this was successful. The exceptions included lands unsuitable for cultivation and those where inadequate rainfall precluded successful farming. The latter were taken back under the public domain as tax-recovery

FISH & WILDLIFE AB

lands. Along the slopes of the Rocky Mountains, the forests of the Eastern Slopes were also deemed to be more important as essential watersheds, rather than in private hands for logging, mining and ranching. Much of the boreal forest was unsuitable for settlement and remained public.

The massive conversion of public land, during the Homestead era and after, to private land, brought us settlement and economic progress. To a degree those former public lands, now farmed, have given us a foundation of wealth, as measured in stark ledger terms. However, the conversion of those lands also has given us declining soil fertility, increasing erosion (especially for cultivated lands), lost wetlands, degrading rivers and the transformation of landscapes with vegetative and wildlife diversity to vastly simplified ones.

Not all owners of land are rapacious, unfeeling miners of soil, vegetation and destroyers of wildlife. For many, there is an ethic of stewardship, an understanding that applying the brakes, rather than continuing to accelerate pressures on the land is beneficial. But, with the exception of some minor regulatory oversight, a land ethic on the part of landowners is a personal decision. It can be shifted by economic pressures, societal leanings and successional events. Short term economic gain often trumps long term care. There is little, or no cost, or approbation for failing to steward a piece of private land.

For users of public land for economic reasons, you abuse it at your peril. This is not to suggest all public land is free of abuse, at the hands of industry, recreationalists or lease holders. Legislation, policy and penalties are available, waiting only for the resolve to use the instruments designed to protect these lands. Arguments can be mounted, and are, that we need to take better care of public lands, resolve land use issues though effective planning and sort out public access to public lands. That these

lands are still in the public domain enable us to have those debates.

Many of these public lands used to be labelled as "other unimproved lands", as if they were somewhat deficient, wanting or inferior. As it turns out, public lands are the greatest bargain we never really planned for; somewhat by default we now have this tremendous resource.

One of the virtues of public lands is they create a benchmark, suitable to assess our judgement and decisions related to land use. How do we know who we are, if we don't acknowledge our history? The mirror of understanding is the land, the water, the wildlife. An examination of the difference between public and private land tells us how we have treated this place called home and allows us to gauge our success at stewarding the resources of today for future generations.

Public lands may be the last frontier. In some ways what remains is an accident of history. We would be wise to view those lands as a heritage, as long as they remain public. Public ownership suggests stewardship, not exploitation and certainly not disposal.

Wallace Stegner, no stranger to public land conversion with his Saskatchewan homestead roots, made the point: "The trouble is that places work on people very slowly, but people work on places with the single-minded ruthlessness of a beaver at a cottonwood tree." Given our continual nibbling away at the public land base in Alberta we may not yet have evolved the societal or political maturity to understand the virtues of public land.

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Public land shouldn't be viewed as a shiny bauble suitable for sale. Baring a major economic collapse, as in the 1930s, public land, once sold, is gone forever. Once you eat the cake, there's no cake left.

When 60% of the province is in public ownership and, with some exceptions, available to Albertans, that empowers us as citizens, especially the 81% of us that live in urban areas. It is part of our heritage, a visceral part of our societal DNA. Any government that proposes a liquidation of what is ours should be viewed as rash and heavy handed, trammeling current rights and freedoms.

Progress, real progress isn't measured solely with what we've acquired, with what we've sold, with what our economic status is, but also with what we have retained. Government, holding land in trust for the people of Alberta, needs to draw a line around public land and say, "This is public land and public land it shall stay." Public land is surely one of Alberta's best ideas; let's keep it that way.

Insects and Us!

BY ELIZABETH BOILEAU (eyboilea@lakeheadu.ca)

In Canada, insects are the most diverse group of animals, making up about 70 percent of known species. They seem to have found their way almost everywhere, including where they are unwanted by humans.

There always seem to be more where they came from. Large numbers in fact are typical for the insect world, given they are often at the low end of any food web yet essential to ecosystem functioning. However, insects are disappearing before our eyes at an alarming rate.

Rapid loss of insect biodiversity may not be something that keeps people up at night or that many are even aware of. Fewer mosquitoes bode well for summer camping, after all. But this loss is in fact a serious global problem. Luckily, since the publication of a few key scientific studies in the last year, there has been more media attention to the sharp drop in insect populations and what this might mean. For example, there was an excellent feature article in *The New York Times* entitled "The insect apocalypse is here: What does it mean for the rest of life on Earth?" (Jarvis, Nov 27, 2018).

Even though more scientific attention is being paid to insects than in previous decades, there is still a long way to go in understanding insect distribution,

GRASSHOPPER SP. ELIZABETH BOILEAU

abundance, ways of life, and sensitivity to habitat changes. What is known is that more than 40 percent of insect species are declining around the world and the rate of extinction for insects is much higher (possibly even eight times higher) than that of vertebrate animals such as birds and mammals. Causes of this decline include intensive agriculture, use of pesticides, urbanization, and climate change.

Given the fact that insects are greatly affected by human activity and environmental changes, a better understanding of them is very important. How are we to track changes in insect populations without scientific data? Surprisingly, The Alberta Ministry of Environment and Parks does not report on invertebrates (of which insects are part). The Alberta Wild Species General Status Listing contains amphibians, birds, fish, mammals, and reptiles, but no insects.

At the federal level, however, there is reporting on insects. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists many insects in its October 2018 report. Some of the endangered insects in Alberta are:

- Gypsy Bumble Bee (*Cuckoo Bombus bohemicus*)
- Bert's Predacious Diving Beetle (*Sanfilippodytes berate*)
- Halfmoon Hairstreak (*Satyrium semilunar*)
- Ninespotted Lady Beetle (*Coccinella novemnotata*)
- Monarch Butterfly (*Danaus plexippus*)

ELIZABETH WITH WHITE ADMIRAL.

- Dusky Dune Moth (*Copablepharon longipenne*)
- Yucca Moth (*Tegeticula yuccasella*)

Several additional species are listed as threatened or of special concern. Alberta is by no means immune to insect loss, and it is likely that we, as a society, lack the information required to best attend to this problem.

Studying insects certainly does pose many challenges. Insects are small, inconspicuous, and in some cases so abundant, it can be difficult to count them, which may even cause the illusion that numbers have not dropped. Further, one of the main problems is that humans generally have negative perceptions about insects. This ultimately translates into less support for research and conservation.

There are some interesting initiatives such as the Western Grains Research Foundation's Field Heroes campaign (www.fieldheroes.ca) which encourages farmers to think about beneficial insects for crops before they spray pesticides. However, there is still much progress to be made when it comes to finding ways to cohabit with our sometimes undesirable companions.

One of the areas I am interested in as a researcher is examining human perceptions of insects and human-insect relationships. Various research studies on adult perceptions of insects have shown, not surprisingly, that most adults are either largely unaware of insects, do not appreciate them, or have negative perceptions of them. Many adults have a strong fear and/or disgust of insects (and other arthropods, such as spiders). This is a fascinating topic that Lockwood discusses in his book *The infested mind* (2013).

But how are these perceptions formed? This is not an easy question to answer, but there are many indications that negative perceptions of insects are formed early in life, influenced by culture,

COMMON GREEN DARNER. HELENA BASTEDO

media, and early education. As a PhD student in Educational Studies, this is the field where my own interest lies. How can we guide young children's learning journey when it comes to insects? If the goal is for children to learn to value insects (and indeed all life forms), respect them as an indispensable part of their lives, and eventually understand the importance of conserving insect biodiversity, what are the means?

Part of what inspired me to research this topic was my experience working for several years as Scientific Interpreter at the Montreal Insectarium. It was an immense challenge to try to change visitors' perceptions of insects and teach them to appreciate them. This was done through a combination of educational presentations, hands-on demonstrations with live insects, and entertainment such as theatrics. I admit that as my own comfort around the live critters grew and my knowledge expanded, I increasingly marvelled at how amazing they were and increasingly loved sharing my passion, especially with young enthusiastic visitors who often didn't share their parents' disdain.

Insects are already a large part of children's lives. Children in Alberta already have frequent, direct contact with insects (unlike large mammals like wolves and moose), whether they are in urban or rural settings. Insect representations are also common in children's movies, books, and material goods such as toys and costumes. Children have often even formed specific insect preferences by preschool age. Interestingly, one UK study showed that children's insect preferences correlated with the number of Google hits as well as the number of scientific studies for those insects, but not with the local abundance. Therefore, children knew more about the "popular" and charismatic insects than the ones they encountered around them.

Children learn about insects through books and media. These

IT'S CALLED NATURAL CURIOSITY! EMILY DONG

sources often contain inaccurate biological information. Think, for example, of *The very hungry caterpillar* by Eric Carle (1969), whereby a caterpillar turns into a cocoon then into a butterfly, not to mention eats food such as pie and ice cream. Butterflies do not make cocoons at all – only moths do. Research is as of yet inconclusive regarding the impact of humanizing animals in books and what the educational value of these stories is and whether they invalidate natural history facts. Regardless, children are getting incorrect information.

There are still the daily encounters such as observing ants and chasing butterflies. Interestingly, children sometimes demonstrate caring behaviours such as wanting to keep an insect as a pet and looking after it, but sometimes the opposite such as crushing and killing insects, without apparent concern. And to complicate matters, the same child can exhibit a variety of these behaviours. This is not unlike the mixed feelings that many adults have of insects (we like some but not others, or tolerate some but only in certain situations, or appreciate their value but don't want any contact with them). Child-insect and human-insect relationships are certainly complex and fascinating.

There is an interesting power dynamic at play in child-insect relations. Being dependant on adults, children are certainly powerless in many ways, and insects being small, seemingly vulnerable creatures may make them targets for children's experimentation of their strength

ELIZABETH OBSERVES AN ANT NEST WITH CHILDREN AT UPSTREAM FOREST SCHOOL, CALGARY. ELIZABETH BOILEAU

or an outburst of emotion such as anger. Children also are experimenters and it is common for children to pull off legs and wings to see "what happens". How much of this is normal developmental behaviour? This is unclear, but these key moments where children take out their anger by stepping on a scurrying beetle could be valuable teaching moments.

Of course, these somewhat innocent or small-scale killings are not the cause of the global insect decline, but could there possibly be a link between children's respect and care of an individual insect and their respect and care for an entire insect species or the animal world at large? Possibly. I believe it's certainly worth exploring this idea. Meanwhile, children benefit regardless from their outdoor explorations and learning about animals.

A BUG HOTEL!

What I am suggesting is that, as part of our solutions to the insect decline problem, we consider educating the youngest of children in order to reduce negative perceptions, fear, phobias or apathy towards insects from developing. This can happen in many simple ways. Here are a few ideas.

INSECT GARDENING

Gardening can be a wonderful activity to do with children. Keeping our insect friends in mind, plan to use local, native species, and plants that are rich in nectar and colourful. Avoid using harmful chemicals. Take the time to check under the leaves of plants for eggs or larvae and share in children's wonder and excitement if they find something.

BUILD A BUG HOTEL

Bug hotels are increasingly popular in the last few years and there are many guides to building them

BLACK MEADOWHAWK DRAGONFLY. HELENA BASTEDO

available online. Typically, they have a roof to protect from rain, face a sunny area, and contain one or more compartments with various types of natural material for insects to use either for laying eggs during the summer or as overwintering shelter. One popular idea is to provide long empty tunnels for leaf cutter and mason bees. Children can enjoy monitoring signs of use in their bug hotel.

CITIZEN SCIENCE

Collecting and submitting data on insects can be a fun way to learn about insects and to contribute to scientific projects. The e-butterfly project (www.e-butterfly.org) is a great example of a citizen science program that allows people to take part in monitoring butterfly populations across North America. Children can also keep their own personal lists of species and compare them year to year!

LEARN WITH CHILDREN

Encourage children's curiosity by learning with them! Although Alberta field guides for insects are limited, other information, both print and online, is available out there. Take children along to naturalist outings. I have sometimes been amazed at how quickly children learn to identify plants and animals due to their insatiable memory and keen sense of observation for details. Suggest small research projects to do at home. Talk to educators

and teachers about their plans for teaching about insects in the classroom. Join a local Nature Kids chapter to participate in family events.

MODEL ETHICAL AND RESPONSIBLE BEHAVIOURS

Children learn from watching adult behaviour. Adults, therefore, need to be aware of what they are saying and how they are acting around children. The smallest act such as taking an insect off a busy bike path and into the grass can have a lasting impact on a child since it demonstrates that adults value and respect living creatures. Be aware when keeping animals' captive that you are doing this responsibly. Forgetting about insects in containers or not feeding insects their required food while captive can send a confusing message to children.

As naturalists it is our responsibility to convey our love of nature to the next generation, and there is no doubt that insects now need us more than ever. Feel free to email me for a copy of the full publication on which this article is based.

A RED ADMIRAL SHOWING THE VENTRAL (BOTTOM) SIDE OF THE WINGS. HELENA BASTEDO

FEATURE ARTICLE

ENDANGERED WHITEBARK PINE CONES AT THE TOP OF A PLUS TREE. MICHAEL RUDY

Imagine!

The Story of Five Needle Pines

BY MICHAEL RUDY

There is something amazing and valuable about extremely long-lived species, partly because they so dwarf the scale of our own existence that they realign our perception of what is normal. Like the pioneers of our great-grandparents' generation, they make lives for themselves in extremely harsh conditions and a distinctly slower paced world.

Although many people understand in an abstract sense that somewhere there are trees that can live for unimaginably long times, few seem aware that they can be found right here at home, and that they are facing extinction. Some of Alberta's longest lived and most charismatic trees are critically threatened by an imported fungus, and they may not survive it.

These trees are the Whitebark and Limber Pines, often known as 'five needle pines' because they have five needles per cluster; more familiar Alberta pines have two (eg., Lodgepole and Jack Pine). Young trees often have a beautiful, smooth, silvery bark, almost reminiscent of an Aspen tree, and extremely distinctive

cones. Limber cones are very large, attractive, and wonderfully scented, while Whitebark cones are an unexpected brilliant purple colour.

Both trees are gorgeous not only in isolation, but also as a part of their natural landscape – leaning precariously out over hilltops and outcrops in the foothills and Rocky Mountains. They grow extremely slowly, take nearly a hundred years to reproduce, and can live for over a thousand years, meaning that the oldest of them may have germinated shortly after the Vikings first explored North America.

Far more than a striking part of the scenery, these trees are a vital part of the environment, providing a vital food source for birds, bears, and other animals. Their seeds are far higher in fat and protein than other trees, and in many parts of their range they are by far the most nutritious food source available to wildlife and birds. They are so important that their influence ripples outward throughout the mountains and foothills, sustaining entire ecosystems. But one of the most valuable services they provide, from our perspective, comes from their high elevation habitat.

Trees in the high mountains are few and far between, and many of them are five needle pines. Their presence here holds onto the snowpack and moderates the release of water, making both drought and flooding less likely downstream. It's a subtle benefit,

THE WATERTON NATIONAL PARK KENOW FIRE, HOURS BEFORE IT RAVAGED THE PARK. MICHAEL RUDY

THE CROWSNEST PASS AREA OF SOUTHERN ALBERTA CONTAINS ONE OF THE LARGEST REMAINING POPULATIONS OF LIMBER PINES IN CANADA AND IS HOME TO THE BURMIS TREE, A HISTORIC LIMBER PINE. MICHAEL RUDY

and difficult to quantify, but it may become more and more important as the climate warms. It is possible that, without the five needle pines to govern the high snowpacks, wildfires like the ones that devastated Fort McMurray and Waterton will be harder to prevent and fight, and floods will become more and more severe.

It is often difficult to explain to the public why something like the five needle pine is worth saving, but parts of Alberta are already tremendously proud of them. In the Crowsnest Pass area of Southern Alberta the 'Burmis Tree', a gnarled and skeletal old dead limber pine, practically symbolizes the area and is represented in many artworks and local businesses nearby. These endangered pines are beginning to capture the public imagination and become important tourism and cultural symbols.

Although they are clearly tenacious and resilient, five needle pines have a devastating weakness – a non-native fungus known as a rust, which is spreading throughout the province and threatens them with extinction. As so often happens, because the pines have no historical exposure to the rust, they have almost no resistance to it. It infects trees by growing through their needles and causing swollen, devastating cankers. Because these infections are rich in sugars, animals chew on them, causing deep, weeping wounds that eventually kill the tree.

The rust is so virulent that in the hardest hit parts of the province nearly all the trees are infected or dead. Nearly - but not quite.

A GNARLED AND SKELETAL OLD LIMBER PINE IN THE CROWSNEST PASS. THE RUST HAS BEEN SO DEVASTATING THAT LANDOWNERS AND RANCHERS SOMETIMES THINK THAT THIS IS WHAT A LIMBER PINE SHOULD LOOK LIKE. MICHAEL RUDY

A TRULY UNIQUE LIMBER PINE. THIS TREE IS AT LEAST FIVE HUNDRED YEARS OLD AND HAS BEEN BLOWN OVER BY A MASSIVE WINDSTORM IN RECENT DECADES BUT HAS CONTINUED GROWING. MICHAEL RUDY

Every now and then, around a corner or nestled in a little gully surrounded by its dead fellows, you may stumble upon a tree that seems untouched. This tree is a 'plus tree'; if you're lucky, it may have genetic resistance to the rust. Only one Limber Pine with complete resistance is known yet from Alberta, and none of the far more vulnerable Whitebarks have demonstrated it yet. Finding these trees is the only way to save the five needle pines from extinction.

But one tree with limited resistance is not nearly enough to repopulate a species and finding more of them is extremely challenging - in two years, I have helped assess the health of tens of thousands of trees. For every plus tree, two or three hundred others are deemed too sick. Not including in parks, there are under two hundred known plus trees in the entire province. And every year, more of them are disqualified by developing new infections, or lost to wildfires. In some areas, over half of the known plus trees developed new infections this year that made them much less compelling as possibly resistant trees.

WHITEBARK PINE SEEDS FROM A HOPEFULLY RESISTANT TREE IN THE KANANASKIS. THESE SEEDS, IF THE PARENT TREE IS INDEED RESISTANT, MAY HELP SAVE THE SPECIES. MICHAEL RUDY

Once a tree has been located, and its health thoroughly assessed, its cones are caged to prevent animals and birds from eating the seed. The cages must be collected as late in the fall as possible to allow the seed to mature. But because of their high, exposed habitat, waiting this long can often be risky. A record snowfall in early October in 2018 dropped over half a metre overnight in some of the areas we needed to visit, isolating over half of our caged trees. We eventually collected all of them, but the snow made our work much more challenging and exhausting.

The seeds collected from these very special trees are germinated, and the seedlings are exposed to a high dose of rust spores. Any

BEAUTIFUL PATTERNS IN SNOW AFTER A RECORD SNOWFALL IN THE CROWSNEST PASS THAT COMPLICATED CONE COLLECTIONS IMMENSELY. MICHAEL RUDY

In the Words of Michael Rudy

"The five needle pines (Whitebark and Limber Pine, in Alberta) are two species of endangered trees that are critically threatened with extinction. They are some of Alberta's longest lived species, and can live for over 1,000 years, but an imported and devastating fungus threatens them with extinction.

"I've worked with both species for two years and am passionate about contributing to their conservation and restoration. I dedicate a lot of time into searching for potentially resistant trees and propagating their seeds both in my spare time and for work, and I've written an article on the problem and the work being done to save them.

"I am a conservation biologist first, and a photographer second. Part of showing something beautiful and special to the public has always involved trying to help save it or educate the public about it, and almost all the subjects of my photos are threatened.

"I know that buying fine art prints is a luxury. If you are unable to afford it but still want to contribute, consider becoming a patron on my Patreon page. Even small contributions make a major impact, and all donations are used toward field surveys and conservation/restoration projects."

genetic resistance will be detected through a higher survival than the general population, and the original trees can then hopefully be used to help restore devastated populations throughout Alberta.

Clearly, the five needle pine story is a challenging ecological problem, but unlike most similar conservation crises, the public is uniquely poised to help. There are likely millions of five needle pines throughout the province that have never been assessed for rust, and some of them will certainly be plus trees. Hundreds of ranchers, farmers, hunters, landowners, and hikers pass them by every day in the foothills and Rocky Mountains and could dramatically assist with the effort to locate healthy trees in areas of very high rust. In doing so, they may help ensure that these iconic and ancient trees will survive.

The Most photographed Tree in Alberta!

"The Burmis Tree" - a Limber Pine - is located in the community of Burmis AB along the Crowsnest Highway (Highway 3). The tree died in the late 1970s and was estimated to be between 600 and 750 years old. In 1998, it was toppled by wind. However, members of the local community refused to leave it lying; it was stabilized by Alberta Culture Historic Sites staff using stainless steel rods and brackets. Even when vandals cut one of the tree's main branches in 2004, locals fixed it again with glue and a prop pole. The community rallied to have the new Highway 3 built around the tree rather than destroy the heritage symbol it has become. The tree remains as the sole point of interest in the once prosperous town of Burmis.

THE BURMIS TREE. WIKIPEDIA

First Hand: Mating Strangers

BY BRIAN GENEREUX

BRIAN GENEREUX

In May 2018 I counted a group of 22 Black-necked Stilts on the south shore of Whitford Lake. The following spring 2019 had similar numbers. It seems Stilts are becoming as common as Avocets and can now be seen mingling together in their shared nesting areas.

How things have changed! In 1977 Dick Dekker reported a nesting pair of stilts at Beaverhills Lake in his book *Prairie Water*. That would turn out to be the first successful nest in Canada. Twenty years ago marked a surprising occasion when I saw my first Stilt at Whitford with subsequent years since then of seeing just the odd one or none at all. Now they're everywhere and my conservative guess would have at least 20 nesting pairs at the lake.

On May 23, a Stilt and Avocet brought mingling up a notch. Not sure whether I needed new binoculars or an eye exam, the two began mating! At first, I thought it was a territorial conflict, but it turned into a pre-mating, mating, and then post-mating ritual exactly as if they were two Avocets. After some internet searching, I actually did find a paper on these birds interbreeding and producing an "Avostilt" in the San Francisco Zoo in 1971. See: William L. Principe, Jr: "A hybrid American Avocet x Black-Necked Stilt."

Great! I don't need new binocs after all and can now use them to find a strange new bird at Whitford Lake!

LINDA FISHER

First Hand:
A Swainson's Hawk Rescue

BY LINDA FISHER

I live on an acreage west of Medicine Hat. I was checking my horse pastures on August 1 and thought I had better check one of the horse's water troughs which I had earlier needed to use as the horse waterer wasn't working. When I got close, I saw that a fledgling Swainson's Hawk was standing in 3 inches of water and could not get out. There were no parents around anywhere. I had heard them the day before but not since then.

Hawks and owls use a nest nearby in my shelter belt every year. I sprang into action. I ran to the house for some gloves and a blanket, hoping to minimize stress on the young bird as I got it out. I put both dogs in the house too, as they would see it as an intruder and dispatch it quickly. Then I realized it was probably better just to tip the trough over - which I did.

The hawk hopped out and stood a few feet away with wings outstretched, looking very intimidating and hissing at me. I got some chopped raw meat I use for one of my cats, placed it nearby and left it alone; still no sign of any hawks anywhere nearby. I went back to the house and phoned the Birds of Prey Centre in Coaldale and spoke with Colin Weir as to options for this young hawk. Choices were to leave it alone and let Mother Nature take its course or bring it in.

I chose to drive and take the hawk to the Centre. It was 37 C that day. I just couldn't leave it there alone with the heat and Coyotes, owls and my dogs all able to eat it. I grabbed my gloves and a large dog carrier and headed back outside. The fledgling was nowhere in sight. I turned the horse trough upside down so nothing else could get trapped inside. I walked all over for 20 minutes in the heat searching for it.

Then I spotted it up in a dead poplar. I texted Colin and he instructed me how to get it down. So back to the house I went - now totally sweat soaked - to get a broom. I was just able to reach up to the height of the hawk with the broom. Colin had said to gently nudge it to make it get on the ground. So I slowly reached up and to my utter amazement the chick stepped onto the sweeping end of the broom and hung on as I lowered it to the ground.

I expected a chase and tackle with the blanket. What a well-trained hawk it was - it just hung on and I placed it right inside the crate and gently tipped the broom to coax it off. It gently fell over and lay there for a bit, then sat up and just stayed there. I covered

LINDA FISHER

the crate with the blanket and headed for my truck. I got to Coaldale two hours later and took the hawk into the Centre. Nicki was there in the store feeding two other young Swainson's Hawk fledglings! They were both just sitting in their own open Tupperware containers and she was hand feeding them raw chicks. It was amazing. They didn't try to leave at all when the feeding was over. She transferred my hawk from the crate and left it to rest to check it out and feed it later.

I watched the eagle demonstration which was amazing and did a very quick tour of the other birds. I left a donation and returned home. Checking a few days later, I learned the hawk was doing just fine. Seems they are not able to drink water - they get all fluid requirements from their food. I was so glad I chose to deliver it to the Centre. They will release it soon this fall with the other young hawks.

THE COALDALE BIRDS OF PREY CENTRE IS A SUPERB FACILITY FOR REHABILITATING ALL RAPTORS AND IS OPEN FROM MAY UNTIL LABOUR DAY FOR TOURS, DEMONSTRATIONS AND MORE. LINDA FISHER

Brook Skagen

Eyes on IBAs

Saskatchewan's Conservation Potholes

BY BROOK SKAGEN

As I write this article, the heat of summer has dwindled and the birds have begun to flock, evidence that August has one foot out the door and autumn has one foot in.

Perhaps nothing marks the coming of Fall more so than a prairie pond filled bank to bank with wading waterfowl, their flocking instinct triggered by the changing daylight hours.

It is these prairie pothole wetlands, scattered from Alberta to Manitoba and Montana to Iowa, that millions of migrants will come to depend on as they travel south in search of more bountiful winter resources, and that will serve as one of the world's most important breeding habitats upon their return. Wetlands are the central feature of many designated Important Bird and Biodiversity Areas (IBAs) across the prairies, including the Maple Creek Grasslands IBA.

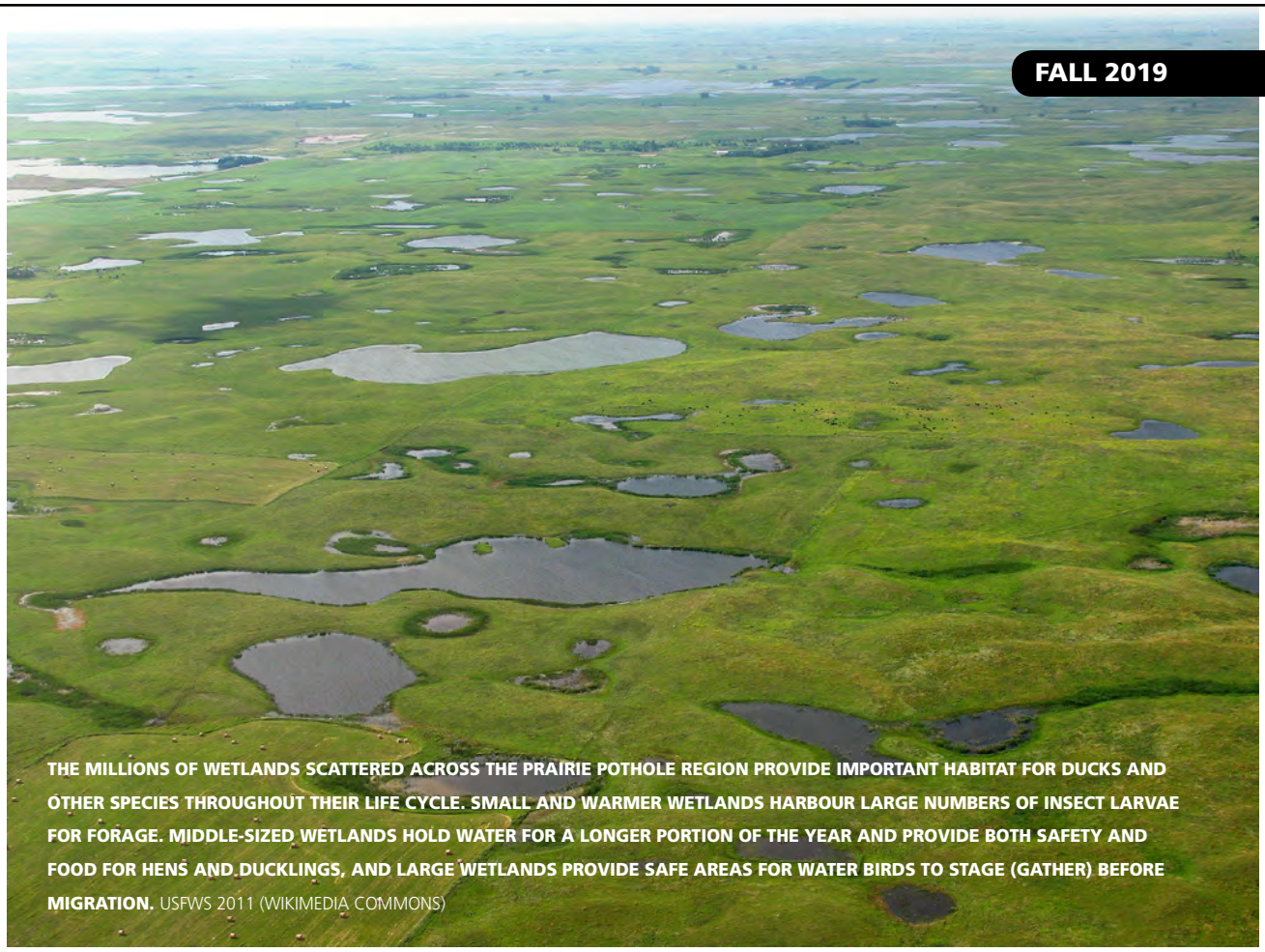
Located approximately 5 km east of Walsh, AB and surrounding the town of Maple Creek, SK, the Maple Creek Grasslands IBA is one of 53 designated Important Bird and Biodiversity Areas in Saskatchewan. The IBA encompasses over 730 km^2 of native mixed-grass prairie, freshwater streams, marshes, saline lakes, and cultivation along the Alberta-Saskatchewan border, making it the fifth largest IBA in Saskatchewan and the third largest IBA in the province's Mixed Grassland ecoregion (a continuation of Alberta's Mixedgrass Prairie Natural Subregion).

The site met National Significant IBA criteria following the documentation of 36 active Ferruginous Hawk (*Buteo regalis*) nests in the area (approximately 1% of the total Canadian population of the federally Threatened and provincially at-risk species). As many as 5,000 ducks have been reported on the IBA's Bitter Lake, Hay Lake, and Junction Lake, as well as associated wetland complexes.

Though a pothole wetland may not be the first pothole that comes to mind when we think of Saskatchewan, all road maintenance jokes aside, approximately 1.5 million wetlands covering over 4 million acres of land are scattered throughout the province. This staggering comprises about 11% of Canada's wetlands. Wetlands not only provide important staging, breeding, and stopover habitat for waterfowl and other wildlife, but also provide an array

THE VARYING LEG HEIGHTS AND BILL LENGTHS OF DIFFERING SHOREBIRD SPECIES ALLOWS THEM TO FORAGE IN WETLANDS WITHOUT INTER-SPECIES COMPETITION.

WIKIMEDIA COMMONS 2013



THE MILLIONS OF WETLANDS SCATTERED ACROSS THE PRAIRIE POTHOLE REGION PROVIDE IMPORTANT HABITAT FOR DUCKS AND OTHER SPECIES THROUGHOUT THEIR LIFE CYCLE. SMALL AND WARMER WETLANDS HARBOUR LARGE NUMBERS OF INSECT LARVAE FOR FORAGE. MIDDLE-SIZED WETLANDS HOLD WATER FOR A LONGER PORTION OF THE YEAR AND PROVIDE BOTH SAFETY AND FOOD FOR HENS AND DUCKLINGS, AND LARGE WETLANDS PROVIDE SAFE AREAS FOR WATER BIRDS TO STAGE (GATHER) BEFORE MIGRATION. USFWS 2011 (WIKIMEDIA COMMONS)

of ecosystem services, such as decreasing nutrient and pollutant runoff, reducing flood frequency and intensity, and buffering the surrounding landscape against the effects of drought.

Ironically, it is drought that remains one of the most prevalent threats to the IBA and surrounding region. Depleted water levels, sometimes to the point of total desiccation, and increased salinity in wetlands often occur as a result of drought conditions. In turn, this influences the ability of shorebirds and waterfowl to forage in the area (Zhijun et al. 2009) and may also reduce the availability of suitable nesting substrate and cover for these and other species. The effects of drought become increasingly problematic with the continued loss of these high-value ecosystems, of which nearly 70% have already been claimed by agricultural and industrial developments. The establishment, monitoring, and advocacy of the Maple Creek Grasslands and other IBAs are a few of many stewardship acts which may aid in buffering these sensitive landscape features from the cumulative threats which surround them, just as they do for us.

As summer draws to a close, I grievously gaze at the flocks of ducks departing day by day, not quite yet ready to retire my binoculars for the season. I am comforted by the fact that just as autumn marks their departure, so too will the following spring signify their return. I'll keep my fingers crossed for early rain as I eagerly wait for their arrival.

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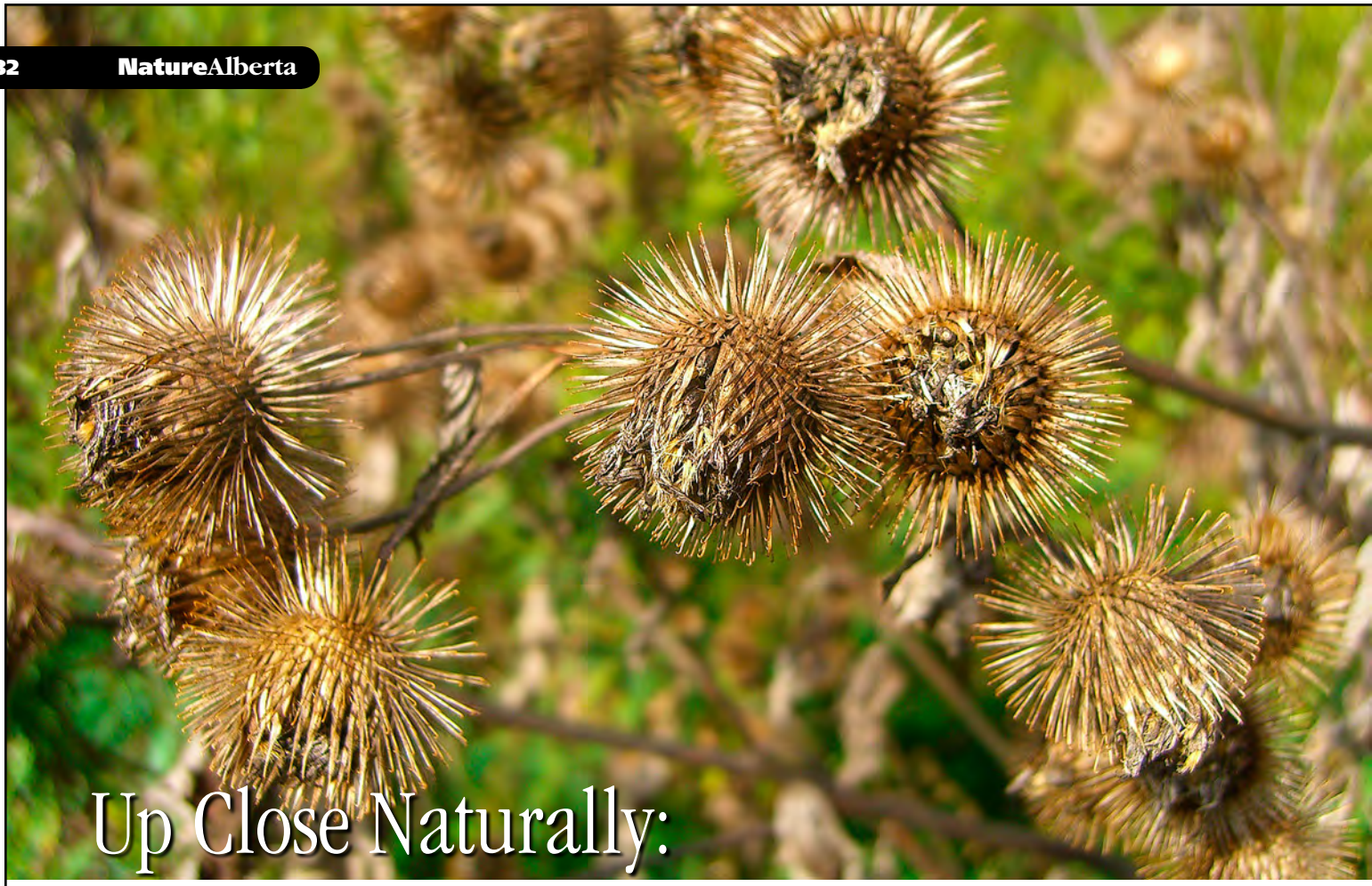

Up Close Naturally:

Seed Dispersal

BURDOCK (PICTURED) HAS LARGE BURS, UNLIKE BLUEBUR, WHOSE BURS ARE TINY BY COMPARISON. WIKIPEDIA

BY MARGOT HERVIEUX

If you or your pet spends time in the woods or fields, you will know that many seeds hitchhike on passing animals.

Many common wildflowers have seeds or "burs" with hooks for hanging tightly to fur, feathers or fabric. Each small, oval seed in the round seed head of the Yellow Avens has its own large and effective hook. You can also easily recognize the cone-shaped seeds of the agrimony plant with their circle of bristles around the base.

Many prairie grasses also have seeds that weave themselves into fur or clothing. Names like Porcupine Grass or Needle and Thread Grass are very appropriate for these plants. The long hairs or awns on the seeds also help plant the seed by twisting as they dry and actually drilling the seeds into the ground.

Plants also trick birds and mammals into helping with dispersal by wrapping their seeds in colourful and tasty fruit. From Saskatoons and Choke Cherries to rose hips and Strawberries, all these fruits are eagerly eaten by birds, chipmunks and even Coyotes. The seeds pass through the animals' digestive systems

Margot also writes a column for the Peace Country Sun, archived copies of which are available at www.peacecountrysun.com.

and are dropped, with a dollop of fertilizer, far from where they started. We often find garden trees like honeysuckle and Mountain Ash growing in unusual places after having been "planted" by birds. Squirrels, chipmunks and jays also help to move and plant seeds since they only eat a small portion of all the nuts and seeds that they stash away.

Another great method of seed travel is by air. We are all familiar with the parachutes attached to Dandelion seeds and the springtime fluff that carries the seeds of poplar and willow. At this time of year, it is easy to spot the plant down which carries the seeds of Cattail, Fireweed, thistle and goldenrod. In back yards and windrows, Manitoba Maple and Ash trees are laden with winged seeds that twirl or glide away from the parent plant.

MANY ANIMALS LOVE THE TASTY FRUIT OF CHOKECHERRIES. WIKIPEDIA

Anyone that has walked past a Caragana hedge on a hot, summer day is familiar with another interesting method of dispersing seeds. Caragana and our native violets have seedpods that twist as they dry, launching the seeds when they split open. The pods of Jewel Weed or "touch-me-not" spring open when they are touched, flinging the seeds away from the parent plant.

If you have kids in your life with an interest in nature, take them for a walk through a fall meadow with a wool sock over one shoe. It won't take long to find seeds of all different shapes and sizes that use all sorts of ways to get around. Look for hitchhikers, tummy travelers, parachutes and explosive pods and consider all the ways that seeds are used by wildlife and people.

Nature Kids

ZOE MACDOUGALL

BY ZOE MACDOUGALL,
NATURE KIDS PROGRAM COORDINATOR

Nature Kids has had a very busy summer this year whether attending various events across the province or hosting our own in Edmonton, Calgary, Red Deer and many other locations.

We hosted our ever-successful Family Nature Nights series again this summer in July and August with themes such as Wildlife in the City, Precious Pollinators, Beautiful Bugs, Way of the Woods, Wet and Wild and Indigenous Summer. We made many new connections with other groups and organizations who came out to present at these events this summer such as the Edmonton Urban Coyote Project and the Alberta Community Bat Program!

We also piloted a Field Trip program this year in Edmonton, Calgary and Lethbridge with families participating in a backstage tour of the Elk Island bison facility as well as a guided hike with Canadian Parks and Wilderness Society to Mount Yamnuska to learn about species at risk and protected areas. Our Women and Girls in Nature events also had another successful year with this program expanding to three new cities in Alberta for a total of 6 events: Edmonton, Calgary, Red Deer, Lethbridge, Grande Prairie and we will host a winter themed one in Edmonton in February of 2020.

We have had tons of fun attending World Migratory Bird Day events across the province as well as the Bluebird Festival and Bug Jamboree at the Ellis Bird Farm and various Farmer's Markets to promote our Nature Alberta programs. It has been a whirlwind summer, but we wouldn't have it any other way! Stay tuned to our Calendar of Events on the Nature Alberta website (naturealberta.ca) as well as our Nature Alberta Facebook page for information on our Fall and Winter events happening this year!

Happy exploring.

EDMONTON URBAN COYOTE PROJECT PRESENTATION.
ZOE MACDOUGALL

FIELD TRIP TO ELK ISLAND. ZOE MACDOUGALL

Let's Go Exploring!

Visiting Alberta's Provincial Parks all year round

BY ZOE MACDOUGALL

Alberta is a great place to live. It's a big beautiful province full of all kinds of natural wonders. This province has over 100 Provincial Parks across its breathtaking landscape which means we have lots to explore as Albertans! Many of these Provincial Parks are open year-round for us to enjoy with everything from camping, swimming, hiking, horseback riding, educational programs and much more. Here I will feature a few of the lovely parks that are open all year across the province that you and your family can adventure to, even when the leaves start to fall. Come explore with us!

Sir Winston Churchill Provincial Park: This park is located 5 km east of the town of Lac La Biche. This provincial park was established in 1952 and is special because it is located on a tied island - which means an island that is tied to the mainland by a narrow piece of land. The park is known for its old growth forests and excellent bird watching. There is lots to do at the park even when the long days of summer have started to wind down and the leaves have begun to change colour. Camping here ends after the long weekend in September but there are plenty of other activities for families to participate in. There are tons of wildlife viewing in this park, over 9 km of hiking trails that are open year-round. Birding is exceptional, as the park provides habitat for over 230 bird species. When winter hits, families can participate in 8 km of groomed cross-country ski trails, ice fishing, and snow shoeing.

Miquelon Lake Provincial Park: This park is located 65 km southeast of the City of Edmonton. It was established in 1958 and is special because it was first designated a bird sanctuary in the 1920s. There are many lakes within this park, the largest one being Miquelon Lake. The area is also designated one of Canada's Important Bird Areas where ducks and waterfowl congregate during spring and fall migration. You can find Trumpeter and Tundra Swans. The park is also located in the Beaver Hills Biosphere and is part of the Dark Sky Preserve, which means that you can visit this park in the fall and winter to take in the night sky without the disruption of artificial light. Families can also camp year-round and take in cross country skiing as well as "skijoring" (to be pulled by a dog on your cross-country skis) in the winter.

Writing-on-Stone Provincial Park: This park is located 100 km southeast of the City of Lethbridge. It was established in 1957 and is special because it has been designated a UNESCO World Heritage Site and is one of the largest areas of protected prairie in Alberta. It is a nature preserve and serves as protection for a large number of Indigenous rock carvings. Families can camp here all year long but if you would like to visit the visitor centre, it is only open until September 30th; after that, you have to make an appointment with Alberta Parks staff. There are many viewpoints and self-guided hikes you can take at any time of the year to visit the hoodoos and rock art.

It is important to find activities that you and your family can enjoy even when the weather starts to get chillier, as spending time in the great outdoors is extremely beneficial for your health.

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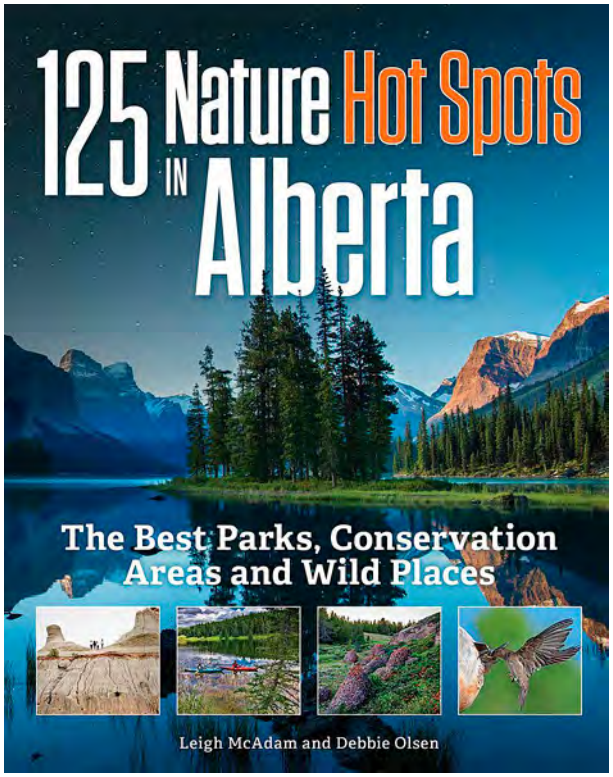
ZOE MACDOUGALL

BOOK REVIEW

125 Nature Hot Spots in Alberta



By Leigh McAdam and Debbie Olsen
Paperback: 224 pages

Since the first travelers visited the hot springs in Banff during the railway era of tourism, Alberta has been a compelling destination for visitors worldwide. Banff became Canada's first national park in 1885 and it remains one of the most popular destinations in the nation.

The mountain parks are just one part of a province that is filled with spectacular landscapes. Canada's fourth largest province is also blessed with thick forests, sparkling lakes and mysterious badlands that conceal the fossilized remains of dinosaurs. *125 Nature Hot Spots in Alberta* is a reader-friendly guidebook that explores this remarkable splendor and natural diversity.

Organized by region, each hot spot entry includes a descriptive destination profile, a colour photograph and a sidebar of at-a-glance information about special features and location. A few examples of the destinations are:

Whitehorse Wildland - one of the few places in Alberta where you can drive to an alpine meadow;

Wood Buffalo National Park - free-roaming bison and the world's largest dark sky preserve;

Writing-on-Stone - national historic site containing petroglyphs and pictographs;

Waterton Lakes National Park - one of the best mountain parks to view bears and other wildlife;

Cypress Hills Interprovincial Park - highest point between the Rocky Mountains and Labrador.

This book provides fresh insights on popular spots and valuable information about lesser-known destinations that are equally worthy of a visit. *125 Nature Hot Spots in Alberta* is an essential selection for libraries, tourism offices, travel agents, and bookstores

CELESTIAL HAPPENINGS

Fall 2019: October to December

BY JOHN MCFAUL

Sun: **Rise** – Oct. 1 (7:35 MDT), Nov. 1 (8:33 MDT), Dec. 1 (8:27 MST)
Set – Oct. 1 (19:10 MDT), Nov. 1 (18:01 MDT), Dec. 1 (4:18 MST)
Times are for Edmonton.
Daylight Savings Time ends Nov. 3rd.
Autumnal Equinox: September 23rd at 1:50 MDT

Moon: **Full** – Oct. 13, Nov. 12, Dec. 11
New – Oct. 27, Nov. 26, Dec. 25

Planets: **Mercury** will be best seen in the eastern morning sky just prior to the sunrise from the last week of November through the first week of December. **Note:** Mercury will transit in front of the Sun on November 11th. At sunrise it will be close to the centre of the sun and will exit the disc of the sun at the 1:30 position about 11:04 AM. **To be safe** project the sun onto a white sheet of paper. Mercury will appear like a small sunspot.

Venus hugs the western horizon shortly after sunset in October. It climbs higher in the sky through November and December. It will be just below Jupiter on November 23rd and below Saturn on December 10th.

Mars will be a morning object in the SE sky throughout the fall. It starts the period in the constellation Virgo and gradually moves into the constellation Libra as the month's progress.

Jupiter maybe seen low in the WSW in the evening sky during October and November. By mid-December it will be too close to the sun to be seen. The moon will pass by on Oct. 31st.

Saturn starts October in the evening sky above the SW horizon. Each evening it will be a bit lower in the sky and further to the South West. By the end of December, it will be lost in the glare of the setting sun. The moon will be near on Nov. 29.

Meteor Shower: Orionids (October 21st, 10 -20 per hour),
Leonids (Nov. 17th, 20 meteors per hour)
The predicted rate is for dark skies well away from city light pollution.

IMAGE OF JUPITER TAKEN BY NASA'S HUBBLE SPACE TELESCOPE, JUNE 2019 WIKIPEDIA

Wildlife Along the Scenic Peace River

BY THEODORE (DICK) DEKKER

Alexander Mackenzie was the first European to canoe the Peace River. His wildlife sightings, reported in 1801, differ from what could be seen two centuries later.

ALEXANDER MACKENZIE. WIKIPEDIA

Alberta's rolling parkland is pleasing to the eye of the naturalist anywhere, but the most impressive mosaic of open grassland and copses of aspen poplars I ever saw were the south-facing slopes of the Peace River valley, between the B.C. boundary and Dunvegan. Irma and I canoed that stretch of river many years ago, but the memory is still vivid, and we consider that trip the most enjoyable and interesting holiday ever.

For five hot August days we drifted leisurely down the scenic stream, watching for wildlife. We saw Beaver and deer, and a surprising number of Black Bears. Their sign was commonplace along shore. A sandbar where we set up the tent was pockmarked by fresh tracks big enough for a Grizzly. Both of Irma's bare feet fitted inside the bear's huge front pads.

During the weekend preceding our trip, the town of Peace River had celebrated its annual festival called Mackenzie Days, which included a river event. On our second day, we overtook an aluminum skiff with two people on board, an older man and a young woman. They had fallen behind their group, when their outboard engine failed. We found them stuck mid-stream on a shallow spot and helped to free and steer them along. Later that day, an amphibious aircraft approached, following the valley. Apparently, the couple had been reported missing. When the float plane descended and taxied down to an open point, we joined the crew of RCMP officers, who were pleased to have located the missing boaters, safe and sound.

Just before Irma and I parted company with them, the man handed us a partly full flask of whiskey. At the time I was not aware that having open booze in a boat was against the law in the province. For us, it was the first hard liquor we ever tasted. Resuming our canoe trip, we took turns passing the bottle back and forth on our paddles. The experience added greatly to our euphoria when we spotted several Wolf pups on a riverbank. Landing on the opposite shore, we decided to stay another day in the hope of seeing more of the Wolf family. However, except for a brief glimpse of one adult, which was met by five frolicking pups, we did not see much of the goings on.

In late afternoon of the third day, when our open camp site was baking hot, we crossed the river to look for a shady spot. Just as we were pulling up to shore, we had to quickly back off again when a large Black Bear emerged from the bushes. Huffing and puffing in the heat of day, he may have been headed for a cool bath or a drink of water.

Next morning, we continued our trip and just before the region was hit with a violent thunderstorm, we reached our planned terminus: the river bridge at Dunvegan where we had left our car.

Today, Dunvegan is the location for the next hydrological project on the Peace, scheduled to start construction

DURING OUR FIVE-DAY CANOE TRIP, WE SIGHTED TEN OR TWELVE BLACK BEARS BY THE RIVER AND ON THE SEMI-OPEN HILLSIDES. THEODORE DEKKER

IRMA BY ONE OF OUR CAMP SITES ALONG THE PEACE RIVER. THE SAND AND MUD AROUND THE TENT WERE DOTTED WITH THE TRACKS OF BEARS, AND ON THE OPPOSITE SHORE WE SPOTTED FIVE YOUNG WOLVES. THEODORE DEKKER

in the near future. The rising waters blocked by the dam would inundate the beautiful valley we had just travelled and probably result in further ecological damage to the Peace-Athabasca delta, which has already been subjected to the harmful effects of two existing Peace River dams farther upstream in B.C.

As to the river's wildlife, I recently read a book written by the first European to canoe the Peace River, the famous Sir Alexander Mackenzie. My daughter-in-law, Brenda, found a copy of his 1801 travelogue in the Edmonton Public Library. Its diaries reflect the original richness of the valley. On the rolling parklands above the river, he reported large herds of Elk and Bison. Floating by that stretch, we saw no large herbivores. By the end of the 1800s, both the native Elk and the Bison, as well as other Alberta mammals, had been brought down to a very low ebb.

ALEXANDER MACKENZIE'S HISTORIC VOYAGES

The hope of Alexander Mackenzie was basically the same as the dream that drove Christopher Columbus in 1492 across the Atlantic Ocean, to discover a short-cut to India. Columbus thought he had found it when his ship made landfall in central America. That's why he called the people he met Indians. Mackenzie had a clearer idea of what he wanted: to survey a navigable water way through Canada's arctic, a route that much later became known as the North West Passage. At the time of Mackenzie's quest, intrepid European mariners had already circumnavigated the tip of South America, and captain Cook had sailed northward up the Pacific west coast to the latitude of Vancouver.

Mackenzie left the fur-trading post called Fort Chipewyan on Alberta's Lake Athabasca on the third of June 1789. With him were four French Canadian voyageurs, two of them accompanied by their wives. Their canoe was 25 feet (8 m) long, made of wood and birch bark. A smaller canoe was manned by a Cree guide named English Chief and several of his wives, plus a hunter. The third canoe was paddled by two other young aboriginal hunters and loaded with trade goods and food. Later during the journey, when the load had lightened, all of these people would board the biggest canoe.

Departing Fort Chip, the brigade followed the Slave River to the huge lake of that name, Great Slave Lake. Finding its outlet, they descended a wide river that was later named after Mackenzie, but he called it the River of Disappointment. For, instead of leading to India, his voyage dead-ended on the shores of the still frozen Arctic Ocean. Spending just a few days there, exploring the island-studded delta, Mackenzie gave in to the anxious wishes of his crew, who wanted to go right back by the same route they had come, because they were fearful of meeting their mortal enemies, the Inuit or Eskimo. Working their way upstream, the Mackenzie party arrived at Fort Chipewyan on September 12 after a journey of 102 days' duration.

The young and capable explorer, driven by ambition, embarked on a second mission on October 10, 1792, again starting out from Fort Chipewyan. But instead of descending the Slave River, he chose to ascend the Peace. After an increasingly arduous journey upstream, he reached the river's headwaters. Guided by local natives he crossed the coastal mountains on foot, built a new canoe, and after a dangerous descent finally reached the Pacific Coast. Along the way, he encountered several native tribes who were not always welcoming. On the contrary, they had to be approached with diplomatic tact and offered presents, such as metal kettles, knives, axes, and glass beads.

Upon his final arrival in the delta of the Bella Coola River, Mackenzie inscribed his name and the date of arrival in red ochre paint on a perpendicular rock face: "Alexander Mackenzie from Canada, by land, the twenty-second of July, 1793." He then left in a hurry, fearing the natives who had passed by in large war canoes. He was the first European to have travelled across the continent from east to west. His history-making journey predates by 13 years the celebrated Lewis and Clark expedition farther south in the United States.

Mackenzie's travelogue was published in 1801 and includes detailed entries about the indigenous

people he encountered, most of whom had never seen a white person. Generally, he found the men better dressed than the women, who did all the hard work and were "inferior to men in cleanliness." Mackenzie added that the males of several tribes left "the organs of generation uncovered."

Focused on reaching his goal in the shortest possible time, Mackenzie had not much to say about the wildlife he observed along the route, except for Alberta's portion of the Peace. On the scenic south-facing slopes rising above the river, he reported numerous Elk and Bison. Another interesting point is that he did not often mention Black Bears, but he did encounter and kill several Grizzly Bears. Could it be that the Grizzlies of the west used to be more common than today? The American Black Bear is essentially an eastern species of wooded habitats. To escape from the aggressive Grizzly, Black Bears take refuge in trees. The Grizzly is essentially an open country animal with long, rather flat claws that are good for digging into the soil but not for climbing trees. After European settlement of the west, Grizzlies declined, and in the absence of their enemy, Black Bears may have increased.

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Foot note #1. Mackenzie was employed as a fur trader by the North West Company, a competitor of the Hudson's Bay Company. Later, both companies amalgamated, reducing the hostile rivalry between the French Canadian *Coureurs de Bois* and the intrepid Scotsmen of the HBC.

Foot note #2. In early June of 1965, T.H. McDonald, an American university professor, left Fort Chipewyan in a 17-foot canoe accompanied by his wife Mary and their 17-year old son, to make the same journey as Mackenzie had. Following the directions given in the 'Voyages' and checking Mackenzie's distances, McDonald found a few measurements imprecise, but most were surprisingly accurate. The Mackenzie party paddled down the river of that name in 13 days, whereas the McDonalds took 26 days. The length of the river was given as 1,540 miles (2,460 km) from Great Slave Lake to Whale Island on the Arctic Ocean. McDonald's narrative was published in 1966 by the University of Oklahoma Press under the title 'Exploring the Northwest Territory.'

WHAT'S GOING ON HERE? SEE THE STORY, PAGE 27. BRIAN GENEREUX

A LUCKY YOUNG SWAINSON'S HAWK; STORY PAGE 28. LINDA FISHER

AN ORNATE CHECKERED BEETLE; SEE THE STORY, PAGE 14. ELIZABETH BOILEAU

VOLUME 49 | NUMBER 3 | FALL 2019

Nature gallery

TWO FRIENDS...SEE EXPLANATION IN "ON THE COVERS", PAGE 3. SARA JORDAN-MCLACHLAN

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