

Nature Alberta

CELEBRATING OUR NATURAL HERITAGE

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WILD TRAP AT RAINBOW LAKE. SEE THE WOLVERINE FEATURE STORY, [PAGE 24](#).

feature article

Investigating the Niche of Alberta's Boreal Wolverine



THE CLIMBING WALL AT PARKS DAY; SEE THE STORY, [PAGE 46](#).

FRIENDS OF JASPER

**A LONG-TAILED WEASEL
ON A POST?? SEE THE
STORY, [PAGE 36](#).**

TERESA DOLMAN



**A COMMON GOLDENEYE TAKES OFF FROM HAWRELAK PARK POND;
SEE THE STORY, [PAGE 10](#). JIM BROHMAN**



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WANT TO SUBMIT ARTICLES OR PHOTOS?

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SPRING ISSUE: **FEBRUARY 28**
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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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CELEBRATE NATURE ALBERTA

SERVING NATURE FOR OVER 45 YEARS!!!



EDITORIAL DISCLAIMER

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BROOK SKAGEN

Editor's Page

BY BROOK SKAGEN
NATURE ALBERTA'S NEW ASSISTANT EDITOR

I would like to take this space to thank and congratulate every one of Nature Alberta's readers, contributors, and supporters for yet another fantastic issue!

There is nothing I enjoy more than reading the enriching articles and entertaining tales found on every page as I sip my morning coffee, and I feel immense pride in continuing to contribute to such a marvelously assembled publication as the newly selected Assistant Editor.

My involvement with Nature Alberta began last spring as one of a handful of Important Bird Area Interns. The internship sent me across southern Alberta on an incredible adventure to identify birds and assess their habitat quality in these ecologically significant areas, as well as share my experiences through the organization's "Bird Conservation" blog. It was by accident that my involvement with the IBA program ignited my volunteering "career".

It was shortly after the release of last year's summer issue that I received a very intriguing email from Erin Campbell, our former Bird Conservation Program Manager: *"I forgot to mention to you earlier, but I submitted one of your blog posts to our quarterly*

magazine's IBA column". I was speechless. Throughout my childhood I dreamed of one day becoming a writer, a journalist, anything that would let me share my passion for nature and literature, anything that would one day get my name in a table of contents. And there it was, on **page 21**, an article I wrote highlighting the thrill of my first White-faced Ibis sighting at Pakowki Lake: my name was typed beside the "Eyes on IBAs" column! Four published articles later and the excitement has yet to subside; *I love* writing about birds!

I have been completely overjoyed to share my passion and knowledge for Alberta's IBAs, and the birds that call these beautiful and unique locations

home, as the "Eyes on IBAs" column writer for the past year. The encouragement I received from both Erin throughout my internship and from your wonderful editor Dennis this past year has truly allowed me to grow as a writer and steward of Alberta's natural world. Thank you all for being a part of such a dedicated and welcoming organization. Please keep sharing your backyard sightings, your neighborhood news, and your beautiful photographs, as your stories bring so much enjoyment into my day. And if you see any mistakes, blame the editor - after all, I'm only the assistant!

Happy Reading!

Brook

CORRECTION

The Cover Photo of the Spring 2015 Nature Alberta, with flying swans, as well as the swan photo on page 24, were taken by Peter Goodman, not Len Hills. The photo of Len with his spotting scope (page 30) was taken by Marian Hills. Our apologies for the mistake. On the plus side, Marian says that she has "sent out quite a few [copies of the article] and they have been well received."

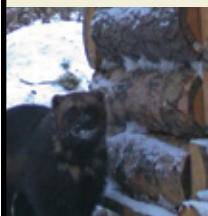
AWA Celebrates 50 years



Alberta Wilderness Association (AWA), one of the oldest conservation organizations in the province, celebrated its 50th anniversary on Thursday June 25th. AWA is starting its next 50 years by purchasing its home – Hillhurst Cottage School – from the City of Calgary. AWA has called Hillhurst Cottage School home for almost 40 years and has been a proud steward of the historic site for nearly two generations.

The stewardship ethic AWA brings to its conservation mission will animate its ownership of the school; AWA is committed to maintain this historic structure as a public resource and centre for conservation. AWA's past and future home is at 455-12th St NW, Calgary.

On the Covers:



FRONT COVER

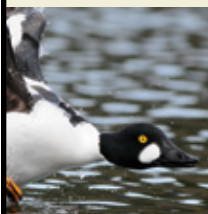
The Wolverine might just be the ultimate symbol of Canadian wilderness and wildness – a fascinating but secretive member of the weasel family about which our knowledge is somewhat limited. Alberta researchers are hard at work to fill in the many gaps that exist about Wolverines. See the Feature Story on the studies being done, [page 24](#).



INSIDE FRONT COVER

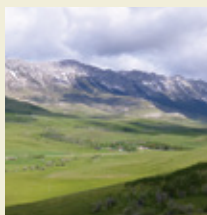
Looking and listening for birds can often lead to an entirely different experience, as Teresa and Doug Dolman of Lethbridge discovered near Cowley AB. Catching photos of weasels is a difficult task, so you can imagine the thrill of seeing a Long-tailed Weasel out in the open and displaying on a fence post! See the

rest of the story on [page 36](#).



"For over thirty years, the Friends of Jasper National Park have been helping to create memorable experiences and lasting connections to Jasper National Park." The photos and the article, starting on [page 46](#), are proof positive of the tremendous benefits this Nature Alberta Affiliate Club is having in Jasper.

Want to take photos, or just watch nature, without travelling far and wide? Then do what Jim Brohman has done: go to a local natural area. For Jim, it is Hawrelak Park Pond in Edmonton, where he has great success photographing birds. See his story, [page 10](#).



INSIDE BACK COVER

You would be hard-pressed to find anything more thrilling than watching a falcon on the hunt. In this case, it's a Gyr Falcon, and the prey are pigeons. It is a spectacle that many Edmontonians have witnessed over the past twenty-five years. For more on the story and more of Janice Hurlburt's action photos, see [page 35](#).

Dana Seidel updates us on her Elk Home Range Behaviour study, first reported in the Spring 2013 edition of *Nature Alberta*. See the story, [page 12](#).



BACK COVER

Edmontonian Brian Peters is an accomplished writer, publisher and photographer. Friend him on Facebook if you want to see his fabulous array of photos. This photo, taken the 3rd week of May, is looking across from the old Trenville Park. In the left foreground are the small "rapids", hardly rapids but always the sound of water rushing over the rocks, always music to the ears.

Says Brian: "It is not unusual to see a deer opposite on top of the river banks, the occasional eagle, and during the summer, also young pelicans gliding by." Conveniently located on the banks of the Red Deer River, just 45 minutes north-east of Elnora with secluded tree sites, Trenville Park is a great family oriented campground and day-use area.

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ALBERTA ISSUES IN BRIEF

New Name, New Minister

What used to be two ministries – Environment and Sustainable Resource Development, and Parks and Recreation – has been merged into one: the Ministry of Environment and Parks (AEP). The new minister is Shannon Phillips, who represents the NDP riding of Lethbridge-West.

Raised in Edmonton, Phillips graduated with honours from the

University of Alberta with a Master of Arts Degree in political science. Before being elected, she worked as a journalist and consultant before taking a position with the Alberta Federation of Labour as an economic policy analyst. She is the mother of two preschool-aged boys.



SHANNON PHILLIPS FACEBOOK

In a June 10th posting, AEP stated: “With our new face comes the opportunity to bring even more new [website] content and bring our readers on amazing adventures through the work we do.”

Environmental Enforcement Positions Good News for Headwaters

FROM AWA NEWS RELEASE, MAY 14, 2015

The Alberta government has announced that 23 new environmental enforcement positions are being established to patrol Alberta’s Eastern Slopes and other backcountry areas. The hirings follow several years of sparse presence on the ground by officers and widespread damage to streams and river beds in Alberta’s headwaters. The new personnel will focus on education, as well as the much-needed enforcement angle

“This is great news,” says Sean Nichols, Conservation Specialist with Alberta Wilderness Association (AWA). “We are hopeful that this will be a deterrent to irresponsible off-highway vehicle use that is degrading the sensitive wetlands and streams crucial for our abundant, clean water supply.”

Findings from AWA’s 11-year ongoing recreational trail monitoring project in the Bighorn Wildland west of Rocky Mountain House indicate that Alberta’s growing population and affluence have resulted in ever-increasing numbers of off-highway vehicle (OHV) users in the backcountry areas of the Eastern Slopes. For many of these new OHV users, a lack of awareness and education can lead to damage done through ignorance. However there are also users that knowingly and willingly perform activities that damage riverbanks and threatened fish habitat, and that cause erosion and siltation into creeks and rivers.

Recent initiatives by the RCMP and provincial judges in communities along the Eastern

Slopes have led to an increase in the frequency and magnitude of fines and charges laid against these offenders, when caught. In a recent ruling, a judge in Rocky Mountain House assessed two \$1,500 fines against OHV users joyriding in the Clearwater River. This is the highest fine ever levied for this charge in Alberta’s history. As reported in Rocky Mountain House’s *The Mountaineer* newspaper, the judge in the case expressed disappointment at “the lack of respect the OHV users in [Rocky Mountain House] have for the local environment and wildlife.”

Greater Sage-grouse Numbers on the Rise

FROM AN AWA NEWS RELEASE, JUNE 3, 2015

Canada's endangered Greater Sage-grouse populations are on the rebound and conservation groups are cautiously optimistic about the increased numbers. Credited with the increase are climatic factors and, as an outcome of the federal emergency protection order, increased attention to remedying this majestic bird's plight.

In 2014, there were thought to be only 14 males remaining in Alberta, with the total provincial population estimated at approximately 30 birds. Only six males were counted at active breeding grounds or 'leks' in Saskatchewan.

This year, thirty-five males were counted in Alberta and twenty males were counted in

Saskatchewan. This is the highest growth rate in either province for at least 20 years.

"This is a strong endorsement for federal intervention under the Species at Risk Act where provincial inaction and poor provincial endangered species laws allow endangered wildlife to reach a crisis," said Ecojustice lawyer Melissa Gorrie. "The emergency order is doing what it should, protecting sage-grouse habitat from more industrialization and promoting more on-the-ground action to restore damaged lands."

The failure of provincial laws to protect Greater Sage-grouse habitat in the face of rapid oil and gas development was a leading factor in the prairie bird's dramatic

population drop: Between 1988 and 2006, nearly 90 per cent of Canada's Greater Sage-grouse died off.

"Canada's sage-grouse populations face a long road to full recovery, but these numbers are heartening," said Mark Boyce, a University of Alberta ecology professor and sage-grouse expert. "The population will require continued protection and active management by the provincial government to build numbers to safe levels."

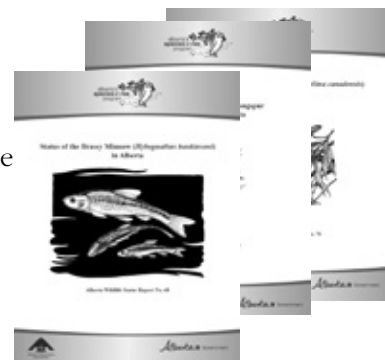
Said Cliff Wallis of the Alberta Wilderness Association: "With the cooperation of all parties, including landowners working to protect the sage-grouse, our hope is that populations will continue to grow."

Three New Alberta Wildlife Status Reports

BY SUE PETERS, ACA BIOLOGIST

On behalf of Robin Gutsell (ESCC/SSC Secretariat), I would like to inform you that three new Alberta Wildlife Status Reports are now available online: *Status of the Canada Warbler in Alberta*, *Status of the Chestnut-collared Longspur in Alberta*, and *Status of the Brassy Minnow in Alberta*. You can view and download these reports from the Alberta Environment and Parks species at risk website (<http://esrd.alberta.ca/fish-wildlife/species-at-risk/>

[species-at-risk-publications-web-resources/](http://esrd.alberta.ca/fish-wildlife/species-at-risk/)) or Alberta Conservation Association's website (www.ab-conservation.com/go/default/index.cfm/publications/conservation-reports/). Alberta Wildlife Status Reports are published and distributed by Alberta Conservation Association and Alberta Environment and Parks (until recently Alberta Environment and Sustainable Resource Development).



Ethical Photography? Not!

This photo was taken in the reed bed near the observation blind at Frank Lake on the May long weekend: “another clown walking through the reeds taking pictures,” as Greg Wagner put it. Since she is wearing hip waders, it seems obvious that she came to the marsh specifically to wade into the reed bed.

This particular location is an Important Bird Area (one of the more popular ones!) and supports what is probably the largest breeding colonies of White-faced Ibis in the province, and depending on the year and water levels, one of the largest Franklin’s Gull breeding colonies in the world. Black-crowned



Night-Heron, American Bittern, Black and Forester’s Terns, Eared and Western Grebes and Ruddy Ducks also nest in the reeds.

Harrassment of wildlife by photographers is emerging as one of the major conservation issues.

Time Spent Outdoors Boosts Conservation Action

FROM THEOUTDOORWIRE.COM; WEDNESDAY, MARCH 11, 2015

This may sound too obvious to even mention, but the more time we spend in nature, the more likely we are to protect it. That’s what a survey by Cornell University of conservation activity among rural landowners in Upstate New York found.

All other factors being equal, bird watchers are about five times as likely, and hunters about four times as likely, as non-recreationists to engage in wildlife and habitat conservation. Bird watchers and hunters were more likely than non-recreationists to enhance land for wildlife, donate to conservation organizations, and advocate for wildlife – all actions that significantly impact conservation success.

As for those who identified as both bird watchers and hunters, this group, on average, was about eight times more likely than non-recreationists to engage in conservation. The study was published in the *Journal of Wildlife Management*.

ISTOCKPHOTO.COM



Walking in Nature is Good for You!

A new study, announced July 1st, 2015, has found quantifiable evidence that supports the common-sense idea that walking in nature could lower your risk of depression.

The study, published in *Proceedings of the National Academy of Science*, found that people who walked for 90 minutes in a natural area, as opposed to participants who walked in a high-traffic urban setting, showed decreased activity in the subgenual prefrontal cortex, a brain region active during rumination – repetitive thought focused on negative emotions.

“These results suggest that accessible natural areas may be vital for mental health in our rapidly urbanizing world,” said co-author Gretchen Daily, the Bing Professor in Environmental Science and a senior fellow at the Stanford Woods Institute for the Environment. “Our findings can help inform the growing movement worldwide to make cities more livable, and to make nature more accessible to all who live in them.”

It is essential for urban planners and other policymakers to understand the relationship between exposure to nature and mental health, the study’s authors write. “We want to explore what elements of nature – how much of it and what types of experiences – offer the greatest benefits,” Daily said.

Lakeland Cabins a No-Go

Alberta Parks has made the decision to not move forward with the proposal to build five rustic backcountry cabins on the canoe circuit in Lakeland Provincial Park, which is located approximately 30 km east of the Town of Lac La Biche.

Feedback was gathered during a 60-day online public comment

period that ended July 7, 2014. The province took all comments into consideration, along with historical and environmental reviews, before making a decision. The vast majority of responses prefer the canoe circuit in Lakeland Provincial Park remain more of a wilderness experience, with little or no

additional infrastructure, or left as is. There were various concerns with maintenance and enforcement of the site because of the remoteness of the location, and several comments that this location was not appropriate, and that other sites within the provincial recreation area should be considered.

Snow Goose Chase!

The 16th Annual Snow Goose Chase, organized by the Edmonton Nature Club and the town of Tofield, was held on Saturday and Sunday, May 2 and 3, 2015 in the Tofield/Beaverhill Lake area east of Edmonton, Alberta.

While Snow Geese are part of this wild weekend, there is so very much more that happens. Participants get to experience the marvels of the annual migration of Snow Geese, Sandhill Cranes, hawks, waterfowl and songbirds. Local experts share their passion and knowledge about Alberta's diverse habitats and living things. The "Chase" brings people and nature together, and children from low income families and newcomers to Canada have the opportunity to experience the great outdoors.

Suffice to say that an amazing number of activities are going on – so much so that the Annual Snow Goose Chase has become one of the top events of the year.

The Chase relies on the efforts of some 50+ Volunteers: members of the Edmonton Nature Club; students from the University of Alberta, MacEwan University, and other local institutions; staff from the Tofield Town Office and community members; and many others – plus support from eleven business and corporate sponsors.



Dear Mr. Bob:

I won one of the games on the bus. I thought it was all fun except for the spiders. I met the Nature Nut too. The beaver talk was great. I want one in my backyard.

Katherine

ALL PHOTOS BY GERALD ROMANCHUK





Nature Alberta NEWS

LSLBO: Spring Monitoring

The 2015 Spring Migration Monitoring program at the Lesser Slave Lake Bird Observatory (LSLBO), a Nature Alberta Affiliate Club, began on April 20th and finished up on June 10 for a total of 52 days of coverage. While we didn't set a record for total number of birds captured this spring, we had lots of exciting highlights for our banding staff.

Overall, our spring weather was hot, dry, and windy. These weather conditions allowed the nets to be set for 86% of the possible net hours. We banded a total of 653 birds (below the spring average of 930 birds) representing 48 species. The top banded species were: Swainson's Thrush (81), White-throated Sparrow (68), Black-and-white Warbler (44), Ovenbird (41), and Clay-coloured Sparrow (35). Other notable species banded were: Townsend's Solitaire – the first spring record and only the second one banded at the LSLBO; Nashville Warbler – only the second spring banding record; and Evening Grosbeak – the second banding record at

the LSLBO (the first occurred way back in 1996). An additional 105 recapture records were collected.

For regular updates from the LSLBO this summer, you can check out the website, as well as our Boreal Centre for Bird Conservation Facebook Page (www.facebook.com/pages/Boreal-Centre-for-Bird-Conservation/297254389793) for some beautiful photo highlights.

Time on the breeding grounds is fleeting for many of our songbirds, which means that our Fall Migration Monitoring program started up on July 12th.

LSLBO: Songbird Festival Weekend

On May 30th and 31st, the LSLBO hosted their 20th Annual Songbird Festival at the Boreal Centre for Bird Conservation. This weekend was a celebration of spring migration and the many songbirds that stop by Slave Lake on their way north each season.

Over 150 people enjoyed the beautiful Saturday morning and took part in all the events. All morning, there was an abundance of family fun including bird house

DATA POSTED

Alberta Breeding Bird Atlas record set and bird checklist data is now on-line at Bird Studies Canada. The Alberta Breeding Bird Atlas (1st and 2nd) as well as the bird checklist data on NatureCounts have been posted and are now available for people to download and explore. The data can be accessed at: www.birdscanada.org/birdmon/

building, nature hikes, crafts, scavenger hunts and a special presentation about migration. The day was finished off with a cake to mark the 20th anniversary of the festival.

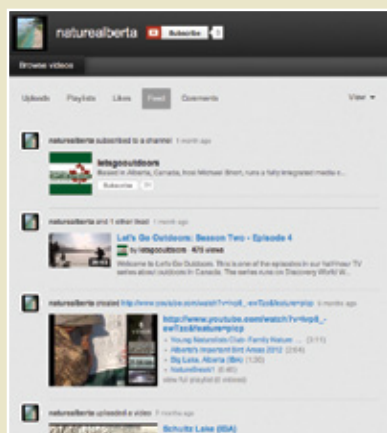
On Sunday, participants headed out on the 10th Annual Bird Run/Walk in support of the bird conservation programs at the LSLBO. It was also a chance to enjoy a lovely stroll or run through the boreal forest and listen to all the beautiful birds singing for them along the way.



TED HINDMARCH, PRESIDENT OF NATURE ALBERTA, ACCEPTED THE EMERALD AWARD'S CHALLENGE AWARD UNDER THE WATER CATEGORY. NATURE ALBERTA RECEIVED THE AWARD FOR OUR HIGHLY SUCCESSFUL PROGRAM, "LIVING BY WATER" WHICH EDUCATES SHORELINE RESIDENTS AND COMMUNITIES ON LAKE ECOLOGY AND RIPARIAN HEALTH.

Nature Alberta & YouTube

Nature Alberta has its own YouTube channel now. All kinds of "good stuff" is there for you to view. Visit: youtube.com/naturealberta



Partnership: Nature Alberta and Land Stewardship Centre

The strategic partnership between Nature Alberta (NA) and the Land Stewardship Centre (LSC) has recently been formalized. LSC staff have been actively reviewing and becoming better acquainted with NA programming and all key elements of the organization, including communications and outreach.

On this front, one of the key areas of focus will be to develop and coordinate NA's social media presence. In an effort to streamline the process, reduce the burden on NA volunteers and ensure consistency of message, LSC staff will now be responsible for maintaining and updating all of NA's various social media accounts including; Facebook,

Twitter, LinkedIn, YouTube, Instagram and the Calendar of Events on the NA website.

LSC's Outreach Coordinator, Alexandra Frederickson (alex@landstewardship.org) will coordinate and implement all of Nature Alberta's social media efforts. She will work closely with Kristina Dembinski (kristina@landstewardship.org) who oversees of all LSC's and NA's marketing and communications activities.

LSC Executive Director Brian E. Ilnicki is confident that this approach will result in more effective use of these tools and will assist collectively in promoting NA clubs and activities.

Dark Sky Preserve

On the Saturday and Sunday of the Labour Day weekend (Sept 5-6), the Beaver Hills Dark Sky Preserve is hosting our annual event. This year it is over 2 days at Miquelon Lake Provincial Park and then Elk Island National Park. Each site has both overnight campers and day visitors at their sites on event days. For more information, go to <http://edmontonrasc.com/>. The website will be updated over the summer.

New Elected Director

Nature Alberta welcomes William Brooke, who has been selected by the Lac La Biche Birding Society to represent the club as its new Director. William replaces Jennifer Okrainec. LLBBS is a Nature Alberta Corporate Club

GUESS WHO???



On the home farm, with a Great Horned Owllet on his shoulder, a young Maggie on the railing behind him, a Border Collie beside him and a contented cow: a picture of a bygone day of rural bliss and oneness with nature!

Can't guess who? Why it's none other than present-day Nature Alberta President Ted Hindmarch.



WHEN PERFORMING COURTSHIP DISPLAYS, MALE COMMON GOLDENEYES ARE VERY VISIBLE AT HAWRELAK POND. JIM BROHMAN

Urban Wild Bird Photography: Hawrelak Park Pond

BY JIM BROHMAN

Nature photography is one of the most popular outdoor recreational activities practiced by nature-lovers in North America.

Bird photography is a subset of nature photography and is a very fun and rewarding activity. But since birds are very elusive and sensitive to disturbance, photographers often use expensive long lenses and/or spend prolonged periods of time tucked away in a photo blind, to capture crisp, artistic photos.

However by visiting a local pond such as Hawrelak Park Pond (where the waterfowl is more accustomed to people) one can get much closer to the birds and be successful with shorter telephoto lenses! Spring and early summer is an ideal time to photograph

waterfowl in the park since they are engaged in feeding, courtship behavior, mating selection, nesting and rearing of the young. Their feather texture, color and patterns are spectacular and, if you are sitting quietly along the shoreline, they come to you rather than the other way around!

Each species possesses a distinct "comfort zone" with humans. Ring-billed Gulls come very close to shore, so allow for ample photograph opportunities. Franklin's Gulls maintain a larger buffer zone (30 plus meters), so are more difficult to photograph. Common Goldeneye are very skittish in the wild but when performing courtship

RING-BILLED GULLS ALLOW FOR AMPLE PHOTOGRAPH OPPORTUNITIES. JIM BROHMAN

AN APPEARANCE WITHIN FEET FROM WHERE I WAS SITTING! JIM BROHMAN



FRANKLIN'S GULLS ARE MORE DIFFICULT TO PHOTOGRAPH. JIM BROHMAN

displays are very visible at Hawrelak Pond. Near the end of May, the first Canada Goose goslings made an appearance near the water's edge within feet from where I was sitting.

Urban ponds (such as Hawrelak) are home to a variety of amazing bird species while others use the pond as a temporary stopover during migration to rest and feed. Each species possesses distinct attributes and behaviors waiting to be enjoyed and captured by keen wildlife photographers. Our goals as photographers should be to learn about the birds' natural history, respect their space and be good ambassadors for nature photography by sharing our photos, sharing our knowledge with other nature lovers who happen upon us as we photograph and not baiting the birds we photograph!

William Hawrelak Park (originally Mayfair Park) is a 68 hectare park in the Edmonton river valley featuring a five hectare lake and open grassy areas. The park hosts several major festivals and events throughout the year and is a fantastic location for all Edmontonians and visitors to explore.



Charley's Nature Note: Mushrooms

BY CHARLEY BIRD

*This “nature note” is about mushrooms and, in particular, about those of the genus *Agaricus*. In Alberta, we have nearly ten species, the commonest of which are *A. arvensis* (the horse mushroom), *A. campestris* (the field mushroom) and *A. silvicola* (the wood mushroom). The image shown is the horse mushroom.*

In most grocery stores, you can buy three kinds of mushrooms: the common white button mushroom, creminis and portobellos. All belong to the species *Agaricus bisporus*. The latter two are strains that are brown in color. The last one is large and is sold when mature.

Mushrooms start from spores which germinate to grow into hyphae. The hyphae grow in the substrate where they absorb nutrients from dead organic matter. When conditions are right, the hyphae come together to grow into the above-ground structures we associate with mushrooms. Like most mushrooms, including the Agarics, these are a stalk (stipe) and a cap (pileus). The

stalk may have a ring (annulus) as in the illustration. The underside of the cap has a hymenium made up of gills (lamellae). Spore bearing structures (basidia) are born on the gills and they produce basidiospores.

Most mushrooms are saprophytes and, as such, are part of nature's very important recycling crew that helps turn dead plant material into fertile soil.

Though *Agaricus bisporus* bought in stores is good to eat, some wild species are poisonous or will make you ill. No wild mushroom should be eaten unless you are quite sure you know of its identity. It is also a good idea to never eat any wild mushroom raw, as cooking may denature poisonous components.

A HORSE MUSHROOM. CHARLES BIRD



In the wild, many species eat mushrooms. Be aware that some flies lay eggs on them and the developing maggots gather in the caps causing them to be “wormy”.

There are a number of good mushroom books that can be used for determination. For those of us in Alberta, my favourite is Helene Schalkwijk-Barendsen's “Mushrooms of Northwest North America”.

One of the best natural areas in west-central Alberta is the J.J. Collett Natural Area. Their website, www.jjcollett.com, has a checklist of the mushrooms that have been found there.

Mycologists are folks that are interested in mushrooms and other fungi. There is an Alberta Mycological Society, which is an Affiliate Club with Nature Alberta. Its website is www.wildmushrooms.ws/.

Mushrooms are fun. Watch for them this summer and early fall.



Dr. Charles “Charley” Bird is a university professor, publisher of 300+ scholarly articles, long-time advocate for Alberta conservation issues, active with Federation of Alberta Naturalists (Nature Alberta) and in particular with his local group, Buffalo Lake Naturalists Society (a Nature Alberta Corporate Club). In 1978, he received Nature Alberta's Loran Goulden Award. Charley's interests and expertise are broad indeed, but especially butterflies and moths; he was the lead author for Alberta Butterflies, published in 1995.



Elk Home Range Behaviour: An Update

BY DANA SEIDEL

As diligent readers of Nature Alberta may remember, my project, in-part funded by collaboration between Nature Alberta and Mountain Equipment Co-op, got started in the summer of 2012. As a Masters student at the University of Alberta, I was interested in understanding the role of foraging selection in home range development in elk.

Home ranges are seen in many mammals, birds, even reptiles. Even so, in most cases, how animals develop the bounds of their home ranges is not well understood. Taken from an understanding of territories where ranges are defined by two factors: the maximization of resources and the constraint of what can be consistently defended. Evolutionarily, home-ranges likely developed to maximize the efficiency of gathering resources in patchy environments.

Specifically in moose as well as other systems, it has been demonstrated that within areas with greater resource availability animals maintain smaller home ranges, supporting the logical assumption that where food is has significant impact on where animals live and reproduce.

Beyond theory however, the mechanisms behind how home ranges actually come to be for individual animals are still blurry. And so, that is what I set out to better understand. The research questions I sought to answer that summer boiled down to, "what makes a good foraging patch?" and "how do elk move between

them?" After all, a home range is simply each movement taken in aggregate.

During summer 2012, I outfitted 12 elk with GPS radio collars and used the regular GPS relocations to identify elk foraging and non-foraging sites in two populations in SW Alberta. My team and I then visited and intensively sampled the above-ground biomass and environmental characteristics at these sites. After the summer collection season passed, I was left to contend with a pile of spatially distributed biomass and species composition data telling me where and what elk were eating throughout the summer



Dana Paige Seidel completed her M.Sc. at the University of Alberta under the supervision of Dr. Mark Boyce in August 2014 and is currently working on a Ph.D. project at the University of California, Berkeley. She's interested in animal movement, landscape and disease ecology. The premise and start of Dana's M.Sc. project was profiled in the Spring 2013 Nature Alberta issue. Complete results of this work are documented in two scientific papers published by the journals of Movement Ecology and Oikos in the spring of 2015.

season. As my results trickled in, it was clear that patches where elk were observed foraging had higher levels of biomass, were further from busy roads, and at higher slopes (presumably offering some protection from predators or humans). What's more, the nature of their environment, as well as sex, and time in the summer, affected what elk selected for in foraging patches. For instance, high levels of tourist traffic in Waterton Lake National Park made animals less sensitive to distance to roads and more sensitive to the traffic on those roads.

Most interestingly, the GPS data demonstrated elk were returning to known patches repeatedly throughout the summer, generally

after an average of 15 days, suggesting the possibility that elk are remembering 'known' patches and returning over time intervals that would allow for regrowth (a theory put forth by scientists in 2009). What's more, to look explicitly at how patches might underpin the makeup of stable home ranges, we compared the spatial distribution of used

foraging patches to the overall home range shape, size, and use based on all available GPS data for the summer. The distribution of foraging patches throughout the home ranges, suggests preliminarily that movement between patches could indeed be a contributing factor to the development and maintenance of home ranges for elk.



CAPTURE EVENT IN THE LIVINGSTONE RANGE BY BIGHORN HELICOPTERS INC. MARK BOYCE

WATERTON LAKES NATIONAL PARK FROM MASKINONGE LOOKOUT.

TYLER SGRO



A BULL ELK FORAGING. SIMONE CIUTI





An Elk Island Moment!

BY BY ROBERT SCRIBA

Quarrelling Ravens and squawking Magpies catch my attention as I walk quietly down an aspen-lined trail in Elk Island National Park in the cool, early autumn morning.

The tops of partially leaved, mature aspen are just catching the first rays of apricot-tinted sunlight. About a hundred yards west of the trail I can see several scavenging birds flitting from the tree tops to disappear in the ground-covering shin-tangle. I stand for a few moments glassing the area with my binoculars for a glimpse of what the attraction may be, but can see nothing in the shallow swale.

With camera ready, I gingerly and quietly as I am able, slowly make my way closer to the site of frantic activity. I wear a camouflage net to break up my human silhouette and to try to prevent as much "swishing"

noise on clothing as I can as I pass through tangles of low brush during my stalk. I step gingerly and slowly, trying not to crack any branches. Today, there is a bit of dew on the grass and leaves which, along with noisy birds, aids my sometimes clumsy stalk.

I am able to get a close look at what appears to be a Moose or Bison kill. There are a pair of Coyotes working hard at tugging a meal from this carcass. The slight westerly breeze prevents my odour from wafting a danger warning to the feeding scavengers, and I move only when the Coyotes have their heads down. I am lucky enough to see a fallen tree lying in the perfect

"A THIRD COYOTE LOOKS AT ME WITH SOME SKEPTICISM." ROBERT SCRIBA

position, if I can get up on it without breaking my neck. I pause and snap a few photos, then up I step, balancing wobbly, and grasp a small twig to assist my balance, then shuffle sideways to where I can lean against a standing aspen tree. I now have a perfect view point where I can lean myself and camera against a very solid stand about 15 yards from the kill site.

The Coyotes are a bit suspicious of something but not quite sure what they are seeing and hearing but their hunger seems to distract them from their usual skittish ways. They are hearing my camera shutter and can see an apparition that seems to have sprouted from the side of that tree but I am not moving or threatening them. I am



Robert Scriba, a resident of Sherwood Park AB, is an enthusiastic photographer and writer studying with The North American School of Outdoor Writing. He also has his own interesting and educational blog, and you may see examples of his writing and photography at: Wow Moments: www.wildviewfinder.blogspot.ca/. You can contact him at: bigoldbear@ymail.com.

watchful and I see a third Coyote emerge from the underbrush a few feet away. It is looking at me with some skepticism but is too hungry to run off and quickly joins the feast.

My legs are getting weak and are quivering from lack of movement but I don't want to disrupt this rare opportunity. After almost an hour the Coyotes, with bloated bellies, fade back into the tangled underbrush allowing me a chance to sit down on my perch. I walk over to the Bison kill for a closer look but cannot determine the cause of death. It is a young Bison so there is a good chance that this may be a Wolf kill.

As I fade back toward the trail, I marvel at the sights I have been privileged to see while hiking in this small park, situated so close to a large city. I have enjoyed rutting Bison, bugling Elk and grunting Moose along with the cheery sounds of many different song birds. Geese, cranes and ducks as well as hunting owls and tapping

woodpeckers all beckon me back to enjoy the wonders of Elk Island National Park whenever I need stress relief.

ELK ISLAND NATIONAL PARK

Elk Island National Park (EIP) is a very popular, year around destination for people who like to enjoy a variety of outdoor recreations. This park straddles highway 16 about thirty kilometres east of Edmonton AB. It is Canada's largest totally fenced National Park. EIP covers about 194 square kilometers of southern boreal, aspen parkland and native grasslands.

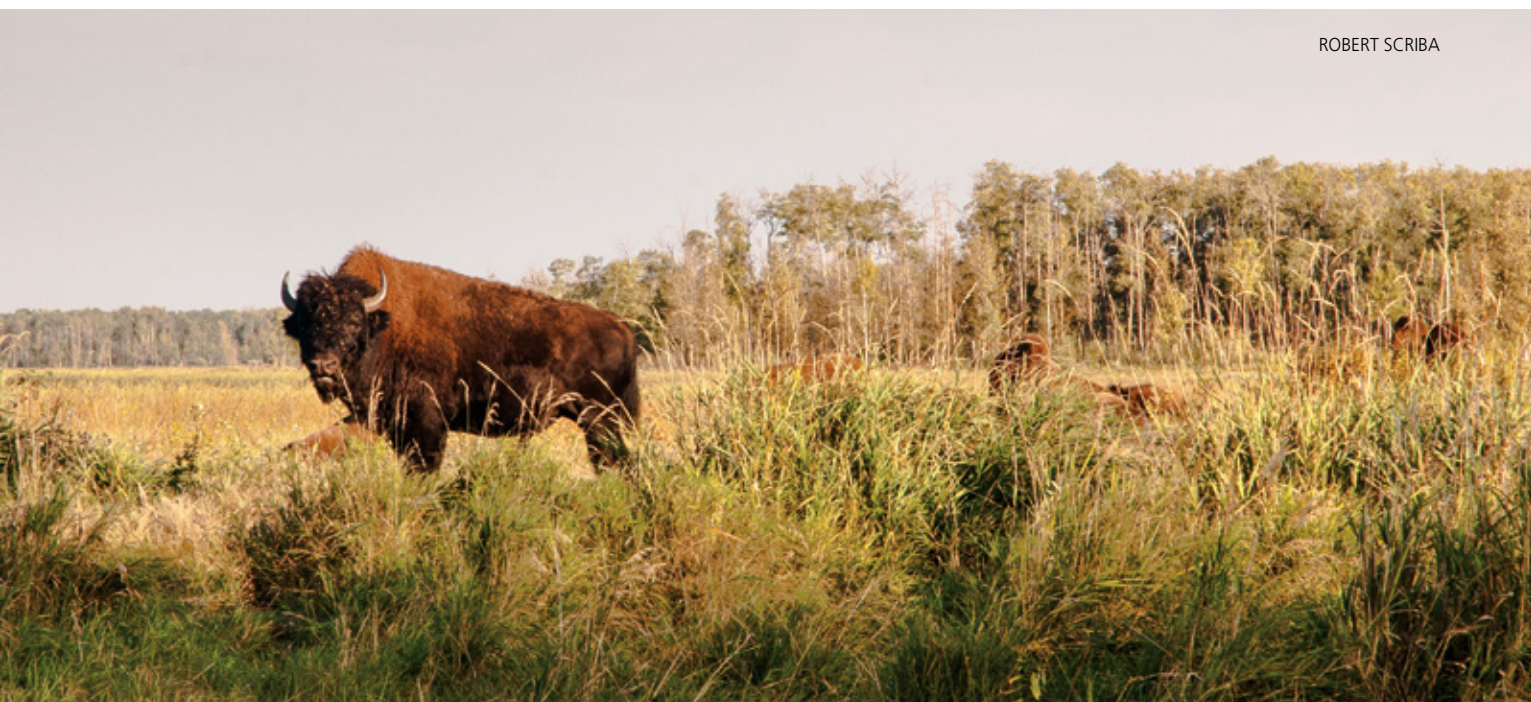
There are an estimated 250 species of birds which have been documented here as well as many mammals from Wood and Plains Bison, Elk, Moose, deer, Beaver and many more, down to the tiny Wood Shrew. Some Wolves have now entered the park as well.



Many human activities take place here from canoeing and kayaking, bird and wildlife watching, camping and picnicking, hiking, skiing and snowshoeing over 80 km of trails, golfing, geocaching and many others. Park services are limited so you must be self-sufficient and use some sense when visiting. Be careful around unpredictable bison, Moose and Elk. Mind your campfires, clean up around your campsite, be cautious in the lakes and be prepared for emergencies during all seasons.

At the time of writing, a day pass for a family costs \$19.60 and a family season pass will cost \$136.40. The season passes are good for all the National Parks in Canada.

ROBERT SCRIBA





JOHN WARDEN

Close to Home: Nature Photography in Alberta

The Sound of Snowflakes

BY JOHN WARDEN

I was looking for swans on a grey, April day. Cold and overcast, it would surely add to my day if I could find a swan or two. But there were no swans, or any other birds for that matter.

The Point at Elk Island National Park was bare, silent, and desolate. It was almost spooky in that ominous, hold your breath waiting for something to happen, sort of way. A cosmic pause...

Then it started to snow, slowly at first and then heavier. The flakes were huge, individual crystallizations as big as quarters, parachuting down in slow motion spirals. In the silence, I heard the

sound of a snowflake as it settled onto the ground. Did I really? Is it even possible to hear a snowflake settle? I strained to listen. And sure enough, softly, all around me like thick diaphanous rain drops, a muted thwack, thwack, thwack.

THE FLAKES WERE HUGE, INDIVIDUAL CRYSTALLIZATIONS AS BIG AS QUARTERS. JOHN WARDEN





GLORIOUSLY ALONE AT WEDGE POND. JOHN WARDEN

I knew that to move – perhaps even to breathe – would shatter this magical moment; a synergy of senses which seemed to have a direct feed to my...what? My heart? My mind? My spirit? I was present in the moment and yet, at the same time, slightly apart from it. I was somehow experiencing myself experiencing the moment. And then...

“WOW, IT’S REALLY BEAUTIFUL HERE, WE’VE NEVER BEEN OUT HERE BEFORE”.

Two people who’d come down off the path and out onto the Point. Their words, their presence, their clattering and chattering, SHATTERING the stillness.

“HAVE YOU SEEN ANY BIRDS?”

“No, not today”. I grabbed my gear and left.

Not their fault, I know, but the thing about solitude is that the only conversation that’s possible is the silent communion between yourself and Mother Nature. If you’re talking to someone else, it’s not solitude.

Not everyone appreciates solitude though, and some people get it mixed up with loneliness. Paul Tillich, a philosopher and theologian of some influence explains the difference.

“Our language has wisely sensed the two sides of being alone. It has created the word ‘loneliness’, to express the pain of being alone. And it has created the word ‘solitude’ to express the glory of being alone.”

And he’s right. For out of nowhere, solitude will call to me, sometimes with a visceral voice. “It’s time for some aloneness”. And so I go, for a few breaths, a few moments, or a few days of just nature and me, one on one.

It’s in the experience of solitude that we find the creative endeavors of the artists. Picasso said that “without great solitude



CONTEMPLATING THE SILENCE OF CAVELL POND. JOHN WARDEN

no serious work is possible” and Edward Gibbon, author of *The Decline and Fall of the Roman Empire* notes that “conversation enriches the understanding, but solitude is the school of genius.”

From that school of genius we encounter creative ecstasy: the

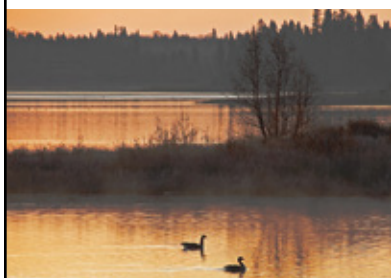
ceiling of the Sistine Chapel, the haiku of Basho and the silence of John Cage’s 4’33”. Gloriously alone we are able to ponder the big questions: who am I, why am I here, and where am I going? And from the depths of contemplation, we touch...inspiration.

Alone,

I wrestle with the silent
Muse, and then –

The sound of snowflakes...

- JOHN WARDEN



Check out John Warden’s updated website: www.jwardenphotography.com, with a new look and many photographs. Plus, also on the site are his past *Nature Alberta* articles.

www.jwardenphotography.com



The Latest Buzz on Alberta's Wild Bees

FROM: BLOG.ABMI.CA; FEBRUARY 4, 2015; POSTED: LINDSAY MONK

How many different species of wild bees would you guess we have here in Alberta? Most people drastically underestimate the diversity of bees that call this province home and think of them only as either bumblebees or honeybees.

The reality is much richer, with a surprising estimate of over 300 different kinds of bees in Alberta. All of them provide an essential ecosystem service by pollinating crops, gardens, and wildflowers. For example, pollination increases the yield of canola, an important crop grown in Alberta, by 10-30% (Morandin and Wilson, 2005).

Because of their important role as crop pollinators, bees are of interest to the Alberta Biodiversity Monitoring Institute's (ABMI) Ecosystem Services Assessment Project. This project is mapping ecosystem services, which are the benefits provided by natural systems that contribute to our health and well-being. In order to map pollination services, the

project requires information on the abundance and diversity of bees in Alberta, and where they're living – information that is lacking for many areas of the province.

To address this information gap, the project has partnered with Dr. Jessamyn Manson at the University of Alberta to conduct two years of wild bee surveys across Alberta's agricultural zone. These surveys are occurring in commercial canola fields all the way from the US border to sites near Grande Prairie.

The project team uses two different methods for collecting bees: coloured pan traps and netting. Pan traps are small bowls that attract bees using colours;

these tend to trap smaller bees. To catch larger bees, researchers spend an hour at each site collecting bees in a net. After visiting 30 sites twice over the summer of 2014, the bee team is currently in the midst of pinning, sorting, and identifying upwards of 3000 individual bees. Once completed, this dataset will provide an important snapshot of the diversity and ecology of Alberta's wild bees.

Alberta's bees come from five different families and approximately thirty different genera – only one of which is *Bombus*, the familiar bumblebee [See *Nature Alberta* Feature Story, "Bumblebees of Alberta": Vol 42, # 2, Summer 2012]. Wild

bees exhibit a range of nesting behaviors and lifestyles. Some, like bumblebees, live in social colonies with a clear hierarchy and division of roles. However, many wild bees are solitary, with individual bees building their own nest and largely keeping to themselves. Surprisingly, some bees, like *Halictus* mining bees, live in social colonies in low elevations and at the southern end of their range, and are solitary at high elevations and in northern latitudes.

Regardless of their lifestyle, all bees need access to undisturbed

habitat for building nests, such as rangelands or shelterbelts, and flowers for pollen and nectar. Bees are incredibly resourceful at finding interesting places to build nests in these undisturbed areas, often settling in rodent holes or even old raspberry canes.

So far, one of the most common and widespread types of bees in Alberta are the sweat bees from the genus *Lasioglossum*. These are small bees that earned their name as a result of their tendency to lick sweat off people! As more information is gathered on Alberta's wild bees, it will be used

to understand regional patterns in bee communities and to create maps of pollination services across the province. For 2015, the bee team is currently in a second field season and continuing to process the 2014 samples.

References

- Morandin, L. A., and M. L. Winston.
2005. Wild bee abundance and seed production in conventional, organic, and genetically modified canola. *Ecological Applications* 15:871-881.



"If people concentrated on the really important things in life, there'd be a shortage of fishing poles." - Doug Larson

Alberta Conservation Association

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Available on the iPhone App Store

photo: Watered Down Underwater Photography



Eyes on IBAs

The Waste-Full Side of Habitat Restoration

BY BROOK SKAGEN, NATURE ALBERTA IBA INTERN

Times of flooding and drought have presented a considerable challenge across the province for decades.

Ponds once teeming with life disappear into the summer air, forests engulfed in raging flames are reduced to ash and blackened soils, and irrigation canals become the prairie's lifeline as blistering hot rays radiate from the summer sun, drying up the province with little mercy.

The summer heat can seem unbearable in a land so dry, and even Alberta's Important Bird Areas (IBAs) are not immune to the lack of precipitation that often comes with the summer months. And yet in mere days water may overcome the confines of the river channels, laying waste to submerged habitat and our own crops and communities when rain is finally delivered. Water is a precious, powerful and unpredictable resource in the prairies, and one IBA knows this all too well.

Frank Lake, located 6km east of High River and 50km southeast of Calgary, is an IBA consisting of a vast marshland network and surrounding prairie uplands, where migratory waterfowl on a globally significant scale, along with hundreds of other species, call home for the breeding season. The site is a haven for photographers, birders, and hunters alike: small trails follow the shoreline and a well-kept permanent blind, located at the north-west basin, provides shelter for nature enthusiasts

to gaze out into the marsh and experience the joy of the outdoors with little disturbance. At first glance the Frank Lake area may seem to be just an ordinary wetland with some extraordinary birds. However, this Alberta IBA is ground zero for an incredibly unique and ingenious conservation effort; it is filled with our wastewater!

Throughout the 1930's, 40's, and 60's, Frank Lake suffered from extreme water losses, drying

THE PERMANENT BLIND STRUCTURE AT FRANK LAKE. BROOK SKAGEN



*Brook Skagen
Nature Alberta IBA intern*



AN AMERICAN COOT. BROOK SKAGEN

up for extensive periods of time, while periods of severe flooding in the 50's, 70's and 80's completely overtook the marshlands. Realizing the ecological importance of the area, Ducks Unlimited Canada (DUC) took management of the area, and aimed to create a stable network of marshes to provide valuable waterfowl habitat. To combat Frank Lake's frequent flooding, a weir was constructed in 1977 with the help of Alberta Environment to facilitate water drainage out of the southernmost basin, but the IBA still suffered during the

dry years. A collaborative effort initiated in 1988 between DUC, the Municipality of High River, and surrounding industries would eventually change that: wastewater that would originally go back into the nearby Highwood River system now supports one of Alberta's most biologically diverse IBAs.

Of course, the effluent is not filled with sludge, grime, or other surprises: it has undergone tertiary treatment, a regulated process during which a series of biological, physical and chemical

measures are implemented so that the water is safe for our re-use or release back into the environment. By diverting treated water that would otherwise flow into the Highwood River tributary of the Bow River (subject to frequent flooding) into the marshlands of Frank Lake, all parties involved are ensuring the preservation of the area, as well as making a contribution to flood mitigation strategies in the region.

The IBA now consists of 3 sub-basins encompassing 3,100 acres of marshland and an additional



WHITE-FACED IBISES IN THE THICK REEDS AT THE MARSH. BROOK SKAGEN

1,700 acres of grassland habitat, with just under 200 species of birds recorded in the area. Though the area's management strategy seems unorthodox, Frank Lake has been thriving as one of Alberta's most popular IBAs since the partnership's formation, and will continue to be so for generations to come. Perhaps this clever partnership will inspire the restoration of other lost wildlife habitat throughout the province, as the project's success serves as a testament to what numerous stakeholders can accomplish when working towards a common goal.

I encourage everyone to see the conservation success that is the Frank Lake IBA, for little beats the calmness of peering out from the blind, with a fresh cup of coffee on hand, and watching chatty shorebirds forage uninterrupted while the distant calls of ducks and gulls are carried by the morning breeze. It is truly fascinating to see our waste put to such an admirable cause.

I look forward to sharing more stories with you in the blind!

Sources:

Ducks Unlimited Canada. 2015. Frank Lake (web page). Retrieved from: www.ducks.ca/your-province/alberta/wetlands-area/frank-lake/

Important Bird Areas Canada. 2015. Frank Lake Site Summary (web page).

Retrieved from: www.ibacanada.ca/site.jsp?siteID=AB079&lang=EN

Frank Lake has been subjected to photographer zealotry (the polite term!) over time. See Alberta Issues, "Ethical Photography? Not!" page 6.

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FEATURE ARTICLE

Investigating the Niche of Alberta's Boreal Wolverine

BY MATTHEW SCRAFFORD AND MARK BOYCE

With few exceptions, every day we are in the field we learn something new and fascinating about Wolverines. The greatest excitement comes when we find a Wolverine's den.

With so few Wolverine dens ever discovered in the lowland boreal forest, each data point is extremely important. In mid-March, we were walking through the bush looking for the GPS cluster of Wolverine M9. He had been in this specific area in Rainbow Lake numerous times in February and early March so we were curious what he was up to. As we traipsed along with snowshoes we came to a black spruce bog with pole-size trees. We stopped hiking when we came to an area trodden with Wolverine tracks. We split up and searched the area to document sign and collect scat.

A few seconds later, a movement caught our eyes and we looked to see a Wolverine 15 meters away staring at us. It had just emerged from a snow den under fallen spruce trees. The Wolverine saw us and immediately dove back into its den. This was not M9, as we could not pick him up with the radio telemetry equipment, but instead we suspect it was his reproductive partner. Although reproductive dens are usually not found in this fashion, but instead through painstaking back tracking and radio telemetry work, we appreciated this fortuitous find! We collected some scat and let her be with her kits.

One of the more interesting aspects of research is taking a wealth of new knowledge and trying to discover how it aligns with what is already known. How does your research provide new information and does it reinforce prior understandings? Initial inspection of results from our Wolverine research program are counter to what many have found. We are finding Wolverines in industrialized habitats that

lack snow late into the spring. We are finding Wolverines adept at predation. Many of our findings are novel, as we are researching Wolverines in an ecosystem where few others have. However, many of our findings also add support and a unique perspective to what studies have found before us.

The North American Wolverine, *Gulo gulo luscus*, is also known as the glutton ["gulo" is Latin for "glutton"] or skunk bear. A relative of *Gulo gulo luscus*, *Plesigulo*, first appeared in North America from Asia about 7 million years ago. The Wolverine we see today took shape 2-3 million years ago during the Pleistocene. Wolverines are a cold-weather species that have a circumpolar distribution. Thick fur, stocky build, wide head, strong bite, and large paws that act as snowshoes are Wolverine adaptations for living in cold and snowy climates. Wolverines roam huge territories that they defend fiercely out of necessity to protect scarce resources. Wolverines in our study with scars and missing eyes attest to the struggle for existence these animals endure.



MATTHEW SCRAFFORD AT F8'S DEN IN APRIL 2014. ANDREW MANSKE

**M7 IN RAINBOW LAKE.**

MICHAEL JOKINEN

F7 RAINBOW LAKE. MICHAEL JOKINEN

Other Wolverines are not the only obstacles faced by Wolverines. In Alberta, carcass poisoning for wolf control in the 1920's almost extirpated Wolverines. Populations increased once poisoning ceased but soon urbanization, clearing land for agriculture, and industrial activity mounted a second offensive on Wolverines. Currently, Wolverines *May be at Risk* in Alberta although population assessments are uncertain because there are limited data available. Our study of Wolverines is designed to fill these data gaps.

Our research is being conducted at the University of Alberta in partnership with the Alberta Trappers Association (ATA), the Alberta Conservation Association (ACA), and the Dene Tha First Nation. Originally, the ATA approached the ACA keen on using trappers to conduct

research on Wolverines that would contribute to an updated population status assessment. This partnership resulted in the deployment of run-poles on traplines throughout much of the province to better understand variables influencing Wolverine distribution. Later, the ACA and ATA enlisted the help of the University of Alberta to study Wolverines at specific study sites in the province. The Dene Tha, akin to the ATA, with their wealth of traditional knowledge on Wolverines and their interest in maintaining viable wildlife populations, were another logical partner and have proven an integral component of our research program.

We focused our research questions on the effects of industrial development on Wolverine ecology in the boreal forest. This research angle was



MATTHEW SCRAFFORD, BLAIR SEWARD, AND MIKE JOKINEN MONITOR M6 DURING IMMOBILIZATION. ANDREW MANSKE

logical given the lack of research in the region, the vast extent of the boreal, and concerns about rapidly expanding industrial development. We established study sites in Rainbow Lake and the Birch Mountains. Rainbow Lake is developed by the oil, gas, and forestry industries whereas the Birch Mountains are relatively pristine habitats that serve as a control. At these two sites, we have live-trapped, radio-collared, and tracked Wolverines to document movements, distribution, foraging, and denning relative to industrial development (*see Insert – “Some Results So Far” – for a summary of our trapping results to date*). We also have a system of run-poles, which in combination with live-traps, will allow us to estimate Wolverine population densities. The focus of this article is to give a general definition of what we believe, based on our research, is the Wolverine’s niche in the boreal forest. This includes

habitat requirements, foraging tendencies, and denning locations.

THE COMPETITIVE NICHE OF THE BOREAL WOLVERINE

The lowland boreal Wolverine’s niche has not been well described relative to the montane boreal Wolverine’s niche. Wolverines are adapted to do best in cold and snowy climates where there are few other carnivores. This is why Wolverines do well in environments such as the Rocky Mountains. Alpine areas host large predators only for a few months during the summer when ungulates move into these areas from lower elevation wintering grounds. During the rest of the year, Wolverines are one of the only large carnivores because there are very few prey. Wolverines make a living in the mountains through scavenging of carcasses and predation of small mammals such as marmots. Researchers also have found plentiful evidence of Wolverines

scavenging the remains of Mountain Goats killed in avalanches, a species that resides in alpine areas for much the same reason as the Wolverine. Basically, alpine areas provide a refuge for Wolverines where they have the competitive edge.

In the lowland boreal forest, we believe that Wolverines may have the competitive edge in areas of extensive peat bogs. A species with somewhat similar habitat requirements would be the Woodland Caribou. Peat bogs support fewer large ungulates and predators relative to upland boreal habitat. In Rainbow Lake, our habitat selection models consistently show Wolverines selecting against upland broadleaf forests and selecting for wetlands and peat bogs. Moose habitat selection studies often show selection for upland broadleaf forests and against peat. In these lowland areas, Wolverines likely find a refuge from competitors.

Although it might seem hard to believe that Wolverines are threatened by other carnivores on the landscape, we are finding evidence that Wolverines are not atop the food chain. A radio-collared juvenile male Wolverine in Rainbow Lake was killed



BRUTUS MISSING SOME FLESH ON HIS SKULL. HE WAS LIKELY PUSHED OUT OF HIS HOME RANGE BY YOUNGER MALES AFTER YEARS OF DOMINANCE. ANDREW MANSKE



by Wolves this past winter. We could see the lunging tracks of a Wolverine through the snow followed by 3 bounding Wolf tracks. We also have evidence of a male Wolverine being treed by wolves that had returned to a Moose carcass they had taken down days before. Wolverines are aware of the power and risk of a pack of Wolves and are constantly scanning and sniffing the landscape to make sure there are no threats nearby.

In regards to competition, we believe there are a few ways that industrial development

could alter the relationship between Wolverines and other large predators. For example, as industry increases the availability of early seral vegetation, Moose, deer, and ultimately, Wolf or Cougar populations, can increase and compete more with Wolverines. This relationship has been found in the foothills of Alberta's Rocky Mountains and in the lowland boreal forest of Ontario. Additionally, roads create access for predators into Wolverine habitats that were once refuge. Our habitat selection models consistently show Wolverines selecting against

areas with high road densities. We believe this is because the risk of encountering a Wolf pack increases near roads because Wolves are using these features to hunt Moose and Caribou.

WOLVERINE AS PREDATORS

If Wolverines do better in habitats with low ungulate and predator density, and they are supposed to be primarily scavengers, how do they make a living when there are few scavenging opportunities? We think that we have not given enough credit to Wolverines as efficient predators. In Rainbow Lake, we have found evidence that Beaver are a very important component of Wolverine diets (see "Wolverine tagging and tracking methods" on [page 29](#) for how we radio-collar Wolverines and document Wolverine foraging). Wolverines likely kill Beavers in the summer and fall when Beavers are on land eating forbs or gathering woody vegetation for their lodges and caches. During winter, we have found evidence that Wolverines dig through the breathing holes in Beaver lodges to access adult and kit Beavers. When ponds are dewatered from otter activity or faulty dams, we believe that Wolverines will find a way into lodges under the ice shelf.

We also find Wolverine adept at killing Snowshoe Hare, grouse, and squirrels. We suspect that Wolverines chase Snowshoe Hare into downed trees or holes and then dig them out. All that is left when we get there is the contents of the intestine. Tufts of fur and feathers are all that remain of

the grouse and squirrels. Certain Wolverines appear to kill Beaver or Snowshoe Hare more regularly than others. This might either be related to the relative availability of these prey species within their home range or to a learned and specialized skill set.

THE BOREAL WOLVERINE'S RELATIONSHIP WITH LATE-SPRING SNOW

The late-spring snow hypothesis was put forward by researchers to explain the distribution of Wolverines in North America. The hypothesis has food storage, spatial refugia, and den site structure components. As opportunists, there might be long periods of time when food is not available to Wolverines. Therefore, caching food during times of plenty for use later can be an adaptive behaviour. In the mountains, researchers have hypothesized that Wolverines use snow that exists late into the spring as a "refrigerator" to keep foods fresh into the summer. At our field sites in northern Alberta, we have noticed Wolverines caching meat in peat bogs. These bogs might act to insulate meats and slow decomposition so that Wolverines can return to caches for later consumption. Caching meat in peat bogs kept cool by permafrost serves as a logical extension of the late-spring snow hypothesis. We aim to visit more of these caches this summer and document conditions found within these caches.

The other angle of the late-spring snow hypothesis was the importance of snow during denning. Wolverines give birth in late February and early March

**M10 AND M7 AT
A LIVE-TRAP IN
RAINBOW LAKE. WE
BELIEVE THESE PAIR
ARE SIBLINGS.**

to kits that are weaned in May. In the mountains, Wolverine dens are in snow caves that are dug into rocks and avalanche debris. Deep snow at dens provides thermal protection to kits. Additionally, deep snow prohibits low-elevation predators from accessing alpine habitats where Wolverines are denning. This presumed obligate relationship between Wolverine denning success and deep snow late into the spring was suggested as a rationale for listing of Wolverines as Endangered in the United States. However, the fact that this relationship does not appear to hold in areas such as northern Alberta was used by the U.S. Fish and Wildlife Service as rationale for denying endangered status listing of Wolverines in the United States.

So how does Wolverine den-site selection in northern Alberta fit into the late-spring snow hypothesis? We have found four Wolverine dens in Rainbow Lake: one in a moss covered tree root wad, one in a beaver lodge, one in a system of fallen spruce trees, and one in a slash pile created by timber harvest. We believe that the variety of structures used by Wolverines during denning exemplifies the adaptability of Wolverines to their environment. Snow in northern Alberta, however, does not often stick around through the time when kits are weaned. So does this refute the snow hypothesis?



Indeed, deep snow may have been an important component at three of the four dens that we found. For example, downed trees covered in snow provided chambers for the female and her kits that were insulated and protected from predators (fishers, martens, or Wolves). The tree root wad and slash pile were surely warmer when there was deep snow insulating its walls. The entrance to chambers within the slash pile was better protected when there was deep snow surrounding it. The Beaver lodge, however, did not require deep snow and might be a bit of an anomaly. Therefore, we think that the key question is not whether snow is important for denning, but rather how late into the winter is snow important for denning? After all, kits are born blind and hairless into -40C weather. Do kits only need extra insulation and protection through early April or do they need it through weaning (mid-May)? How much snow is enough?

CLOSING

The persistence of Wolverines in northern Alberta is reliant on the maintenance of their niche. It is likely that one of the most important components of the boreal Wolverine's niche is the maintenance of a low-productivity environment. We are finding that Wolverines in the lowland boreal select for bogs where few other large predator species reside. Here

they predate on Beaver and cache kills in the muskeg. Like many species in northern Alberta, Wolverine populations and their environments are under constant threat from land conversion for agriculture, urbanization, and industrial development. These developments have the potential to alter the niche of the Wolverine and ultimately their populations. The aim of our research is to identify potential threats to Wolverine populations and habitats and provide options for mitigating these effects. The ultimate goal would be to allow both Wolverines and economic activity to persist in northern Alberta.

We intend to conclude our research on Wolverines this coming winter. All radio-collars we place on Wolverines will be programmed to fall off during the summer and fall of 2016. If they don't fall off, we will target trap the Wolverines wearing these radio-collars during the fall and winter of 2016/2017 for removal. We are excited to dig into these data in the coming years to get a clearer picture of the niche of the boreal Wolverine and how industrial development impacts this niche.

WOLVERINE TAGGING AND TRACKING METHODS

How does one go about trapping, tagging, and tracking a Wolverine? We built a system of 32 log live-traps at our two field sites over the course of two winters. We generally placed these traps in the movement corridors of Wolverines, such as along creeks and rivers. The log box (see top



SUMMER 2015

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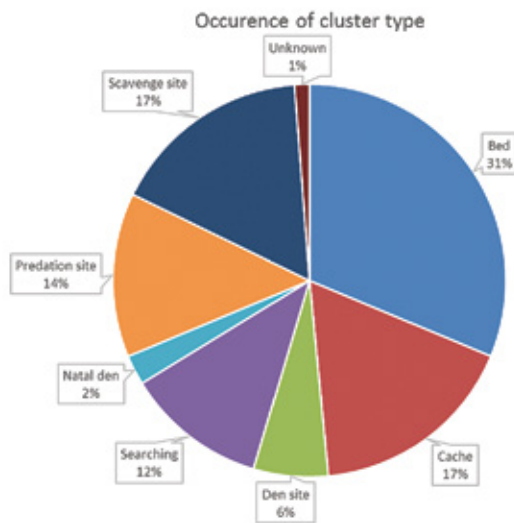
M2 AT A LIVE-TRAP IN RAINBOW LAKE.

photo) is made with a 20-30cm DBH [diameter breast-height] tree that is cut on-site. We fashion a box with a lid and a cantilever system. We bait the trap with Beaver. When the Wolverine enters the trap and pulls on the Beaver, it triggers the cantilever system which releases the lid and traps the Wolverine.

The inside of the box is about 6 x 2 x 2.5' which gives the Wolverine

room to move about after being captured. When the lid on the trap goes down, it triggers a satellite trap transmitter that tells us instantaneously through email and text that the trap is sprung. We get to the trap as soon as possible and immobilize the Wolverine using a jab stick. We take numerous samples from the animal and attach a radio-collar.

The radio-collar takes GPS locations at two-hour intervals and sends us GPS data on a daily basis. When the animal is in a single location for a long period of time, it accrues many GPS points. We refer to these locations as clusters. We can map and visit these clusters to learn what the animal was up to and what it was eating. In total, we have visited 175 GPS clusters and learned new and interesting things about Wolverine ecology. Below is a breakdown of the occurrence of different cluster types from our sample.



SOME RESULTS SO FAR:

Rainbow Lake: We have identified 41 individual Wolverines in Rainbow Lake over the last two winter field seasons. A total of 33 Wolverines (19 males, 14 females) have been live-trapped and we have documented 8 Wolverines on run-poles.

Birch Mountains: We have live-trapped a single female Wolverine in the Birch Mountains over a short but intense live-trapping effort in the winter of 2015. The ACA and ATA have documented 8 different Wolverines on run-poles in the Birch Mountains.



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African Elephant in Tanzania

The Notorious Zebra and Quagga Mussels

BY BROOK SKAGEN

Sunlight dances off broken waves, glistening the sandy shoreline with water's retreat. The fresh scent of wild mint and pine fill the warm summer air, and the sudden splash of feeding trout jitters my bones with excitement; the scenery of my favorite fishing hole resonates deep within me.

Yet every time I visit my happy place within the pines, I fear a barren and lifeless land will replace the once pristine freshwater oasis. There's a movement threatening Canada's water, from the smallest streams to the widest reservoirs, and it is Alberta bound.

The notoriously problematic Zebra Mussel, and lesser-known (but equally devastating) Quagga Mussel, of the genus *Dreissena* are moving west with increasing pressure. These seemingly harmless freshwater bivalves, originating from the Black Sea of Eurasia, are responsible for the dilapidation of the Great Lakes, Lake Winnipeg, and numerous other water bodies throughout North America since their arrival in the 1980s.

These species are efficient filter feeders, attaching onto any surface or substrate where they will then

consume algae, zooplankton and other aquatic microbes. The organisms they consume are critically important for the development of juvenile fish, aquatic insects, and native bivalve species to the point of altering an ecosystem's food web.

Asexual reproducers, the Zebra and Quagga Mussels are able to prolifically produce their microscopic larvae (veligers). Without the natural predators of their native environment, the mussels rapidly carpet the shoreline, ultimately eliminating the biodiversity of the water body. Water clarity increases as food sources are depleted,

allowing more sunlight to penetrate down to the lakebed. This enables vegetation to spread at an uncontrollable rate in areas not yet carpeted by the mussels, resulting in a loss of biodiversity and the degradation of fish habitat. Entire species of fish can become extirpated from affected water.

The damage these mussels cause is not limited to the environment. The Government of Alberta



A SMALL CLUSTER OF ZEBRA MUSSELS. BOTH ZEBRA AND QUAGGA MUSSELS RANGE FROM 1-3CM LONG WHEN MATURE. BROOK SKAGEN



A HOT-WATER PRESSURE WASH IS USED TO REMOVE ANY MUD OR DEBRIS FROM THE WATERCRAFT THAT MAY INHIBIT THE INSPECTION PROCESS. THE HIGH TEMPERATURE WILL DESTROY VELIGERS OR OTHER UNWANTED ORGANISMS, WHILE THE PRESSURE REMOVES THEM FROM THE WATERCRAFT. BROOK SKAGEN



ONE OF THE MANY WATERCRAFT INSPECTION STATIONS THROUGHOUT ALBERTA. BROOK SKAGEN

estimates the damages caused to municipal, agricultural and industrial infrastructure and the needed management controls at \$75 million dollars annually. Their colonial-like growth can clog irrigation intake and dispersal systems, wastewater treatment pathways, and compromise the integrity of any machinery or equipment to which they may attach. These problems require constant maintenance and monitoring, and will raise the cost for water and energy services. The spread of these mussels is truly detrimental to each and every Albertan.

Not only do these organisms destroy the natural areas we hold dear, but also take advantage of the individuals who hold a great passion and value for our waters: boaters, fishermen, you and me. By fixating onto the hulls or propellers of watercraft used in an affected area, these invaders are able to travel and disperse further than they could ever do alone. Both mussel species are able to survive for up to 30 days out of the water, hitchhiking across provincial and international borders with ease. The introduction of these mussels in just one lake or stream may compromise the water of an entire region, as many are hierologically connected within a single watershed. To add to the horror of these tiny bivalves, there are currently no known effective methods of removal. Once in a hydrologic system, they are there to stay.

Fortunately, there is a solution to stop the mussels dead in their tracks. The prevention of these tiny terrors from entering Alberta has already begun across

the province. Initiated in 2013, the Government of Alberta's Provincial Aquatic Invasive Species (AIS) Prevention Program has been busy keeping our province free of these hitchhikers. Backed by a recently enacted change in legislation, the program now involves the implementation of mandatory Watercraft Inspections, at designated stations throughout Alberta. All watercraft, from blow-up dingys, canoes and kayaks to cabin cruisers and sailboats, must stop for an inspection by an appointed Aquatic Invasive Species (AIS) Inspector when signage indicates an inspection station is ahead. In fact, since the beginning of the 2015 boating season, three mussel-fouled boats have been intercepted at inspection stations.

An AIS Inspector myself, I am passionate about the preservation of our precious and valuable water resources. I am not in a position of enforcement, and my goal is not to get any one in trouble. I am more than happy to educate you and your family about invasive species, as well as

catch up on local fishing stories. However, the inspection is a standardized process, and I must ensure your boat is clean, drained and dry before leaving. Watercraft are checked only for invasive species that may be attached to your watercraft, equipment, or trailer, and there are no fees associated should any be found. Inspectors perform thorough inspections to ensure the preservation of your favorite water hobby, and are in no way trying to inconvenience you. The whole process may only take a few moments, and is more streamlined when every one is involved. No one knows your boat better than you!

In an effort to further improve the ease and accuracy of the inspection process, the world's only canine mussel inspectors will be making an appearance at various stations during the peak summer months. Unlike their human counterparts, the dogs are easily able to detect the microscopic larvae of both Zebra and Quagga Mussels, helping to ensure that no mussel is missed. This will be the second season that the dogs, originally a pilot project with the Working Dogs for Conservation organization, will be working alongside AIS inspectors to protect Alberta's water resources. The dogs will be stationed to focus on boats coming into province from any mussel-infested regions of the United States.

Along with the mandatory watercraft inspections, the AIS Prevention Program is also promoting a CLEAN-DRAIN-DRY



FOUR-LEGGED FRIEND JOINS IN ALBERTA'S FIGHT AGAINST INVASIVE MUSSELS.
[ALBERTA.CA](http://alberta.ca)

campaign. The actions are as effective as the phrase is simple: any time you leave a water body, ensure your boat and trailer are clean of any mud and debris, lower your engine and pull the bilge plug to allow your vessel to drain, sponge out any excess water standing in the live well and other compartments, and let your anchor line and equipment dry in the sun as best you can. It takes just one infested boat to destroy the ecological integrity of our beloved province, but by remembering to transport your boat cleaned, drained, and dry, it won't be yours!

Preventing the spread of Zebra and Quagga Mussels into Western Canada may appear to be an uphill battle, but with all Albertans on board, we can greatly prolong or prevent their arrival, as a few of our US partnering states have successfully done. Effective methods of removing these species may be discovered with

the time we save, and millions of dollars will be saved with every year the mussels are held off. Any one who suspects they've seen an invasive species, including but not limited to *Dreissena* mussels, is asked to call the AIS Hotline at 1-855-336-2628 (BOAT), available 24/7. Protect our local water by remembering to CLEAN, DRAIN, and DRY your boat; your favorite oasis within the prairies or that hidden gem within the trees are depending on all of us.

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Greg Wagner

March eBirder of the Month

FROM EBIRD.ORG

Well-known biologist and consultant Greg Wagner of High River AB was the winner of the March 2015 eBird Challenge, sponsored by Carl Zeiss Sports Optic.

The March winner was drawn from among those who submitted at least 20 complete checklists containing one or more species of waterfowl in the month of March. Greg's name was drawn randomly from the 2,096 eBirders who achieved the waterfowl challenge threshold. Greg will receive new ZEISS Conquest HD 8×42 binoculars for his eBirding efforts. Said Greg:

"I first really became aware of eBird in October 2011 when I was approached to be the volunteer Important Bird Area (IBA) Caretaker for Frank Lake, south of Calgary, Alberta. The lake is five minutes from my home and is a site that I have regularly visited for decades. Because eBird is the reporting vehicle for the IBA program, I began using it to record bird observations for my trips to Frank Lake and elsewhere. I am now pleased to report that as of the Easter long weekend, there are an average of more than 40 complete checklists per week for the site. There have also been more than a thousand historical checklists submitted to eBird for the lake, with several hundred

more still to be entered. There is now a substantial database on bird occurrence at the lake, which can be used to inform management, land use and development activities – thanks to eBird! My only regret is that I didn't discover eBird sooner so that more of my birding information could have been recorded.

"As a professional wildlife ecologist I know how important it is to keep detailed information on wildlife populations. eBird provides an easy means for doing this and the BirdLog app allows data to be readily recorded in the field. Once the site visit is done, just press submit and it is sent to the Cornell Laboratory of Ornithology and stored forever. The information is readily available for analysis and is an

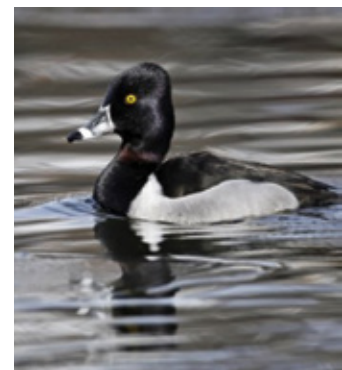
invaluable tool informing bird conservation, ecology and management.

I have also developed an ecotourism plan for the local area. Frank Lake, which draws large numbers of local, out-of-province and international birders to the area, is the cornerstone of this plan. The town of High River now has links to the eBird bar graph checklists of Frank Lake and other nearby areas to encourage birders to use the area."

You can find out more about the IBA Program in Canada and explore all of our 600 IBAs on the IBA Canada website.



GREG NOTED THE ALL-TIME HIGH COUNT FOR RING-NECKED DUCK AT THE FRANK LAKE HOTSPOT DURING A MARCH CHECKLIST. EBIRD.ORG



Ponderables

"Facts do not cease to exist because they are ignored."

ALDOUS HUXLEY

First Hand: Gyr Falcon on the Hunt!

BY JANICE HURLBURT (EDMONTON NATURE CLUB)

I wonder in how many places a person can witness both a Gyr Falcon and a Prairie Falcon (a kind of north meets south)... on the same day...in the same location...in the middle of a city...without doing so much as stepping out of your car. This is the birding action that was taking place on a regular basis this year between mid-November and mid-March at the Alberta Grain Terminal (AGT) in Edmonton. The attraction? Hundreds of pigeons feeding on the scattered grain on the railroad tracks.

Not the most beautiful of settings, but once the falcon is in the air, the surroundings of asphalt and steel are forgotten as we watch its stunning aerial display, stirring up the pigeons and eventually singling out its meal.

The Gyr Falcon was first spotted at the AGT by Jim Lange, 25 years ago. And in the ensuing years, it has attracted a growing circle of birders documenting its activities and photographing the awesome drama that unfolds.

Sometimes, the watchers have to wait several hours for the falcon to arrive, but that too has its rewards. During this time, they share their latest birding experiences or exchange information on lenses and camera settings best suited to capturing the action. It is a wonderful place for those newer to birding to not only see a 'lifer' or two but to glean knowledge from the more experienced birders.

It is hard to not keep coming back – especially with the possibility of a three-falcon day when an intrepid Merlin might fly in under the Gyr Falcon's notice. Common Ravens add to the mix, often pushing the falcon off its hard-won catch. So it's not just the pigeons being chased. Sometimes it's Gyr against Gyr, Gyr against Prairie Falcon, Gyr against Raven.

For those of us watching in the parking lot, it's a vivid piece of natural theatre; a rare chance to experience the thrill of falcons criss-crossing overhead with unmatched speed and elegance. It certainly livens up the winter birding in Edmonton and gives me a good reason to look forward to next winter.

I am indebted to the birders who came before me. First, Jim Lange who initially spotted the Gyr Falcon at the site and then the photographers who gather daily through the four month period that the falcons are there, and who have been so generous in helping me to learn the proper camera settings and techniques. Without this community of birders, I would not have had this experience. There's not always a lot of conversation (sometimes because it's too darn cold) but there is that shared experience of witnessing these powerful falcons in action that creates a small bond between folks who are otherwise strangers.

A RAVEN ASSERTS ITS AUTHORITY! JANICE HURLBURT



GYRFALCONS ARE A BLEND OF SPEED AND GRACE.

JANICE HURLBURT



SUCCESS! JANICE HURLBURT



First Hand: Long-tailed Weasel

BY TERESA DOLMAN

On May 27 2015, my husband, Douglas, and I participated in the Crowsnest Pass May Species Count. We had stopped at the side of a gravel road northwest of the town of Cowley to look and listen for birds.

We soon became aware of a Long-tailed Weasel (*Mustela frenata*) in the adjacent pasture, which, by the way, happened to have a healthy population of Richardson's Ground Squirrels. All of those squirrels were standing at attention, keenly aware of a predator in their midst.

Out came our camera to take a few pictures. The weasel was close to a fence post bordering the pasture, and in one of the photos it appears that the weasel is looking up at something. We lost sight of the weasel momentarily and then with a shock realized that it had climbed to the top of the post! Of course, more photos were taken.

Weasels are well known to be excellent climbers, often going up trees in pursuit of prey. If this particular weasel had climbed this kind of "tree" before, experience would have taught him that he



"LOOKING UP AT SOMETHING" TERESA DOLMAN

was unlikely to find prey there. On the other hand, perhaps he needed a good scratch on the rough wood – several of the photos show that he is rubbing his belly and chin on the post. Other photos show him looking out over the pasture, perhaps scouting the territory for potential meals? Or did he climb the post for the same reason some of us climb mountains – the mountain is there and we can do it!

Whatever the reason, it certainly afforded us a rare opportunity to observe a small snippet of the behaviour of this animal. According to the Alberta Environment and Parks website, the Long-tailed Weasel population in our province has declined dramatically, likely the result of habitat loss and fragmentation.

CLIMBING UP THE POLE. TERESA DOLMAN



SATISFYING AN ITCH? TERESA DOLMAN



AN EXCELLENT VIEW! TERESA DOLMAN



First Hand: Synchronized Diving?

Bob Mutch was at Bullhead Reservoir, northwest of the Cypress Hills, in April of this year, watching a raft of Eared Grebes swimming together in tight formation. Suddenly, as if one entity, they simultaneously dived under the water – briefly – then rose to the surface together. Were they group-fishing? Practicing for the grebe Olympics? Showing off? Just having fun? What's the answer?



First Hand: Sabine's Gulls at Cold Lake

BY TED HINDMARCH

One of the highlights of the Cold Lake May Species count was a large number of Sabine's Gulls on a migration stop-over at the lake over the weekend. This year, weather cooperated for our count's first ever group Pontoon boat outing Saturday evening, allowing for the capture of this great close-up of a Sabine's Gull as they fed on the surface around the boat.

RON DONNELLY



The Lost Islands of Upper Kananaskis Lake

"In 1917, surveyor and mountaineer Arthur O. Wheeler of the Interprovincial Boundary Survey wrote that "in a valley surrounded by towering peaks, lies Upper Kananaskis Lake, a large sheet of deep-blue water of irregular shape, dotted with heavily-timbered islands." The lake, as described by Wheeler, no longer exists, its shape has changed and its islands are mostly gone."

So begins a fascinating story that not many may know about: The Lost Islands of Upper Kananaskis Lake. It is a story worth reading, and you can find it at:

<https://albertahistoricplaces.wordpress.com/2015/07/15/the-lost-islands-of-upper-kananaskis-lake/>



UPPER KANANASKIS LAKE, 1914, SHOWING THE ISLANDS

ROSE-BREASTED GROSBEEK.

JANIS WATT



Ten Acres of Wildlife!

BY JANIS WATT

As you can tell by the photos, we have a colorful acreage! I'm proud to have a private sanctuary here! Our ten acre property is 10 kms west of New Norway AB.

I never shoot off this property and I'm very surprised by the number of birds and mammals this acreage has by migration or permanent residency. This parcel of land is all natural and a "dog-eat-dog" world (figure of speech!) Competition is great for some of the wildlife here.

Great Horned Owls are doing very well, with the adult pair bringing up only one owlet this year. Along with Yellow-headed Blackbirds (what a voice!) in my slough, are mated Blue-winged Teal and Green-winged Teal along with other ducks. And then there are the woodpeckers: both Downy and Hairy Woodpeckers, and a gorgeous sapsucker – likely a Yellow-bellied Sapsucker. Other birds that have really impressed

me are Evening Grosbeaks, Tree Swallows and Rose-breasted Grosbeaks. My prized shots are of the weasels we have here: both Short-tailed and Long-tailed Weasels. We may even get "Weaselets" as well!

Many people are surprised at just how many species (birds, mammals and everything else!) can be found on a small parcel of land – and 10 acres is certainly enough to keep a photographer busy for life!



FEMALE SHORT-TAILED WEASEL.

JANIS WATT

YELLOW-HEADED BLACKBIRD. JANIS WATT





LONG-TAILED WEASEL, LAST CHRISTMAS. JANIS WATT

**YELLOW-BELLIED
SAPSUCKER.** JANIS WATT



**MATED PAIRS: BLUE-WINGED TEAL
(BOTTOM) AND GREEN-WINGED
TEAL (TOP).** JANIS WATT

EVENING GROSBEAK. JANIS WATT



Mark Boyce:

2014 Royal Society of Canada Fellow

FROM UOFA.UALBERTA.CA/SCIENCE/

In recognition of his lifetime achievements in wildlife ecology, and for advocating for threatened species by shaping conservation policy, Mark Boyce, Alberta Conservation Association Chair in Fisheries and Wildlife in the Department of Biological Sciences, has been named a Royal Society of Canada Fellow.



MARK BOYCE.

Mark has earned a reputation as a world leader in population ecology and conservation biology. His work, which links theory and application to some of the world's highest-profile conservation issues, has helped to guide and shape policy in the US and Canada.

In addressing the rapidly changing realities of wildlife populations, Boyce has been asked to provide expert testimony before the United States Congress on three occasions: on conservation of the Northern Spotted Owl, on wolf recovery in Yellowstone National Park, and on the need for a science mandate for the U.S. National Park Service. In Canada, he has provided legal testimony on conservation of the Greater Sage-grouse. Following his efforts, Environment Canada issued an Emergency Protective Order, forcing the hand of the provincial government that

refused to take action to protect the species. Also as a result of his research and role on the Grizzly Bear Recovery Team, in 2010 the Grizzly Bear was listed as a threatened species in Alberta by the Minister of Sustainable Resource Development.

Boyce has authored more than 200 publications, including six books, on population biology and ecological modeling that have been cited 14,000 times, as an indication of the huge contributions he has made in applying basic science in stochastic demography,

population viability analysis and modelling approaches for habitat ecology.

He also uses innovative methods to engage the wider public, including writing a popular column in the monthly *Alberta Outdoorsmen* magazine in which he explains ecological research to a broad audience. Recently, he convinced the Alberta government to make a trial run using a smartphone app to record daily observations by moose hunters in the field. This citizen-science method promises to save millions of dollars in monitoring costs so that these revenues can be better invested in conservation programs.

Ponderables

“Reality is that which, when you stop believing in it, doesn’t go away.”

PHILIP K. DICK

Up Close Naturally: The Deadfall and Debris of Life

BY MARGOT HERVIEUX

With gardening in full swing, people often turn their thoughts to tidying up every leaf and dead branch. If you leave some deadfall and debris, however, you can greatly improve your yard as habitat for wildlife.

A simple place to start is by leaving fallen leaves in shrub borders and back corners. The leaves act as a mulch, holding in moisture and suppressing weeds. They also shelter a wide variety of insects and spiders which prey on pests and also attract ground feeding birds like White-throated Sparrows and juncos.

Fallen branches or small brush piles provide shelter for all kinds of creatures: from resting Snowshoe Hares, scampering chipmunks, and hunting weasels to hibernating toads and Mourning Cloak Butterflies. Larger fallen logs are ideal spring-time stages for drumming male Ruffed Grouse.

Standing dead trees, or snags, are so well used by wildlife that they are often referred to as nature's apartments. From top to bottom they serve as homes and restaurants for all kinds of plants and animals. Not everyone can risk leaving a dead tree, but if you have a problem tree consider just topping

it about 3 metres (10 feet) above the ground.

Woodpeckers excavate nest holes in both live and dead trees but decaying wood is much easier to work. Smaller birds like chickadees and nuthatches especially like the punky wood of a dead birch. These birds create a new nest each year, leaving the empty holes for future tenants.

The large cavities made by Pileated Woodpeckers and flickers are used by flying squirrels, Kestrels, Saw-whet Owls and even Bufflehead and goldeneye ducks. Smaller holes make perfect nest sites for House Wrens and Tree Swallows.

Dead trees also offer a variety of feeding opportunities. Flaking bark hides all kinds of tasty insects and bare branches make excellent perches for darting flycatchers and hunting owls and falcons. A hollow tree also makes an excellent sounding board for male woodpeckers drumming to advertise their spring territories.

Tree cavities or chunks of loose

bark also provide shelter for bats. While not popular with everyone, bats are worth encouraging on your property because they eat huge quantities of insects including mosquitoes and moths. If you can't offer a dead tree or old outbuilding, consider putting up a bat house.

Once the tree falls and comes in contact with the moist earth, the wood begins to break down even faster. Ants, beetles, centipedes and even worms take up residence and they attract predators from birds to shrews. In spruce and fir forests you may even find seedlings growing on top of old logs. The decaying wood is moist and full of nutrients and the young trees don't have to compete for space. If you find a row of spruce trees growing in a straight line they may have started life atop one of these "nursery trees".

Nature has been recycling for far longer than we have. By leaving dead wood we are allowing the forest to reuse nutrients and providing food and shelter for everything from microbes to mammals.



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

BOOK REVIEW

Fishing Northern Canada for Lake Trout, Grayling and Arctic Char

REVIEW BY SANDRA FOSS

Fishing Northern Canada for Lake Trout, Grayling and Arctic Char is a great read, just packed with useful information for anyone contemplating travel to go fishing in northern Canada. The book has lots of photos of HUGE fish: Lake Trout, Arctic Char, Northern Pike, Arctic Grayling, and Atlantic, Coho, and Chinook Salmon, plus lots of interesting firsthand stories about how and where these various fish were caught. The subtitle of the book, "A Fisherman's Paradise in the Land of the Midnight Sun," is right on the mark!

The book is a most useful travel guide, with info on how and where to travel, what to wear, and what to take including safety gear when fishing and travelling in a variety of remote northern areas of Canada. This book has it all: descriptions of the various fish, and their preferred habitat; how to tie some interesting flies that might attract those fish, like Conehead Woolly Buggers (if you happen to be a fly fisherman); and the necessary licensing information (costs, and where to obtain the licenses). I did note that all the recommended rods were heavy (8, 9, or even 10 weight.)

Included are details on highways and various small local airlines that fly into the various remote northern areas in eastern and western Canada, several reminders about the need to pack "light," and descriptions of

some fabulous "shore lunches", as well as a number of bear cautions – for the Yukon in particular. There are descriptions of the very spectacular scenery in the locations where the lodges and camps are found. Also included are hints on what else to do and see (and even eat) in some of these special places. A few cultural cautions are included, as some of the First Nations do not regard fishing as a "recreational activity" but something you do to eat and feed your family. An additional reading list is also provided.

A variety of authors (including Duane Radford, and Adrienne Radford on the female perspective) have contributed to this great reference book, with each having their own favourite spots, in the Yukon, NWT, Nunavut, northern Ontario, Quebec, and Labrador.

FISHING NORTHERN CANADA for LAKE TROUT, GRAYLING and ARCTIC CHAR



A Fisherman's Paradise in the Land of the Midnight Sun

EDITED BY
DUANE S. RADFORD and ROSS H. SHICKLER

Edited by Duane S. Radford and Ross H. Shickler. Published by North Country Press, in USA.

ISBN: 978-0-692-32306-9

I highly recommend this book, and my reaction to it is: how fast can I get up there? Many of the remote lodges and camps that are discussed are small, and take very limited numbers of guests, so you need to plan ahead. Happy reading and happy fishing!

NEW WATERFOWL FOLD-OUT SERIES

A new series of foldout guides from the Cornell Lab of Ornithology makes it easier to identify ducks, geese, loons, grebes, and other types of waterfowl. It all boils down to a simple question: Where's the white?

The guides show species in full color and also as black and white silhouettes. The location of patches of white on the bird's body and its overall shape offer clues to its identity. Pocket Naturalist Guides are lightweight, waterproof, easy-to-digest, and small enough to take anywhere.

"In the first guide we focus on the basics," says McGowan. "In guides two and three we move into identifying species of dabbling, diving, and sea ducks. When you're trying to identify a bird you've never seen before, at a distance, perhaps in bad light, it can really help to boil it down to this simple 'Where's the white?' idea."

To learn more about the Cornell Lab's courses for the public, visit birds.cornell.edu/courses.



CELESTIAL HAPPENINGS

Starry Nights

Summer/Fall: August to October

BY JOHN MCFAUL

FEATURED CONSTELLATIONS: VULPECULA AND LEPUS

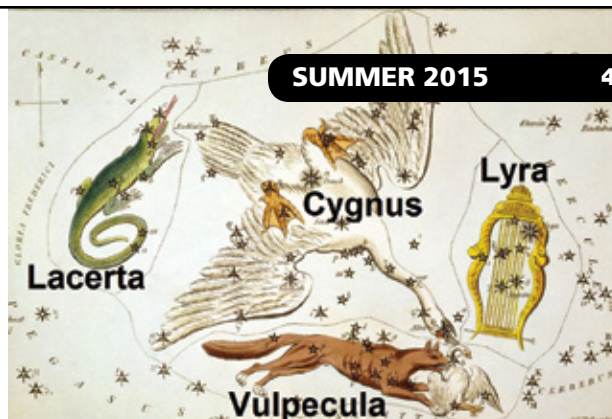
As summer gives way to fall, three prominent stars form a luminous triangle in the southern sky known as the Summer Triangle. These are Deneb, Vega and Altair. They are the brightest stars in their respective constellations Cygnus the swan, Lyra the harp and Aquila the eagle. Lurking below Cygnus is the diminutive constellation of Vulpecula, the Fox.

This constellation was created in the 17 century by the Polish astronomer Johannes Hevelius. It was originally known as Vulpecula cum anser, the little fox with the goose, see drawing. The brightest star, Alpha Vulpeculae, in the constellation is also known as Anser in recognition of the goose that was. Interestingly, this star is thought to be part of a stream of stars that occur in our galaxy that were once part of a dwarf galaxy that was captured by the Milky Way galaxy eons ago.

Hidden amongst the faint stars of this constellation is M27. It is the 27th celestial object listed in the chart of objects catalogued by Charles Messier. He was a French astronomer who was interested in looking for comets. He created his catalogue in order to not mistake the objects listed within as comets. M27 is also known as The Dumbbell Nebula because of its shape. It is a planetary nebula which are formed

when aging stars give off spheres of gas. Their round shape and greenish colour reminded the 18th century astronomer William Herschel of the planet Uranus which he discovered in 1781. It is thought that our sun will go through a planetary nebula stage lasting a few tens of thousands of years some 5 billion years from now. M27 is about 3500 light years from the Earth and may be seen with binoculars as a faint smudge of light in very dark skies.

There are 110 Messier objects including planetary nebula, galaxies, open star clusters, gas clouds and globular star clusters. Globular star clusters are dense clusters of up to a million stars that revolve around galaxies including the Milky Way. One such cluster is M79 in the constellation Lepus, the Hare. Lepus lies at the feet of the constellation Orion. It begins to appear in the morning sky in August and is a harbinger of the coming winter.



CELESTIAL HAPPENINGS

- Sun:** Rise – August 1 (5:49 MDT), Sept. 1 (6:43 MDT), October 1 (7:35 MDT)
Set – August 1 (21:30 MDT), Sept. 1 (20:24 MDT), October 1 (19:11 MDT)
Autumnal Equinox: September 23rd at 2:22 AM MDT
- Moon:** Full – Full - August 29, Sept. 27, Oct. 27
New – August 14, Sept. 13, Oct. 12
Note: There will be a total eclipse of the Moon on September 27th. The moon will rise at 7:18 PM after the partial phase has started. Totality begins at 8:11 PM and ends at 9:23 PM.
- Planets:** **Mercury** is very low above the western horizon in early August just after sunset. By early October it will have moved into the morning sky. On October 11th the waning moon will be nearby. By October 15th it will be furthest from the sun and will be seen above the ENE horizon before sunrise.
Venus shines brightly above the ENE horizon a little before sunrise in late August. The waning moon will be close on September 10th. On the morning of October 25th it will be very close to Jupiter with Mars just below.
Mars will be a morning object from late August through October hovering 10 to 15 degrees above the eastern horizon before sunrise. On September 10th it will form a triangle with the moon and Venus. On October 9th it will be in conjunction with the Moon and Jupiter. By October 17th it will be less than a degree from Jupiter.
Jupiter is lost in the solar glare in August. It reappears in the morning sky by September 10th when it is low in the ENE sky. It is near the Moon and Mars on October 9th. Jupiter is very close to Mars on October 17th. By October 25th Venus joins Jupiter and Mars to form a nice triple planetary conjunction.
Saturn is to be found in Scorpio hovering above the south-western horizon each evening from August through October. The Moon is nearby on Aug 22nd and September 18th. At the end of October it sets soon after sunset.
- Meteor Shower:** Perseids (August 12th, 50/hour). The rate of meteors observed is for dark skies well away from city lights and with no Moon.

YOUNG NATURALISTS CLUB

Eleven Easy Ways to Bring Your Family Closer to Nature

BY CANDACE FARRAR AND EMILY DONG, NATURE KIDS PROJECT MANAGERS

Many studies have shown that children who spend little or no time in nature are more likely to present symptoms of mental and physical health concerns including obesity and Attention-Deficit Hyperactivity Disorder. Recent work also shows that a child's increased participation in less-structured activities, such as sight-seeing and playing alone or with others (rather than more-structured activities like chores or lessons), is related to an improvement in his or her goal-setting abilities.

To see the benefits associated with exposure to nature and less-structured activities, families can set aside time to enjoy the beauty of nature around them.

To get started, here's a short list of nature activities to help your family connect with nature and reap the associated health and cognitive benefits.

- 1 Enjoy native animals and plants in your backyard or park.** This might mean installing a birdbath or bat house in your yard, or planting native plants in your garden. When out for a walk, remind your family to look high and low to catch a variety of living things. Encourage your children to draw pictures of a plant or animal found on the walk or in the yard.
- 2 Revive old traditions, or start new ones.** Collect fireflies (or any insect!) in a jar at night and release

them before bedtime. Collect leaves and encourage younger children to make a craft with them. Play in the sprinkler outside. It doesn't need to cost anything to have fun outside!

- 3 Discover a whole new world.** Find a scrap piece of board or large rock and place it on bare earth. Come back in a day or two and lift the board. You might be surprised by the many living things that have found shelter there. Test out your identification skills with a field guide if you have one.
- 4 Go camping in the backyard.** Make use of your tent or buy a small one for the kids. Enjoy the sounds of a rainstorm on the tent (as long as you have a good fly!) or the breeze on a warm day.
- 5 Take a hike.** The more you teach your family to love nature, the more that love can grow! The younger the child,

the shorter and easier the route should be. Be prepared to stop often as they explore the area. Always remember to bring sunscreen, water and snacks. Even if you can't make it to a natural area, walk through the neighbourhood and challenge your family to look for wildlife or flowers.

- 6 Watch the weather.** Learn the difference between cloud types and how they form and then keep an eye out for interesting formations. This is a great skill to have throughout life!
- 7 Collect stones.** This hobby can last a lifetime! No matter where you are, you're likely to see interesting rocks, shells or even fossils. Challenge your family to find stones of every colour of the rainbow, or that are an interesting shape.
- 8 Help your kids build a tree house, fort or hut.** It's best to let kids design and build these structures themselves, but for safety's sake, an adult should always be present to give a helping hand. Building

a fort will provide a sense of stewardship and create a safe, personal space for your children to enjoy.

9 Plant a garden. For the younger gardeners, choose large seeds that mature quickly. Vegetables or flowers are both great options. Caring for a garden will provide hours of time outside, as long as you guide them through and help them understand the transformation from seed to full-grown plant. If you have no space for a traditional garden,

try a container garden! Planting a garden with native plants will also provide habitat for a variety of species that your family can enjoy watching.

10 Invent a nature game. Encourage the whole family to think of games to play when in nature. This could be as simple as “Find ten critters or their signs” or an imaginative, complex creation of their own. Not only does this encourage imagination, but it will keep them excited to be outside!

11 Attend Family Nature Nights.

Each summer, Nature Alberta’s Nature Kids teams up with the Alberta Science Network, and the City of Edmonton to bring Edmontonians free nature education programming for all ages and abilities. Each event aims to highlight local natural areas and encourage a sense of community and stewardship. Most importantly, Family Nature Nights provide families with the opportunity to learn all about how incredible our natural world can be. Join us in July and August to explore, investigate, and to learn something new!

BOOK REVIEW

Arthropods of Canadian Grasslands

Published by Biological Survey of Canada

Native Grasslands are among the most incompletely studied biomes in terms of their animal biodiversity. Other than a few pest species, the arthropods of Canada’s grasslands have been virtually ignored, despite the crucial role they play in maintaining the ecological balance of these ecosystems. The primary goal of the Biological Survey of Canada’s Grasslands Project is to coordinate research on the diversity, ecology and impacts of the arthropods of Canadian grasslands. The project involves a large number of specialists with expertise on different taxa, in different geographic regions, and with different research interests.

Given the high diversity of grassland arthropod taxa, the wide range of ecological conditions,

and the breadth of human impacts and ecological change in grasslands, the focus and products of the Grasslands Project will be equally diverse. As with any comprehensive biological study, the project will require basic research on the diversity and distribution of selected taxa of grassland arthropods. More comprehensive ecological studies on selected grassland habitats or regions are also feasible. Finally, grassland ecosystems provide an excellent opportunity to study the effects of human activity on the native flora and fauna, as well as the effects of arthropods on human activities.

PUBLICATIONS

A four volume, *Arthropods of Canadian Grasslands* set dealing with different aspects of the

diversity, ecology and interactions of Canadian grassland arthropods has been published, the last two volumes in 2014. All four volumes will be of interest to Nature Alberta members and readers, as they contain an enormous amount of information about the grasslands biodiversity of Alberta.

Vol 1: Ecology and Interactions in Grassland Habitats

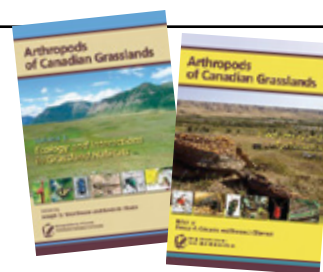
Vol 2: Inhabitants of a Changing Landscape

Vol 3: Biodiversity and Systematics, Part 1

Vol 4: Biodiversity and Systematics, Part 2

The set, or individual volumes, can be purchased or downloaded from:

<http://biologicalsurvey.ca/monographs/read/17>



CLUBS PAGE

TWO YOUNG VOLUNTEERS
ENJOYING THEMSELVES!

FRIENDS OF JASPER



The Friends of Jasper National Park

BY HEATHER AUSSANT

Good friends are hard to find, but when you do, they help create lasting memories and they are partners for life.

For over thirty years, the Friends of Jasper National Park have been helping to create memorable experiences and lasting connections to Jasper National Park. Through innovative programming, volunteer opportunities and partnerships with the community, the organization provides valuable opportunities that promote involvement and inspire stewardship.

Through programs, projects and special events, the Friends aim to:

- promote appreciation, understanding and respect for Jasper National Park;
- increase awareness of the purpose and value of the Park;

- provide opportunities that instill the appreciation for the complex, fragile environments and the cultural heritage of the Park; and
- inspire action for protection and preservation of the Park.

With so many areas to highlight in over 30 years, here are the top 5 things to know about the Friends of Jasper National Park this summer.

SUCCESS IN RESTORATION

The Friends have partnered to successfully restore well-loved areas in Jasper National Park such as the Pyramid Island Project and Cavell Meadows. Through partnerships with Parks Canada, the Jasper community and the help of hundreds of volunteers, they restored the trails and vegetation in these areas so that they can be enjoyed for years to come. These efforts did not go unnoticed – and the organization has received two Alto Awards for their project efforts.

The Friends are set to embark on the latest project: The Whistlers Restoration Project. Along with Parks Canada and the Jasper Skytram, the three organizations will work together to:

- realign, redefine and rehabilitate the Whistlers Summit Trail;
- better protect the fragile alpine landscape from degradation and heavy impact created by the heavy use;
- enhance opportunities for visitors to learn, experience and create a connection with Jasper National Park through their visit;
- provide improved trail infrastructure, including benches and interpretation; and
- foster public appreciation and awareness of the benefits of volunteer engagement.



**ONE ACTIVITY IS THE
MAPS(MONITORING
AVIAN PRODUCTIVITY AND
SURVIVORSHIP) BIRD BANDING
PROGRAM. FRIENDS OF JASPER**

**THE CAVELL
MEADOWS
TRAIL AFTER
RESTORATION.
FRIENDS OF JASPER**





SOME MEMBERS OF THE HIKING CLUB. FRIENDS OF JASPER

The project officially launched on Parks Day (July 18, 2015) and is expected to last three years. In addition to the restoration efforts, a number of mountain-themed programs and volunteer opportunities will be offered.

JASPER TRAIL ALLIANCE

Whether you've strolled, hiked, ridden or ran Jasper's trails, you've likely encountered some of the work of the Friends' Jasper Trail Alliance (JTA). At the intersection of outdoor recreation and conservation, this group of volunteers is working to improve trail conditions for the human users while maintaining important wildlife corridors for the non-human types.

Volunteers work to rehabilitate old trails, clear sightlines for all users and also help to create or improve trails. Volunteer trail days are always a great opportunity to get out and enjoy the fresh air, get a great workout, make new friends, and gain a deeper appreciation of the trail network in Jasper National Park. You can give a 'High Five' to Jasper Trails on any day ending in a 5 – the 5th, 15th and 25th of each month, from June through September.

EDUCATIONAL PROGRAMS

Plan to visit Jasper? Why not learn a little bit more about the area – and the Park – by taking part in one of the Friends' educational programs or special events:

Jasper...A Walk in the Past:

Take a step back in time and discover the characters that helped shape Jasper National Park and the mountain town of Jasper. This 1.5 hour historical walking tour of town takes participants on a personal journey into the past through a variety of stories about the people, places and events that have made Jasper what it is today.

Hiking Club:

Are you new to the area and/or want to meet other people interested in hiking? The group will tackle different trails around the Park each month. Get out, get fit and meet new people!

Full Moon Hikes:

Explore nature after dark with your Friends. A volunteer guide will bring you to one of their favourite places in the park to enjoy the night sky and the full moon. You'll learn more about the stars, nocturnal animals and things that go bump in the night while enjoying a moonlight hike.

Early Birds – Birdwatching Hikes:

Get out and enjoy some of Jasper's best birding habitats with a Friends volunteer. Whether you're a beginner birder or looking to add a lifer to your list, our hikes are a great way to familiarize yourself with the park, meet others who share your interests, and see the birds that grace our forests each spring.

These are just a few of the programs offered. Visit www.friendsofjasper.com/events for a complete listing of programs and events happening throughout the summer months, including drop-in children's programming, workshops with local artists and more.

PARKS DAY

Canada's Parks Day is a national event showcasing parks and historic sites in every province and territory in Canada. Since its inception in 1990, the Friends of Jasper National Park have increased the scale of their local event and now host one of the biggest and best Parks Day events across the country, celebrating both the natural and cultural heritage of the area. This year marks the 25th anniversary of the event – on July 18th - and the organization has lots of fun things planned throughout the weekend.

MEMBERS OF THE JASPER TRAIL ALLIANCE.

FRIENDS OF JASPER



Jasper's Parks Day event showcases the many ways that locals and visitors – past and present – enjoy the park while maintaining its fragile state. Through a number of community partnerships and with the increasing help of volunteers, programs include free guided hikes and heritage walks; interactive learning experiences for both children and adults; a showcase of ongoing park projects, local arts and entertainment; cultural exhibits (including cultural celebrations of Jasper's traditional indigenous peoples); an outdoor climbing wall; children's area; opportunities to try different park activities (stand up paddleboarding, climbing, paddling); a family picnic in the park and much more. These are just some of the ways that people can make a personal connection and share their park experiences. Everyone is invited to come out and enjoy all that the Park has to offer!

YOU CAN MAKE A DIFFERENCE

Shop the Store That Supports The Park

Located in the historic Jasper National Park Information Centre, the Friends of Jasper National Park Gift Shop offers a unique selection of books, maps, gifts, souvenirs and Canadian-made jewelry. Proceeds from sales support the organization's goals.

Don't want to buy anything but want to make a contribution? Consider making a donation to the organization; 100% of donations are used for programs and projects in Jasper National Park.

Become a Member

Stay informed and have your say in the organization. Members receive a regular newsletter, invitations to special events and a 10% discount in our store. Sign up today at www.friendsofjasper.com/get-involved/become-a-member/.

Volunteer

The Friends encourage the responsible stewardship of Jasper National Park by promoting volunteerism that actively engages both residents and visitors in the care of this special place. And, it's a fair analysis that the organization would not be able to accomplish all that it does without the help of its Friends.

Volunteers are needed in all areas of the organization – on the trails, at events, in the store and for programs. Email volunteers@friendsofjasper.com to get involved!

We hope that you'll get out and make a new Friend this summer! Want to learn more about the Friends of Jasper National Park? Visit their website at www.friendsofjasper.com or email info@friendsofjasper.com.

Nature Alberta

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**A GYRFALCON SCARES
UP A FLOCK OF PIGEONS.
SEE THE STORY, [PAGE 35](#).**
JANICE HURLBURT



WEST OF THE LIVINGSTONE RANGE. SEE THE STORY, [PAGE 12](#). TYLER SGRO



Nature *gallery*



"TRENEVILLE-ON-RED-DEER"; SEE "ON THE COVERS" **PAGE 3**. SHARIF GALAL



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