

Nature Alberta

C E L E B R A T I N G O U R N A T U R A L H E R I T A G E



AMERICAN AVOCETS; SEE THE STORY PAGE 20.

feature article

Bugs and Birds at Cooking Lake



We hope you have a very
Merry Christmas...
and all the best in the
New Year!



*Nature Alberta:
Celebrating our natural heritage*

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

- To encourage among all Albertans, by all means possible, an increase in their knowledge of natural history and understanding of ecological processes;
- To promote an increase in the exchange of information and views among natural history clubs and societies in Alberta;
- To foster and assist in the formation of additional natural history clubs and societies in Alberta;
- To promote the establishment of natural areas and nature reserves, to conserve and protect species, communities or other features of interest;
- To organize, or coordinate symposia, conferences, field meetings, nature camps, research and other activities whether of a similar or dissimilar nature;
- 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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Editor's Page

BY BROOK SKAGEN (ASSISTANT EDITOR)

A New Take on Pheasant Tracking

Native to Japan and Southern China, the Ring-necked Pheasant (*Phasianus colchicus*) has become a widespread resident throughout the Parkland and Grassland natural regions of the province since its introduction in 1908. Its adaptability to various environments has allowed the pheasant to become one of North America's most popular upland game bird species.

But in spite of an expanding range, the bird has seen nationwide population decreases; supplemental releases, predator control, and various other management programs have been implemented as a result. It is therefore imperative for wildlife professionals to be able to efficiently and effectively monitor trends and behaviours

of the Ring-necked Pheasant for population management planning and implementation.

The use of radio transmitters in avian research has been ongoing for over 50 years, contributing greatly to our knowledge and understanding of numerous bird species. Recent advances in technology have resulted in an assortment of transmitter types and designs, including those with Global Positioning System (GPS) tracking capabilities, along with numerous attachment techniques for various applications. Common external attachment methods for the use of radio transmitters in avian studies include the use of neck collars, backpack harnesses, leg bands, or adhesives, each with benefits and limitations dependent on study species, objectives and design.

Recently, students and faculty of Lethbridge College's Ecosystems Management program have conducted a pilot study they hope will contribute to future study designs for pheasant research. From October 11-15th, 2016, Instructor Brad Taylor and students of Lethbridge College's Wildlife Conservation & Field Techniques class aimed to study the short-

term post-release movements of pen-reared pheasants, in order to evaluate the use of glue-on tail-mounted radio transmitters. The technique, though commonly applied in raptor research, has never before been used for the study of upland game birds.

The pheasants were processed and released on October 11th, 2016. Small radio transmitters, complete with GPS functionality, were placed on the shafts of the birds' tail feathers with fast-dry veterinary glue, allowing for regular flight and preening movement. The attachment process was rapid, with processing taking less than 5 minutes on average for each bird. Following their process and release, students monitored the pheasants' movements through the use of radio telemetry to triangulate their positions.

Glue-on tail-mount transmitters were found to have both strong benefits and crippling limitations when used for pheasant monitoring. With an average attachment time of only 12 hours, the method provided a very limited glimpse into the birds' daily movements. The quick-dry veterinary adhesive allowed for rapid bird processing, and did not appear to be the cause of transmitter detachment. However, the susceptibility of tail-mount transmitters to catch on to vegetation and other habitat features, and the inability for contacted feathers to remain attached to the bird for a



FEMALE RING-NECKED PHEASANTS ARE MUCH MORE INCONSPICUOUS THAN THEIR MALE COUNTERPARTS. USFWS MOUNTAIN-PRAIRIE 2014

EDITOR'S PAGE cont'd...

practical period of time may render the method ineffective for Ring-necked Pheasants or other ground-dwelling birds. The students have already discussed possible design modifications and alterations, and hope their findings will better contribute to the development of well-informed study designs for future research.

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On the Covers:



FRONT COVER

Dick Dekker has spent uncountable hours traversing the shores of Cooking Lake: As he says, from 2009 to 2015, "a 5 km route from the southeast shore to the narrows at the north end. I walked that stretch, and the same way back, once or twice a week from early April until freeze-up in November." The results of that dedicated research are many, some of which he shares with us in this month's Feature Story on page 20.



INSIDE FRONT COVER

This big-horned ram is an introduction to the story, "Changing Animals" on page 9, but it plays double duty this time by wishing you the very best Christmas and New Year!

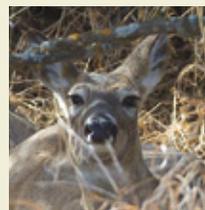


INSIDE BACK COVER

Few sights are more exhilarating than the huge flocks of Snow Geese above a large lake, or taking off en masse from a feeding field. Note the Sandhill Cranes which did not take flight. See the story by Brook Skagen on page 14.



Seen in late fall and winter, the Rough-legged Hawk is most often spotted perched on a fencepost or electric/telephone pole, although it does have a habit of hovering like an Osprey or Kestrel. See Wildlife Starring on page 36.



BACK COVER

Fall is the season when you'd expect big animals to be obvious. Not so! Two deer in the Cypress Hills just about disappear in the shrubbery. Fortunately, they could not hide from photographer Rick Price.

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ALBERTA ISSUES IN BRIEF

New Report on Castle Park

FROM CPAWS, SEPT 19, 2016

A new report released earlier this month by Global Forest Watch Canada raises concerns about land-use in the new Castle Wildland and Provincial Parks. The report suggests more work is needed to conserve and restore this treasured place.

While the new Castle parks announcement was a big step (finally excluding commercial logging), this new information shows that cumulative land-uses over the past fifty years have damaged this ecologically significant area.

The report indicates human footprint and habitat fragmentation in the Castle is higher than previously thought, particularly within the boundaries of the provincial park. Disturbances to the land have grown considerably since 2000. Less than half of the entire Castle, and only two per cent of the new Provincial Park is considered “intact forest,”; intact meaning that it has big enough areas of forests (without roads and motorized trails) to support grizzly bears and other species over the long term.

Additionally, the study reports a loss of almost 40 square kilometres of natural habitat in the Castle from 2000-2015 through disturbances to the

land such as clear-cut and salvage logging, motorized recreation trails, and oil and gas development.

As the government drafts the management plan for the new parks, it will be very important to consider the current state of the area and include plans for restoration and road and trail closures. We need to take a thorough look at land uses within the Castle, such as off-highway vehicle use, and make some hard choices if we are to limit and reverse the damage we are seeing.

While the state of the Castle is troubling, it also creates an opportunity to work on restoring the area for water, wildlife and people in Southern Alberta. We can learn from positive models of a restoration economy in similar landscapes in the northwestern United States, such as the Southwest Crown Collaborative, where people are being put to work restoring damaged areas.

Despite the extensive habitat loss and fragmentation, the proposed Castle protected areas will safeguard some of the last remaining intact forests in the Southern Alberta foothills. Restoring and protecting this area is more important than ever.

Environmental groups urge UNESCO to revisit Site C dam

FROM CANADIAN SECTION, WILDLIFE SOCIETY NEWSLETTER, THEGLOBEANDMAIL.COM - OCT 3, 2016

A United Nations mission assessing “the state of conservation” of Wood Buffalo National Park has been asked to list the park as endangered and to call for a halt to construction of the Site C dam in British Columbia.

In presentations Monday to the United Nations Educational, Scientific and Cultural Organization (UNESCO), four environmental groups and the Mikisew Cree First Nation said the park, which is on a prestigious list of World Heritage Sites, is being damaged by upstream hydro projects in B.C. and by expanding oil sands developments.

Mr. Courtoreille said the dam being built on the Peace River in northeastern B.C. will exacerbate a water-flow problem that began when two BC Hydro dams were built in 1968 and 1980. He said water levels in the park, which straddles the Alberta-Northwest Territories border, have dropped so low that it is now difficult to paddle across some lakes by canoe. He also said migratory birds and the resident wood bison have lost important habitat because of the dams, adding that so many muskrats have been drowned by rapidly changing water levels that trapping has nearly been wiped out.

Joint Statement Issued on National Park Management

FROM CANADIAN SECTION, WILDLIFE SOCIETY NEWSLETTER, CALGARYHERALD.COM - OCT 4, 2016

BANFF - Canada's largest environmental groups are calling on the federal government to conserve nature first in the national parks, focusing on the expansion of the Lake Louise ski resort, the proposed Maligne Lake resort and a proposed bike path between Banff and Jasper.

They released a joint statement on those issues, raising concerns about projects being approved that encroach on the wilderness in the national parks.

"We're not opposed to people being in our parks - we want people to connect with nature in every way they can, but at the same time we can't let the type of infrastructure we're developing in our parks take away from what people are coming to see and that's the wilderness."

Alberta Plans to Restore Caribou Habitat

FROM CANADIAN SECTION, WILDLIFE SOCIETY NEWSLETTER, CBC.CA - OCT 1, 2016

The Alberta government is going ahead with its plan to restore habitat in two swaths of caribou rangeland that were previously disturbed by decades of industrial use.

The provincial government plans to work over the next five years with the oil and gas industry to restore 10,000 kilometres of land in the range of the Little Smoky and A La Pêche caribou herds that has been cleared for seismic lines.

There are more than 16,000 kilometres of seismic lines, cut by the energy industry through the forest, within the study area and habitat restoration will involve replanting trees.

ISTOCKPHOTO.COM



Open Letter from Scientists and Scholars about the Little Smoky Caribou Range Plan

September 28, 2016

The Honourable Rachel Notley, Premier
Government of Alberta
premier@gov.ab.ca

This letter is to request your action to end a planned predator and competitor cull in the Little Smoky region as part of efforts to protect caribou in the area. The Alberta Boreal Woodland Caribou Range Management Plan calls for the death of wolves, bears, cougars and ungulates such as moose, deer and elk. Although we appreciate the effort to meet a federal commitment to protect caribou in the Little Smoky region, we believe the project will have negative long-term consequences for bio-diversity in the area and will, ultimately, not work to improve health of the caribou herd. There is an alternative that does not require the slaughter of other animals and we ask that you act to stop the planned cull and consider other options.

The government's current plan proposes to fence a 100 km² area in the Little Smoky region of western Alberta to farm caribou for the next 50 years. Caribou calves produced within this enclosure will be released in predator-free areas. To meet the recovery program of the Government of Canada, and to reduce landscape fragmentation to less than 65% of the overall area, some seismic lines will be restored to natural habitat, mainly to reduce access.

Removing predators and ungulates to favour the production of caribou will compromise biodiversity in the whole region and will have cascading ecological consequences on adjacent wildlife communities. Furthermore, releasing caribou raised in the absence of predators means they will be less sensitive to natural danger cues and unfit to perpetuate the caribou population. Data show previous predator culls in the area have not met their goals. From 2005 to 2012, 1000 wolves and several cougars, wolverines and other predators have been killed, but the caribou population has not grown.

Most compelling, a late-winter study habitat study in the Little Smoky area showed that wolves did not hunt in caribou habitats, instead preferring upland habitats inhabited by moose and deer. It also showed that survival of the caribou population depended on establishing priority management zones where functional habitat would be protected from further disturbance, an initiative that could be implemented without totally compromising industrial activities in the area.

While the proposed government's fencing program will cost hundreds of millions of dollars to implement and maintain over the next 50 years, a scientifically sound alternative program could be executed for a fraction of the cost and would produce positive caribou population growth within a decade (please see attached Figure 1). Such a program is estimated to cost less than \$2 million over the next five years, and will address the fundamental factor in the conservation of the Little Smoky caribou population - habitat loss and fragmentation. This alternative program will protect and reconnect vital muskeg habitat while maintaining industrial activity. With proper habitat management, and an increased supply of food and protective cover, the Little Smoky caribou population will have the opportunity to survive and grow.

- 2 -

As biologists with extensive experience in wildlife conservation and management, and success in implementing effective, similar programs in other regions, we sincerely hope your office will seriously consider our alternative program.

We would be pleased to meet with anyone in your office for further discussion.

Regards,

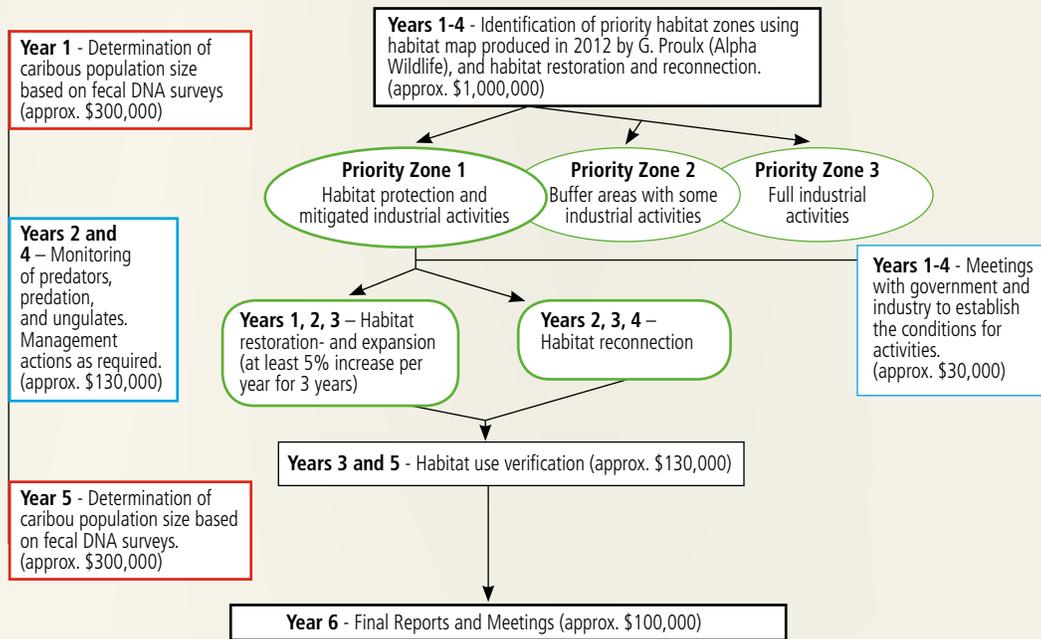
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Figure 1: Proposed Little Smoky caribou 5-year management program.



Nature Alberta NEWS



Sandra Foss Receives Honourary Life Membership Award

BY TED HINDMARCH

In 2014, Sandra was awarded Nature Alberta's Honourary Life Membership Award for her many years of work for Nature Alberta (Federation of Alberta Naturalists). She dedicated over 18 years to the Nature Alberta board – many of those on the executive including a three year term as President followed by a total of 4 years as Past President.

Due to circumstances, Sandra was unable to attend our award presentations in 2014 and due to her 2015 move to BC was also unable to attend the award/ anniversary gala in 2015. This past September our past-president Ted Hindmarch made a point of finally completing the award presentation through a visit with Sandra in her new home in Sidney, Vancouver Island.

Once again, congratulations Sandra. Sandra continues to be a proof-reader for our magazine as well as still being engaged in the environment through tidal flats water quality studies near her new location.

New Executive and Board

Be advised that the following is the new Executive effective 29 Oct Board/AGM:

PRESIDENT – **Lu Carbyn**

VICE-PRESIDENT – **Brian Joubert**

TREASURER – **Thomas Kwan**

SECRETARY – **Claudia Lipski**

PAST PRESIDENT – **Ted Hindmarch**

NEW APPOINTED DIRECTORS:

Lu Carbyn, Thomas Kwan

(Christine Brown, Joseph Hnatiuk, and Cale Bentley submitted resignations and did not stand for appointment.)

RE-APPOINTED:

Linda Howitt-Taylor, Brian Joubert, Dale Serink, Ted Hindmarch (Past President)

One Appointed vacancy exists.

CORPORATE DIRECTORS:

Lloyd Bennett announced resignation from his LNS corporate director position. We are awaiting word on a replacement following their fall AGM.

Will Brooke of LLBBS did not attend and indicated he would be stepping down, but we are awaiting confirmation on status for LLBBS.

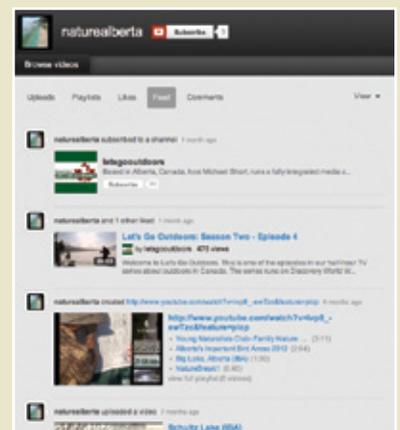
No other changes to Corporate elected directors.

Note: the correct spelling of the ENC rep is Kerri Charest (not charet); NA apologizes for the error.

Nature Alberta & YouTube

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

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Changing Animals: The Legacy of Hunting in Alberta

BY TODD KRISTENSEN AND CHRIS JASS

Locals say that southern Alberta winds can blow the freckles off a frog and paint off a post. That wind came in handy when the bottom of St. Mary Reservoir, near the Montana border, was recently exposed during maintenance.

Prairie gales scoured away several feet of sediment and exposed one of the world's richest collections of extinct animal tracks. This unique record of life from 13,000 years ago has drawn international attention and is informing us about the role humans played in the extinction of Alberta's megafauna, like camels, mammoth, and horse.

Archaeologists and palaeontologists are discovering that human hunting patterns may have changed animal communities for millennia here in the province and across North America. Those winds have not changed their course. New genetic research in Alberta's Rocky Mountains reveals that modern hunters are continuing to influence the evolution of our animals.

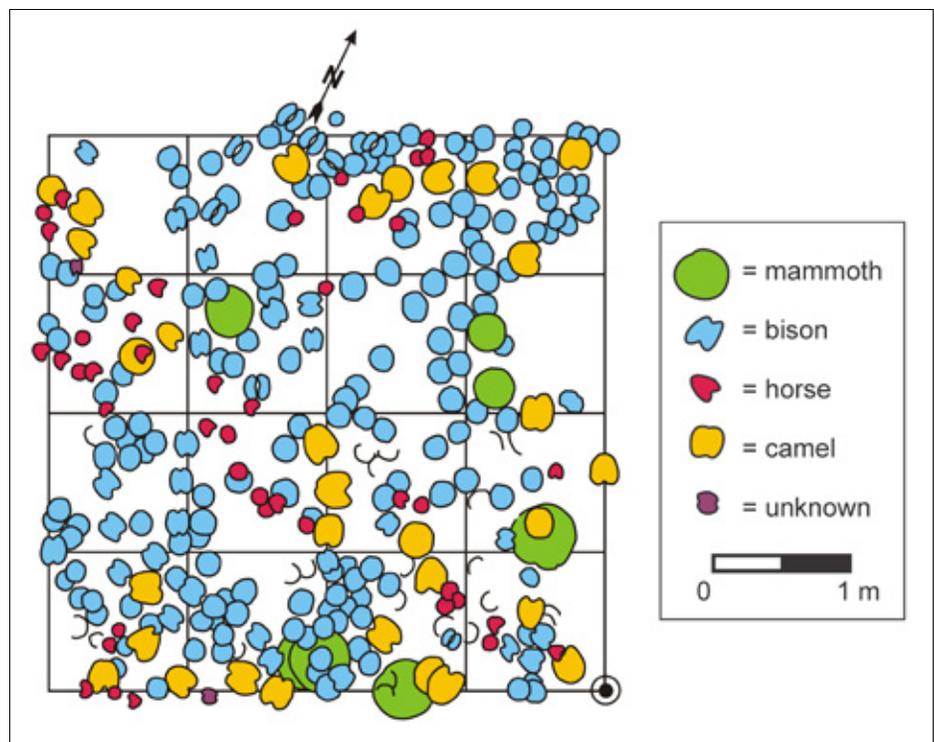
**THIS TRAMPLEGROUND DIAGRAM
REVEALS THE DENSITY OF TRACKS
PRESERVED AT WALLY'S BEACH.**

ADAPTED FROM PAUL MCNEIL

BIGHORNS AND SMALLER HORNS

David Coltman, a professor of molecular ecology at the University of Alberta, shares one important trait with sheep trophy hunters: an interest in the biggest horns. Dr. Coltman is involved in a 40 year study of

bighorns at Ram Mountain near Nordegg – one of the longest big mammal monitoring projects in the world. He and Dr. Marco Festa-Bianchet of Sherbrooke University in Québec are leading a team that uses genetics and horn measurements to track long term human impacts on wildlife.





RAMS BUTT HEADS IN JASPER NATIONAL PARK. COMBAT CAN LAST OVER 20 HOURS. HORN SIZE INFLUENCES MATE SELECTION: INDIVIDUALS WITH LARGER HORNS AND LARGER BODY MASS ARE MORE SUCCESSFUL IN COMBAT. IF HUNTING PATTERNS ALTER HORN SIZE IN SHEEP POPULATIONS, HUMANS MAY BE INFLUENCING LARGER PATTERNS OF MATE SELECTION AND EVOLUTION. ALBERTA CULTURE AND TOURISM

Until 1996, male sheep on Ram Mountain were regularly hunted from late August to October if their horn curl met a minimum dimension. After that time, regulations tightened, and rams were rarely taken. Hunting stopped in 2011. The changes in regulations offered an intriguing

mountain top mini-laboratory to investigate how human selection of specific traits (large horns) influenced the evolution of an animal population.

Coltman notes of trophy sheep hunting that “you couldn’t craft a better experiment to see how fast humans can change an

ungulate population”. Bighorns have mating patterns that favour dominant, larger horned males who battle for access to large groups of females. Biologically, horns are not shed each year like antlers of elk and deer, which means that changes in horn size can be a reliable canary in a coal mine for long-term impacts of trophy hunting. The results of the Ram Mountain research (a major article was published in January, 2016 in the journal *Evolutionary Applications*) has spurred global debates that rage on in genetic labs and meeting rooms of wildlife managers.



HORN CURL IS A KEY FACTOR THAT DETERMINES WHICH BIGHORNS ARE TARGETED BY HUNTERS. ACCORDING TO ALBERTA ENVIRONMENT AND PARKS, ROUGHLY 2500 ALBERTANS AND 70 NON-RESIDENT HUNTERS PURSUE BIGHORN SHEEP EVERY YEAR. ALBERTA CULTURE AND TOURISM

The research team discovered that rams with the biggest horns were hunted before they achieved reproductive success (eight to twelve years old), which drove long-term declines in horn length. Within three to four sheep generations, human hunting played a large role in the alteration of sheep populations' phenotypes (physical expressions of a gene). Horn size decreased by 30% over 20 years with over 20% of that decline attributed to genetic change. Hunting sharply dropped in 1996 but horn size has been slow to recover.

Doubters suggest that environmental variables and demography can explain the drop in horn size. For example, a decrease in harvesting of female sheep drives populations up, which decreases food availability, and in turn, drops the quality of environmental input that at least partially influences horn size (Coltman notes that horn size is like human height: it is partially influenced by genetics and partially influenced by environmental conditions). In other words, according to density-dependence models, if you stop hunting females, male health will drop along with horn size. But this hasn't panned out in National Parks or elsewhere in Alberta and B.C. where Dr. Festa-Bianchet and Dr. Coltman have studied sheep: across Western Canada, intense hunting leads to rapid changes in horn length, and, in places where hunters are removed from the equation, horn size stays big.

The implications are twofold: 1) humans can alter the evolution

of wildlife on short time frames and 2) wildlife managers need to balance the economic gains of trophy hunting (which are particularly high in Alberta where a sheep hunting package offered by outfitters can exceed \$40,000) with its potential impacts on conservation goals. David Coltman explains: "Horn size may be an honest indication of the healthiest males so if you are removing the healthiest males before they reproduce, there are potential long-term negative effects on population quality". If other traits, like body mass, are linked to horn length, we may be driving the evolution of sheep and other big game in directions that threaten their survival.

ANCIENT ECOLOGY AT WALLY'S BEACH

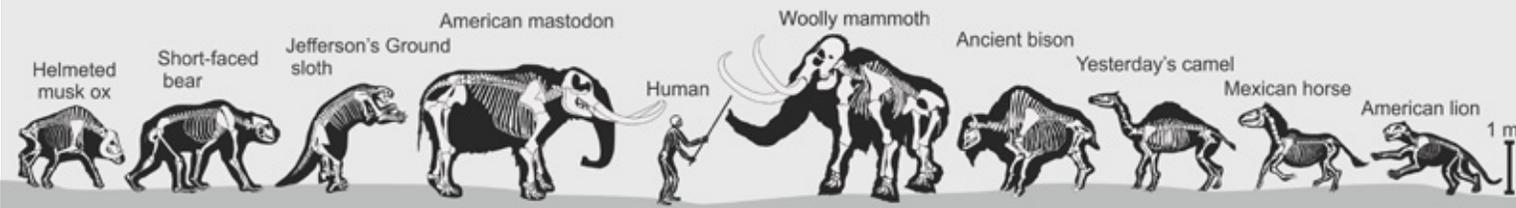
It's a long step back to human hunting patterns 13,000 years ago. Archaeologists at the University of Calgary, under Dr. Brian Kooyman, have learned that humans at a site complex called Wally's Beach on St. Mary Reservoir dined on camel, horse, and other big game on an ancient island in St. Mary River. Over 500 beautifully preserved tracks and trackways of mammoth suggest that these shaggy elephants could have been on the menu as well.

The 9,200 acre St. Mary Reservoir was built and filled in the early 1950s. Wally's Beach was exposed in the 1990s when the reservoir was lowered in order to build an adjacent spillway. Ensuing droughts further exposed the lake bottom to some of the harshest winds in Alberta.

Shayne Tolman, a teacher from Cardston, who is responsible for drawing archaeological and palaeontological attention to Wally's Beach, estimates that 1.5 to 2 m of sediments have been scoured away in the past 15 years. Imagine a magician pulling the cloth from a set table. Now imagine the act being performed ten times and each time the cloth is pulled, the plates and utensils fall on top of another set table. Hundreds of years of ancient meals and tools have become compressed on to one surface at Wally's Beach.



MAMMOTH TOOTH. ROYAL ALBERTA MUSEUM



ICE AGE (LATE PLEISTOCENE) FAUNA OF ALBERTA. TODD CHRISTIANSON

Over six thousand artifacts have been discovered including conclusive evidence that people were hunting Late Pleistocene populations of megafauna at a time when these animals were likely struggling to cope with climate change. While the evidence for camel and horse consumption in ancient Alberta is generally accepted, the role of humans in megafauna extinctions is not. Many researchers argue that pre-contact human populations were too small to impact big game. In addition, of the 33 genera of animals (over 40 species) that went extinct in North America at the end of the Pleistocene, humans only conclusively hunted five.

OVERKILL

Dr. Todd Surovell of the University of Wyoming has ironically become a champion of the human 'overkill' hypothesis of megafauna extinction despite spending much of his time attempting to disprove the idea that humans overhunted animals like mammoth. At a distinguished lecturer series in Edmonton in February, Surovell noted: "Each line of evidence that I use to try to prove that humans didn't

drive mammoths to extinction fails". The inability to reject hypotheses has in turn driven Surovell to become a world renowned expert of the overkill idea. Surovell has mapped the global overlap of humans and proboscideans, constructed detailed chronologies of megafauna extinction, and conducted mathematical models to extrapolate the potential impact of early humans in North America. All lines of evidence point to a simple observation: "Outside of Africa, when humans arrive, elephants disappear".

At the other end of the research spectrum, some argue that climate change from the last ice age (which peaked around 17,000 years ago) to the Holocene is the culprit that levelled the majority of Alberta's big game animals. Warming temperatures were fostering new plant communities, wreaking havoc on mammal gestation rates, and stressing breeding patterns of big game. Most archaeologists have found a middle ground and suggest that humans delivered the final blow to some animal populations that were already weakened by habitat fragmentation and warming temperatures.

Paul McNeil, a Calgary-based palaeontologist who studied the mammoth trackways at Wally's Beach, notes that they were left by older animals with very few juveniles: a sign of a stressed population. In this state of decline, Surovell argues that if humans culled 3% of the mammoth population per year, they would've been driven to extinction in a few centuries. This could've been greatly abbreviated if hunters targeted specific demographics like calves or fat-rich females (which we know First Nations preferred when it came to buffalo hunting on the plains). Either way, ancient hunters may have been killing mammoths at rates that were sustainable under past conditions but quite unsustainable against a backdrop of rapid climate change. The same pattern may have played out for other big game animals like horses and camels but confirmation must await further archaeological and palaeontological research.

HUMAN-DRIVEN EVOLUTION

What are the modern implications for the official mammal of Alberta (the bighorn) and other big game? Are Alberta's megafauna



**MAMMOTH TRACKS AND TRACKWAY,
WALLY'S BEACH.** SHAYNE TOLMAN

extinctions a valid warning bell for current practices? There are significant differences from modern hunting and pre-contact times. First Nations populations were small and did not have the ability to monitor animal communities across the province. However, modern populations and hunting regulations can create much stronger (narrowly targeted) forces of artificial selection that drive real evolutionary change. If twenty years of trophy hunting alters a sheep population's phenotype, what will one hundred years do?

The pace of modern climate change may also be much faster than that experienced during the Late Pleistocene/Holocene transition. Agronomists are already concerned that grass productivity will decline across the northern prairies as temperatures warm, while

conservationists worry that climate change in mountain landscapes will threaten the already fragile existence of fragmented animal populations (like sheep and caribou). Archaeological, palaeontological, and genetic records can reveal long-term impacts of humans on animal populations that can't be witnessed in a single generation and those records indicate that hunting patterns (particularly of specific demographics) on a backdrop of climate change can be a devastating one-two punch for some species.

Humans have influenced animal populations in the province for thousands of years with no sign of stopping. To ensure that practices like trophy hunting are sustainable and that economically important species are not driven to local extirpation, biologists and wildlife managers should recognize the powerful ability of hunters to drive short-term evolution of big game animals.

CHANGING LANDSCAPES

Paul McNeil poetically notes the power of wind: it created Wally's Beach by blanketing immense trampling grounds with silt; 13,000 years later that wind exposed the trackways for our discovery and it is now slowly eroding it away. These winds bring change. Overlapping footprints of caribou, musk-ox, mammoth, camel, and horse at Wally's Beach tell of a diverse and biologically productive

landscape in Alberta: not unlike a modern African savannah, according to Paul. It didn't last. Bison survived dramatic transitions at the end of the Ice Age and swamped the ecological void that became our modern prairies. Up to 60 million bison lived in North America at European contact. It didn't last. Within a few hundred years, a modest population of hunters plummeted the bison population to a few thousand.

Prairie landscapes are still evolving in response to changes at the end of the Ice Age and more recent bison extirpation. Grazing patterns, carcasses, dung and urine, wallow pits, and hoof marks all created heterogenous micro-environments that supported other fauna and flora. Some of this diverse landscape manipulation is being replaced by cattle but Albertans, from farmers and ranchers to biologists and bird watchers, will continue to experience changes as the prairies stabilize from the Ice Age and disappearance of bison. Not all of the dynamic changes that occur in the natural world can be controlled by humans, but it is clear from both prehistoric and modern evidence that Albertans can have both direct and indirect impacts on animals and ecosystems around us. The decisions we make, whether about hunting, conservation, or climate change, will have impacts on what Alberta looks like for centuries to come.

ONCE CONSIDERED SEPARATE SPECIES, THE SNOW GOOSE OCCURS IN BOTH "WHITE" AND "BLUE" PHASES. COLIN STARKEVICH 2013



Eyes on IBAs

Flocking to Conserve

BY BROOK SKAGEN

Every year, Snow Geese flocking in the tens of thousands migrate from their Arctic breeding grounds to the wetlands of the interior United States, passing through Alberta in remarkable numbers. Their vocal arrival signals the coming of winter, just as the songs of robins and meadowlarks awaken the province from its winter slumber.

The spectacular event is commemorated through dozens of local Snow Goose events and festivals, becoming an autumn tradition for nature enthusiasts province-wide. With numbers so vast, it's a wonder how these enormous flocks find suitable habitat to forage and rest throughout their journey. But to some water bodies of Alberta's far north, the deafening gaggle of white is not the only migration spectacle across the landscape.

Located approximately 120 km from High Level, the Hay & Zama Lakes Important Bird & Biodiversity Area (IBA) is a vast lowland wetland complex in Alberta's far northwest, encompassing

over 600 km². Comprised of boreal coniferous, deciduous and mixedwood forests, shallow eutrophic lakes, floodplains, and river deltas, Hay & Zama Lakes have long been regarded as an area of significant ecological value by Aboriginal peoples and modern conservationists alike. In 1982, the complex wetland network was designated as a "wetland of international significance" under the Ramsar Convention on Wetlands, and as of 1999, approximately 80% of the IBA has been designated as a Wildland Park. The park's outstanding scenery and rich biodiversity provides visitors with hunting, fishing, camping and various other recreational opportunities year-round.

Water levels fluctuate seasonally with the inflow of the Hay River, creating various habitats for mammals, birds, and fish

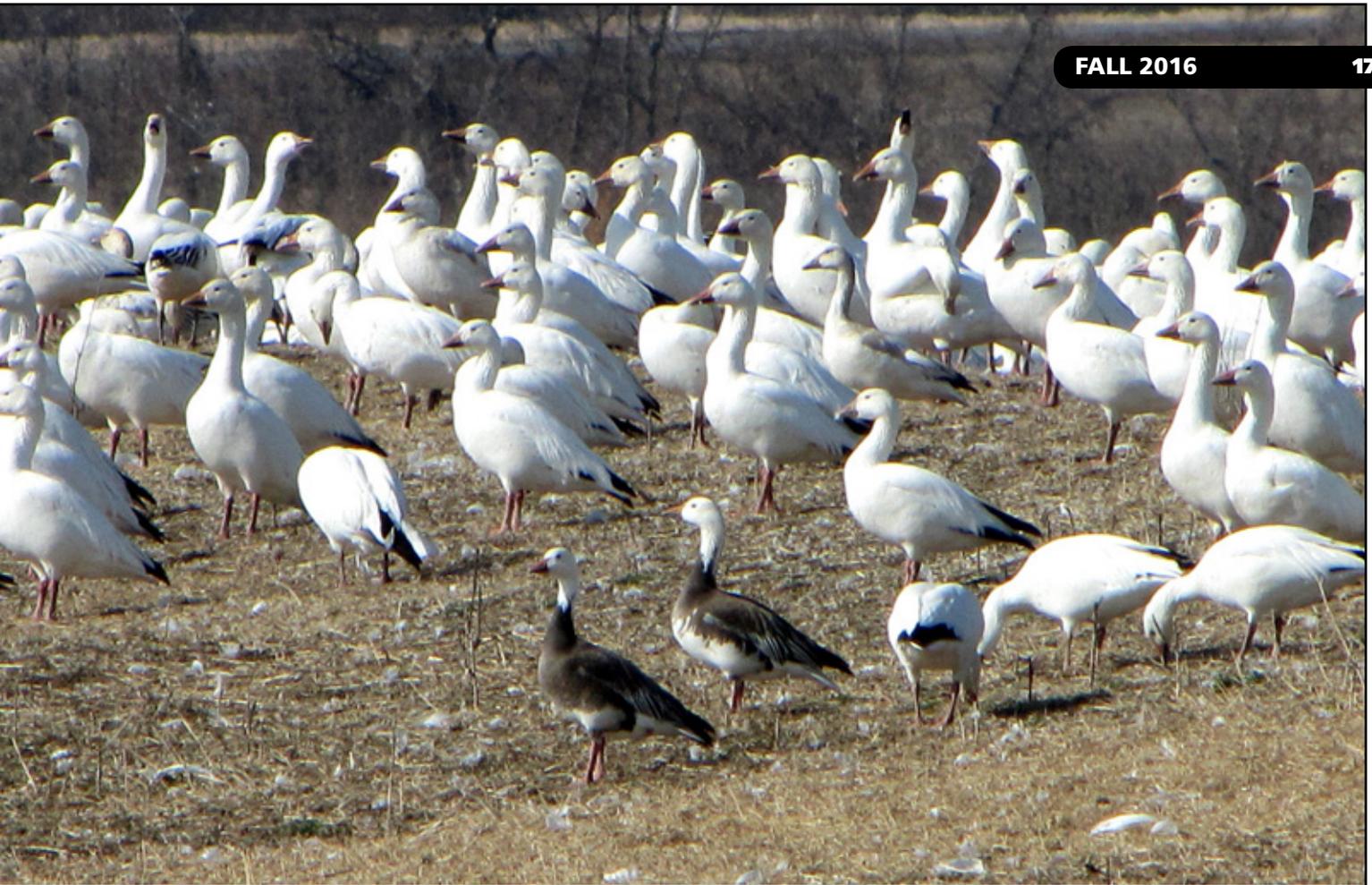


throughout the year. The IBA is an important migratory stopover for hundreds of thousands of waterfowl and shorebirds during spring and fall migrations, as three of North America's four migration flyways intersect the vast wetland network. Globally significant concentrations of the Snow Goose (130,000) and continentally significant numbers of Greater White-fronted Goose (15,000) have been observed in the area, triggering the site's IBA designation. As many as 1,000,000 birds have been observed throughout the wetlands during the course of fall migration.

The Hay-Zama Wildland Park is the only selected site for the reintroduction of the Wood Bison, a provincially At-Risk species. First introduced in 1984, the original 29 bison herd has since expanded to about 500. Abundant grasses and sedges provide excellent



Brook Skagen
Nature Alberta IBA intern



WHITE PHASE SNOW GEESE INTERBREED WITH BLUE PHASE (TWO IN FOREGROUND), THOUGH WHITE IS BY FAR THE MOST DOMINANT IN THE WEST. WIKIPEDIA

winter forage, sustaining the herd throughout the year. The Wildland also provides critical habitat for ungulates such as the Woodland Caribou.

The IBA is a conservation island, surrounded by various oil, gas and forestry activities that fragment the landscape. The Hay-Zama Committee, a group of various government, Dene Tha' First Nation, and industry stakeholders have successfully managed the land prior to the park's designation in 1999. The committee continues to cooperatively address and manage environmental threats and concerns throughout the

area alongside the provincial government, demonstrating the ability to successfully cooperate towards the management of Crown Lands.

The seasonal migration of birds is a remarkable wildlife spectacle, with some species congregating in extraordinary numbers. The arrival of the Snow Goose and other fall migrants is an annual event

birders and nature enthusiasts alike cherish across the province. It is because of biologically-rich areas such as the Hays & Zama IBA that these impressive flocks can be sustained throughout their challenging journey, providing weary travelers with much needed food and rest. With every white bird I hear cackling by, I am reminded of the importance of the

THE WETLANDS OF HAY & ZAMA WILDLAND PARK ARE IN CONSTANT CHANGE WITH FLUCTUATING WATER LEVELS. ALBERTA PARKS 2016



Hays & Zama Wildland Park, and many more of Alberta's precious IBAs.

Sources:

Alberta Tourism, Parks & Recreation. 2007. Hay-Zama Lakes Wildland Park: "...a wetland of international importance" (online guide). Retrieved from: http://www.albertaparks.ca/media/2661/HayZama_web.pdf

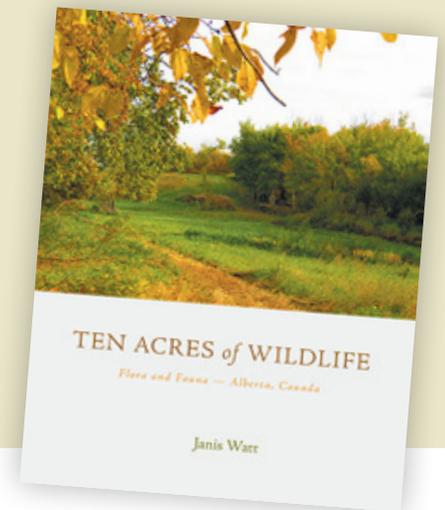
BirdLife International. 2016. Hay and Zama Lakes (IBA factsheet). Retrieved from: <http://datazone.birdlife.org/site/factsheet/hay-and-zama-lakes-iba-canada>

IBA Canada. 2016. Hays & Zama Lakes (web page). Retrieved from: <http://www.ibacanada.org/site.jsp?siteID=AB059>

10 Acres of Wildlife Has Website

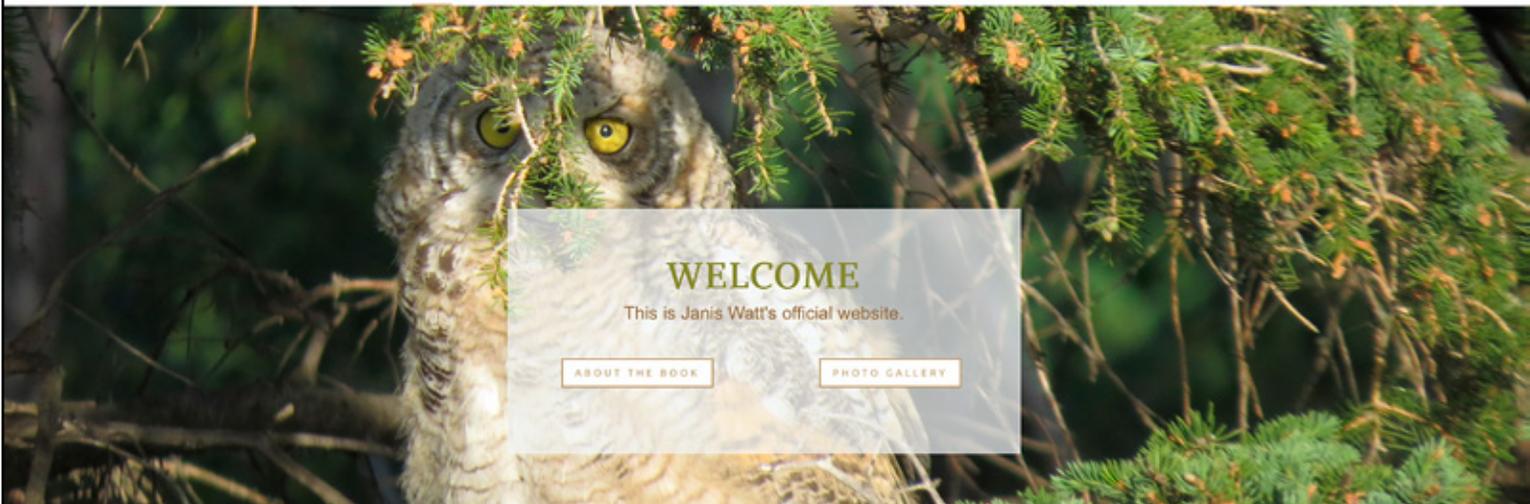
Just recently, Janis Watt had her book *10 Acres of Wildlife* published (see the last edition of Nature Alberta for the review). This follows an article in the magazine highlighting the area. Now Janis has developed a website as well. Check it out:

www.tenacresofwildlife.com



Janis Watt

HOME ABOUT THE BOOK ABOUT THE AUTHOR GALLERY CONTACT PRESS AND MEDIA





Bird Count 2016

BY JUDY BOYD

FRANKLIN'S GULL. ISTOCKPHOTO.COM

The number of species went down this year: from 278 last year to 262 this year and the number of individual birds also went down: 221,034 last year to 204,036 this year.

In 2015, the most numerous species was the Franklin's Gull with 26,405. Second was the Canada Goose with 13,349 and third was the Red-winged Blackbird with 10,249. In 2016, the 3 most numerous species were again the Franklin's Gull, Canada Goose and Red-winged Blackbird (Franklin's Gull with 17,698, Canada Goose with 14,194 and Red-winged Blackbird with 9,893.)

This year, 16 species were found in only one location around the province: Ross's Goose at Lethbridge; Tundra Swan, Northern Pygmy Owl, Long-eared Owl, Pacific-slope Flycatcher and Scarlet Tanager at Calgary; Pacific Loon, American Golden Plover, Stilt Sandpiper, American Pipit (CW), McCown's Longspur, Bay-breasted Warbler (CW) at Brooks; Pacific Wren at Crowsnest Pass;

Northern Saw-whet Owl (CW) at Central Alberta; Dusky Grouse and Pine Grosbeak at Waterton.

19 species were found in 2 locations around the province: Eurasian Wigeon was seen at Lac La Biche and Medicine Hat; Yellow Rail, Sedge Wren and Chestnut-sided Warbler at Calgary and Cold Lake; Clark's Grebe at Milk River and Taber/Vauxhall; Semipalmated Plover and

CW = COUNT WEEK



NELSON'S SPARROW. ISTOCKPHOTO.COM

Baird's Sparrow at Brooks and Calgary; Short-billed Dowitcher at Brooks and Milk River; Common Nighthawk at Lac La Biche and Milk River; Hammond's Flycatcher and Nashville Warbler at Brooks and Crowsnest Pass; Winter Wren at Calgary and Waterton; Brewer's Sparrow at Medicine Hat and Taber/Vauxhall; Nelson's Sparrow at Calgary and Lac La Biche; Rusty Blackbird at Cold Lake and Lac La Biche; Bullock's Oriole and Cassin's Finch at Crowsnest Pass and Waterton; Red Crossbill at Calgary and Lethbridge; White-winged Crossbill at Calgary and Banff.

Last year we had only one species in all areas. This year we had 11 species in all areas: Canada Goose, Mallard, Blue-winged Teal, Sora, American Coot, Red-tailed Hawk (1 area was a count week bird), Tree Swallow, American Robin, Yellow Warbler, Red-winged Blackbird and Brown-headed Cowbird.

Last year nine species were found in all but one area, and seven species were found in all but two areas. This year 11 species were found in all but one area: Bufflehead, Wilson's Snipe,

Black-billed Magpie, American Crow, Common Raven (1 area was a count week bird), Barn Swallow, European Starling (1 area was a count week bird), Common Yellowthroat, Chipping Sparrow, Clay-coloured Sparrow and Savannah Sparrow. This year 12 species were found in all but two areas: Northern Shoveler, Lesser Scaup, Great Blue Heron, Spotted Sandpiper, Eastern Kingbird, Cliff Swallow, Black-capped Chickadee, House Wren, Song Sparrow, Yellow-headed Blackbird, Brewer's Blackbird, and American Goldfinch.



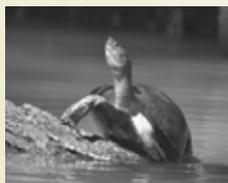
COMMON NIGHTHAWK. ISTOCKPHOTO.COM

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FEATURE ARTICLE

Bugs and Birds at Cooking Lake

BY DICK DEKKER

BACHELOR BIRDS AT COOKING LAKE

Gorging on lake flies and their aquatic larvae, hundreds of avocets assemble each year at Cooking Lake. They stay from early April to late October, but why are so very few pairs nesting?

After the drying-up of famous Beaverhills Lake - a birdwatcher's Mecca for more than half a century - Cooking Lake has become a favourite destination for Edmonton birders, particularly during migration seasons. About 25 km east of the city, the south shore of the lake is easily accessed from highway #14.

The water depth and biological characteristics of Cooking Lake were studied intermittently between 1964 and 1986 by the University of Alberta and Alberta Environment. In 1979, the lake's surface area was calculated to be 36 square kilometres and the length of the wandering shoreline was 72 km.

The lake's water level has fluctuated little from the mid

1970s to the 1990s. During that period, I seldom visited the lake because a wide rim of bulrushes and cattails obscured the view of the waterline, and shallow shorebird habitat was practically absent. However, after a series of years with below average precipitation - which led to the demise of Beaverhills Lake - Cooking Lake shrank in size and mudflats widened along the southeast shore.

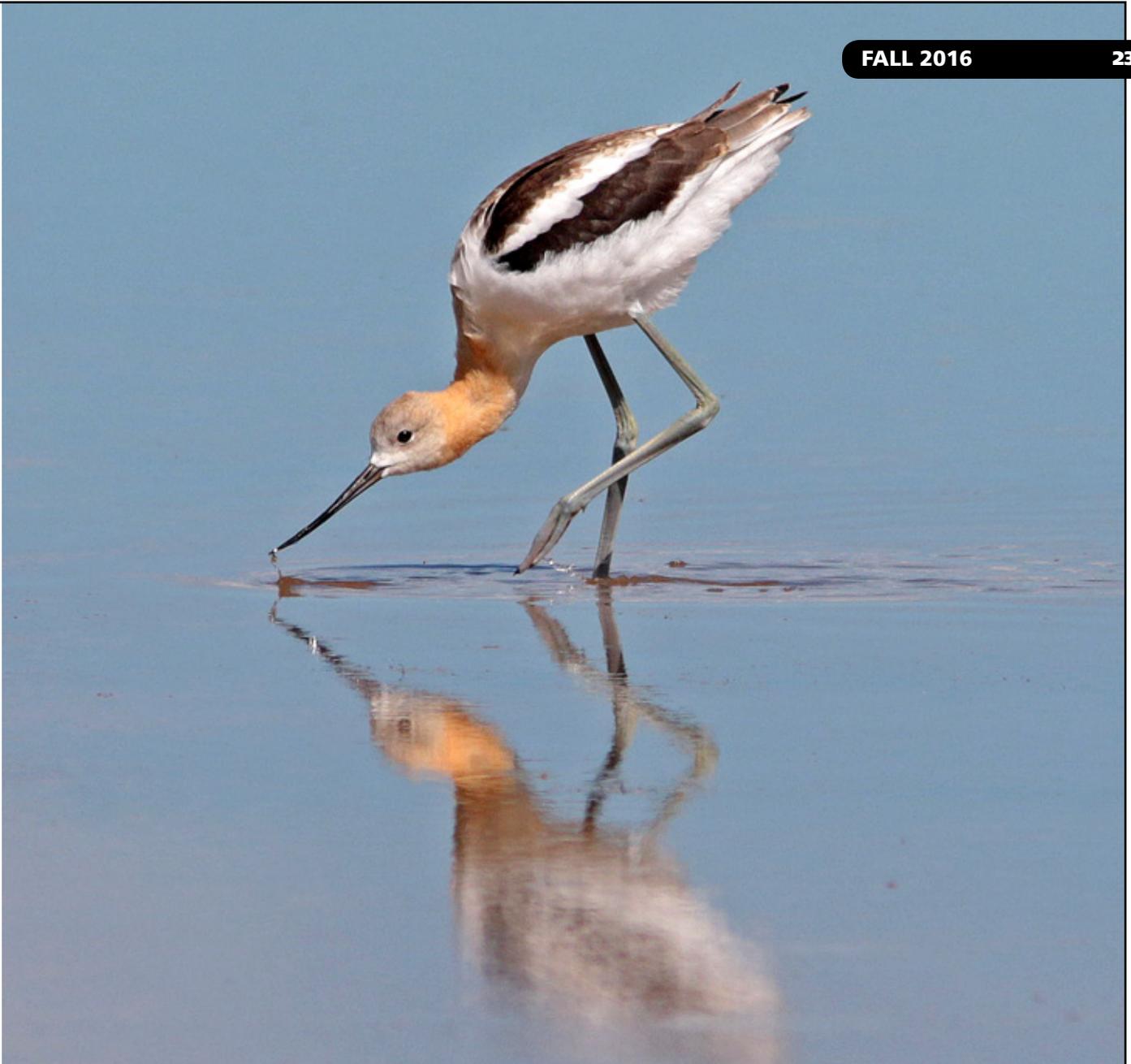
From 2009 to 2015, I conducted a shorebird survey along a 5 km route from the southeast shore to the narrows at the north end. I walked that stretch, and the same

way back, once or twice a week from early April until freeze-up in November. The number and variety of shorebirds were greatest when the water was shallow and there were mudflats. Conversely, wading birds were few and far between when the lake had flooded into the bulrushes

The American Avocet, with its strikingly black and white plumage, was the dominant wader even though their flocks often stayed far out from shore, particularly when strong easterlies had pushed the shallow sheet of water downwind, exposing half a kilometre or more of mudflat.



ONE AVOCET IN BREEDING PLUMAGE,
THE SECOND IN WINTER GARB. DON DELANEY



THE UPCURVED BEAK IS WELL-SUITED TO ITS STYLE OF FEEDING. DON DELANEY

After the breeding season, migrating shorebirds commonly stage on wetlands with an abundant food resource. In that regard, Cooking Lake appears to have much to offer because the avocets spent most of their day roosting. From time to time, they scooped up aquatic insects or crustaceans by swiping their long, upturned bill back and forth through the shallows. In

deeper water, avocets forage while swimming.

During my surveys, I roughly estimated the number of avocets at several hundred, and in some years at one to two thousand. With such a large population present from spring to fall, one would expect that many avocets would lay eggs and produce young. But, odd as it may seem,

there did not seem to be much evidence of breeding.

Avocets are known to nest in loose colonies, preferably on islets that provide refuge from ground predators such as coyotes and foxes. Just outside my bird survey route there were two gravel bars, about a hundred metres long and roughly the same distance from shore, with an outlier of boulders and some

vegetation on the higher ground. In 2015, I noted that avocets were nesting on one of these islets, and I decided to spend more time there the following spring. I did not access the islet. And to minimize disturbance of the birds, I sat down on a convenient field stone on the opposite shore for close observation through binoculars.

In 2016, the lake was free of ice by April 3, and one week later I spotted the first avocets of the season. During May, the population of the islet grew to about fifty, and by early June there were several hundred, perhaps even as many as 500. A precise count was difficult to obtain because an unknown number of avocets could have been sitting out of view behind boulders or vegetation. Others were obscured by flocks of Franklin's Gulls that used the islet as a daytime roosting site.

On June 26, I spotted the first three avocet chicks, walking in shallow water near the islet. And on June 30, there were five chicks, chaperoned by adult birds. On July 2, three family groups included a total of seven chicks. In addition, I came across two loudly protesting pairs with chicks some distance farther along the main shore.

Precocious from the moment they struggle free of the egg, avocet chicks are capable of picking up food items for themselves. They tend to wander at will, and their parents are known to lead them well away from the nesting colony.

Breeding populations of avocets can be expected to contain a few unmated floaters, but large numbers of non-nesters, as was the case at Cooking Lake, have not been reported before in

the scientific literature. German ornithologists, who colour-banded European avocets in an eleven-year long study, concluded that their birds did not breed until they were from two to five years of age. Dutch researchers recently found an oystercatcher that was banded 46 years ago. If large shorebirds enjoy such a long lifespan, there might not be an evolutionary imperative for avocets to produce offspring year after year. Most of Cooking Lake's avocets were apparently content to sit out their summer in idleness on the lake's productive shallows.

BUGS AT COOKING LAKE = LOTS OF BIRDS!

Thousands of Franklin's Gulls frequent Cooking Lake from early spring well into summer, and food is super abundant. So why are there no gulls nesting at the lake?

NO, THEY AREN'T TRYING TO DROWN EACH OTHER; THEY ARE BUSY MATING. BRIAN GENEREAUX





FRANKLIN'S GULL IN VARIOUS STAGES OF THE MOLT. DON DELANEY

Gulls are birds of summer in Alberta and the most common species is the Franklin's Gull. With its black head, red bill and red legs, it is also the prettiest of its tribe. In breeding plumage, the white chest of the adults is a glowing pink. Their high-pitched cries drift down from the clouds when these insectivorous little gulls cruise high over land or water hunting for flies and other bugs that have been carried up by rising currents of warm air.

Franklin's Gulls nest in dense and noisy colonies in the reedbeds of large wetlands such as at Whitford Lake, which is about 50 km north of now-dry Beaverhills Lake. But there is no current record of their nesting at Cooking Lake. This is all the more puzzling because these gulls are super common from spring to late summer, and there is no lack of food.

Like avocets, Franklin's Gulls feed heavily on *chironomid* midges,

also called lake flies. Although they superficially resemble mosquitoes, lake flies do not sting. There are many species that vary in size. Their eggs are laid in water and develop into worm-like larvae that eventually metamorphose into the flying insect. Hatching in incredible numbers, lake flies form dense mating swarms that hang like a smoke screen over the shoreline vegetation when the wind is down.

While the gulls are expert at taking airborne lake flies as well as those on the water surface, shorebirds like avocets and yellowlegs zero in on the aquatic larvae of the flies. Developing in four stages, some larvae attach themselves to the lake bottom, others burrow into the mud or are suspended in the water column. The largest larvae are two to three centimetres long and red in colour, which is why they are called bloodworms.

Between 1962 and 1987, Cooking Lake's zooplankton community was studied intermittently by scientists from the University of Alberta and Alberta Environment. The lake was found to be slightly saline and hyper eutrophic, which means rich in nutrients that promote excessive growth of algae and other vegetation, but less suitable for animal life that needs oxygen. As detailed in the comprehensive *Atlas of Alberta Lakes*, published by the UofA in 1990, the **wet weight** of the benthic invertebrates was expressed in milligrams of biomass per litre of water and per square metre of bottom.

Chironomid midge larvae represented 92% of the phytoplankton biomass at Cooking Lake, but they were not counted individually, which prevents comparisons with other lakes where the results were given as the number of midge larvae

per square metre of lake bottom, and as their percentage of the biomass in dry weight.

A very thorough study of a shallow lake in the Netherlands came up with 2000-3000 bloodworms per square metre. By comparison, the number of *chironomid* larvae in Cheyenne Meadows, a large prairie wetland in Kansas, was calculated at fifty bloodworms per square inch, which works out to roughly six per cm^2 . The number of bloodworms per square metre of lake bottom at Cheyenne Meadows varied from 6000 to 65,082/ m^2 .

The abundance of bloodworms apparently varies temporally as well as spatially, depending on environmental factors. In addition, besides shorebirds and gulls, ducks also feed voraciously on

midge larvae, and so do fishes. At Cooking Lake, dabbling ducks are common all summer long, but fishes, even minnows and sticklebacks, were frozen out after the lake's water levels dropped to the current lows.

In 2016, a prominent additional food resource for the gulls were

ephyridid flies. About half the size of a house fly, their common name is shore fly (brine fly in Britain). Locally super abundant along the water line, these flies feed on biofilm, the residue of microscopic algae and bacteria that stay behind and coat the mudflats when the water retreats.

The gulls used a novel and very effective method of catching the flies. Walking along the waterline in group formation, like an advancing army, their beaks partly open, the gulls snapped up flies that flushed just ahead. This foraging method of Franklin's Gulls has, to my knowledge, not been described before in the scientific literature.



FRANKLIN'S GULL IN FLIGHT. DON DELANEY



FRANKLIN'S GULL.

DON DELANEY

Another odd and very numerous insect of wet places is the tiny, 2 mm long, springtail (*commembola*). Massed tightly together in puddles of water left behind by the retreating lake, a collection of springtails looks like an oil spill polluting the beach. Examined closely, you might be surprised to see that those black smears consist of hundreds if not

thousands of tiny insects. If you try to touch them, these funny critters jump away like fleas by flexing their folded tail.

During much of August of 2016, the number of gulls on Cooking Lake was exceptional, perhaps as high as ten thousand. Other migrating waterbirds, including avocets, were passing through

in numbers that were difficult to count on the deeply incised bays of this productive lake. All of these winged beauties, that delight our eye, depend on a much, much larger food base of lowly creatures – the bugs – which are so numerous as to be beyond our comprehension.

If you like more information on the birds of Cooking Lake, the following publications are available in pdf format by emailing ddekker1@telus.net.

- ¹ Birding highlights at Cooking Lake, 2009-2010. Parkland Naturalist, Autumn 2010.
- ² Cooking Lake from algae to eagles/ The Golden opportunity of Golden ranches. By Dennis Baresco. Nature Alberta, Winter 2011.
- ³ Birding highlights at Cooking Lake in 2009 and 2010. Nature Alberta, Winter 2011
- ⁴ Watching peregrines at Cooking Lake. Parkland Naturalist, Spring 2012.
- ⁵ Four years of bird surveys along the changing shores of Cooking Lake. Parkland Naturalist, Spring 2013.
- ⁶ Avian botulism kills shorebirds and raptors at Cooking Lake. Parkland Naturalist, Winter 2015.

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The Adaptive Significance of Formation Flying in Canada Geese

BY JIM BROHMAN

Canada Geese (Branta canadensis) are well known for their irregular V-shaped flight formations during their biannual migratory journey.

They breed from the Arctic right through the temperate regions of North America and winter south to Florida, the Gulf Coast and Northern Mexico. From the time of nesting to the time of migration, goslings have approximately 6 months to

prepare for the perilous journey. The purpose of this paper is to review the literature on the benefits of formation-flying in Canada Geese and comment on the need for future research in this fascinating area of biology.

Canada Geese have many anatomic adaptations for sustained flight including wings with specialized flight feathers, a streamlined body (which minimizes drag), a modified skeletal system that provides tremendous strength and lightness and large flight muscles that attach to an enlarged keel (part of the sternum). Physiologic adaptations include a highly efficient respiratory system that provides large quantities of oxygen to the working muscles and the ability to process stored lipids rapidly during sustained flight (Weber, 2009). According to work by McLandress and Raveling (1981), Canada Geese enhance their body weight by 25% to 36% prior to migration in males and females respectively.

However, despite these adaptations, mortality during migration is still high in geese (around 35%) especially in



**IN A MATTER OF MONTHS, GOSLINGS
WILL BE JUVENILES; BUT FOR NOW...**

JIM BROHMAN



THE TYPICAL V FORMATION. JIM BROHMAN

adolescent birds (Menu, 2005). Possible causes of mortality include predation, hunters, a suppressed immune response, starvation, dehydration, and extreme exertion (Owen, 2006). It has been speculated for many years that birds invoke behavioral strategies which maximize their survival. One of these strategies is flying in V-formation commonly seen in waterfowl (including Canada Geese) during migratory flights (in local flights, Canada Geese fly in horizontal or vertical lines) (Baldassare, 2004). During

formation flying each bird flies slightly above and to the right (or left) of the bird in front of it. According to Hepner (1985), the angle of the V-formation can vary from 24 degrees to 124 degrees. Since the visual field of Canada Geese is 135 degrees, as long as the angle of the formation is greater than 29 degrees then each bird in the flock can see every other bird in the echelon including those behind it (Baldassare, 2004). So besides energy conservation, another possible purpose of flying in

V-formation may be for the flock to maintain visual contact with each other and to communicate (both necessary for flock cohesion and navigation).

It wasn't until 1970 that two aerospace engineers, Lissman and Shollenberger, outlined the precise **aerodynamic forces** that could produce an energy savings in birds flying in formation. The main premise of their theoretical work had to do with the pressure difference between the upper side of a bird's wing (low pressure zone) and the lower side of



the wing (the high pressure zone). This pressure difference cannot be sustained beyond the wingtips during flight so circular patterns of rotating air (called vortices) are formed. These vortices generate an up-wash at the end and behind the wing and a downwash directly behind the bird (Cutts, 1994; Portugal, 2016). So birds flying behind and to the side of the preceding bird are buoyed up! According to Hainsworth (1987), formation-flying Canada Geese have an energy savings of approximately 36% compared to flying solo (based on a mathematical model). The theoretical maximum energy savings is much higher but due to less than precise wing tip spacing, the savings is less. This is in contrast to a bird flying at the apex who has little or no energy savings.

Then in 2001, Weimerskirch was the first researcher to **empirically** demonstrate the energetic benefit of flying in V-formation. He fitted White Pelicans (*Pelecanus onocrotalus*) with heart rate monitors and trained the human-

imprinted birds to follow an ultra-light aircraft (or boat) while flying in V-formation. He showed that the heart rates and flapping frequencies were 11% to 14% lower when flying in formation compared to flying alone. With the advancement in electronic technology, Portugal et al. (2014) fitted 14 human-imprinted Northern Bald Ibises (*Geronticus eremite*) with “bio-loggers” while the birds followed an ultra-light aircraft. The investigators reported that when the birds flew in V-formation they flew primarily within the up-wash zone. Furthermore, birds in the echelon flapped in synchrony with the preceding bird thus maximizing the up-wash benefit. They also observed that if birds were caught in the downwash zone (directly behind the preceding bird), they changed their flapping so that they were doing the opposite of what the bird in front was doing, which, according to the researchers, may minimize the downward force.

According to Portugal et al. (2014) the Ibises changed the

lead position regularly; however, evidence for this behavior in Canada Geese seems to be lacking. Having observed many flocks over the years the author has never observed lead-switching nor have some local biologists who are experts in the field (casual conversation). However, this lead-changing behavior is widely reported in the non-scientific literature (including “The Cornell Lab of Ornithology” and Wikipedia on the topic of Canada Geese). Sustained observation from the ground of migrating Canada Geese only provides a glimpse of flocks covering great distances so it is possible that lead switching could occur along the journey (perhaps at rest stops/feeding grounds along the way).

Formation flying in birds is easy to observe, yet challenging to study. With the advent of new technologies such as “bird cams”, “data loggers” and drones there is the potential to answer scientific questions about V-flight formation in Canada Geese; however, these devices may cause undue stress on birds that are already under



immense stress. Conversely, it may be possible to do an observational study by “citizen scientists” armed with video cameras on tripods to photograph numerous Canada geese flocks flying in V-formation and analyze the footage for lead-changing and wing beat synchrony (this project could then be applied to other species of waterfowl).

Perhaps future research will demonstrate that the apex bird does not switch the lead since they are either an alpha male

or alpha female, are in superb physical condition, experienced navigators, pace-setters and are demonstrating a form of altruistic behavior.

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THE VERTICAL LINE FORMATION OF A “FEEDING FLOCK.” JIM BROHMAN

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A MIXED FLOCK OF GEESE – GREATER WHITE-FRONTED, SNOW AND CANADA GEESE – FEEDING. JIM BROHMAN



A Tribute to Wayne Nelson

BY STUART HOUSTON

WAYNE NELSON ON A TYPICAL SUMMER'S DAY! MARY MACARTHUR



In 2003, R. Wayne Nelson, with his wife Alora and his friend Rick Morse, began their study of vultures in Alberta. Wayne first collected photos of vulture nestlings of known age. His book, Turkey Vultures: a Photographic Guide for Aging Nestlings, was published as Alberta Species at Risk Report No. 124 in February 2009.

This book, the first step in Wayne's 12-year study, was the first major contribution of Wayne, Alora and Rick, with occasional help from Lloyd Kunas and David Moore in Edmonton, and from Pres Winter, who lives at Viking, closer to the centre of maximum Alberta vulture nest density. Once the book was in the printer's hands, Wayne turned his attention to wing-tagging vultures.

When Wayne began wing-tagging in 2008, after a see-one-do-one experience in Saskatchewan, his area extended east from Athabasca on the northwest and Stettler at the southwest, east to the Saskatchewan boundary. The densest collection of vulture nests was north of the Yellowhead Highway from Two Hills and St. Paul to Bonnyville. Rick Morse already had a raptor banding permit for Alberta, whereas Wayne's permit was chiefly for banding Peregrine

Falcons in Haida Gwaii, so Rick's Alberta raptor permit was used. Wayne published superb newsletters to share his findings with his nest finders; each had an updated map of old and new vulture nests. This was superior reporting to band finders compared to what was done by vulture banders in neighbouring Saskatchewan.

Wayne's fine explanatory article about wing-tagging vultures appeared in Nature Alberta in Spring 2010. Excellent photonews stories appeared in the Edmonton Journal by Hanneke Brooymans on August 24, 2009, and another undated by Greg Southam, and Mary MacDonald of the Camrose bureau appeared in the farm newspaper the Western Producer, on August 22, 2013. During seven years of wing-tagging, Wayne and Rick tagged 278 vultures in 154 nests, expending a great deal of time, effort and gasoline, a very expensive hobby for any bander!

In 2016 Wayne was stricken with an extremely rare neurological disease that has slowed him up and discourages him from driving a vehicle. To save as much as possible of the scientific data from follow-up of vulture nests that Wayne would have collected if in good health, the Turkey Vulture Tracking Fund of Nature Saskatchewan has now been extended to offer Albertans the \$100 rewards already offered in Saskatchewan. Most of the Alberta-tagged vultures are old enough to breed. We are certain that some of the breeding vultures in both provinces carry a wing tag, because we have identified eleven of them in Saskatchewan, breeding between 4 and 11 years of age, at distances of 17 to 303 km from their natal nest.

Rick Morse has responded to a need to take Wayne Nelson's place.

The Nelson-Morse directory of new Alberta vulture nests will continue in Alberta, but will concentrate on recording those vultures carrying wing-tags; some will be distant from any known deserted house, but are welcome information, and

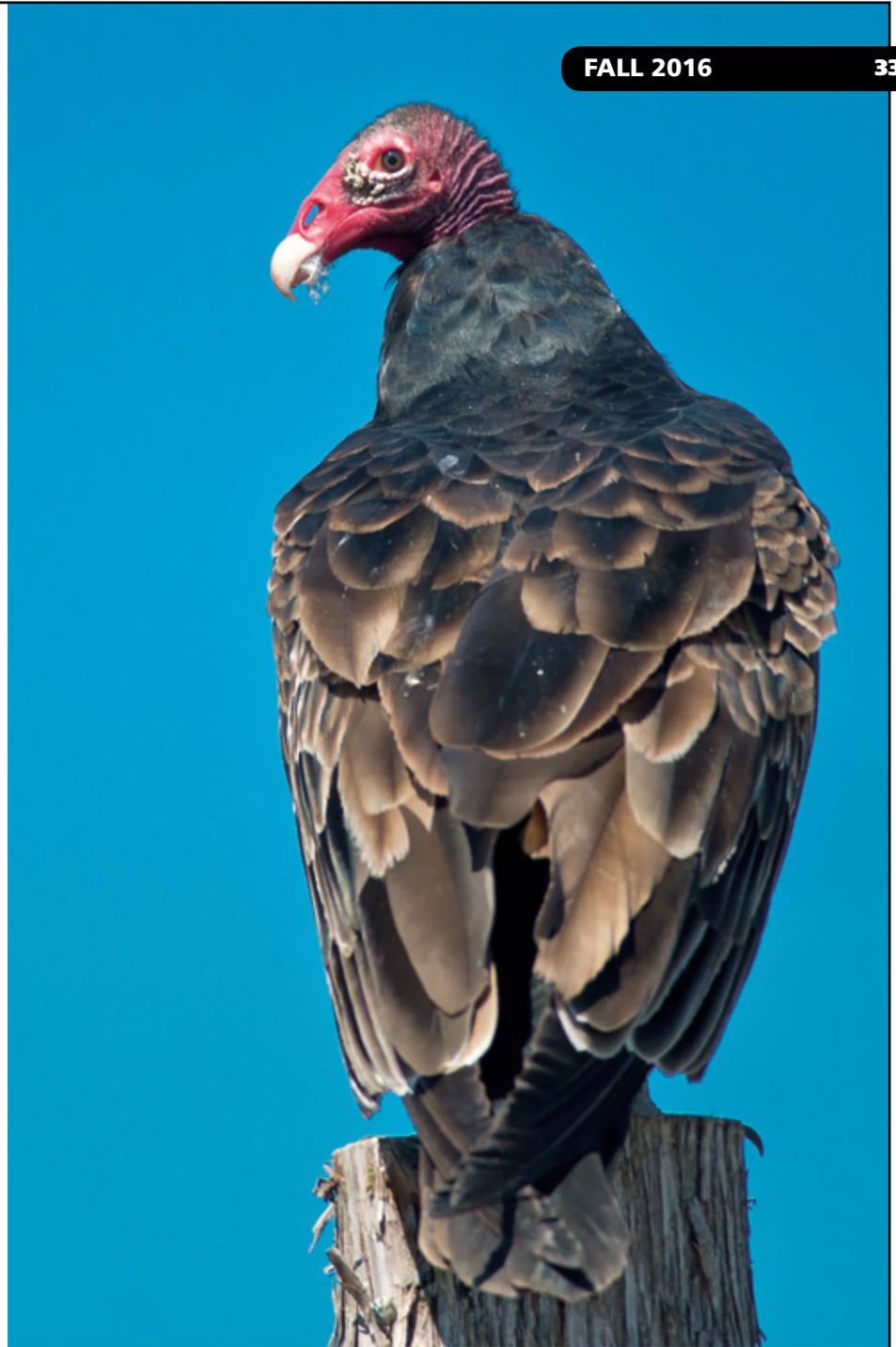
others will be breeding within a known deserted house. Please never go into a deserted yard or house alone; do so only with a companion who remains outside the building whenever presence of young vultures is sought or a trail camera is being placed.

If a wing-tagged vulture is reported, the distance from its natal nest and its location will then be calculated and shared with the finder. Often the tag number is not clearly read as the vulture flies away. If appropriate, Rick will place a Trail Camera provided by the Saskatchewan Turkey Vulture Tracking Fund, in the nest to record for four days and four nights, recording the tagged vulture and its mate feeding their young. Any new tagged vulture feeding young generates a \$100 reward to the finder. Saskatchewan considers this as an appropriate tribute to Wayne Nelson since his own visits to nests were cut short by illness.

If you know or learn of, any wing-tagged vulture in Alberta that failed to reach Wayne and Alora, especially throughout the year 2016, and in the years to come, please report it directly to:

Rick Morse
ricmorse@shaw.ca
 8 Gaylord Place
 St. Albert AB T8N 0S8
 Residence Phone 780-459-8381.

In Saskatchewan
stuart.houston@usask.ca
 863 University Drive
 Saskatoon SK S7N 0J8
 Telephone 306-244-0742,
 but not after 9 pm please; Stuart is 89 years old and goes to bed early.



We also hope to determine whether, and to what extent, presence of a wing tag may perhaps reduce the breeding success of the vulture wearing the wing-tag. Such evidence (J. Ornithol 154:1-11, 2013) has been compiled in the Ph. D. program at the University of New Brunswick by Sarah

Trefry, the daughter of Phil and Helen Trefry who worked with the Peregrine Falcon breeding project near Wainwright and now have semi- retired near Tofield. Please watch for vulture nests and wing-tags throughout the next six years.

Charley's Nature Notes:

Conks

BY CHARLES BIRD

Much of my research time this past year has been devoted to documenting the fungi of a number of natural areas in south-central Alberta.

Many fungi have annual fruiting bodies and show up only in the warmer weather from late spring to fall. Now, with the advent of snow and the cold of winter, almost the only ones that we can find on a hike are the perennials that show up on the trunks of trees. This "nature note" is about one of these.

Here in south-central Alberta, many of us live in the Aspen Parkland, the blend zone between the Prairie and the Boreal Forest. Aspen is our commonest tree. Most older aspen are parasitized by this fungus. It gains access through airborne spores landing on a branch scar, then developing and moving into the heartwood where brown rot occurs. This fungus is, therefore, one of nature's cleanup crew by

helping to return older and dying trees to organic soil.

This Conk or Bracket Fungus occurs on the sides of aspen trees, often around eye level. It is easily recognized by its hoof shape, the top of which is rusty brown then black and cracked while the lower side has a white rim and a grey lower side. On close examination, the lower side is covered with a multitude of tiny pores from which spores are produced and liberated to be dispersed by air currents. If one were to vertically section the conk, one would see a series of spore layers, each representing a year's growth.

While many fleshy mushrooms are edible, this fungus is not. Its common name comes from the fact that Conks knocked off a tree can be used to help start a fire.



Phellinus tremulae was formerly included in *P. igniarius*. The latter is now understood to primarily be found on willows.

Many "mushroom" books leave out the perennial, non-fleshy species. If you want to learn more about this one look up the following - http://www.mushroomexpert.com/phellinus_tremulae.html. You can also find it in Yasu Hiratsuka's "Forest Tree Diseases of the Prairie Provinces" and in Roger Phillips' "Mushrooms and other Fungi of North America".

Winter may be here, but there are still many things to see on a hike.



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.

Charley's Nature Notes:

Richardson's Ground Squirrel or Gopher

BY CHARLES BIRD

I was looking over some hilly, native short-grass, pasture land east of Arrowwood, Alberta on November 4 with my son Art when, much to my surprise, I realized that we were being watched by a gopher which was crouched at the entrance to its burrow.

This was a very odd sighting as the individuals are rarely seen at this time of year; gophers normally go into hibernation in their burrows during the late summer or early fall.

“Gophers” – actually, Richardson's Ground Squirrel (*Spermophilus richardsonii*) - are rodents that are around

30 cm (12 in) long. Males are longer and heavier than females. They range in color from rusty to buffy brown. They generally occur in colonies in areas where the grasses are short. Their burrows usually have a rim of excavated dirt. When predators are sighted, they have a chirp for aerial danger or whistle-like call

for a ground predator. They go into solitary hibernation in late summer and emerge, males first, when bare patches show up as the snow melts. Females emerge later, are bred soon after and after a gestation period of about 23 days, 6-8 pups are born.

NEAR STETTLER AB. CHARLES BIRD





NEAR ARROWWOOD AB. CHARLES BIRD

During the spring and summer, gophers eat the leaves, flowers and seeds of various grasses and herbs. They later cache seeds for use when coming out of hibernation.

Many farmers with “gophers” in their fields or pastures, have an annual spring ritual of going “gopher shooting” or poisoning. Early poisons were dangerous as predators that consumed poisoned gophers could be killed. Less dangerous poisons are now being promoted.

Thirteen-lined Ground Squirrels are more slender, have 13 whitish stripes down their backs, occur in taller grass areas, are more solitary and have burrows without a noticeable rim of excavated dirt. Franklin’s Ground

Squirrels are larger, darker, have bushier tails and occur in wooded areas. Prairie Dogs are larger, more colonial, have larger rims of dirt around their burrows and are found from extreme southern Saskatchewan south to Texas.

These ground squirrels are a major food source for Swainson’s and Red-tail Hawks, which are often called gopher hawks or Buteos, and also for Badgers and Coyotes.

As much of the prairies and Aspen Parkland have been cultivated, current cultivation methods with large machinery have tended to limit gopher colonies to fence lines. Coincidentally, that is where many badger holes are found.

The sighting of a gopher at the side of a road is one of our first harbingers of spring. Gophers are found only in North America, where they occur, primarily in prairie areas of the northern Great Plains, from Alberta east to Manitoba and south to Montana and South Dakota.

You can learn more about these interesting mammals by going online and clicking on https://en.wikipedia.org/wiki/Richardson%27s_ground_squirrel. You can also read the excellent accounts in Naughton’s, 2012 book “The Natural History of Canadian Mammals”, Pattie & Fisher’s, 1999 “Mammals of Alberta” or Dewey Soper’s, 1964 book, “The Mammals of Alberta”.

Up Close Naturally: A Cozy Place to Spend the Winter

BY MARGOT HERVIEUX

I have bugs in my house. Not problem bugs or dangerous bugs, just creatures looking for a safe, cozy place to spend the winter.

Most bugs survive the cold as eggs or pupae but some over-winter as adults. Flies, beetles, wasp queens, and even some butterflies and moths simply snuggle under the leaves or into a bark crevice and freeze solid. Increased sugars in their blood act as antifreeze and prevent tissue damage.

Sometimes the search for the perfect hibernation spot leads insects and spiders into our homes. One of my favourite fall house guests is the Two-spotted Ladybeetle. They venture indoors in search of a place to hibernate and often end up on windowsills. They will also appear during mid-winter when it is too cold to send them back outside. If you are willing to let one stay, put it in the coolest part of your house so it can go back to sleep.

Children often call Two-spotted Ladybeetles babies because of their size but baby ladybeetles look more like strange caterpillars. We actually have over 35 different species of ladybeetle in Alberta and they are

easily distinguished by the pattern and number of spots. These days, the most common is the Seven-spotted Ladybeetle, which was introduced from Europe.

Another common fall visitor is the tiny, Many-plumed Moth, named because of its feather-like wings. This little guy hibernates in cracks and crevices and often ends up in houses. They don't need to feed during the winter and I usually have one or two survive indoors all winter long.

Spiders that enter our homes in search of a winter retreat often find good pickings. Some, like the fast-moving Wolf Spider, don't build webs but actively hunt down insect prey. In contrast, House Spiders make their presence known by filling dark corners with cobwebs.

Firewood can be another source of unexpected winter visitors. Wood boring beetle larvae make galleries in old wood and then pupate in their chambers under the bark. The warmth of your house signals the change to adulthood and you may suddenly find a big, often



TWO-SPOTTED LADYBEETLE. WIKIPEDIA.ORG



WOLF SPIDER. WIKIPEDIA.ORG

iridescent, beetle flying inside on a January day.

Another accidental visitor to our basements is the centipede. These multi-legged predators prefer to prowl through the leaves of your garden but they do occasionally slip through a crack and end up inside. They do not cope well in our dry environment, however, and more often than not you will just find an empty carcass.

Insects and spiders don't usually intend to come indoors but are attracted by the heat as the days get chilly. Not everyone is willing to leave the creatures be, but the discovery of a ladybeetle in February turns many thoughts to spring.



CENTIPEDE. WIKIPEDIA.ORG



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

Wildlife! Starring...

The Rough-legged Hawk: a Familiar Fall Visitor

BY BROOK SKAGEN

As the crisp autumn air makes its timely arrival, many of our feathered friends take flight to the warmer climates of the Caribbean, South and Central America, United States, and Mexico. But to some birds of Canada's far north, Alberta's frigid weather is a warm welcome.

The Rough-legged Hawk (*Buteo lagopus*) is a common winter migrant through the province, often seen perched atop telephone poles or fence posts of the open prairie in search of small rodents. A Holarctic raptor,

the Rough-legged Hawk typically travels through Alberta from its Arctic breeding grounds, though it has been documented overwintering in parts of the province. The large buteo's name is derived from its fully feathered

legs, of which the Ferruginous Hawk and Golden Eagle are the only other North American raptors to possess.

Like other raptors, plumage can vary greatly between light and dark colour morphs. However, the Rough-legged Hawk is our only buteo to display

sexually dimorphic plumage, with females typically having pale heads and dark belly patches, while males appear more mottled. Their highly variable appearance may lead to misidentification between other species, such as juvenile Swainson's Hawks (*Buteo swainsoni*), though temporal overlap in range between both species is rare. Winter distribution has also been found to vary between sexes, with adult males tending to winter further south than females. Canadian populations are best monitored by the Christmas Bird Count, which has shown relatively little change overall since the 1970s, though



A DARK-MORPH ROUGH-LEGGED HAWK. KEN ORICH



THE DARK TERMINAL BAND HELPS DISTINGUISH THE ROUGH-LEGGED HAWK FROM OTHER RAPTORS. KEN ORICH



THE MOTTLED PLUMAGE OF MALE ROUGH-LEGGED HAWKS CAN APPEAR QUITE SIMILAR TO THAT OF A JUVENILE SWAINSON'S HAWK.

KEN ORICH

reproductive success and regional wintering populations are known to fluctuate with prey abundance.

While most of our avian species retreat south to warmer climates, Arctic species such as the Rough-legged Hawk are well adapted to winter life. The Rough-legged Hawk is a joy to watch gracefully soaring above the winter prairie landscape, and is a welcome addition to Alberta's winter diversity.

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Mark Boyce

awarded Miroslaw Romanowski Medal

FROM THE WILDLIFE SOCIETY, OCTOBER 28, 2016



The Royal Society of Canada named Mark Boyce, a Wildlife Society fellow and Past President of the Canadian Section, as this year's recipient of the Miroslaw Romanowski Medal.

The award honors scientists who help solve environmental problems through research. Boyce, who works on statistical models that link the study of wildlife populations to the environments where they live, has made major contributions to the field.

"If you're going to conserve clapper rails, or you're going to conserve spotted owls or you're trying to have a conservation program for ferrets, the first thing you think about is ensuring habitat," said Boyce. "That's been, I think, my major contribution — that connection between habitats and populations."

Boyce is a population ecologist at University of Alberta, holding an endowed chair as the Alberta Conservation Association Chair in Fisheries and Wildlife. He has tackled a wide range of

questions relating to wildlife and habitats, from whether wolverines (*Gulo gulo*) need snow cover habitats, to how pronghorns (*Antilocapra americana*) respond to oil development. His theoretical work enables researchers to predict and quantify how species will react to specific environmental changes.

Boyce's research has led to concrete benefits for wildlife. For example, he and his colleagues modeled critical habitat of the greater sage-grouse (*Centrocercus urophasianus*), an endangered species in Canada. When the Canadian federal government failed to use Boyce's research to identify critical habitat in its recovery plan, Boyce joined a lawsuit against the government.

"We won," said Boyce. "They had to hire a bunch of staff to

actually implement our models and roll them out across the distribution of sage-grouse in Canada." Now, says Boyce, an emergency protective order prevents oil and gas companies from developing critical sage-grouse habitat, and the birds' population is growing every year.

Such triumphs make it clear why The Royal Society of Canada chose to bestow its environmental award on Boyce. They notified him by email in late summer, and will present the medal to him in an award ceremony in Kingston, Ontario on Nov. 18.

"I was very pleasantly surprised," said Boyce. "It's a very nice honour."

CELESTIAL HAPPENINGS

Starry Nights

Winter: December to February

BY JOHN MCFAUL

FEATURED CONSTELLATIONS: THREE C'S OF THE SOUTHERN SEAS

On a cold winter's night one can be forgiven for dreaming of walking a secluded beach on a south sea island with the gentle lapping of the waves against the shore and the palm trees swaying to the rhythm of a gentle breeze. During the day the sparkling waters beneath the tropical sun entice you to go for a dip. At night you can dip your imagination into the star studded sky above.

The early European explorers of the southern seas did just that as they conjured up constellations from the stars of the austral skies. Perhaps the most famous is the constellation Crux also known as the Southern Cross. It appears on the flags of five nations. Three other southern "C" constellations can also be located by diligent stellar enthusiasts.

Near Crux is the bright star Alpha Centauri which is part of a multiple star grouping that is closest to the Earth at only 4.3 light years (about 43 trillion km). Just east of Alpha Centauri lies the constellation Circinus – The Compass. It is a triangle of moderate faint stars that the 18th century astronomer Nicolas Louis de Lacaille used to depict the tool that draftsman use to make circles. It could also be used to determine distances on navigation charts.

Of note in this constellation is the x-ray binary star Circinus X-1. It is a star that exploded as a supernova and then collapsed to form a neutron star. A neutron star is thought to be made up entirely of neutrons and is about 20 km in diameter, but with a mass 1.5 times that of the sun. Thus a teaspoon of the star would weigh

about 10 million tons on earth. The supernova explosion that formed the star is thought to have occurred about 4600 years ago.

Below the Crux lies the constellation Chamaeleon – The Chameleon. It was first described by the Dutch astronomer Petrus Plancius in 1597. The early explorers marveled at how this creature could change colour to match its surroundings and shoot out its tongue to capture prey. In fact, perhaps to entice the celestial chameleon, the constellation Musca – the Fly is found nearby.

The third C of the group is Columba – The Dove. It is another constellation



established by Petrus Plancius. He originally called it Columba Noachi after the dove that brought back an olive branch to Noah to show that the earth had dried after the flood. In this regard it is placed near the constellation Puppis – The Stern which was once part of the former constellation Argos Navis. This was named after the ship that Jason and the Argonauts used to find the Golden Fleece. From Alberta during the mid-evening hours of February, Columba may be seen flying just above the southern horizon a little to the right of the hind feet of Canis Major.

CELESTIAL HAPPENINGS

Sun: Rise – Dec. 1 (08:28 MST), Jan. 1 (08:50 MST), Feb. 1 (8:18 MST)
Set – Dec. 1 (16:18 MST), Jan. 1 (16:26 MST), Feb. 1 (17:17 MST)
Times are for Edmonton. Winter Solstice occurs at 3:44 AM on Dec. 21.

Moon: Full – Dec. 13, Jan. 12, Feb. 10
New – Dec. 28, Jan. 27, Feb. 26

Planets: **Mercury** may be seen very low in the SW evening sky during the middle of December. It becomes a morning object in the SE shortly before sunrise by mid-January with Saturn nearby. The waning crescent moon is close by on January 25th.

Venus is to be seen in the SW sky in the early evening hours throughout the winter months. It will be the brightest star-like object. From early January through February it will be a little SW of reddish Mars. The moon will join this twosome on January 1st and February 28th.

Mars begins the winter months in the evening sky some 20 degrees above the SW horizon. At this time it will be in the constellation Capricornus. It then gradually passes through Aquarius to finish up in Pisces by the end of February. Saturn will be nearby during January and February. Uranus will be about 1 degree to the NE on February 25th.

Jupiter is to be found in the constellation Virgo near the bright star Spica. It will be a morning object in the SE at the start of December and will finish up in the SW by the end of February.

Saturn is a morning object low in the south eastern sky in early January. The moon will be nearby on January 24th and February 20th.

Meteor Shower: Watch for the Geminids on December 13th and the Quadrantids on Jan 3rd.

The rate of meteors observed is for dark skies well away from city lights and with no Moon.



CPAWS Southern Alberta Recognized

The Canadian Parks and Wilderness Society, Southern Alberta (CPAWS SAB) received the Canadian Network for Environmental Education and Communication (EECOM) award of excellence for Outstanding Non-Profit Organization for environmental education August 27.

Each year, EECOM recognizes outstanding individuals and organizations that have made significant contributions to environmental learning across Canada. This work is critical to ensure Canadians are environmentally literate, engage in environmental stewardship and contribute to a healthy, sustainable future.

“We are honoured to receive this prestigious national award,” said Anne-Marie Syslak, Executive Director. “Connecting with and

understanding the natural world is integral to foster appreciation and caring for the environment.”

Since 1997, CPAWS Southern Alberta has offered school programs for youth, workshops for adults and interpretive hikes in nature for grades 3 to 12. Their conservation programs focus on trees and forests, water, parks and wilderness, and species at risk like grizzly bears. Their unique programs combine classroom visits with outdoor learning and environmental stewardship. This

has proven to be a successful model. In 2008, they won an Alberta Emerald Award for their efforts. Each year, CPAWS SAB delivers more than 300 programs to over 5000 participants. In 2015, they hit the landmark number of reaching more than 100,000 participants with environmental education programming.

CPAWS provides educational programs for school groups, educators, community groups and new Canadians. For more information, visit [CPAWS Environmental Education](#).

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**SNOW GEESE MIGRATE IN SPECTACULAR FLOCKS;
SEE STORY, PAGE 14.** LEE KARNEY, USFWS 2007



**ROUGH-LEGGED HAWKS;
SEE WILDLIFE STARRING, PAGE 36.**
KEN ORICH

Nature gallery



TWO DEER...WELL CAMOUFLAGED! LEE KARNEY, USFWS 2007



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