

Monitoring Health in a Declining Muskox Population: Challenges and Solutions in the Remote Arctic



A herd of muskoxen in Northern Canada (Parks Canada)

28

Feb. 2019

7:30 pm

Kerry Wood

Nature

Centre

Red Deer

Dr. Fabien Mavrot's current research project focuses on improving our understanding of muskox health in the Canadian Arctic. He uses a participatory approach, combined with hunter-based sampling, to gain insight on epidemiological processes possibly impacting muskox populations.



Above photos by Dr. Fabien Mavrot



Dr. Fabien Mavrot

Dr. Fabien Mavrot currently works at the University of Calgary Veterinary School. He is a Swiss Veterinarian with a strong interest in wildlife and epidemiology. He wrote his Veterinary thesis on infectious keratoconjunctivitis in Alpine Ibex and Chamois at the Center for Fish and Wildlife Health, the University of Bern. Dr. Mavrot subsequently completed a PhD on gastro-intestinal parasites of domestic ruminants at the Section for Veterinary Epidemiology, University of Zürich.

General Meeting/
Refreshments 7:30 PM
Speaker 8:00 PM

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SEASONAL SIGHTS AND SOUNDS OF ALBERTA: ENDOTHERMIC STRATEGIES IN COLD ENVIRONMENTS

By Dr. Sally Stuart

Struggling up the hill on cross country skis—despite the minus 15C temperature—I am sweating profusely. Acutely aware of how much heat I am producing (muscle contraction is a superb heat generator), my mind strays to the evolution of endothermy. Endothermy, which is the ability to generate internal heat to regulate body temperature, is a trait exhibited in both birds and mammals. Interestingly, it evolved millions of years ago, independently and in different groups of ancestral reptiles.

Endotherms, especially homeotherms (organisms that maintain a consistently warm temperature with little variability) have many advantages over those that cannot regulate their body temperature. The most obvious of these advantages is the ability to remain active despite declining environmental temperatures. However, the huge metabolic (energy) requirements of being an endotherm presents significant challenges for those living in cold northern climates, especially in the winter when food supplies are often limited.

In order to survive, endotherms have evolved to either migrate south (e.g., some birds) or have perfected both behavioral and physiological mechanisms to prevent heat loss and conserve energy. Insulation is one of the most effective ways to prevent heat loss, so many animals grow a thick pelage in the winter.

Apparently, wolves grow coats which are so thick they do not shiver even on really cold nights (Bernd Heinrich).



Small mammals (e.g., mice, voles and shrews) can live beneath the snow in the subnivean zone where they make nests and forage on stems of plants and bark around trees.

Studies on the tiny masked shrew (*Sorex cinereus*) have shown that this little 4-gram mammal burrows beneath the leaf litter where, even when ambient temperatures are -29C, the temperature below the snow can be -4C under the snow and as warm as 1C in their tunnels. Small birds such as chickadees must literally eat their own body weight during the day, burning off this fat on cold nights. They also undergo a form of hypothermia, where at night they drop their body temperature from a normal temperature of 40C to about 30C.

Hibernation is one of the most complex, fascinating yet least understood strategies used by endotherms. True hibernation (according to classic text book examples) is only used by small animals, probably weighing less than 5kgs. Prior to hi-

bernation, animals must gain a huge amount of weight. During hibernation, energy is conserved because the body temperature and metabolic rate are reduced and blood flow is centred in the core. Some hibernators drop body temperature almost to freezing. A curious feature is that they undergo periodic arousal. A classic example of this can be seen in the Richardson's ground squirrel, where researchers have found that arousal happens every 14-19 days. During arousal, the animals warm up from 3C to 17C, stay there for a few hours, and then return again to hibernation temperatures. Arousal seems like an odd strategy as it requires huge amounts of energy and the reasons for it are still being debated. One theory is that they need to urinate in order to eliminate toxic urea, which has accumulated in their system from the breakdown of proteins.

Dormancy in bears is probably the most interesting example of hibernation. Prior to hibernation, bears must make or find a suitable "den" in which to hibernate. A unique opportunity to view this is provided by the video posted on Discovery Wildlife Park Facebook "When will Berkeley hibernate," showing a two-year old grizzly bear making the final preparations to her winter den. Bears hibernate for many months (brown bears for as long as seven months), during which period they do not eat, drink or urinate. Body temperature and metabolic rate decrease by a minimal amount—temperature decreases from 37C to 31C and the metabolic rate decreases to about 25% of normal. Their heart rate decreases from 40 to 8-10 beats per minute.

Hormones play a major role in hibernation, with leptin suppressing appetite and cortisol increasing, perhaps to enhance lipid mobilization. Despite these adaptations and many others, bears may lose up to 37% of their weight during hibernation. Incredibly, during this period bears do not experience muscle or bone loss: they literally arouse from hibernation and start exercising! However, the challenges faced by male bears are minor compared to those of female bears of reproductive age. Utilizing delayed implantation of the fertilized egg, gestation, parturition and lactation all occur during hibernation. According to Oftedal (1993) a black bear cub requires 11 kg of milk over 12 weeks to gain 2-5 kg. If she had a litter of three, the female would have to produce 33 kg of milk! Although she has no access to food and water, the female is able to compensate for some of the energy and fluid requirements by eating her cubs' feces.

Although a long, cold Alberta winter can be daunting for humans, it provides us with unique opportunity to learn a little about our smallest endotherms. After the next fresh snow fall, look for and follow some of their tiny footprints, and marvel at their ability to survive the cold winters.



CHRISTMAS BIRD COUNT 2018

JUDY BOYD: COUNT COORDINATOR

The Christmas Bird Count was held on December 23, 2018. We had 101 observers (up from last year's 90) record a total of 44 species (down from last year's 47) and 6311 individual birds (down slightly from last year's 6389.) The highest number of species recorded since 1986 happened in 2004 with 61 species and the highest number of individual birds recorded was in 2005 with 14,540 birds counted.



Walked: 31.25 hr, 51.19 km.
Driven: 55 hr, 1918.5 km
Feeder watched:
109 hours 55 min.
Snowmobiled: 2 hr, 2.7 km
Horseback: 1.5 hr, 6 km
Temperature: -3 to -14°C
Wind speed: 0 to 40 km/hr
Wind direction: variable
Snow cover: 5-18 cm

Colleen Anderson, Phillip Anderson, Larry Bablitz, Lorraine Bannister, Kevin Bannister, David Bannister, Rebekah Bannister, Bill Barritt, Karin Bjorge, Myron Bjorge, Ron Bjorge, Judy Boyd, Larry Boyd, Lois Burkinshaw, Phil Burkinshaw, Colleen Caddy, Jerry Caddy, John Caddy, Ed Cameron, Sandra Cameron, Wally Cameron, Brian Charles, Angela Charles, Mitchell Charles, Wyatt Charles, Dale Christian, Vern Connelly, Dave Cook, Gordon Davis, Leo de Groot, Marg Dewald, Morris Flewwelling, Mary Flexhaug, Bertha Ford, Harry Ford, Eileen Ford, Jordan Ford, Laurel Ford, Stewart Ford, Robert Grey, Rick Guest, Sharon Guest, Connie Haustein, Bill Heinsen, Colin Hill, Marlene Ironside, Roy Jamieson, Carol Kelly, Grant Kelly, Keith Kline, Linda Kullman, Andrea Lash, Carol Lavold, Amy Leitch, Kevin Leitch, Rexton Leitch, Rio Leitch, Ryder Leitch, Rygaard Leitch, Joyce Lemke, Jim Leslie, Claudia Lipski, Shelley Macauley, Tim McJunkin, Hugh McKinnon, May McKinnon, Charles Meggison, Mark Meunier, Ruby Meunier, Maureen Miller, Anne Morrow-Garbutt, Sandy Murray, Dorothy Murray, Chris Olsen, Alan Partidge, Lucienne Partridge, Chantal Payne, Chester Payne, Marie Payne, Thomasina Payne, Myrna Pearman, Doug Pedersen, Larry Primus, Rose Primus, Darlene Reimche, Alisa Ritchie, Sarah Ritchie, Bernie Romanow, Dave Salomons, Everdien Salomons, Heather Saunders, Aly Seymour, Joanne Susut, Christina Struik, Harvey Sutherland, Sandra Sutherland, Rick Tallas, Bev Thompson, Diane Waldron, Althea Williams, Diane Wilton

	2017	2018
Canada Goose	96	137
Mallard	297	53
Lesser Scaup	0	1
Common Goldeneye	55	237
Common Merganser	2	1
Gray Partridge	29	60
Ruffed Grouse	19	26
Great Blue Heron	0	1
Bald Eagle	11	12
Northern Goshawk	1cw	1
Rough-legged Hawk	4	5
Rock Pigeon	680	510
Eurasian Collared-Dove	24	27
Great Horned Owl	5	7
Short-eared Owl	0	1
Belted Kingfisher	0	2
Downy Woodpecker	118	131
Hairy Woodpecker	42	52
A Three-toed Woodpecker	1	1
Northern Flicker	13	27
Pileated Woodpecker	5	14
Prairie Falcon	0	1
Canada (Gray) Jay	14	7
Blue Jay	159	200
Black-billed Magpie	468	458
American Crow	13	25
Common Raven	298	254
Black-capped Chickadee	694	939
Boreal Chickadee	69	24
Red-breasted Nuthatch	32	49
White-breasted Nuthatch	80	91
Brown Creeper	3	4
European Starling	30	19
Bohemian Waxwing	778	1297
Snow Bunting	294	121
American Tree Sparrow	7	11
Harris's Sparrow	0	1
Dark-eyed Junco	22	22
Pine Grosbeak	167	17
House Finch	49	95
White-winged Crossbill	3	99
Common Redpoll	1038	685
Pine Siskin	58	11
House Sparrow	641	548
Total individuals	6389	6311

BIRD FOCUS

By Keith Kline

RDRN is asking for members to email their bird sightings within the area covered by the Central Alberta Birding Trail map to RDRN at rdrn.nature@gmail.com. Please check to see if your bird sighting has already been recorded on the results before sending an email. Please let us know if you do not wish your name to be posted. Results can be viewed through this link on the RDRN website. <https://birdingtrailsalberta.com/central-alberta-bird-sightings-2019/> The Central Alberta Birding Trail map can be downloaded from the RDRN website. The RDRN website also has the downloadable Central Alberta bird checklist.

CENTRAL ALBERTA BIRDING TRAILS

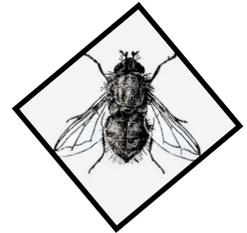
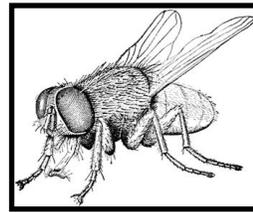


Birding Guide for Central Alberta

INSECT FOCUS

Wednesdays • KWNC
10:00 AM — 12:00 PM

February 20: *Diptera*



March 20: *Hymenoptera*

April 17: Field trip and review

May 15: Field trip

**GREAT BACKYARD BIRD COUNT:
FEBRUARY 15-18, 2019**

SUPPORT BIGHORN COUNTRY: DEADLINE FOR SUBMISSIONS IS FEBRUARY 15, 2019!
aep.bighorncountry@gov.ab.ca. You can also contact Rick Blackwood, Assistant Deputy Minister - Strategy Division — rick.blackwood@gov.ab.ca or 780 427 1139.
<https://www.loveyourheadwaters.ca/the-bighorn>

DID YOU KNOW?

By Susan Van der Hoek

Groups of deer are most commonly called herds, but can also be called "mobs" or "parcels." The last term, parcel, can also mean—according to the Oxford English Dictionary—"a small party, collection, or assembly (of people, animals, or things); ... a drove, a flock, a herd."

OXFORD LIVING DICTIONARIES



The Red Deer River Naturalists, the first natural history organization to be established in Alberta, was incorporated as a society in 1906. The objectives of the society are to foster an increased knowledge, understanding and appreciation of natural history, and to support conservation measures dealing with our environment, wildlife and natural resources.

Annual membership is \$15.00 for individuals and \$20.00 for families.

Regular meetings are held at 7:30 p.m. on the fourth Thursday of most months at the Kerry Wood Nature Centre, 6300-45 Ave., Red Deer, AB. Non-members are welcome.

Members are encouraged to contribute to this newsletter. The deadline is the last Friday of the month.

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