

Is something screaming? Uncovering the secret lives of boreal mammals with technology

Feb. 24, 2022

7:30pm - 9:00pm

RDRN Zoom Virtual Series

Join the meeting here:

Meeting ID: 833 4356 2232

Passcode: 928134

Come for an evening of Discovery into the life
of Boreal Mammals with Dr. Emily Studd



Resulting from a rural upbringing and long stints of field work in remote locations, my favourite pastime is sitting and passively watching wildlife go about their daily lives. From this has grown a fascination in how individuals respond behaviourally to environmental change and how these behavioral responses shape an ecosystem. My work strives to understand what drives the decision to be active, how activity changes in different situations, and what the implications are of that decision for a population or food web. I did my BScH at Queen's University, my MSc and PhD at McGill University with Dr. Murray Humphries, and a PDF at University of Alberta with Dr. Stan Boutin. I am currently an NSERC post-doctoral research fellow at the University of Toronto Mississauga. There, I am working with Dr. Bailey McMeans exploring the predictors and consequences of activity responses to seasonality on organisms and food webs.



Photos by Dr. Emily Studd

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Red Deer River Naturalists

DR. SALLY STUART'S "SEASONAL SIGHTS AND SOUNDS OF ALBERTA"

ENVIRONMENTAL DEMANDS, BRAIN PLASTICITY AND STRATEGIES FOR SURVIVAL IN THE WHITE-BREASTED NUTHATCH

The shortest day of the year had barely passed. It was 8:00 AM on December 30th 2021, a bitterly cold day with a temperature of -20 C. In the distance I heard the nasal "yank, yank" call of the White-breasted Nuthatch, *Sitta carolinensis*. Already these small birds, weighing about 22 grams, recognized the lengthening of the days and were reestablishing breeding territories and pairs.

According to the online IOC World Bird List (editors Gill et al. 2022), there are 29 living species in the family to which nuthatches belong, the *Sittidae*. Only two species are found in Alberta, the White-breasted and the Red-breasted Nuthatch.

Nuthatches are superb tree climbers and are the only species with a propensity for climbing head-first down the tree. Unlike woodpeckers, they do not require stiff tail feathers to brace themselves against the tree. Rather, they have long narrow toes and claws, including a particularly large, strongly curved claw on their rear-facing toe, the hallux.

Alerted to their presence by their nasal call, I am embarrassed to admit that I have never thought of the nuthatch as having much of a vocal repertoire. A scientific paper by Ritchison in 1983, identified 13 distinct calls given by adult birds, although at least four were variants of the characteristic nasal "yank, yank" (also known as the "quank" or "ank" call). Most calls are made by both sexes. The males alone have a song used for courtship and territorial defense.

The call I recorded (shown in the sonogram) is classified by Ritchison as a "rapid" quank call. In the sonogram, notice the 15 rapid, distinct notes, each one lasting about 0.1s with a typical frequency of about 2.2 kHz. The range of frequencies is quite narrow, the difference between low and high being only about 0.8 kHz. This call apparently indicates great agitation probably due to me being in the vicinity. What differentiates this and other calls is usually the speed and number of calls in a sequence.

Why do nuthatches make a variety of rather similar calls? Like most birds, some are produced by both sexes to keep in contact as they feed, others announce their arrival at the nest site, and many are alarm calls elicited when predators or rival nuthatches are in the vicinity.

A fascinating study by Lucas et al. (2007) looked at seasonal variations in avian hearing and found the auditory acuity of White-breasted Nuthatches (like some other birds) changes throughout the year, due to shrinking or increasing in the area of the brain associated with hearing. Unlike many other birds that hear best in spring, nuthatch hearing was most acute in fall and winter. Furthermore, they hear best at frequencies around 2 kHz, over a narrow frequency range as would be expected based on their call characteristics. The authors suggested various reasons for having enhanced hearing sensitivity in the winter. Birds generally hear best during the breeding season, probably because that is when birds tend to be most vocal. Nuthatches engage in courtship throughout the winter months, which is earlier than most birds. Other advantages included locating invertebrates hidden deep under the bark at a time when food is scarce. However, a far more important

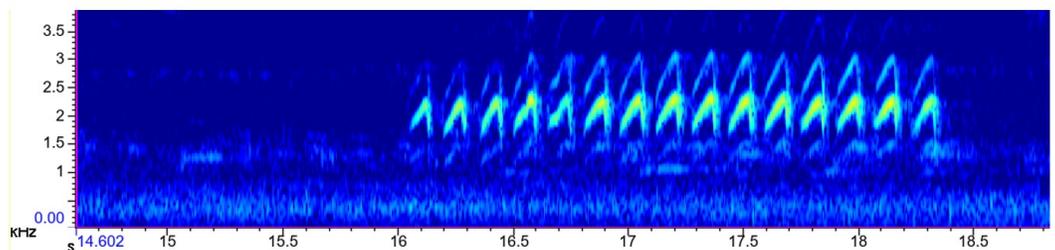
reason maybe that auditory acuity protects against predation, and would allow them to hear the sounds generated by the wings of predators. Feeding on trees, which lack concealing leaves, is very precarious. Birds are highly visible which, when combined with a limited ability to see (head down often facing the trunk), makes them particularly vulnerable. Potential predators that we see on our acreage include Northern Shrikes and Great Horned Owls.



White-breasted Nuthatches, which reside in territories year-round, are known for their hoarding (caching) of seeds to survive cold weather. D, L and K Petit (1989) studied White-breasted Nuthatches at sunflower seed feeders, mostly in Ohio. Birds always selected a single seed, and then used bark crevices to manipulate the seed while striking it open with their beak to remove the shell. They preferred to cache the seeds within 30 m of the food source, usually in the trunk (as opposed to branches) and often further concealed it with bark, lichen or moss. Interestingly, an article by William Davis (Bird Observer, 1995) observed similar behavior. Davis speculated birds were using knots like a vice and wondered if this could be considered an example of tool use.

The problem with caching seeds is you must also be able to accurately locate them when needed, a task made even more difficult when caches are concealed. Similar to humans, the paired hippocampus area in the cerebrum of the bird brain helps control tasks such as spatial awareness and long-term memory. According to Frank Gill (*Ornithology* 3rd Edition), three families of perching birds, which include nuthatches and chickadees, are prodigious seed hoarders and have larger hippocampus volumes compared to other birds. As the volume increases, new neurons (nerve cells) are added, a process known as neurogenesis. In chickadees, they found that the hippocampus volume expanded by almost 30% in autumn and winter, when seed caching is of utmost importance. The area then shrank the following spring. Growing new neurons and generating electrical messages, which neurons do continuously, needs huge supplies of energy. Despite the increased energy demands of larger brain areas, the advantage must outweigh the disadvantage. Having better hearing to detect predators and the ability to locate repositories of energy rich food items helps birds survive, breed and pass on their genes. The changes in bird brains with season are quite phenomenal, and the shrinkage noted in the spring may be to save energy and to reduce weight.

Now is the perfect time to both observe White-breasted Nuthatches and listen to their vocalizations as they engage in courtship and reestablishment of territories. Surviving the harsh environmental conditions in winter is possible because of the remarkable anatomical and physiological plasticity of their brains. Although this phenomenon is far more limited in humans, perhaps future bird brain research will lead to new treatments for human brain injury.



WOODPECKER WINDFALL! Rick Tallas lucked out while walking along the Riverbend Golf Course trail in mid-January. He spotted and was able to photograph both species of three-toed woodpeckers, which were feeding within about 10 m of each other!

Both of these woodpecker species are black and white in colour and the males have yellow crowns. Both also have the distinction of having only three toes (two forward, one back), rather than the usual woodpecker configuration of four toes (three forward, one back). Both species are year-round residents, but are also considered to be irruptive; some years, they move well south of their breeding range. They are uncommon throughout coniferous-dominated forests of Alberta and it is always a delight to encounter them. To see them both in one area, at the same time is a rare treat indeed!



Both of these species have the unique habit of flaking off bark to access hidden insects. The Black-backed Woodpecker usually targets recently burned areas but both species can be found in mature forests where dying trees and snags are abundant. They will often “work” the same tree until most of the bark has been flaked off. The bark flakes accumulate around the tree bases.



Black-backed Woodpeckers (above): can be distinguished by their solid black back and a black moustache. Their black tails have white outer tail feathers.

Three-toed Woodpeckers (right); can be distinguished by barring on the back, white wing spots, and a black face with a white line behind the eye and thin white line below the cheeks.



GREAT BACKYARD BIRD COUNT FEBRUARY 18–21, 2022

For a quarter of a century the annual Great Backyard Bird Count has been a bright spot for nature lovers. Everyone is invited to join the count, so their birds can become part of a massive database used by scientists to track changes in bird populations over time. The Great Backyard Bird Count is a joint project of the [Cornell Lab of Ornithology](#), [National Audubon Society](#) and [Birds Canada](#). “Sometimes people feel intimidated about jumping into the world of birds if they have no previous experience,” said Patrick Nadeau, president of Birds Canada. “The Great Backyard Bird Count is a wonderful way to get your feet wet, feel the warmth of the community and start to realize the wonders in your own neighborhood. The tools and resources are free. And you are helping birds when you get involved.”

Each participant counts birds for any length of time (but for at least 15 minutes) and reports what they see online. It’s easy for people of all skill levels. Participants enter a new checklist for each new location or time of day during the four-day count. There are also tools and information on the GBBC website to help new and returning birders. A webinar about how to participate in the GBBC will be held February 16 from 2:00 PM to 3:00 PM. [registration is free](#). Check out <https://www.birdcount.org/> for more information about the count.



Board Notes

By Peggy Birse, Managing Director

At the RDRN Annual General Meeting and election of officers, January 27, we welcomed the following Executive and Directors for 2022:

Rick Tallas - President
Daryl Beck - Secretary
Bob Kruchten - Treasurer
Don Wales - Director + Past President
Dean Baayens - Director
Charity Briere - Director
Anto Davis - Director
Joey Temple - Director
Rod Trentham - Director

We also welcome **Judy Brownlee**, a new volunteer on the Policy Committee. **Peggy Birse** continues as our Managing Director and Recording Secretary, and **Myrna Pearman** is the Interim Coordinator of Nature Central and the Habitat Steward program. **Shaye Hill**, our 2021 Nature Central Naturalist-in-Residence, delivered an informative presentation about Nature Central at the AGM. A copy it can be found on the Nature Central website <https://www.naturecentral.org/whats-new>.

HABITAT STEWARD



HABITAT STEWARD PROGRAM RELAUNCHED

By Myrna Pearman

We are pleased to announce that the Habitat Steward Program has been officially relaunched! Thanks to the graphic design talents of Doug Pedersen, we have our header finalized. This header (above) will be used for all Habitat Steward correspondence and will be the graphic that adorns the gate signs.

Application forms have been posted on the Nature Central website and hard copies will soon be available from the RDRN bulletin board at KWNC.

If you would like to become a Habitat Steward or renew your current participation, simply print out and fill in a form, or fill in an online form (fillable Google form or fillable PDF) and email to myrnapearman.nature@gmail.com. Links to the forms can be found at <https://www.naturecentral.org/habitat-steward-program.html>

Social Media: 588 Facebook Members, 272 Twitter Followers and 277 Instagram Followers

DID YOU KNOW: By Susan van der Hoek



A group of waxwings are known as an *earful* or a *museum*. The term Waxwing refers to the red tips of the species' wing feathers, which look as if they were dipped in sealing wax. We have two species in Alberta. Our winter resident is the Bohemian Waxwing (*Bombycilla garrulus*) [left] with a few Cedar Waxwings mixed in while our summer resident is the Cedar Waxwing (*Bombycilla cedrorum*). Waxwings are considered one of the most specialized of frugivores. Their diet consists entirely of fruit from October through May, after which they abruptly switch to aerial and vegetation-borne insects through the breeding season. Waxwings can become intoxicated by eating berries that have started to ferment.

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 PM on the fourth Thursday of most months by Zoom. 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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