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**THE NEW YEAR BEGINS
WITH A FRESH BLANKET OF SNOW
TO DRESS OUR TREES AND TRAILS**



LIFE ON THE EDGE: HOW CHICKADEES SURVIVE WINTER

by

Emily Burke, Conservation and Education Specialist

Winter is a time of extremes: freezing temperatures, a lack of food resources, and minimal daylight hours for foraging all plague many animals in the North Woods, but these challenges



are the most dire for small, endothermic (“warm-blooded”) species. Why? Because, like all endotherms (including us humans), these animals must maintain a high body temperature, but their small size poses a unique problem in two ways. First, their smaller volume to surface area ratio means they lose body heat to the surrounding cold air at a faster rate than larger animals. Second, because metabolism

increases as body mass decreases, all other factors remaining constant, more food is required to maintain body temperature. Put together, this all means the small and warm-blooded among us must work extra hard at finding food and staying warm in the frigid temps. And no animal has been more well-studied at the “how” behind this feat than a familiar backyard feeder visitor: the black-capped chickadee.



These tiny birds – often weighing less than a half ounce – have developed several adaptations for surviving the problem of winter, both physiologically and behaviorally. On the physiological side, chickadees increase their feather count by about 25% just before winter, a change that takes advantage of down’s insulating abilities, as well as the outer feathers’ wind and water resistance. Secondly, chickadees have a relatively huge hippocampus – the region of the

brain that controls spatial memory – in relation to their body size, compared to most other birds. A chickadee’s massive hippocampus allows it to cache food and to remember not just the cache locations for up to 28 days, but also more nuanced details like which caches have been pilfered by other birds and which ones contain the tastiest morsels. More impressive still, the neurons associated with last year’s caches die off every autumn to free up space for new neurons to grow to remember this year’s caches. Finally, chickadees practice something that is relatively unique in the bird world – nightly torpor, or regulated hypothermia. On particularly chilly nights, chickadees can purposefully drop their body temperatures up to 15°F below their normal daytime 108°F, allowing them to conserve up to 25% of their energy (i.e., calories) when the temperature is at freezing, and to save even more when it’s below the 32°F threshold.

Chickadees gain even more energy savings through behavioral adaptations. First, they spend a lot of time shivering by contracting their large pectoral flight muscles, which generates heat. But because this strategy also uses up a lot of energy, chickadees also forage almost constantly during daylight hours in the winter. In fact, the birds often gain more than 10% of their body weight every day from early morning to late afternoon, an amount that they often lose every night through shivering, only to start the process all over again the following morning. (This is equivalent to a 150 pound human spending a cold winter night outside and losing 15 pounds!)

To facilitate more efficient foraging, chickadees often forage in flocks in the winter, the rationale being that more eyes make finding food easier. Lastly, chickadees are strategic about where they spend winter nights, usually crammed into tiny cavities out of the wind to minimize heat loss, often emerging in the morning with quite the disheveled, “bedhead” look.

Much more than common backyard birds, chickadees are true innovators when it comes to cold weather survival. So the next time you’re huddled under the duvet or stuck like glue to the wood stove, take some time to appreciate the evolutionary wonders of chickadee winter adaptations.

The photo featured in this story was taken by Jon Alexander and submitted to the GRNA 2020 Photo Contest

STAFFING CHANGES AT GRNA

You may have noticed a new title associated with Emily Burke's name in the previous article. According to Executive Director Jenn Wright, as of January 2021, the following changes took place.

- Emily Burke accepted the newly created *Conservation & Education Specialist* position! She will be increasing her hours to full-time and has already jumped in with leading the Land Management Committee. She will split her time between education and conservation and will also take over the care and management of our volunteers.
- Betsy asked to be reduced to part-time work in 2021 to pursue her consulting work as well as to spend time with family. She will focus on donor and fund development, continue most of the marketing duties, and will work closely with Jenn to finalize plans for the next phase of boardwalk reconstruction.
- Brian continues to work around his full-time school position and is coming in mostly on weekends to check trails, groom ski trails, and complete other projects around the Center. Once school is out for the summer, Brian is hoping to pick up additional hours.

Office staff continue to work from home most of the time, but hope to get back to their office in the Antrim County building, for at least part of the time, as soon as vaccinations become more widely available.

NEW PROGRAMS FOR 2021

We have a number of new classes added to our calendar, some of which are online and free, which means you could join us no matter where you are located! We also have a series of classes through NMC Extended Education that are partially online and partially outdoors at GRNA. With the new snow we are hoping to host some ski and snowshoe programs, too!

Free Online Zoom Classes on Tuesdays



Wonders of Wildflowers

Tuesday, January 26 from noon to 1 pm

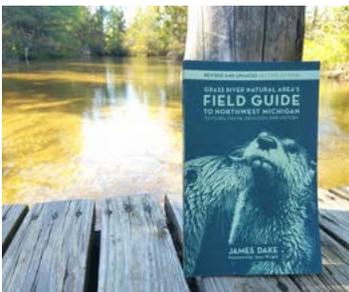
Beat the chill of winter by dreaming about the color and beauty of spring and summer wildflowers! Join James Dake online on your lunch break for a colorful and warm photography presentation to look at over a dozen of our local species and how their beauty is only outmatched by their wondrous feats, like their abilities to melt snow, change from male to female, shoot seeds long distances, cure ailments, or trick insects into helping in their survival. Discover methods of seed dispersal, pollination, and reproduction of our beloved wildflowers that rival exotic plants around the world.



Skull Sleuthing

Tuesday, February 2 from 5 pm to 6 pm

Join Emily Burke for a live, interactive class to learn about the secrets of skulls. We'll explore how to identify the skulls of a variety of Northern Michigan wildlife, as well as how to uncover clues about the animals' diets, lifestyle, and place in the food chain from skull traits. Bring your curiosity and your questions, and let's get sleuthing!



Explore *The Field Guide to Northwest Michigan, Second Edition*

Tuesday, February 9, 6:30 pm to 7:30 pm

Join James Dake, author of Grass River's new *Second Edition of the Field Guide to Northwest Michigan*, to learn about the making of this regional best seller. James will share the stories behind the photographs of Michigan plants and animals that make up the field guide and illustrate what makes Northwest Michigan unique. Be inspired to get outdoors and explore and protect our beautiful state.

Animal Communication



Tuesday, February 16 from noon to 1 pm

Ever wondered why coyotes howl? Or how pheromones work? Or even what message your dog is trying to get across to other dogs when it pees next to your neighbor's mailbox? Then this class is for you! Join Emily Burke as we explore the basics behind how animals communicate, as well as what it is that they're "saying" to each other. We'll also take a look at some of the amazing ways that our local animals have evolved to ensure that their messages are both sent and received.

[Click here to register and get your Zoom link.](#)

NMC classes begin on February 10th and include winter adaptations of animals and tapping into the science of maple syrup production. There is a cost for these programs. Additional information on these classes can be found at the link above.

Watch Facebook and our [website](#) for additional in person programs as they are scheduled. New micro-classes appear regularly on [Facebook](#) as well.

VOTING FOR THE 2020 PHOTO CONTEST IS OPEN

Twenty-two entries came in for our 2020 Photo Contests. Vote for the best photos of 2020 by "liking" the photos on our [Facebook](#) page that you think should win! The contest photos will appear at the top of our Facebook feed until February 1. You will be helping to select the People's Choice award while a panel of knowledgeable photographers will choose a winner based on artistic content. Thank you for all of the fantastic submissions. They represent the perfect mix of people enjoying the outdoors and the incredible wildlife at Grass River Natural Area.

NEW LOGO WEAR

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Choose from any of the logos featured above printed on a variety of styles, colors, & sizes from youth to adult.

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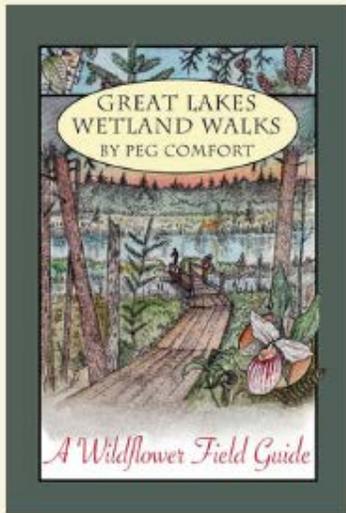
**The 2nd Edition of
Grass River Natural Area's
FIELD GUIDE
to Northwest Michigan
is now available.**



This guide is written and compiled by GRNA Education Director James Dake. It features several new and expanded sections and a new Foreword by Executive Director Jenn Wright.

Cost is \$18.87 plus tax

Order online by clicking on this box or available at the Grass River Center Gift Shop



**This beautiful and
informative book
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nature enthusiasts.
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CONSIDER A DONATION

Our financial well being is dependent on programming dollars and donations, and with the former sidelined for the most part at the moment, donations are of paramount importance. Your generous support is always greatly appreciated, but in these difficult days, your willingness to help us continue our mission with a personal donation promotes you to Nature Warrior status at GRNA.

Grass River Natural Area is a nonprofit organization that has flourished for fifty-one years because of the generous support of people who value our mission "to manage the Grass River Natural Area, conserve and protect its watershed, and provide opportunities that increase knowledge, appreciation and community-wide stewardship of the natural environment".

If you believe in our mission and want to help us fulfill it for many years to come, please click on the Donate button below. Your support is greatly appreciated.

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