



IN TUNE WITH WINTER

By Margaret Gillespie

Ruffed grouse. Maybe, like me, you grew up calling these secretive woodland birds “partridge.” Early New Englanders started this misnomer, which continues today. Technically, ruffed grouse (*Bonasa umbellus*) are part of the grouse family whereas true partridges are related to pheasants and quail. What behavior comes to mind when you hear the name “ruffed grouse?” Think rock band. Well, not quite . . . but drumming is one of the most well-known activities of this local, but obscure, forest bird. It may come as a surprise that ruffed grouse don’t strike objects while drumming. The answer is in the air. The Cornell Lab of Ornithology’s “All About Birds” describes the event succinctly: “As the bird quickly rotates its wings forward and backward, air rushes in beneath the wings creating a miniature vacuum that generates a deep, thumping sound wave that carries up to a quarter of a mile.” Male ruffed grouse drum throughout the year to denote their territory, although this display is much more frequent and compelling in the spring breeding season. Other lesser known activities and adaptations make the ruffed grouse a winter champion, well-tuned to the rigors of the snow, wind, and cold. Let’s explore some of their secrets to winter survival.

An urgent winter challenge is finding adequate food. Gone is the summer fare of tender sprouting leaves, buds, insects, wild fruits, and seeds. Even the autumn acorns are hidden under the snow. Grouse change their feeding habits to winter mode, focusing heavily on catkins of aspen and birch, tree buds, and available fruits such as staghorn sumac. The birds’ digestive systems can handle toxic chemicals that protect aspen from most consumers. Another obstacle for grouse during leisurely feeding on bare branches is exposure to predators. Goshawks are adapted to quick turns and seem to run a slalom course through the trees in pursuit of ruffed grouse. Great horned owls hunt them at dusk and dawn. Grouse have their own version of “eat and run.” They adopt an “eat and fly” plan. After rapidly filling their crops with protein-packed buds,

the birds speed to shelter in places like hemlock stands where they can process their food in safety. Grit is an essential part of digesting their coarse food. Grouse easily acquire grit in the form of sand and gravel on roadsides.

Sinking into snow while we walk is a tiring waste of time and energy. We might reach for snowshoes or cross country skis to solve our problem. Grouse have already grown their own version of snowshoes by the time winter comes. Called pectinations, these natural weight dispersers are scales resembling tiny combs protruding from the outside of grouse’s toes. In the brushy, forested areas grouse frequent, these birds spend more time walking than flying. Having built-in snowshoes enables them to navigate with ease. For further protection from snow and cold, grouse grow extra feathers on their legs as well as around their nostrils. How about a natural scarf? The ruff of feathers the male grouse raises around its neck during breeding displays gives this bird its distinctive name but does not increase insulation.



Ruffed Grouse
flickr/firstmac (David Mitchell)

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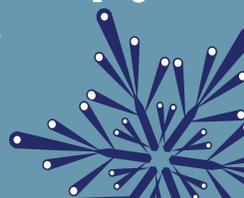
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WINTER AT THE SCIENCE CENTER!



Get nearer to nature with a Wild Winter Walk or Winter Bird Banding. Both programs run January through March. See pages 6 to 8 for details.



FORGING TRAILS: WHERE ARE ALL THE BIRDS?



Several people have asked me that question this fall. And I have been asking myself the same thing. Since the beginning of September my bird feeders have been deserted . . . and I mean DESERTED . . . not so much as a chickadee or a nuthatch. Now I've been feeding birds in New Hampshire for 30 years and I don't ever remember having such a complete and prolonged drought of birds. I'm used to filling all the feeders at least three to four times per week, but I've literally had the same seeds in the feeders for two months (which reminds me . . . must change seed before it rots). I'm writing this column on November 1, so I trust (hope) when you read this our feeders are back to normal.

So why no birds? The answer I have postulated is that there is just SO much natural food in the woods this year that the birds don't need our handouts. It's also been very mild and as of last night we had not had a single frost at my house in Ashland. Conifers are drooping with cones, oaks are bombarding our metal roofs with acorn bullets, Mountain Ash trees are heavy with sweet ripe berries – it is a veritable all-you-can-eat buffet out there for our common backyard residents.

Just like chipmunks (which are also having a bumper year), many of our non-migratory songbirds gather and store food to get them through the winter. Nuthatches, jays and chickadees will tuck away seeds for a rainy day (more like a snowy day), so for the last several weeks they have been on overdrive, gathering as much as they can before the supply dries up.

This abundance of food is not just in New Hampshire. All over the northeast from the tree line in northern Ontario and Quebec, down through the New York, cones and acorns abound. This means that northern nomads like pine siskins, purple finches, and redpolls have not arrived in our state to bolster the feeder activity (although, all three are expected to eat their way south and east this winter and be seen in good numbers here . . . just not yet).

So be patient. Once winter arrives and the first snows blanket the woods, our feeders should become the favorite restaurant in town again. At least, that's my story and I'm sticking with it.



Purple Finch

Iain MacLeod, Executive Director
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603-968-7194 x 23

GREEN TIP: KEEPING IT CLEAN

Litter poses big problems when it gets into our oceans, lakes, and streams. Common forms of debris such as straws, plastic bottles, metal cans, single-use plastic bags, and balloons are dangerous to wildlife. Plastics in particular break down into small pieces birds and animals may eat. If you are planning to enjoy ice fishing this winter, here are some tips to keep it clean on the ice.

- Use reusable beverage containers and bags. If you consume packaged food and drink, take home wrappers and trash; carry in, carry out.
- Don't leave monofilament fishing line lying around. You can often find special bins for discarded line at boat ramps, piers, marinas, and tackle shops.
- Remember, in New Hampshire, it's against the law to use lead fishing tackle. Clean out your tackle box now and replace lead sinkers with non-lead alternatives so you won't be tempted to use the outlawed tackle.

We are grateful to the Meredith Rotary Club for their annual donation of fish from the Meredith Ice Fishing Derby, which is used to feed the otters, osprey, and other creatures. The next derby is February 10 and 11, 2018.



SQUAM LAKES NATURAL SCIENCE CENTER

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Squam Lakes Natural Science Center is a non-profit educational institution incorporated in 1966 as a charitable organization under statutes of the State of New Hampshire with its principal place of business in Holderness. Its mission is to advance understanding of ecology by exploring New Hampshire's natural world.

Tracks & Trails is a regular publication of Squam Lakes Natural Science Center distributed to members and contributors. Comments are welcomed by newsletter editors Janet Robertson and Amanda Gillen.

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STAFF PROFILE

DALE LARY



When and how did you first get involved here and in subsequent years?

I met Liz Rowe, then Director of Operations, at a dinner party in early 2008. Liz told me about the lake cruises the Science Center offered. I expressed interest in becoming a Tour Captain, which I did in May 2009.

Shortly after starting, I was offered the position of Cruise Coordinator, which I have held for the past nine seasons.

What do you do when you aren't working at the Science Center?

I put my cameras to work photographing landscapes and wildflowers in New Hampshire, particularly at Squam Lakes and the White Mountains. I have been doing photography for nearly 20 years. It is my passion and favorite pastime. I also spend as much time as possible with my daughter and her family in Gilford. Watching my grandson grow up is an absolute joy – he gets photographed quite often too. When just relaxing, I enjoy a good book and always have one in the process of being read.

What's your first memory of the natural world?

My first memory was, and still is, a very vivid one. It was the first time I saw New Hampshire. I was born and raised in the inner-city of Cleveland, Ohio when the steel mills and oil refineries were in full production polluting the air with thick smog and Lake Erie with refinery by-product. I remember days when the smog was so thick, I could look directly at the sun on a "clear" day and simply see a round orange ball in the sky. When there was a threat of rain, it was necessary to place the family car in the garage as the rain would wash the smog out of the air resulting in a muddy layer of stain all over the car if not protected. I considered this to be a normal way of life.

Then I saw New Hampshire. One of my Navy shipmates invited me to central New Hampshire to do some fishing and

hiking. I absolutely fell in love with the area and never looked back to Cleveland. The mountains, lakes, wildlife, and clean air were an awakening that pulls me even stronger today.

What do you like most about working here?

I consider all of the Tour Captains, Cruise Coordinators, and lake cruise management staff to be my friends and I enjoy working with all of them. The teamwork is wonderful – we all have each other's backs and we all want to provide the best quality for our lake cruise passengers.

What do you wish other people knew about the Science Center?

How hard the entire staff and volunteers work to make the Science Center a memorable experience that compels visitors to return often and tell others of their wonderful visit.

What would you tell someone that who is thinking about donating or volunteering?

It is certainly time and money well spent, as the Science Center is always looking to provide more exhibits and educate visitors to the natural world. The new Lake Cruise Headquarters that opened in 2017 is a perfect example.

What do you think will change about the Science Center in the future?

From my view, the Science Center is always riding the latest wave of dynamic scientific advances and technology. The future will be where science and technology takes it.

Dale started his career in business and technology as a Field Engineer in the newspaper publishing business developing and manufacturing proprietary computers systems for the newsroom and display advertising departments of over 250 newspapers worldwide. He worked as Product Support Engineer, Product Support Manager, and then Director of Worldwide Customer Support. Staying in the graphics industry, Dale later became Vice President of Worldwide Customer Support for a Meredith manufacturer that produced super-wide format inkjet printers 20 feet long and capable of printing photo-realistic billboards and large outdoor signage. Dale retired in 2001 to pursue his passion for photography and then started his second "career" with the Science Center in 2009 – "It's the best job I have ever had."

Planning on purchasing holiday gifts online? Support the Science Center while you shop at AmazonSmile. Amazon will donate 0.5% of the price of eligible AmazonSmile purchases to Squam Lakes Natural Science Center whenever you shop on AmazonSmile.

Go directly to <https://smile.amazon.com/ch/02-0271824> or select the Science Center as your charitable organization at <http://smile.amazon.com>

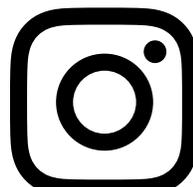


WISH LIST

Large umbrellas
Silverware - especially forks and spoons
Golf cart
Underwater Rover
Dog crates
Refrigerator



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Your planned estate gift will help Squam Lakes Natural Science Center to continue to achieve its mission to teach about the natural world for generations to come.

Learn more at http://www.nhnature.org/support/planned_giving.php



NATURALIST'S CORNER

MOVING THROUGH SNOW

By Jeremy Phillips

Animals remaining active during winter must adapt many aspects of their lives to survive. Cold temperatures, snow cover, mobility, and finding food all play into how animals are able to stay alive. Here in New Hampshire, snow is usually a major factor affecting how animals move and also requires them to use energy. Let's look at some winter-active animals to see how they are adapted to move through snow.

Moose (*Alces alces*) use both behavioral changes and physical adaptations to conserve energy in deep snow. Their long legs allow them to walk through most types of snow with ease. When snow gets deeper, they seek refuge in softwood cover where conifers act as umbrellas keeping deep snow from piling up. Not only are moose able to move easier where the snow is not so deep, but spending more time in conifers keeps them cooler. Even in winter, moose may struggle to keep cool on warmer days or in sunnier areas that may get above 23 degrees Fahrenheit. Conifers also act as a food source; however, moose prefer mixed hardwoods where they can find plenty of browse and are still close to the cover of conifers.

It is easy to see the differences between porcupines (*Erethizon dorsatum*) and moose, however they are alike because both will reduce movement to save energy during the winter. The North American porcupine may reduce its movements depending on the amount and type of snow it has to cross. Predation may increase when the snow is soft and deep. Fisher (*Martes pennanti*), one of the main predators of porcupine, has a harder time finding snowshoe hare (*Lepus americanus*) in these conditions and may turn their hunt to the slow moving rodent. Porcupines have to choose to stay put or push through the deep snow. It can be a deadly decision if there is a quick fisher lurking nearby. In other types of conditions when the snow is crusty or not as deep, or where paths from previous ventures can be found, porcupines have a much easier time making their way to their favorite trees nearby. Moving through the snow, for these short-legged creatures can be risky but must take place for them to feed and ensure the energy they need to survive winter.

The snowshoe hare is aptly named for its large feet (5 to 7 inches!), which allow it to move swiftly - at over 25 mph - and conserve energy in snowy conditions, the same way our snowshoes help us. But the hare prefers to remain unseen by predators. Its snowy white coat is good camouflage during winter. The snowshoe hare creates a divot, called a "form," in the snow, usually under the conifer branches weighted down by snow or under a mass of debris. Like the moose and the porcupine, the snowshoe hare moves above the snow using its large feet.

Subnivean (sub meaning "under" and nives meaning "snow") animals benefit by spending a great deal of time under the snow. This offers animals like mice, voles, and shrews many benefits. Snow is a great insulator with an insulation value equal to about 30 percent of actual, cellulose insulation. Once tunnels are created, all their food (leaves, bark, insects, and seeds) is at hand and unfrozen. Moving under the snow also gives protection against anything using their eyes to find food. Owls, fox, coyote, and other predators using their ears can still be a risk as can smaller predators that can fit in the tunnels such as weasels.

Moving is tricky business in the winter for animals that remain active. It can take much more energy to move than at other times of year. However, movement is crucial to find food, escape from predators, or to find more suitable grounds to survive. When out in the snowy winter, keep an eye out for animals' movements. You might see moose tracks, porcupine trails, snowshoe hare forms under conifers, or tunnels from subnivean creatures. Their survival is wondrous.



Snowshoe Hare Tracks



FROM THE HERON'S NEST

By Laura Mammarelli

The Girard/Brennan family generously donated a Tower Garden to Blue Heron School. Plants grow indoors without soil in a tower that automatically provides light and circulates water. The children are learning to germinate seeds to place in the tower and to check the pH of the water so it is correct for the healthy plants.



Blue Heron School, a nature-based Montessori school for children ages three to six, operates Monday through Friday, 8:30 a.m. to 1:00 p.m., or 8:30 a.m. to 3:30 p.m., September to June. For more information please visit www.nhnature.org/programs/blue_heron_school.php or contact Laura Mammarelli, Blue Heron School Director, at 603-968-7194 x 40 or blueheron@nhnature.org.

KIRKWOOD GARDENS PLANT SPOTLIGHT

By Brenda Erler

Ninebark

Physocarpus opulifolius 'Summer Wine'

Culture: Best in average, medium moist soil, but very adaptable; sun to part shade

Bloom: late spring

Height: 6 to 8 feet tall, 5 to 6 feet wide

This cultivar of a native shrub has beautiful wine colored foliage and small pinkish-white flowers in mid-summer. It is very adaptable to a variety of soil types and conditions and can be grown in difficult locations. Its peeling bark provides winter interest and the graceful, arching growth makes it useful as either a specimen or in a hedge.

Kirkwood location: Under the large Sugar Maple in the upper garden bed, near Route 3.



Christmas Fern

Polystichum acrostichoides

Culture: Best grown in rich, moist, well-drained soil in part shade to shade

Height: 24 inches

This dark green, leathery, clump-forming fern is native to the eastern U.S. It stays green throughout the winter and the individual pinnae on each frond resemble tiny Christmas stockings. It tolerates New Hampshire's rocky soil and so is a great addition to any shade or woodland garden. The clumps grow but stay where planted. Tolerates deer, drought, and heavy shade.

Kirkwood location: Several areas throughout the upper garden. It forms an edge in the bed under the large Sugar Maple by Route 3.



Plant Spotlight and Kirkwood Gardens are sponsored by Belknap Landscape Company, Inc. www.belknaplandscape.com

NEWSBRIEFS

- Blue Heron School Associate Teacher Jordy Gianforte completed four weeks of summer classes in July at the Northeast Montessori Institute. She is working to earn Montessori primary certification for 3 to 6 year olds. She currently has Montessori certification for Elementary I, 6 to 9 year olds.

- Corrie Kinder is working at Blue Heron School as a part time Assistant Teacher. She will graduate in December from Plymouth State University with a Bachelor's Degree in Childhood Studies. Previously Corrie was an intern at the White Mountain Montessori School. She loves working with young children and spending time outside.



- Almost 400 people attended our annual Halloween Hoot 'N Howl on Saturday, October 14. Volunteers from Stonyfield

Yogurt put up decorations and carved pumpkins donated by Moulton Farm and staff members. More than 25 volunteers helped run the event. Guests enjoyed treats and drinks provided by Dunkin Donuts, Plymouth; E.M. Heath, Holderness; Hannaford Supermarkets, Gilford and Plymouth; Tootsie Roll Industries; and many talented volunteer bakers. The weather was perfect and it was fun to see all the creative Halloween costumes.

- The Helen Clay Frick Foundation of Pittsburgh gave a grant in October to fund improvements to the bobcat shift area, which are the nighttime quarters for the animals. Frick Trustees Natalie Della Rosa and Ned Dane helped to acquire the funding.
- Longtime member Richard "Dick" Davenport, of Holderness passed away in February 2017. Dick was a member of the Naturalist Legacy Society and provided a generous bequest. A portion

of his gift was used to construct 'sunning cages' for the program raptors and make some needed alterations to the Raptor Mews. The remainder will be placed in the Board Designated Reserve fund. Dick was an active conservationist in the Squam area and notably served as a board member and land steward for Squam Lakes Conservation Society.

- In November, Executive Director Iain MacLeod presented a paper about Project OspreyTrack at a symposium entitled "Innovations in Raptor Education" at the annual conference of the Raptor Research Foundation in Salt Lake City.
- The staff took a road trip to the Montshire Museum in Norwich, Vermont in mid-November for its yearly staff retreat. This gave staff a chance to share ideas and network with colleagues at another facility.

CALENDAR OF PROGRAMS & EVENTS

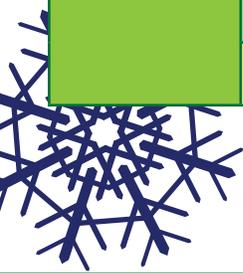
Advance registration is required by noon the day before the program. If minimum enrollment is not met, programs may be cancelled. Walk-ins may be accommodated if space is available.

DECEMBER

DECEMBER 7 THURSDAY 10:00 to 11:30 a.m. Two sessions: Ages 4 to 6 Ages 7 to 10	Homeschool Series: Earth Cycles This educational series is specifically for homeschooled students. Programs focus on the cycles you can observe in the natural world. Topics include rock cycle, water cycle, life cycles, and more! One adult must participate with children at no additional cost. Each additional adult pays child cost. <i>Cost per session: \$9/member child; \$11/non-member child</i>
DECEMBER 13 WEDNESDAY 11:00 a.m. to 12:00 p.m. For ages 2 and 3	Nature Play Time Join us to explore the natural world in winter with your little one! We will investigate ice and snow, and experience winter with our five senses. Come once or come every month. Program will be held outdoors. Dress in warm layers with snow pants, hats, gloves, jackets, and snow boots. Adults get to play too! An adult must participate with children at no additional cost. <i>Cost per session: \$5/member child; \$7/non-member child</i>

JANUARY

JANUARY 4 THURSDAY	Homeschool Series: Earth Cycles 10:00 to 11:30 a.m. Two sessions: Ages 4 to 6, Ages 7 to 10 <i>See description for December 7.</i>
JANUARY 6 SATURDAY 9:00 a.m. to 12:00 p.m. For all ages	Bird Banding Open House  For over 30 years we have started the New Year off with a bird banding open house. For tracking purposes, the U.S. Fish & Wildlife Service officially designates that all birds become a year older on January 1. Come celebrate their birthday and the New Year with us. Find out all about banding and, with luck, help band and release some hardy feathered creatures. Children must be accompanied by an adult. <i>Cost: No charge to attend but reservations are requested</i>
JANUARY 6 SATURDAY 1:00 to 3:00 p.m. For adults and families with children ages 6 and up	Wild Winter Walk  Have you ever wondered what happens to the animals at the Science Center during the winter? Most of them stay in the same place, just as they would in the wild. Join a staff naturalist for a guided walk on the live animal exhibit trail to see our animal ambassadors dressed in their winter coats and discuss how these native animals are well-adapted for winter in New Hampshire. If needed, snowshoes are available at no extra cost or bring your own. Children must be accompanied by an adult. Dress to be outdoors with snow boots, hats, gloves, and warm layers. <i>Cost: \$8/member; \$10/non-member</i>
JANUARY 10 WEDNESDAY	Nature Play Time 11:00 a.m. to 12:00 p.m. For ages 2 and 3 <i>See description for December 13.</i>
JANUARY 13 SATURDAY	Wild Winter Walk  10:00 a.m. to 12:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i>
JANUARY 20 SATURDAY	Wild Winter Walk  1:00 to 3:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i>
JANUARY 27 SATURDAY	Winter Bird Banding  10:00 a.m. to 12:00 p.m. For all ages Looking for a chance to see wild birds up close? Join us to find out why and how we capture, band, and release birds that gather at our winter feeding station. Children must be accompanied by an adult. Time will be spent indoors and outdoors; bring warm layers, hats, and gloves. <i>Cost: \$8/member; \$10/non-member*</i>
	Wild Winter Walk  1:00 to 3:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i>
*MAKE A DAY OF IT! Attend both the Wild Winter Walk and Winter Bird Banding. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.	



FEBRUARY

FEBRUARY 1 THURSDAY	Homeschool Series: Earth Cycles 10:00 to 11:30 a.m. Two sessions: Ages 4 to 6, Ages 7 to 10 <i>See description for December 7.</i>
FEBRUARY 4 SUNDAY	Wild Winter Walk ❄️ 10:00 a.m. to 12:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i>
	Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages <i>See description for January 27.</i>
FEBRUARY 10 SATURDAY	Wild Winter Walk ❄️ 1:00 to 3:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i> <i>*MAKE A DAY OF IT! Attend both the Wild Winter Walk and Winter Bird Banding. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.</i>
FEBRUARY 14 WEDNESDAY	Nature Play Time 11:00 a.m. to 12:00 p.m. For ages 2 and 3 <i>See description for December 13.</i>
FEBRUARY 17 SATURDAY	Wild Winter Walk ❄️ 10:00 a.m. to 12:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i>
	SCHOOL VACATION WEEK Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages <i>See description for January 27.</i>
FEBRUARY 23 FRIDAY	SCHOOL VACATION WEEK Winter Agility Challenge 1:00 to 2:30 p.m. For families with children ages 5 and up Wildlife has answers to many of winter's challenges. Let's experience winter like an animal as we make our way through a fun course where we can move like snowshoe hare, slide like otters, balance like bobcats, and jump like deer. How fast can we go? After our wild adventure, we'll gather inside and meet an animal that takes winter in stride! Children must be accompanied by an adult. Time will be spent indoors and outdoors; wear snow boots, and bring warm layers, hats, and gloves. <i>Cost: \$8/member; \$10/non-member</i> <i>*MAKE A DAY OF IT! Attend both School Vacation Week programs. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.</i>
	Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages <i>See description for January 27.</i>
FEBRUARY 24 SATURDAY	Wild Winter Walk ❄️ 1:00 to 3:00 p.m. For adults and families with children ages 6 and up <i>See description for January 6.</i> <i>*MAKE A DAY OF IT! Attend both the Wild Winter Walk and Winter Bird Banding. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.</i>
	SCHOOL VACATION WEEK Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages <i>See description January 27.</i>
FEBRUARY 28 WEDNESDAY	SCHOOL VACATION WEEK Winter Agility Challenge 1:00 to 2:30 p.m. For families with children ages 5 and up <i>See description for February 23.</i> <i>*MAKE A DAY OF IT! Attend both School Vacation Week programs. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.</i>



MARCH

MARCH 1 THURSDAY	Homeschool Series: Earth Cycles 10:00 to 11:30 a.m. Two sessions: Ages 4 to 6, Ages 7 to 10 See description for December 7.
MARCH 2 FRIDAY	<i>SCHOOL VACATION WEEK</i> Wild Winter Walk ❄️ 10:00 a.m. to 12:00 p.m. For adults and families with children ages 6 and up See description for January 6.
	<i>SCHOOL VACATION WEEK</i> Animals in Winter 1:00 to 2:00 p.m. For all ages Winter means cold, ice, snow, and shorter days. How do New Hampshire animals survive these conditions? See three live animals up close and find out about various adaptations they use to successfully cope with the stresses of winter. Cost: \$8/member; \$10/non-member
MARCH 4 SUNDAY	Wild Winter Walk ❄️ 1:00 to 3:00 p.m. For adults and families with children ages 6 and up See description for January 6.
MARCH 10 SATURDAY	Wild Winter Walk ❄️ 1:00 to 3:00 p.m. For adults and families with children ages 6 and up See description for January 6.
MARCH 14 WEDNESDAY	Nature Play Time 11:00 a.m. to 12:00 p.m. For ages 2 and 3 See description for December 13.
MARCH 17 SATURDAY	Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages See description for January 27.
	Wild Winter Walk ❄️ 1:00 to 3:00 p.m. For adults and families with children ages 6 and up See description for January 6. <i>*MAKE A DAY OF IT! Attend both the Wild Winter Walk and Winter Bird Banding. Bring your brown bag lunch for the time in between. Advance Package Discount: \$11/member, \$15/non-member for both programs on the same day.</i>
MARCH 24 SATURDAY	Winter Bird Banding 🐦 10:00 a.m. to 12:00 p.m. For all ages See description for January 27.

NATURE TOURS

Land of Enchantment: Natural Wonders of New Mexico
November 6 to 16, 2018



Join Iain MacLeod for a spectacular, small group tour of New Mexico. November is a special time to visit. The temperatures are comfortable; the light is fantastic and tens of thousands of cranes and snow geese have just arrived for the winter. In addition to wildlife and spectacular scenery, the trip includes visits to the Bandelier National Monument, the Valley of Fires lava beds, Carlsbad Caverns, Santa Fe National Forest and beautiful old town Santa Fe. Other highlights include the Bosque Del Apache National Wildlife Refuge and Bitter Lakes in the Pecos Valley. See Prong-horn Antelope, Prairie dogs, Road-runners, vast flocks of waterfowl, raptors galore, and incredible sunrise and sunset flights of Sandhill Cranes.

Cost: \$3,700 (assumes double or twin occupancy room*) All-inclusive cost includes: round-trip airfare from Boston to Albuquerque, ground transportation (15-passenger van), all accommodations, all meals, admission fees, and leaders' fees. *There is an additional \$400 charge for a single room. Maximum group size: 10.

View full itinerary at nhnature.org/programs/nature_tours.php. Contact Iain at 603-968-7194 x 23 or iain.macleod@nhnature.org for details or to book your place.

SAVE THE DATE

2018
**Summer
Splash**



**Saturday
July 21**

BUSINESSES INVEST IN EDUCATION

THANK YOU FOR YOUR SUPPORT!



Many local businesses provide support through memberships, sponsorships, and in-kind contributions of goods and services every year. This year these generous businesses helped to make the Science Center's education programs possible.

2017 Business Members: Advanced Lock & Alarm, Bob's Shur-Fine Market, Children's Dentistry, Foreco, Franklin Savings Bank, Holderness Harbor, Golden Pond Country Store, Landaff Creamery, MegaPrint, Malone, Dirubbo & Company, Pike Industries, and Wicked Accurate Bookkeeping Services.

2017 Business Sponsors: Belknap Landscape Company, Cross Insurance Agency, Dead River Company, Meredith Village Savings Bank, New Hampshire Electric Co-op Foundation, Patty Stewart and Associates, and Rockywold-Deephaven Camps.

2017 Business In-kind Donors: Aubuchon Hardware, Moultonboro, Belknap Landscape Company, Biederman's Deli/Chase Street Market, Bob's Shur-Fine Market, Charles River

Laboratories, Coca-Cola Bottling Company of Northern New England, Cold Brook Gardens, Common Man Restaurant, Country Lady Bug Greenhouse, Custance Brothers Woodworking, Donovan Tree Experts, Dunkin Donuts, Plymouth, Forever Green, Del R. Gilbert & Son Block Company, Hannaford Supermarket, Meredith, Hannaford Supermarket, Plymouth, Hart's Restaurant, E.M. Heath Supermarket, Holderness Harbor, Keiver-Willard Lumber Corporation, Lakes Region Tent & Event, Lakeside Mobility & Scooter, Little Church Theater, Marie's Catering, MegaPrint, Miracle Farms Landscaping, Moulton Farm, New England Commercial Solar Services, Petal Pushers Farm, Plymouth Animal Hospital, Powder Mill Fish Hatchery, Precision Lumber, Spider Web Gardens, Squam Boat Livery, Squam Bridge Landing, Squam Lake Marketplace, Stephen's Landscaping Professionals, TFG Aquarium Services, Tootsie Roll Industries, True Colors Print & Design, Van Berkum Nursery, Venture Print Unlimited, and Wayside Farm and Great Northern Berries.

2017 Summer Splash: Many more businesses generously supported the 2017 Summer Splash on July 22. For a complete listing, see page 9 of the fall 2017 *Tracks & Trails*, <http://www.nhnature.org/membership/newsletter.php>.

2017 Business Volunteer Groups: Holderness School, Hypertherm, J Jill, Meredith Village Savings Bank, Newfound Regional High School, New Hampshire Electric Coop, New Hampton School, Pike Industries, Plymouth State University Volunteer Club, Southern New Hampshire University, Stonyfield Farm, Tau Omega: PSU chapter.

We gratefully acknowledge all business supporters. Please notify Development and Communications Director Janet Robertson if any listings are inaccurate or missing. Contact Development Officer Kim Beardwood Smith to learn about 2018 sponsorship opportunities and Volunteer Manager Carol Raymond for information about volunteering.

VOLUNTEER UPDATE: THANK YOU VOLUNTEERS!

We are grateful to our wonderful volunteer team! In 2016, 354 volunteers donated 8,760 hours of service in many ways including: greeting visitors, orienting school groups, maintaining trails, fixing exhibits, pulling invasive species, maintaining gardens, interacting with guests as docents or First Guides on the trail, working behind the scenes with animal care tasks or office project and mailings, helping to teach school programs, and serving as trustees and committee members.

Each year the Science Center hosts the Parsons Volunteer Recognition Dinner to thank and recognize our dedicated volunteer team. This year's dinner was held in August at Plymouth State University. Cross Insurance Agency and Patty Stewart and Associates sponsored the dinner in 2017, as they both have for more than 10 years.

At the dinner the Board of Trustees recognizes a category of volunteers to highlight and thank. Board Chair Ken Evans announced the "Wood Lot Crew" as this year's honorees and introduced Facilities Director Tim Curry who thanked the team for helping to prepare, cut, chop, and stack wood for the wood furnace (located in the Wood Energy Exhibit). The Wood Lot Crew not only prepares all the wood for the furnaces (currently, a two-year supply is ready), but also takes on other wood construction projects. The Wood Lot Crew volunteers are: Bob Davis, George Gurney, Dennis Hager, Ken Ruhm, Ed Rushbrook, Rob Stewart, Bob Tuveson, and Wayne Martin.

The President's Volunteer Service Award honors Americans who inspire others to volunteer through leading by example. Executive Director Iain MacLeod presented pins and certificates to those volunteers eligible for the awards based on their service in 2016. Bronze Award recipients who donated between 100 and 249 hours of service are: Dawn Bourret, Andy Eaton, Susan Gurney, Wayne Martin, Andie Robinson, Ken Ruhm, Carol Stewart, Lea Stewart, and Carol Thompson. Denise Moulis received the Silver Award for donating over 250 hours. Jim Barry gave more than 700 hours and received the Gold Award. All told, this group of volunteers donated 2,068 hours of service.

"Volunteers Complete the Picture" in the Trailhead Gallery is updated each year to show cumulative hours of volunteer service. These volunteers achieved 200 hours in 2016: Ken Evans, Donna Goldberg, Susan Gurney, Bill Lee, Wayne Martin, Andie Robinson, and Joey Tuveson. Dawn Bourret, Dennis Hager, Brenda Jackson, Barb Laverack, Dom Marocco, Irene Marocco, Mari O'Neil, Joe Oustucky, and Pam Stearns advanced to 500 hours. Volunteers Nance Ruhm and Betsy Whitmore exceeded 1,000 hours. And Nancy-Jane Duncan surpassed 2,000 hours.

Our volunteer team, including regular volunteers and groups from schools and businesses, continue to make our efforts to fulfill our mission successful. Thank you!

OPENING A WINDOW TO THE NATURAL WORLD

Please Give to our 2017 Annual Fund Appeal

You may be a member, a volunteer, a donor, a business sponsor, a trail visitor, or a program participant. However you are connected to Squam Lakes Natural Science Center, thank you. If you have not already made a gift to this year's Annual Fund, please consider making a donation now.

There are many ways you can give:

- Respond to the letter you recently received and mail a gift
- Call the office at 603-968-7194
- Make an online contribution at www.nhnature.org/support/annual_fund.php
- Consider the convenient recurring gift option on our website – it's an easy way for you to make a larger gift by spreading it over the year through monthly or quarterly donations
- Double your donation with a matching gift through your employer

- Give from your IRA – if you are 70 ½ or older, you can save on taxes through a tax-free IRA distribution to a qualified charitable organization such as the Science Center
- Celebrate a special occasion or honor a friend or family member with an honorary gift



The wonderful support we receive every year from individuals, foundations, and businesses is critical to achieving our mission to advance understanding of ecology by exploring New Hampshire's natural world. Please respond as generously as you can again this year. Thank you for your support!

Opening a Window to the Natural World is written by Janet Robertson, Development and Communications Director. You may contact Janet at 603-968-7194 x 12 or janet.robertson@nhnature.org.

These generous donors made tribute gifts, which were received between July 1 and September 30, 2017:

In memory of Mary Denison
Elizabeth Dewey

In memory of Alan T. English
Janet and Rich Cocchiaro

Lawrence Coolidge
Cottage Place on Squam Lake
Douglas and Maribeth DeCluitt

Andy and Mal Eaton
Fred Smagorinsky
and Holly English
Matt and Lori Grady
Peter and Fifi Kampf
Carl and Sandra Lehner
Mathieson/Conver Family
Anthony McManus
and Jo Ann Rohde

Robert and Alison Ritz
Robert and Sara Rothschild
Robert and Carol Snelling
Carol and John Thompson
Tosa Foundation
Peter T. Webster

In memory of Anne Fosse
Anonymous

In honor of Liz and Dennis Hager
Nance and Ken Ruhm

In honor of Sandy McGinnes
Pam and Bill Simonds

In memory of Paul F. Miller, Jr.

Will and Alicia Abbott
Michael, Tim, Dan,
and Kate Valdez Butterworth
Miriam Butterworth
Ronald and Margaret Carlson
Robert Dempsey
Diane Garfield and Peter Gross
Gesu School
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Tad Sperry and Ellen Harvey
Robert and Jennifer Sterling
William Vogel
Bruce and Betsy Whitmore
Christopher Williams
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In memory of Melvin "Red" Murray

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Harold and Henrietta Kenney
Missy Mason
Wayne McCabe
New England Audiology
Patricia Salvador
John and Donna Sweeney
John and Catherine Walker

In honor of Natalie Parsons' birthday
Susan and Ken DeBenedictis

Ruthann Ruthfield
Diana Topjian

In memory of Barbara Reardon
Anonymous

Town of Boscawen
Paul Branscombe
Davis & Towle, Morrill & Everett
Barbara Hickey
Christopher and Elizabeth
Hodgdon
Donna Locurto
New Beginnings without
Violence and Abuse
Margaret Pickering

In memory of Barbara Ridgely
Virginia Ridgely Howe

In honor of Nance Ruhm
Raymond Bergin and Martha Smith

**In honor of Constance
and Sankey Williams**
Richard Fernandez
and Eloise Chevrier

RUFFED GROUSE QUIZ

1. T or F? In winter, ruffed grouse do more walking than flying.
2. What makes aspen buds such a challenge for most creatures to eat?
3. T or F? Ruffed grouse "drum" by beating their wings against a territorial drumming log.
4. In winter, ruffed grouse grow extra scales on the sides of their toes called _____, which distribute their weight like snowshoes.
5. What are two main benefits of snow caves for ruffed grouse?

Answers:

1. True | 2. Toxic chemicals | 3. False. The drumming sound is made in the air. | 4. Pectinations | 5. Warmth and protection from predators.

IN TUNE WITH WINTER *continued from page 1*

Snow as a friend? Given the right conditions, snow transforms into an ingenious shelter for ruffed grouse. Here are the requirements. Ideally there are at least 10 to 12 inches of fluffy snow with no freezing rain looming. A grouse will plummet headfirst into the snow and enter a completely new world, its personal snow cave. Gone is the wind chill factor and temperatures are close to freezing, which may be 40 degrees or warmer than at the snow's surface. These birds might even nibble some hidden plants or tunnel a short distance. Keeping ever alert for foxes or coyotes, a grouse will burst out of its refuge into the air at any sign of danger. This abrupt departure warns nearby birds to follow suit.

If you are open to some advice for engaging in the rigors of the winter landscape, take a page from the ruffed grouse's book. Walking is a good way to get from place to place. When outdoors, dress the part. If possible, stay out of the wind. Loiter where it's warm. Don't be concerned about diving right in – being safe sounds smart. Remember a snack, and contrary to the grouse's palate, I wouldn't recommend aspen catkins.

TRAIL'S END

'TIS THE SEASON



By the time this newsletter hits your mailbox or inbox you will have received a request for your consideration of our 2017 Annual Fund. By now, many of you have already responded and for that I sincerely thank you. In this note, I want to tell you how important your financial support is to the mission of the Science Center. And, for those of you who are just now getting into the holiday spirit, this message will hopefully resonate with you as well. So here goes.

We are blessed as an organization to have multiple sources of revenue. The Science Center receives funding through school, trail, program, cruise, special events, and member participation. This revenue covers about 70% of our costs to operate and maintain our facilities. In addition, from past campaigns, efficient stewardship, and prudent management we have investment earnings, which cover an additional 10% of our costs. For a large New Hampshire nonprofit, we are among the few that rely on annual donations for only 20% of those costs. But let me explain the significance of those last donated dollars.

They provide the support we need to keep our science standards up-to-date and aligned with the Next Generation Science Standards recently adopted by the State. They allow for updating and improving exhibits to reflect the latest thinking on the environment and on human interactions with nature. These dollars provide for staffing, parking, and restroom and maintenance needs, as we have grown in only a few years from 50,000 trail visitors to over 61,000 in 2017. In all of our programs, we now touch nearly 100,000 people annually and for some, are the only exposure to the natural sciences they will receive during the year.

In the U.S., which is an especially generous country, over \$300 billion is donated to charity every year. Fundraisers, marketers, researchers, and psychologists have addressed the question of why people give. The basic premise is that it is just not rational for folks to give away a significant percentage of their hard-earned money to help others. They have shown that the more givers rely on their intellect to determine how much and where to give, the less they give. They don't believe tax deductibility plays much of a role either. They have discovered what you and I and others already know; giving makes us feel good. It comes from a different part of our brains. And, giving to an organization that is doing good in the world makes feeling good feel even better.

So, enough about facts, numbers, statistics, and accomplishments. When you count your blessings this year, think about the last times you spent at the Science Center with your children, grandchildren, friends, and relatives. If you get that "warm glow" on a chilly winter day, join us on the future of our mission. Thank you.

Trail's End is written by Ken Evans, Chair of Squam Lakes Natural Science Center's Board of Trustees.
You may contact Ken at evanmead139@gmail.com.

IN MEMORIAM: PAUL F. MILLER, JR.

It's true the Science Center would not be what it is today without the dedication and work of countless people. One who stands out is Paul F. Miller, Jr.

Paul passed away in September 2017 at the age of 89. He served as Trustee from 1995 until 2007, when he became Honorary Trustee. Paul gave his time and experience to govern the Science Center, serving as Chair of the Development Committee, on the Finance Committee, and also sharing his considerable expertise guiding the Investment Committee. Notably, Paul served as co-chair (with Steve Woodsum) of the \$5 million Horizon Project campaign, for which he and Warren were lead donors. The Horizon Project funded several new animal exhibits, enhanced facilities to attract and accommodate more school and public visitors, added to infrastructure with new management information systems, improved animal care, collections, maintenance and storage facilities, and created a \$1 million Horizon Reserve for long-term financial stability. In Paul's words, "We believe it is crucial to develop in young children an appreciation and respect for nature if we are to save beautiful areas like Squam Lake and its watershed. For that matter, most adults also need to gain more respect for their natural surroundings. The Science Center has become an integral educational part of our lakes region

community. And of course, the additions and improvements that we've seen have been truly dramatic, especially the most recent completion of the Horizon Project." Paul and Warren are members of the Naturalist Legacy Society and have planned an estate gift, which will help the Science Center carry on into the future.

Paul was born and grew up in Philadelphia. He was a U.S. Coast Guard veteran and graduate of the University of Pennsylvania. He had a successful career in investments and founded the investment firm Miller Anderson & Sherrerd. Paul was active in his community and supported many other organizations. Paul is survived by Warren, his wife of 65 years, three children, six grandchildren, and a sister. He is missed and remembered warmly.





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Sponsor A Species: Support the wildlife at the Science Center with a sponsorship.

www.nhnature.org/support/sponsor_species.php

Nearer to Nature: This compilation of writings by Naturalist Margaret Gillespie will transport you to the woods and waters of New Hampshire's natural world. Get inspired and up close to insects, birds, mammals, and plant life through words and pictures featuring the best of New Hampshire and Squam Lakes Natural Science Center. Retail: \$19.95.

www.nhnature.org/programs/nearertonature.php

50 Nature Activities for Kids: Get nearer to nature with Senior Naturalist Dave Erler. Dave's many years of experience as a naturalist along with a lifelong curiosity for nature have come together in this book. Parents and children can enjoy 50 nature activities with step-by-step instructions to get outside and explore the natural world together! Retail: \$14.95.

www.nhnature.org/programs/50natureactivities.php

KIDS NATURE ACTIVITY: LOOK FOR ANIMAL TRACKS

- Winter is a great time to look for animal tracks, especially one or two days after a light, fresh snowfall.
- It's fun to find tracks and follow them to see where they lead you. Along the way you may find clues as to what the animal was doing and why it was moving in the direction it headed. Taking pictures of a clear, distinctive set of tracks can preserve the experience and help you to identify them later. Try to note the size of the track for a reference point.



This activity is from 50 Nature Activities for Kids by Science Center Senior Naturalist Dave Erler.