



VERNAL POOLS: SAFE HARBORS FOR INTRIGUING RESIDENTS

By Margaret Gillespie

Vernal pools can be puzzling places if you happen to come across one by surprise. They are essentially watery depressions on the forest floor, but how do they occur in a natural landscape? As spring snow and ice melt, the resulting water flows downhill, pooling in depressions in the landscape. With a depth in the range of two to four feet, vernal pools do not appear to be of any value. However, according to their secretive residents, they are a vital habitat.

For creatures depending upon vernal pools for survival, these wetlands are a source of health and renewal, essential for their reproduction and sustainable future. Vernal pools are ephemeral, filling with melting snow and runoff, they exist for only a short time in the spring and early summer before sun and rising temperatures evaporate their precious water. This seasonal wet-dry cycle eliminates fish as a possible resident of these temporary wetlands, making them exceptionally well suited as nurseries for many species of amphibians and invertebrates that would fall prey to fish in permanent water bodies. Many of the species that develop in a vernal pool are in a race to complete their metamorphosis before the water dries up, enabling them to fly, hop, or crawl out of the pond prior to its seasonal end. The timing of the life cycle of each species in a vernal pool is a seemingly intricate dance choreographed by thousands of years of evolution.

When we say the creatures that inhabit a vernal pool are secretive, we mean it! In their "A Field Guide to Animals of Vernal Pools," authors Kenny and Burne (2001) express how true this descriptor really is. They share that a moderate sized vernal pool might be host to several thousand wood frogs visiting to breed in the spring before returning to the forest. On a rainy night in early summer, several hundred mole salamanders may be moving to or from a vernal pool for their annual breeding migration. These salamanders, which live about 20 years, will spend their life within a half mile from their natal pool, and Kenny and Burne point out that many of us, even those of us that spend a lot of time in the woods, may never see these elusive woodland creatures. Let's follow the spring journeys of three different creatures for whom vernal pools are pivotal to a healthy existence.

Please note, while exploring vernal pools, it is important to remember these environments are fragile and to proceed with care.

The spring peeper, *Pseudacris crucifer*, one of our well known "end of winter" greeters, becomes active as soon as pond ice melts. They are completely dedicated to finding a mate, breeding, and laying eggs. It is the males that arrive at the breeding pool first to attract females and defend their tiny territory (adults are less than 1.5" in length) with their well-known call, "peep, peep, peep." Females arrive shortly after chorusing begins and remain into summer. After mating, the female deposits



Spotted Salamander

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DINOSAURS RETURN

JULY THROUGH OCTOBER 2024



FORGING TRAILS: THE WINTER THAT NEVER WAS



As I write this column in mid-February, there IS some snow on the ground but that has been a rare commodity this winter. Although most of Squam Lake froze over, much of the other water bodies in the Lakes Region remained partially, or entirely open well into February. Ice-in on Lake Winnepesaukee wasn't officially declared until February 9!

With so much open water, it has been a fascinating winter for birds and birders like me. Lingering ducks and other waterfowl have been a highlight. I spent

many hours over several weeks monitoring a flock of as many as 36 Greater and Lesser Scaup on Opechee Bay in Laconia. Normally these ducks pass through the Lakes Region in spring and fall and are not seen in winter, but with three-quarters of the lake open and lots of food to be had, why leave?

On February 12, I discovered a Long-tailed Duck and a Red-necked Grebe on Lake Winnisquam. I would normally expect to see these birds stopping in the Lakes Region in November (they typically winter on the ocean). A little research revealed that both were a first record for Belknap County in the month of February and there are only a couple of previous records from anywhere in inland New Hampshire for the month.

Loons were everywhere this winter too. I found ten on February 12 alone on various lakes. They are taking a huge risk lingering here, as they can quickly get ice-bound if the temps turn cold. Our colleagues at the Loon Preservation Committee (LPC) have been busy rescuing Loons all over the state.

The other fascinating aspect of birding this winter was the phenomenal white pine cone crop resulting in a bumper food supply for all seed-eating birds. Throughout the fall and early winter backyard birders were lamenting the lack of birds at their feeders. "Where are my birds?" was the daily refrain on listservs and Facebook groups. The simple answer was that the birds had so much natural food and a mostly snow-free forest floor that they just didn't need our free handouts. I kept reassuring people, who were quick to profligate various theories, that once we finally get some snow cover, the birds will return... and sure enough, when the white stuff fell, the birds returned... although I then heard some people complaining that their feeders were swamped with Pine Siskins, which had flocked here from the boreal forests of Canada to gorge on the conifer seeds.

These changing winter conditions are of course a result of climate change. Our winters are warming up and getting shorter. Maybe in fifty years our children and grandchildren will only have childhood memories of ice-bound lakes in New Hampshire.

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Pine Siskin by Iain MacLeod

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 editor Amanda Gillen.

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OPENING A WINDOW TO THE NATURAL WORLD

By Amanda Gillen, Communications Director



MEET RACHEL SALIBA

I am thrilled to introduce our community to Rachel Saliba, the Science Center's new Development Director. Rachel has a background with independent schools and nonprofits. She worked for U.S. Congresswoman Claudine Schneider before becoming a U.S. Peace Corps Volunteer. Since then, she has worked for the Harvard School of Public Health, Appalachian Mountain Club, Holderness School, Sage Hill School, Berwick Academy, Tilton School, and Interlakes Community Caregivers. Most recently, Rachel and her husband were part of the team to start the first co-educational boarding school in Egypt. She is also a long-time Science Center visitor and member bringing her three children on regular visits in the 90's and early aughts.

Rachel is excited to start meeting and talking to our members, volunteers, and community. You can contact Rachel at rachel.saliba@nhnature.org or 603-968-7194 x 126.

SUPPORT THE MARSH BOARDWALK

Look for information in the summer *Tracks & Trails* about an opportunity to have your name on the new boardwalk. The Wetlands Walk along the marshy area near the Songbird Feeding Station features the popular Marsh Boardwalk. The boardwalk has been a part of the live animal exhibit trail since the 1980s with the recent boardwalk being constructed in 2009. After many years repairing the boardwalk it was found to need significant structural work. The boardwalk was torn down last December to be replaced this spring.

We are working out the details of the new boardwalk. If you would like to be notified about how you can support the Marsh Boardwalk please email Rachel Saliba at rachel.saliba@nhnature.org.

Photo Right: The Marsh Boardwalk circa the 1980s.



The Science Center is here to connect you to the natural world and provide a consistent educational experience immersed in nature. Thank you for your support. Squam Lakes Natural Science Center tax ID: 02-0271824.

ANIMAL CARE: HOW DO ANIMALS END UP HERE

by Lauren Moulis, Animal Care Director

Have you ever wondered what it takes to get a new animal to Squam Lakes Natural Science Center? As many of you already know, we care for native New Hampshire wildlife species that are injured, orphaned, or otherwise unable to survive in the wild. Although the animal species all live in New Hampshire, the animals that end up at the Science Center do not necessarily come from New Hampshire. One of our bobcats is from Tennessee, a Bald Eagle is from Florida, and a Black-crowned Night Heron is from Virginia, to name a few. Like these three, no animal has the same intake history. So, how did they all end up at the Science Center?

Before any animal comes to the Science Center we consider what animal would best fit our educational directives, and then begin to inquire with wildlife rehabilitators around the country and other facilities like ours that may be trying to find a home for non-releasable wildlife. Once we find an animal that we are able to help by allowing them to live out their lives at the Science Center, a permitting process begins which can take anywhere from 30 days to a few months depending on the type of permit.

During this time, typically the facility that currently has the animal is preparing them for transit with health exams, practice being comfortable in a crate, and supplying the Science Center with records that will be important for the

animals' long-term success. These records allow us to ensure their habitat is set up correctly for the individual, create a basic diet, and create their first training and enrichment plan.

Once the permits have been approved on both sides, the animal either can be driven to the Science Center from its location of origin, or more often than not, must fly to us via commercial or private plane. There are several animal transportation options that we are able to use to help get the animal to New Hampshire safely. Rules that relate to temperature, water source, and type of containment are just some of the regulations.

When the animal finally arrives at the Science Center, they are quarantined for a minimum of 30 days and seen by our veterinarian during that time. Animal care works to ensure that even during the quarantine period, they are being enriched daily along with their general husbandry so that when they are finally cleared of their quarantine they have already started to get into a familiar routine.



Black-crowned Night Heron

NATURALIST'S CORNER

WHAT CAUSES CRICKETS TO CHIRP DURING THE DAY?

By Audrey Eisenhauer



On the afternoon of Monday, April 8, 2024 you have the opportunity to observe an amazing natural phenomenon right here in New Hampshire – a total solar eclipse! A total solar eclipse occurs when the Moon passes between the Sun and the Earth at just the right alignment to cast a shadow on a portion of the Earth, blocking the face of the Sun for observers in that location.

The eclipse will be visible throughout New Hampshire, but to witness totality, where the moon completely blocks the

sun, viewers will have to head to northern New Hampshire. Visit timeanddate.com to see what the eclipse will look like from your location. **It is important to remember to never look directly at the Sun.** Eclipse observers should always use eclipse glasses (different than sunglasses) or other safe solar viewing methods, such as a pinhole projector, to view the Sun during an eclipse (see *the Kids' Activity on page 10 for directions*).

During a total solar eclipse, the sky will darken as if it were dusk or dawn, temperatures may drop, and some stars may become visible. The onset of darkness is exciting to witness as a viewer of the eclipse, but people aren't the only ones to notice this change. We see animals responding to this transition as well – birds stop singing, crickets start chirping, bees return to their hives, and nocturnal animals may become active.

You can help NASA document these responses of the natural world to the solar eclipse by participating in the *Eclipse Soundscapes Project*, a citizen science program seeking help in gathering multi-sensory observations and audio data during the eclipse. The project aims to recreate a study conducted during an eclipse in 1932, but utilizing modern techniques and technology. There are several ways to participate, from writing down your observations and submitting them through the project website, to using an audio recording device and submitting your recorded audio files. Visit eclipsesoundscapes.org to learn more and get involved.

However you choose to observe the eclipse, be sure to get outside on the afternoon of Monday, April 8, 2024 to witness this awe-inspiring event. And don't forget your eclipse glasses!

WISH LIST

- **For Animal Care:** Stuffed animals; pet toys; local hardware and grocery store gift cards; baby blankets; dog/cat beds; cologne/perfume; PVC fittings/caps
- **For events:** Bistro style string lights
- **For Exhibits:** Genuine black bear rug
- **For Kirkwood Gardens:** Six to eight foot orchard ladder; garden spades and forks
- **For Lake Cruises Headquarters:** Pedestal fan, cordless power washer, cordless leaf blower, boat hooks
- **For Staff:** Airline miles to attend professional development experiences



FROM THE HERON'S NEST

Blue Heron School students had eventful Autumn and Winter seasons. Students explored a variety of topics with the Naturalists, ranging from learning about animal groups, to tracking, and even building outdoor fires. In the classroom children learned about several continents, continued their studies on “naturalist topics”, and celebrated seasonal holidays by making crafts and cards. Children continue to prepare food for each other and others for Family Days. We had several parent volunteers lead lessons with the children on mindfulness and cultural activities from Russia, Philippines, and South America. Kindergarten children took field trips to the Holderness Library and the Public Safety buildings, and are learning botany with Emma Erler. We are looking forward to planting seeds for our garden this Spring!



Blue Heron School is a nature-based Montessori school for children ages three to six. For information please visit nhnature.org/programs or contact Blue Heron School Co-Directors Jordan Fitzgerald and Jordy Gianforte at 603-968-7036 or blueheron@nhnature.org.

KIRKWOOD GARDENS

By Emma Erler

STARTING SEEDS INDOORS

Q: When is the right time to start seedlings indoors?

A: Each year, most of the annual plants grown in Kirkwood Gardens are started from seed indoors. Doing so saves the garden money (annuals are expensive!) and allows us to grow unique varieties that aren't necessarily available at garden centers. In an age of trademarked annual plants, it can be difficult to find the heirloom plant varieties that pollinators particularly love. Fortunately, successfully starting seeds indoors is relatively simple as long as you have some basic equipment, and most importantly, start them at the right time. The best source of information on seed starting timing is often on the seed packet. Most seed companies will print on the label how many weeks before the last frost to start indoors. In Zone 5, where most New Hampshire residents live, the last spring frost is typically in late May. That means you can

anticipate planting your tender annual flowers and vegetables in the garden sometime around Memorial Day. You can figure out an appropriate seed starting date by working backwards from the anticipated planting date. For example, if a seed packet suggests starting seeds indoors 8-10 weeks before the last frost and you expect to plant outdoors on May 27th, you should sow your seeds between the third week of March and the first week of April.

Although you may be anxious to get your seeds going, try not to be too hasty. Plants that are started from seed too early will probably be of poor health and quality by the time you're ready to plant them in the garden. Instead of rushing to sow, make sure you have a quality seed starting set-up, including grow lights, seed starting mix, small clean containers with drainage holes, and a heat mat (if sowing in a space where the temperature is below 70°F).

PLANT SPOTLIGHT

Canada Anemone *Anemone canadensis*

Culture: Easily grown in average, moist to wet, well-drained soils in full sun to part shade. Organically rich soils in part shade are preferred, but plants will tolerate dry shade once established. Canada anemone can be found growing in the wild in many locations in New Hampshire. It often spreads aggressively by rhizomes, so it should be treated as a low-maintenance groundcover. Hardy in Zone 3.

Bloom: Upward-facing, white flowers atop upright flowering stems. Each flower has five petal-like sepals and a showy yellow center. Bloom lasts for several weeks, typically starting in May.

Height: 1 to 2 feet

Canada anemone is an herbaceous perennial that belongs in the buttercup family. Under ideal growing conditions, it spreads very quickly to form a dense groundcover. It is usually avoided by deer and has few serious insect or disease issues. It can be a very showy element of native plant gardens, and tends to grow well near streams, ponds or water gardens.

Kirkwood location: lower garden near apple tree bench or upper garden on the driveway side



Foamflower *Tiarella cordifolia*

Culture: Easily grown in average, moist, organically rich soils in part to full shade. Soil should not be allowed to dry out. Foamflower is a small New Hampshire native perennial that occurs naturally in low moist woodlands. Hardy in Zone 3.

Bloom: Tiny white flowers in airy clusters have a somewhat "foamy" appearance in mass. Bloom lasts for about six weeks starting in May.

Height: 8 to 12 inches

Foamflower is an attractive plant for shady native gardens, eventually forming a dense groundcover and spreading by seed when growing conditions are right. It is in the same family as Heuchera and has similar looking leaves. Crossing Tiarella and Heuchera has yielded many varieties of the popular garden perennial Heucherella (Foamy Bells). Foamflower is an excellent landscaping choice for wild gardens, shady border fronts or moist areas along stream banks.

Kirkwood location: lower garden by pergola or upper garden along crushed bluestone ramp.



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

SPRING 2024 PROGRAMS & EVENTS

Programs have limited capacities and advanced registration is required.
Full details and tickets are available on the Calendar of Events at nhnature.org.


APRIL

<p>APRIL 3 WEDNESDAY Rain date Wednesday, April 10 7:00 to 8:00 p.m. For ages 8 and up</p>	<p>Woodcock Watch - Dance of the Timberdoodle Every spring, the American Woodcock performs a wonderful courtship display over the fields and woodland edges of New Hampshire. They start at dusk with their rasping calls (known as peenting), then head for the skies on whistling wings. Then comes the downward zig zag aerial flight accompanied by the strangest combination of whistles and chirps – think of someone spinning the dial on an old transistor radio... that's what it sounds like. Join Executive Director Iain MacLeod for an evening of woodcock watching and learn about this fascinating little bird. Youth must be accompanied by a registered adult. <i>Cost: \$12 member/\$15 non-member</i></p>
<p>APRIL 9 TUESDAY 5:30 to 7:00 p.m. For adults</p>	<p>Science Pub- Linn-ology: The Fascinating Lives of Lakes At Walter's Basin Restaurant: Doors open at 5:30 p.m., Presentation starts at 6:00 p.m. <i>By Andrea LaMoreax, President & Policy Advocate, NH Lakes</i> Limnologists study lakes. NH is home to 1,000 lakes and each has a life of its own. Find out about the fascinating lives of lakes and learn about some strange and wacky things, too. Bring your questions and stories about wild and wacky things you've seen in our lakes. Join us at Walter's Basin Restaurant in Holderness to gather for a casual evening learning about and discussing science topics over food and drinks. Doors open at 5:30 and the presentation begins at 6:00 p.m. Space is limited and pre-registration is required. <i>Cost: No charge but attendance is limited so pre-registration is required. Order and pay individually for food and drinks.</i></p>
<p>APRIL 20 SATURDAY 10:00 a.m. to 12:00 p.m. For adults</p>	<p>Pruning Trees and Shrubs for Beginners Pruning is one of the most critical yet often neglected tasks in the garden. Late dormant pruning of trees and shrubs helps prevent damage and promotes healthy plant growth for years to come. This workshop by Lead Horticulturist, Emma Erler, will cover basic pruning goals, techniques, tools, timing, and common plants. Lose your fear of pruning and discover how fun and approachable it is with the appropriate tools and techniques! <i>Cost: \$25 member/\$30 non-member</i></p>

MAY

<p>MAY 1 WEDNESDAY For all ages</p>	<p>Trails Open! Join us for opening day of the 2024 trail season. The live animal exhibit trail and all hiking trails will be open to the public for regular trail hours (9:30 a.m. to 5:00 p.m.). See full details at nhnature.org <i>Cost: \$26/adult; \$24/seniors (65+); \$20/youth (ages 3-15); free/children 2 and under; free/members</i></p>
<p>MAY 4 SATURDAY 9:30 a.m. to 5:00 p.m. For all ages</p>	<p>New Hampshire Day New Hampshire residents may visit the live animal exhibit trail for \$5 admission thanks to our generous sponsors: Dead River Company and New Hampshire Electric Co-op Foundation. Non-New Hampshire residents may purchase regular-priced admission tickets. New Hampshire residents must provide proof of residency upon admission. Enjoy Up Close to Animals presentations at the Amphitheater at 11:00 a.m., 1:00 p.m., and 3:00 p.m. Advanced purchased tickets are required. Your timed entry tickets allow you to check in any time during the one-hour admission window. <i>Sponsored by:</i></p> <div style="display: flex; justify-content: center; align-items: center;">   </div>
<p>MAY 18 SATURDAY 11:00 a.m. to 12:30 p.m. For ages 6 and up</p>	<p>Vernal Pool Exploration Spring is an exciting time to be out and about. It's the time when vernal pools are coming to life. Venture out to one of the Science Center's vernal pools to learn about the animals dependent on these temporary wetlands. Waterproof boots and bug spray are highly recommended. This program requires walking off trail, up hills, and across uneven terrain. <i>Cost: \$12 member; \$15/non-member</i></p>
<p>MAY 22 WEDNESDAY 3:00 to 5:00 p.m. For teens and adults</p>	<p>Native Plant Walk - Spring Ephemerals Many of New Hampshire's trees, shrubs, and woodland wildflowers take advantage of the sunlight to bloom before trees fully leaf out in the spring. Join Lead Horticulturist, Emma Erler, as she draws your attention to some of the most stunning and ecologically important native plants found growing at the Science Center. Youth must be accompanied by a registered adult. <i>Cost: \$25 member/\$30 non-member</i></p>

JUNE

<p>JUNE 5 WEDNESDAY 5:30 to 9:30 a.m. For adults and teens</p>	<p>Annual Breeding Bird Census Session 1 - 5:30 to 8:00 a.m. Session 2 - 8:00 to 9:30 a.m. For over three decades we have conducted a census in early June of bird species that nest on the Science Center campus. Join Iain MacLeod to help with this year's survey, done primarily by ear, listening for the territorial songs of male birds, indicating probable nesting. This is a great opportunity to hone your bird song identification skills. The early session (5:30 a.m.) involves canvassing two forested zones, including Mt. Fayal. The later session (8:00 a.m.) covers fields, exhibit areas, and Kirkwood Gardens. Binoculars are available or bring your own. Youth must be accompanied by a registered adult. <i>Cost: No charge to attend. Advance registration is required.</i></p>
<p>JUNE 19 WEDNESDAY 11:00 a.m. to 12:00 p.m. For adults and teens</p>	<p>Kirkwood Gardens Guided Tour Join Lead Horticulturist, Emma Erler, for a guided tour of Kirkwood Gardens. This is your chance to learn about the history of the garden, identify what's in bloom, and ask any gardening questions you might have in this personalized tour. Youth must be accompanied by a registered adult. <i>Cost: \$9 member/\$11 non-member</i></p>
<p>JUNE 25 JULY 9 TUESDAYS 9:30 to 11:30 a.m. For adults and teens</p>	<p>Invasive Plant Species Identification and Management (two-part series) Part 1: Invasive Plant Identification – Tuesday, June, 25 Part 2: Invasive Plant Management – Tuesday, July 9 Support healthy gardens and landscapes while tackling invasive plant issues with skills learned in this valuable two-part workshop led by Lead Horticulturist, Emma Erler. In the first session, you'll become familiar with and learn to identify many of the most commonly encountered invasive plants in New Hampshire. In the second session you'll learn about successful management strategies through hands-on demonstrations of techniques. Seasonal considerations, prioritizing project areas, and native plant revegetation strategies will be covered. Register for one or both sessions. Youth must be accompanied by a registered adult. <i>Cost per session: \$25 member/\$30 non-member</i></p>
<p>JUNE 28 FRIDAY 10:00 to 11:30 a.m. For all ages</p>	<p>StoryWalk™ Kickoff Reception <i>StoryWalk™ surrounds the Holderness Town Gazebo behind the Holderness Post Office at Curry Place.</i> Stroll along the channel as you read a fun nature inspired story posted one page at a time along the trail. Children can participate in a craft and enjoy a snack connected to the story at the Kickoff Reception. Presented in partnership with Holderness Library, Squam Lakes Association, and Holderness Recreation Department. StoryWalk™ is open daily from June 28-September 2. <i>Cost: No charge and no reservations required.</i> Sponsored by: </p>

SAVE THE DATE: 2024 SUMMER FUNDRAISING EVENTS

Family Picnic

Saturday, July 20, 5:00 to 8:00 p.m.

Tickets go on sale July 1.

Join us for this family-friendly event featuring food trucks, live animal programs, ice cream, lawn games, live music, and more in a fun, casual atmosphere for all ages.

Garden Party at Kirkwood Gardens

Thursday, August 22, 5:30 to 7:30 p.m.

(following the Annual Meeting for Members)

Tickets go on sale August 1.

Celebrate the wonders of nature while supporting the Science Center at this adults only cocktail party.



DINOSAURS RETURN

JULY THROUGH OCTOBER 2024

Learn more about the dinosaurs and sponsoring this special exhibit at nhnature.org/dinos

SQUAM LAKE CRUISES

Bald Eagle Adventure Cruise

June 4 to June 25: Tuesdays at 3:00 p.m.

A naturalist discusses the recovery of Bald Eagles in New Hampshire and the route focuses on viewing the Bald Eagles that nest on Squam Lake.

Discover Squam Cruise

May 18 to June 30: Daily at 1:00 p.m.

July 1 to October 19: Daily at 11:00 a.m. and 1:00 p.m. | Wednesdays, Saturdays, and Sundays also at 3:00 p.m.

Enjoy Squam Lake and learn about the natural history, wildlife, culture, and people of the lake.

Loon Cruise

June 24 to August 23: Mondays and Fridays at 3:00 p.m.

See Common Loons as a Science Center naturalist and Loon Preservation Committee biologist discuss loon conservation, biology, and monitoring. The cruise route changes to maximize loon observations.

Cruise with a Naturalist

July 2 to October 10: Tuesdays and Thursdays at 3:00 p.m.

See wildlife on every memorable trip with a Science Center naturalist. Cruise route changes to maximize wildlife observations.

Squam Lake Cruise Rates:

Adult \$32; Senior (65+) \$30; Youth (up to age 15) \$28 - Not recommended for children under age 5.

Cruises may be cancelled if minimum attendance (4 passengers) is not met or for severe weather.

Members receive a \$4 discount per person.

Conveniently purchase cruise tickets online at nhnature.org

Squam Lake Charters

Host your own unique gathering on Squam Lake with a private cruise customized to fit your occasion, or transport wedding guests to Church Island. Our four canopied pontoon boats and experienced tour guides are ready to help with your special outing. Contact Erick Amero at 603-968-7194 x110 or erick.amero@nhnature.org for reservations.

\$375 per hour per boat

VOLUNTEER AT THE SCIENCE CENTER

Volunteers donate their time and skills according to their interests and availability. There are many volunteer opportunities from which to choose. Volunteers assist staff in their work, supporting the Science Center's mission to advance understanding of ecology by exploring New Hampshire's natural world.

Interested in learning more about volunteer opportunities? Visit the Volunteer page at nhnature.org or contact Volunteer Manager Carol Raymond at 603-968-7194 x 122 or carol.raymond@nhnature.org.

Volunteers have a tremendous impact on the work we are able to do. Numbers tell part of the story but show the commitment of our volunteer team. In 2023, 318 volunteers donated 5,628 hours of service to the Science Center. We are incredibly grateful to our volunteers and the services they provide.

2024 VOLUNTEER TRAINING SCHEDULE

Volunteers are trained for their service in a few ways. Some positions are experiential where volunteers train as they provide service. Volunteers may also be trained individually. Several positions require formal training.

Docent and First Guides Training:

- Tuesday, June 18 from 3:30 to 7:30 p.m.
- Wednesday, June 19 from 3:30 to 7:30 p.m.
- Saturday, June 22 from 10:00 a.m. to 2:00 p.m.
- Tuesday, June 25 from 3:30 to 7:30 p.m.
- Wednesday, June 26 from 3:30 to 7:30 p.m.

Adult docents 18 and older and teen docent First Guides, ages 14 through 17, attend 20 hours of formal training to prepare to be representatives on the exhibit trail. Docents and First Guides are busiest between July 1 and September 1, but opportunities are available year-round.

Lake Education Assistant Training (choose one training date):

- April 25 from 10:00 to 11:30 a.m. or May 13 from 3:00 to 4:30 p.m.

Lake Education Assistants are 18 and older and would enjoy demonstrating lake testing activities with school children aboard pontoon boats. Some heavy lifting is required. Lake Education Assistants are busiest in May and June but may have opportunities in September and early October.

School Group Greeter Training:

- May 1 at 10:00 a.m.

School Group Greeters are the first person to greet students and teachers on the bus when they arrive for programs and trail walks. Greeters direct school visitors to check-in, where to organize their groups, and other details. This is a weekday morning activity that lasts about one to two hours. School Group Greeters are busiest in May and June, with some opportunities in September and October.

To learn more or apply for a volunteer position, contact Volunteer Manager Carol Raymond at 603-968-7194 x 122 or carol.raymond@nhnature.org.

MEMBERSHIP UPDATES

Don't forget to purchase or renew your membership so you can get "Nearer to Nature" all season long! Your Membership allows for free daily trail admission May 1 through November 1, as well as bonus member benefits at local attractions and over 150 ANCA locations throughout the country. You'll also receive discounts for additional trail tickets, programs and lake cruises. For a full list of benefits please visit nhnature.org/membership.

Upper Level Memberships

In addition to benefits for all membership levels, upper level memberships (Wetlands, Field, Forest, and Mt. Fayal) may include free trail passes to give to family and friends; lake cruise tickets; memberships to give; free caregiver pass; and invitation to donor events. Upper level member benefits may also be donated. We work with local social service agencies to find families in need who would benefit.

All membership dues provide support for care and feeding of the animals; educational programs for schools, families and children; upkeep and maintenance of trails, exhibits, and buildings; Kirkwood Gardens; educational lake cruises; and general operating expenses. Most importantly, membership dues help to support Squam Lakes Natural Science Center's mission: to advance understanding of ecology by exploring New Hampshire's natural world.

Business Memberships

Business support is vital to help the Science Center achieve its mission. When you become a Business Member you align your business as a supporter of an environmental organization who has been educating the public for almost 60 years. There are many opportunities for businesses to showcase their brand in front of nearly 70,000 engaged visitors each season. Depending on the Membership level best suited for your business you may receive live animal exhibit trail tickets to give to your clients and employees, discounts on function room rental for your next meeting, and discounts on private boat cruise charters for your next employee or client appreciation event. Plus, listing on the Business Membership webpage and in the Welcome Center. Learn more on the Business Membership page at nhnature.org.

New Membership System

Please be patient with us this season while we learn our new membership software. Also, remember that all members will be required to show their membership card and a photo ID at Admissions.

SPONSOR A SPECIES



River otter

Take your support of the Science Center animals to the next level! Sponsor your favorite animal and see your name listed on our website and along the live animal exhibit trail. Plus, receive benefits based on the level you choose, such as free live animal exhibit trail tickets, plush stuffed animal, an animal fact sheet, a certificate of appreciation, the Science Center quarterly newsletter *Tracks & Trails*, and monthly e-Happenings.

The animals at Squam Lakes Natural Science Center serve as ambassadors for their species, here for the purpose of teaching about New Hampshire's natural world. The cost of caring for wildlife is considerable. All of the animals need specialized diets, daily care, enrichment, and creature comforts. You can help provide food, health care, and housing for the animals - for your favorite feathered or furry species - through Sponsor A Species. You may sponsor a species for yourself, your family, or your company, school, or club. You can even send a sponsorship package as a gift. The animals thank you for your support!



2024 BONUS MEMBER BENEFITS

							
APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER



Reciprocal admission is generally good for up to two adults and two youth per visit. Be sure to take your membership card with you when you go. Check with specific organizations for hours, directions, and information. Remember as a Science Center member, you receive discounted admission all year at participating ANCA organizations like VINS in Quechee, VT and Seacoast Science Center in Rye, NH.

Check out the Membership FAQs at nhnature.org/membership

KIDS' ACTIVITIES: MAKE AN ECLIPSE VIEWER

You don't need fancy equipment to safely view the solar eclipse happening on April 8, 2024 (see *Naturalist's Corner* on page 4 for more information). Never look directly at the sun, even during an eclipse, because it can permanently damage your eyes. Instead, build one of the following eclipse viewers using materials you can find around your house.

Paper Plate Pinhole Projector

Materials

- 2 paper plates (or similar stiff, white paperboard)
- Scissors
- Tape
- 3" square of Aluminum foil
- Push pin, safety pin, or paperclip

Directions

1. Cut a 2" square in the middle of one of the paper plates.
2. Tape the square of aluminum foil centered over the hole.
3. Use the push pin to make one hole in the center of the foil (the smaller and cleaner the hole, the sharper and clearer your projection will be).
4. Stand with your back to the sun and hold the plate up so that the sun shines on the plate. Remember not to look directly at the sun.
5. Hold the second plate beneath the plate with the foil

square. A dot of light will appear on the second plate from the light shining through the hole in the foil.

6. Adjust the distance between the two plates until your projection of the sun is focused. Once the eclipse starts, you will see the shape of the moon move across your projected sun.

Cereal Box Pinhole Projector

Another type of eclipse viewer can be made with a cereal box. Check out the video titled "How to Make a Pinhole Projector to View the Solar Eclipse" on the NASA Goddard YouTube channel for directions.



What will your legacy be?

Your legacy gift will help Squam Lakes Natural Science Center continue to achieve its mission to teach about the natural world for generations to come while ensuring that your wishes are honored. Becoming a member of the Naturalist's Legacy Society is simple.

Learn more at nhnature.org/support or contact Development Director Rachel Saliba at 603-968-7194 x 126 or rachel.saliba@nhnature.org.

TRAIL'S END



There is always something new at the Science Center, and I enjoy highlighting a few in this brief column. My focus today is on our stewardship of the Science Center's wonderful animal collection which attracts nearly 70,000-plus visitors to our trail each year. Many reading this are familiar with our two mountain lions and black bear who debuted in 2023, as well as old favorites like the otters and the raptors (I am partial to the owls...)

In response to the high priority given in our strategic plan to stewardship of all our creatures, we created a new standing board committee centered on animal welfare. Its focus is squarely on how we can continue to care for our animals in the best ways possible. This is no simple or easy task as our collection has many species with very specific and different needs. The animals at the Science Center are here because they have been injured, orphaned or are unable to survive on their own in the wild – broken wings, loss of sight, serious injury or other misfortunes.

There has long been a dedicated staff group focused on animal welfare and the Board is now adding more intense attention to our animal collection with this new committee. The first chair of our Animal Welfare Committee was Justin Van Etten (who had just completed a three-year term as our Board Chair – thank you again Justin!) – and our new committee chair is Ann Ehrhart who among other things is a Blue Heron School parent. Under this group's auspices, we are just about to complete a new ambassador animal annex to house all the mammals who are not seen on the trail but make countless outings to schools, civic groups, retirement homes, and other settings to spread the word about New Hampshire ecology, animals, and the Science Center as well. We are also undertaking the creation of a Master Site Plan that will outline a long process of refreshing and, in some cases, expanding the enclosures on the live animal exhibit trail, revitalizing the materials that comprise the enclosures, and more. We hope both you *and* the animals notice and enjoy the improvements to come!

Trail's End is written by Sarah Brown, Chair of Squam Lakes Natural Science Center's Board of Trustees. You may contact her at sarahbrown1948@gmail.com.

VERNAL POOLS *continued from page 1*

up to 1,000 eggs before leaving the pond to return to the surrounding uplands. The eggs hatch in about a week and the tadpoles remain in the pool for 5-7 weeks as they transform through metamorphosis into juveniles ready to leave the pond. In years when pond drying is early, this transformation may happen earlier, producing smaller sized juveniles. In very dry years, the tadpoles may become stranded and die. Although their calls encourage us to celebrate the new season, these vocalizations also remind us of how important these wetlands are to a variety of creatures.



Spring peeper

flickr/Judy Gallagher CC BY 2.0

Are you searching for a glimpse of a more elusive but somewhat larger creature? The spotted salamander, *Ambystoma maculatum*, takes the prize. These five-to-six-inch-long creatures spend most of their lives underground but they too require vernal pools for reproduction. On rainy spring nights, these salamanders leave their underground burrows to head to the same pool where their life started. Once the salamanders arrive, they form what is referred to as a “congress” – an elaborate underwater mating dance where potentially hundreds of individuals swirl around each other. Males deposit spermatophores, or sperm packets, in the pool, which are picked up by a female that has selected that male. The female takes the sperm into her cloaca, internally fertilizing the eggs. The females then deposit one to several egg masses ranging in size from one to six inches, each containing a dozen to several hundred eggs. The larvae hatch six to eight weeks later, if they have survived egg predation by caddisfly larvae, spotted turtles, and other predators. Ultimately, only a small proportion of eggs make it through larval development to complete metamorphosis and leave the pool. Those that are successful will return two-five years later for the annual spring congress.

Wood frogs, *Rana sylvatica*, have a different approach to surviving severe northern winters by virtue of their amazing ability to partially freeze! These creatures’ internal organs are obviously vital and potentially threatened by freezing, but the transition to winter mode protects them. Water exits the organs, moving outward to create a shield of ice. Natural body fluids, urea and glucose, deter freezing in essential organs. In spring, their transition back to activity and breeding comes early, enabling the wood frogs to reach their breeding pool as early as possible, just as ice is starting to melt and the ground may still be covered with snow. Timing is essential for the success of this strategy. Laying eggs early ensures embryos start to develop when water levels are at their height, and increases the probability that tadpoles will hatch just as food sources become plentiful and grow large enough to leave their

ephemeral nursery before it dries up in the heat of summer. A chorus of wood frogs is usually the first among frogs to raise our spirits. This spring when you hear their duck-like calls emanating from your local vernal pool, consider the chain of events that has to follow for those quacking sounds to lead to young wood frogs being added to the population.

Once thought of as nothing more than large puddles, vernal pools are now recognized as significant contributors to the biodiversity of an area, providing breeding habitat for many species that don’t breed successfully in permanent ponds. The threats to vernal pools and their inhabitants are many and include development and climate change. Climate change predictions include more episodic precipitation, which may cause vernal pools to dry earlier in the year and remain dry longer. Can the creatures that have evolved breeding cycles to match the wet-dry patterns of these essential habitats change their timing to match this new pattern? Or will we see these species decline? Clearly these unique habitats are worthy of conservation, protection, and further study.

The three species highlighted here are only a few of the many fascinating creatures that rely on vernal pools. Get out this spring and discover the secretive residents of these ephemeral habitats. Submit your observations to New Hampshire Fish and Game’s Nongame and Endangered Species program to help with protection and conservation of vernal pools in the Granite State. Despite mud season, spring can be a joyous time of discovery and renewal in nature, especially in a vernal pool. Engage your eyes and ears, immerse yourself and emerge refreshed and welcomed by the freshness and excitement of the new season!



Wood frog

VERNAL POOL QUIZ

1. T or F? Vernal pools are fed by streams.
2. Name three creatures which utilize vernal pools.
3. What are two examples of threats to vernal pools?
4. T or F? Vernal pools lack drainage.
5. What is the typical depth of a vernal pool?

Answers:

1. False. Melting snow and runoff fills vernal pools.
2. Spring peepers, spotted salamanders, and wood frogs
3. Development and climate change.
4. True
5. Two to four feet



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