

A Way to Help Our Environment

Humans have been observing what scientists call "phenology" for thousands of years even if we didn't have a specific word for it. Phenology is the study of recurring plant and animal life cycle stages (phenophases) and their timing and relationships with weather and climate. Think about leafing and flowering, the emergence of insects, and the migration of birds. Native Americans even gave different names to each monthly full moon corresponding to what was happening in the environment (Full Flower Moon and Harvest Moon as examples). Survival relied upon a keen understanding of one's environment, and while this isn't the case today, the study of phenology is still extremely important and builds a connection to the environment.

Each species takes clues from the environment to properly time various life cycle changes. These come in many forms. One example is how many amphibians move from hibernating in the soil and woods



during the first big rain of spring. Although they are vulnerable on land, when they all do this together a larger number will survive than if they were to go at different times. Birds use the amount of daylight (photoperiod) to time each stage, allowing them to adapt in advance of predictable environmental changes like migrating before it gets too cold or laying eggs before food is in abundant supply. Yet other species use temperature, such as some plants.

Timing is important because of the many interactions between species. When some are responding to weather, some to temperature, and others to photoperiod, mismatches can occur. This is evident as we face climate change. Here in the Northeast, we can expect warming and changes in precipitation patterns. An example of a changing climate affecting the stages of life is apparent in the Netherlands. Cued by temperature English Oaks have been leafing out earlier each spring, and the moth caterpillars, who

feed on the oaks, emerge and spin cocoons earlier. However, Pied Flycatchers migrate from Africa based on day length, so when they arrive after a long migration they find their main food source of caterpillars are already moths. This has caused a 90% population decline in these Flycatchers!

What can we do to help? Scientists and land managers are faced with a huge challenge to monitor changes around the world to determine which species are experiencing timing changes, mismatches, or range movement. Citizen science projects are a fantastic way for all of us to contribute to large and longterm datasets that can be used to make important decisions about conservation and environmental stewardship. Everyone who uses the trails at BLT preserves and admires the lady's slipper in the spring, marvels at the beautiful reds and orange leaves of fall, and fawns over the adorable porcupettes (baby porcupines) of summer, can also make a difference. All we have to do to help is be willing to take five minutes after a walk to record online. at Nature's Notebook what we have seen. Please watch your email for BLT's Nature's Notebook project information and training sessions. Find out more about Nature's Notebook on page 4.

by Katelin Craven

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Lucy Quimby President



William Phillips Vice President



James Hinds Treasurer



Laura Mitchell Secretary

Kathy Billings Katelin Craven Chris Dalton Shirley Ellis Lori Gettler Robert Ostrowski Paul Pasquine Linda Perkins Dave Thompson Dear Friends,

Please join your land trust in celebrating a major accomplishment and help us in the final stretch of reaching another major milestone!

When Bangor Land Trust incorporated in 2001 and began promising to protect land in perpetuity, that was an act of faith, courage, and commitment. We met in a board member's office; our first annual budget was \$636. We were determined to do an ethical and conscientious job, but our only external guidance came from a 17 page booklet, <u>Land Trust</u> <u>Standards and Practices</u>, published by the national Land Trust Alliance.

In 2006 the Land Trust Alliance started an accreditation program, allowing the nation's land trusts to hold themselves accountable to appropriate and rigorous standards. They updated Standards and Practices and published a two volume guidebook. In April 2006 the Bangor Land Trust board voted to meet the challenge of becoming accredited. In April 2014 we sent off three two-inch thick binders containing all the required evidence of our having followed the 12 Standards and 88 Practices. This represented 860 hours of work – ably led by Jim Hinds, assisted by our office manager Donne Sinderson, and contributed to by the whole Board. We performed self-evaluations, organized our files, carried out additional surveys on our properties, wrote policies and management plans, and documented what we did to comply with those policies. Land trusts are tax-exempt and the substance of our work – land – has a high financial and emotional value. Without high ethical standards and accuracy of operation there can be no trust.

On Friday, February 13, we got the call – Bangor Land Trust has joined the ranks of 285 accredited land trusts nationally, 16 in Maine! You can be confident that the land trust you support meets national standards.

Our second challenge, related to our promise of protection in perpetuity, is to build an endowment. The land we have promised to conserve will always need the land trust's care, and resources will always be needed. An endowment is not only a way to provide for this care, it is also a way for people who love the land, who have carried it in their hearts, to leave a legacy of care and a gift to future generations. Last winter Bangor Land Trust received a challenge grant of \$25,000 from the Ram Island Fund. We have just \$5,000 left to raise to meet this match, and we turn to you all for your help. Many hands make light work. Your gift will support Bangor's Wild Back Yard in perpetuity.

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All living organisms live by the immutable rules of physics. Billions of years of evolution have resulted in novel and fascinating ways of benefitting from these universal laws. Let's look at one implication of the second law of thermodynamics—energy moves from areas of higher concentration to lower concentration . That's why we get cold when we go outside in the winter – the heat energy generated by our bodies moves to a lower concentration of heat energy, the outdoor air. One way to stop this is to put up a barrier, such as clothing, blocking the transfer of energy.

Your winter jacket is designed to prevent body heat from escaping. It does this by providing tiny airspaces that stop the transmission of heat energy. Still air is a poor conductor of heat energy because it has a low concentration of molecules and thus cannot absorb and transmit energy readily . Our coats mimic what other animals have done in various ways for millions of years.

If the tiny airspaces in your winter jacket are created by down, you are benefitting from the evolution of a protein called keratin. DNA analysis of this very useful multipurpose protein suggests that it evolved along a number of different pathways through the evolutionary process in a variety of different animals. Keratin is found in invertebrate animals and in all the vertebrates. What do feathers, fur, claws, beaks, toe pads, and scales have in common? Keratin!

For many animals, shorter days trigger hormonal changes that result in the formation of winter fur and feathers. Fur's long, protective guard hairs trap air by being hollow. They work together with layers of shorter, extremely fine hair, to trap air. Trapped air slows down the transmission of heat energy.

Body size and life style dictate the type of winter fur and feathers. Beaver, fox, river otters, martins, fishers, deer, moose, and bears all produce denser fur in winter. These animals are not inconvenienced by a larger girth. Other animals such as weasels and mice would find thick fur a hindrance as they try to squeeze through small passages. Species such as these eat ravenously and seek shelter from the cold as an alternative means of surviving winter.

Feathers seem to have evolved from the keratin-filled horny scales of early dinosaurs. Feathers probably had multiple functions for the dinosaurs, such as insulation, signaling, and aid to locomotion. Most modern birds have large, stiff protective feathers and short, fluffy, downy feathers to trap air. This trapped air prevents a loss of heat from their bodies just as it does in our down comforters, jackets and sleeping bags. In regions with cold winters, the density of birds' down feathers increases greatly during the fall. Birds such as chickadees, who do not fly long distances and stay here for the winter, develop a larger number of downy feathers and far fewer long feathers for flapping and gliding.

Marine mammals that frequent cold water have a different set of challenges. Many of these mammals dive deep into the ocean to feed, so the great water pressure would



force out air trapped by dense fur. Fur would not be a good option for them. Water temperature, even in the arctic, is never as cold as air temperature, so trapping of a dead air space would not be as helpful. In addition, the large size of these mammals means the ratio of heat-losing surface area to total body volume is low and makes it easier to keep warm (another implication of thermodynamics).

These large marine mammals turn to blubber as a means of blocking the transmission of heat energy. The word "blubber" derives from a Middle English word that means "to bubble". Whale fat bubbled when boiled to make fuel. Blubber has more blood vessels and connective tissue than "regular" fat, and the blood vessels in blubber can constrict to conserve heat. Therefore, this insulating fatty layer (which also functions as energy storage) serves them well. The thickness of the blubber is not as important as its low water and high fat content. Smaller marine mammals, like seals, have both fur and blubber as they spend some time on land and do not dive as deep.

I think I will put on my down jacket and go out and get a jelly donut!





Nature's Notebook invites all interested citizens to help document the changes taking place in our natural environment as our climate changes and our earth warms. Plants and animals are inevitably affected by the changing climate - warmer temperatures, droughts in some areas, and more concentrated precipitation events in others. And there is no doubt that the earth's climate is changing and will continue to change - at a speed that depends in part on how well we as humans can organize to minimize the amount of carbon dioxide we put into the atmosphere. But who is looking out for the plants and animals that will need to adjust and redistribute themselves as conditions change?

Bangor Land Trust and Nature's Notebook are helping to record changes in plants and animals in cooperation with both state and federal programs, as a necessary first step to an action plan to help conserve species. The US Geological Survey has a state by state list of Species of Greatest Conservation Need (SGCN) compiled with the help of state fish and wildlife agencies. You can find the list for Maine here: http://wwwl. usgs.gov/csas/swap/ download?state=Maine.

Maine is creating its own Wildlife Action Plan, looking at what habitat types are needed to foster the health of vulnerable species. You can get more information about that here: http://www.maine.gov/ifw/wildlife/ conservation/action_plan.html. Bangor Land Trust is sharing information about our conserved lands with the state agencies that are working on these conservation projects.

Most of Bangor Land Trust's preserves contain parts of Penjajawoc Marsh and its uplands, or conserve the wildlife corridor that connects Penjajawoc Marsh to Caribou Bog. This area is used by many of the birds that appear on the Maine list of species of greatest conservation need, including the Least Bittern, Great Blue Heron, American Coot, Common Moorhen, Northern Harrier, Black Tern, Whip-poor-will, Chimney Swift, Eastern Kingbird, Eastern Wood-Pewee, Barn Swallow, Northern Rough-winged Swallow, Tree Swallow, Wood Thrush, Veery, Black-and-white Warbler, Chestnutsided Warbler, Yellow Warbler, American Redstart, Canada Warbler, and White-throated Sparrow. By helping Bangor Land Trust to be good stewards of Bangor's Wild Back Yard, you are helping your animal neighbors cope with climate change!

Much of Bangor is home to some form of wildlife. By the time you read this, the mockingbirds may have returned to build nests downtown. Here are some other things you can do to take care of Bangor's wildlife: Keep cats indoors (they kill enormous numbers of songbirds each year), please follow dog and leash guidelines on Bangor Land Trust preserves to avoid disturbing wildlife, and avoid using weed and insect killers that may harm endangered insects, such as the Monarch butterfly. These are challenging times – you can help!

"Nature is not a place to visit - it is home." Gary Snyder





Bangor, Maine trail camera photos of: left, bobcat on January 21, 2015 (20 degrees at 1:47 pm) and right, coyote on January 25, 2015 (24 degrees at 3:18 pm)

Programs Committee Report

by Lucy Quimby, Interim Chair

The Programs Committee is proud to report the accomplishment of 22 programs offered to membership and the public in 2014. Thanks to the following people for leading one or more of the programs:

Steve Sader Chris Dalton Cathy Elliott Jerry Smith Shirley Ellis **Bob Duchesne** Katelin Craven George Elliott Gail Downs Bob Milardo Clare Cole Donne Sinderson Christy Stout Lucy Quimby Jean Adamson Robert Ostrowski Dave Thompson Kevin Smith

Katelin Craven became Chair of the Committee on October 1, 2014. Bangor Land Trust is fortunate to have her leading the Programs team.



Road Ride Committee Report

by Shirley Ellis, Chair

This winter's weather might not have prompted you to think about riding your bike, but the Pedal the Penobscot Road Ride committee has already started planning for the ninth annual ride. The ride will be held on Sunday, September 13th.

The Committe would like to welcome three new members: Lynn Bolduc, Gary Gonyar and Carolyn Eaton.



Each year more riders sign up for the event, and several of the returning riders tell us that it is their favorite ride of the season. Many of the riders form a team of five or more, and some of the family teams contain two or more generations of riders. You can celebrate Grandparent's Day by Pedaling the Penobscot. It falls on the same day again this year.

The Land Trust will be at the Orono Great Maine Bike Swap hosted by the Bicycle Coalition of Maine on April 12th at the UMaine New Balance Recreation Center. Please stop by to see what is being planned for this year's ride. If you can not attend the bike swap, watch for announcements about the ride on Facebook or our website http://www.bangorlandtrust.org.

Ensure that your children, grandchildren and greatgrandchildren are able to explore and enjoy the woods and meadows you know and love. Please give an <u>extra gift this year to the Wild Back</u> Yard Legacy Campaign.

Have you been thinking about a way to make a difference - that will last even after you're gone? You can give an enduring gift of Bangor's wild back yard to future generations by making a bequest to Bangor Land Trust in your will.

For more information call 942-1010, stop in the office at 8 Harlow St fourth floor (Tues, Wed & Thurs from 8 am to 5 pm) or send a message to info@bangorlandtrust.org.

"In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught."

Baba Dicum

2014 Membership

Conservators (\$5000+) Anonymous (3) Blueberry Broadcasting Emera Maine Maine Community Foundation

Protectors (\$2500 - \$4999) People's United Bank Pulse Marketing

Land Stewards (\$1000 - \$2499) Kathy Billings Jane and Frank Bragg Dan and Dina Cassidy Dysart's Restaurant Maine Coast Heritage Trust Paul and Rachel Means Laura and Don Mitchell Parke and Andrea Oldenburg Gwethalyn and William Phillips Quirk Auto Sea Dog Brewing Co.

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(\$250 - \$499) Bangor Federal Credit Union Beal College Boeing Company David and Susan Carlisle Casco Bay Energy Co. Tom and Lea Cassidy Mr. and Mrs. Robert Chase Christopher Dalton James D. Elmore W.S. Emerson Company Epic Sports Jeff and Lori Gettler Dr. and Mrs. Bruce Malmer Renee and Leonard Minsky WBRC Architects & Engineers Woodard & Curran William and Sharon Zolper

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Matching Funds GE Foundation RBC Foundation The Boeing Company



Bangor Land Trust is proud to announce that it has received accreditation from the national Land Trust Alliance.

What sort of standards does a land trust have to meet in order to get accredited? The answer is in the two volumes pictured below, published in 2004 by the Land Trust Alliance:

Here are some of the highlights -

(1) BLT has to have criteria for determining the conservation value of the land and easements we purchase or accept as gifts. We have to show

that we have the capacity to take on each project, and that it really does have public benefit.

(2) BLT has to have a properly functioning

functioning board, that meets regularly, understands its fiduciary responsibility, follows its by-laws, and makes all major decisions, especially decisions involving land transactions.

- (3) BLT has management plans for all its preserves and funds set aside to take care of our lands and trails.
- (4) BLT is accountable to its donors to keep accurate financial records and use the money that is given to us as promised.
- (5) BLT keeps accurate financial records, prepares monthly budget-andactual reports, and has year-end financial statements prepared by a qualified financial advisor in accordance with Generally Accepted Accounting Principles.

Earning accreditation is the fulfillment of a resolve that the Bangor Land Trust board made in 2004 and the result of 3 years of diligent and focused work assembling the documentation to demonstrate our adherence to the Land Trust Standards and Practices.

Jim Hinds deserves a special thank you for leading the accreditation team. Thank you, Jim!





BANGOR LAND TRUST

PO Box 288 Bangor, ME 04402-0288

www.bangorlandtrust.org info@bangorlandtrust.org

BANGOR LAND TRUST'S MISSION: "Protect for public benefit land and water in the Bangor region that have special ecological, natural, scenic, agricultural, or recreational significance while increasing public understanding of the value of land and water conservation."

Upcoming Programs:

- Nature's Notebook Training (April 4th at 9-11:30am) at the Bangor Land Trust office
- Woodcock Aerial Display (evening of April 18th)
- Vernal Pools (afternoon of May 23rd)
- Lady's Slipper Search (June)
- Evening Bird Watching & Frog Calls (July)

Some details are still to be determined. Check out the web site or call 942-1010 to find out more. Is there something you'd like to learn about?

If you would prefer a color version of <u>Bangor Land Trust News</u> through email, contact the office (info@bangorlandtrust.org).

When making your annual membership gift, an <u>additional</u> donation to the Wild Back Yard Campaign, will be matched by a challenge grant through the Maine Community Foundation's Ram Island Fund!

Ensure the long-term viability of YOUR land trust with an endowment gift today. (Be sure to include a note that your gift is for the endowment.) THANK YOU!

Look for Bangor Land Trust at: The Bicycle Coalition of Maine's 2015 Orono Great Maine Bike Swap ---Sunday, April 12 ---10am-1pm ---UMaine New Balance Recreation Center, Orono

> The Swap has become the unofficial kick-off to the Maine cycling season. At the Swap, you can choose from hundreds of bikes, including hybrids, road bikes, mountain bikes, children's bikes, recumbents and more. The inventory covers all price ranges, so you're sure to find something that suits your budget.

> Looking to sell a bike you're not using? You can do that, too! Visit bikemaine.org/swap for more information, to register your bike, or to sign up to volunteer. Admission to the Swap is \$3 for adults and teens and FREE to UMaine students and children ages 12 and under.

Need bike accessories or gear? Area bike shops will be selling helmets, bike parts, and accessories, and Maine Bound will hold its annual Gear Sale on site as well!

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Thanks to St. Joseph Hospital and Bangor Letter Shop for their help in getting this newsletter to you.