

Mass Audubon *Protecting the Nature of Massachusetts* **Connections**

OCTOBER — DECEMBER 2014

A NEWSLETTER FOR THE MEMBERS OF MASS AUDUBON

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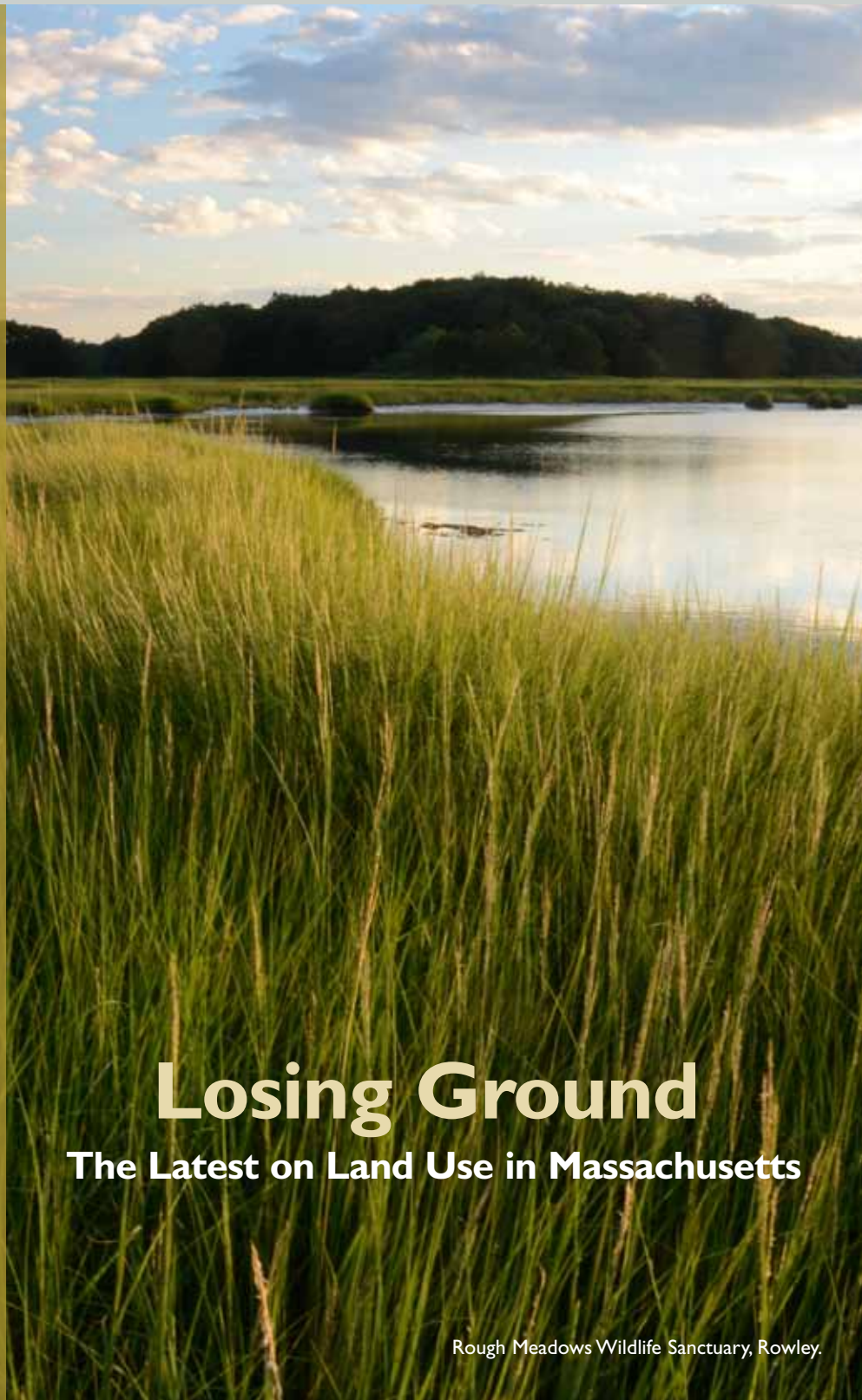


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Losing Ground

The Latest on Land Use in Massachusetts

Rough Meadows Wildlife Sanctuary, Rowley.



Losing Ground

The Latest on Land Use in Massachusetts

By Jeff Collins

You've probably noticed land use changes in your community over time, such as the clearing of forests to make way for new housing or commercial buildings. You may be wondering if some of these developments are indicative of a larger trend.

How is land use changing in Massachusetts? To find out, Mass Audubon has developed a series of reports over the past three decades that analyze local changes and create a big picture of trends across the state. The latest update, *Losing Ground: Planning for Resilience*, tells a story of economic ups and downs. It also helps us plan for a strong future in the face of threats such as sea level rise and more intense storms.

Land Use in Your Community

Losing Ground online: Explore interactive maps of land use and conservation, read the full *Losing Ground: Planning for Resilience* report, browse previous reports, and much more at massaudubon.org/losingground.

Shaping the Future: To help citizens become involved in planning decisions, Mass Audubon offers its award-winning Shaping the Future of Your Community program, which includes workshops, a guidebook, and more. Visit massaudubon.org/shapingthefuture.

Our Previous Discoveries

The early *Losing Ground* reports highlighted an environment in deep peril. The first report, released in 1987, showed that over 100,000 acres of land were developed between 1981 and 1986. The second report, which came out in 1999, revealed a loss of 44 acres of open space—or more than five Fenway Park ball fields—per day, mostly to large-lot residential development. The 2003 report showed that Massachusetts lost only 40 acres per day from 1985-1999, but described the significant impacts of development on nature and the natural services we depend upon.

By 2009, the trend of land development and conservation had reversed: 40 acres of open space were protected every day and only 20 acres were lost. It was good news, but the fourth edition of *Losing Ground* also highlighted the damage to natural areas that takes place when nearby land is developed.

Legislators, government officials, the media, and land trusts have come to rely on the data in *Losing Ground* reports. The result has been increased state funding for open space conservation and a new trend of more open space protected per day than developed.

Creating the New Report

We faced a serious challenge early on in the development of this fifth edition of *Losing Ground* when we learned that a new version of statewide land use data would not be available for our analysis. So we turned to our state's strong academic community to find researchers who were interpreting land cover using satellite imagery. Clark University helped to ground us in these new methods, and we then worked with students and faculty in Boston University's Department of Earth and Environment to compile and analyze the data.

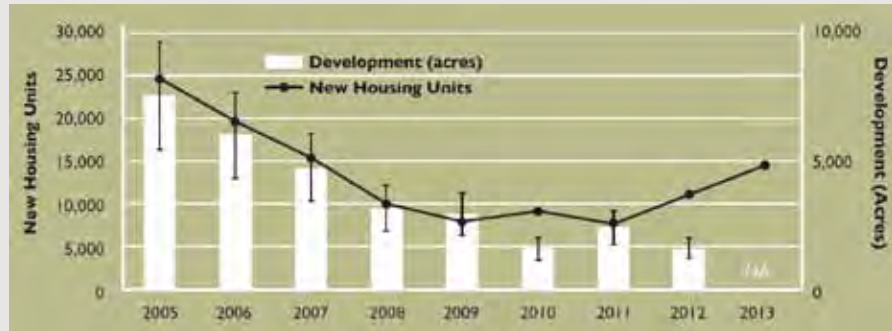
At BU, Dr. Curtis Woodcock and his team have developed techniques for calculating land cover change using Landsat satellite imagery. The satellites collect new imagery every few weeks, which meant that we could track detailed changes over time, such as the slowdown in development resulting from the housing crisis.

Mass Audubon staff also carefully double-checked over 1,700 individual photos from the satellites to help interpret some of the more unusual changes, including a very clear strip of damage caused by the 2011 tornado outbreak.

We took our findings one step further to address a pressing issue: how development impacts the ability of land to stay resilient in the face of climate change. The Nature Conservancy created a mapping tool that identifies areas of the state most likely to offer high-quality habitat even in changing climate conditions, and we figured out which of these areas were developed and which were permanently protected.

What We Found

Our new report shows that protected land now covers over one quarter of the state. During the period from 2005 to 2013, state agencies, municipalities, nonprofit organizations, and private landowners permanently protected three acres per day for every one acre that was developed. While the news is encouraging, we shouldn't be complacent. This installment of *Losing Ground* covers the years of the Great Recession, when development slowed dramatically due to economic conditions. An uptick in the number of new housing permits suggests we're heading back toward the high development rates of previous years.



New developments and permitted housing units in Massachusetts.

Choices for the Future

The fact that we've managed to protect so much land while maintaining vibrant communities serves as a national model for blending environmental protection with economic growth to provide a high quality of life. Massachusetts is the third most densely populated state in the nation. Incredibly, more than half of the land is neither developed nor protected—and much of it is of high conservation value, including critical wildlife habitat and land that is important for climate resilience. This means that we have a lot of choices to make.

Growth and development will continue, but not all development is the same, and the key is to build in the most appropriate places while preserving high-priority natural areas. With careful planning at the community and regional levels, we can ensure a healthy economy and safeguard our clean air and water, forests, farmlands, and recreational opportunities. Protecting natural areas also helps to keep our landscape resilient in the face of climate change impacts such as increased storm intensities, floods, droughts, and heat waves, since forests and wetlands absorb water and provide shade.

It's not just about protecting high-priority landscapes. We also need to restore some of these important functions to our developed areas. By adding green spaces such as parks, community gardens, streamside plantings, and green roofs, we can greatly improve our quality of life and make room for wildlife while keeping our economy strong.



Helping Budding Scientists Bloom

By Heather Cooper

Science and nature are a natural fit, especially for preschoolers. Mass Audubon educators have been partnering with schools across the Commonwealth for more than 60 years, and if there's one thing we've learned along the way, it's that preschoolers love being scientists. They have an innate talent for exploring, asking questions, and delving into scientific investigations about the world around them.

Many teachers believe that bringing children outdoors is important, but they're often unsure of where to start, what to do, and how to respond to questions about the natural world. This is where Mass Audubon's teacher-naturalists really shine: All of our school programs incorporate STEM (Science, Technology, Engineering, and Mathematics) learning into outdoor experiences.

That's why we were thrilled to have received a competitive grant from the Massachusetts Department of Early Education and Care (EEC) to develop innovative STEM curricula for students aged 2.9-5.

New STEM Teaching Units

To make the most of the EEC grant, our licensed preschools (see inset) worked together to develop a series

of free, activity-based teaching units for early education providers covering the following science topics:

- Birds ("Our Feathered Friends")
- Trees ("Tree...mendous Trees")
- Soil ("Digging into Soil")
- Weather ("Wicked Cool Weather")

Each one offers inquiry-based activities to spark curiosity and help young learners understand their connection to plants, animals, and nature's cycles and systems, and includes an outdoor education "road map" for teachers who don't have natural history training.

No special equipment is required, and the units were field tested in urban, suburban, and rural settings, indoors and out, to ensure that they can be taught anywhere. Teacher Michelle Blake from ABCD Mattapan Head Start, located in one of Boston's most densely populated neighborhoods, tested the Birds unit. "The class examined bird feathers with a magnifying glass," she said, "and on one of our walks one child corrected another child, telling him that the bird was a blue jay, not a pigeon. It was a great learning experience for all the children."

Learning Beyond the Classroom

As part of the curricula, students participate in hands-on activities, such as building a bird's nest, measuring trees, and exploring the textures of bark. Each unit is accompanied by a series of activities that prompt further discovery. For example, children who explore seeds in the schoolyard are invited to discover them in their neighborhoods or kitchens, providing a chance for both adults and children to reflect on content learned at school.

Online Resources for Educators

The free units will be available for download in English and Spanish via the Mass Audubon website and the EEC website starting in October. To find out more, visit massaudubon.org/education and mass.gov/edu.



Pathways to Nature Preschool

500 Walk Hill Street, Mattapan
617-983-8500 • massaudubon.org/boston

Drumlin Farm Community Preschool

208 South Great Road, Lincoln
781-259-2224 • massaudubon.org/drumlin

Arcadia Nature Preschool

127 Combs Road, Easthampton
413-584-3009 • massaudubon.org/arcadia

Real Math, Real Science, Really Inspiring

"Why do we have to do this math problem?"

"Who cares about science?"

For nearly a decade, Mass Audubon's Broad Meadow Brook Conservation Center and Wildlife Sanctuary has teamed up with the EcoTarium, a unique indoor-outdoor museum, to help thousands of Worcester sixth graders answer these questions. As part of their collaborative Real Math, Real Science school program, staff educators from both organizations use field-based activities to make sometimes abstract subjects accessible, relevant, and exciting.

Stream Scientists

Hands-on activities allow students to take on the roles of scientists, and small group sizes mean that everyone has a chance to get involved. In one lesson, they act as stream ecologists, measuring the flow rate of Broad Meadow Brook by dropping ping-pong balls into the water and recording how far and fast they travel. Then they're off to the EcoTarium, where they collect and study pond water samples under a microscope. By peering into the normally unseen but incredibly diverse world of aquatic invertebrates, students are able to make educated guesses about a pond's plant and animal populations.

Forest Biologists

Another lesson challenges the participants to figure out whether Broad Meadow Brook or the EcoTarium has the biggest tree. In order to measure something as enormous as a mature tree, they learn four different methods for determining the height of tall objects using almost no equipment—one involves using a ruler to "lay" the tree down and measure its height. The students also learn how to figure out how much oxygen a tree produces and discuss the vital role that plants play in producing the air we breathe and sustaining life on our planet.

Making the Connection

"Most of our students do not have the opportunity to experience nature on their own, much less with a naturalist as a guide. The excitement of a city kid when he or she sees a salamander or a frog in its natural habitat is so gratifying," says Worcester Public Schools Science and Engineering Liaison Kathy Berube. "One student even told me that he wants to be a naturalist and that he never knew that someone could have a real job doing these things! To spark an interest or even prompt a budding passion for nature and for science is by far the best product of this program."

Support this Project

The Real Math, Real Science program is funded in part by the George I. Alden Trust. Broad Meadow Brook and the EcoTarium plan to offer the program to Worcester sixth graders again for the 2014-2015 academic year.

To support this project, including funding pre- and post-field trip classroom time, contact Broad Meadow Brook Development Director Shelley Rodman at srodman@massaudubon.org or 508-753-6087.

Heather Cooper is Marketing Manager.





An Invaluable Wildlife Resource

By Hillary Truslow

Linda Cocca has just about heard it all. Since she began her position as a wildlife expert at Mass Audubon back in 1988, she has answered thousands and thousands of inquiries regarding nature and wildlife via phone, email, and social media.

There was the time she received a call from someone concerned about erratic blue jay behavior, only to discover that the cause was the vodka that had been innocently added to the birdbath to prevent it from freezing during the winter. Or the time when a gentleman asked if a squirrel might hide jewelry, since his place for safekeeping in the attic had turned up empty (the answer, if you're curious, is no, they don't, and yes, he found the jewels).

A former preschool teacher, Linda brought an ease, patience, and sense of humor to her work, which often involved speaking with very worried people. "Getting people to say 'Thanks, I never knew that' is why I loved this job," says Linda. "When someone is terrified of something they have seen in their yard, I explain why the animal or bird is doing what it is doing. Once they understand, they are much calmer and happier."

While each year a few questions are decidedly outside the box (such as a purported sighting of a long-extinct bird), a majority of the requests typically fall under the umbrella of frequently asked questions regarding such things as baby birds out of nests, woodpeckers drilling on houses, why there aren't any birds at the feeder, how to

get rid of a raccoon, and so on.

To help consolidate information and provide a resource to Mass Audubon staff across the state, Linda began the momentous task of creating Mass Audubon's Living with Wildlife manual in the 1990s. When it was first published in the fall of 2000, the binder of more than 300 pages was chock-full of natural history facts and solutions to common situations

people face when they encounter wildlife.

It didn't take long for Linda's colleagues to recognize this binder as an invaluable resource for helping to educate the public, so the paper manual went digital and found a home on the Mass Audubon website. Over the years, the content has been updated and enhanced and, with the launch of the new website, there are even more opportunities for

people to find the answers they are looking for, including a dedicated search just for wildlife, a "Frequently Asked Questions" page, and a seasonally based "What's Happening Now" feature.

This past July, Linda officially retired, leaving behind a wealth of information for inquiring minds to access 24 hours a day, 7 days a week. She's still figuring out how to spend her retirement, but don't be surprised if you see her lending a hand at one of our wildlife sanctuaries. In the meantime, be sure to check out the "Nature & Wildlife" section of our website at **massaudubon.org/wildlife**.

Hillary Truslow is Assistant Director of Marketing and Communications.



13 Invasive Plants

By Lou Wagner

Invasive plants pose a serious threat to the nature of Massachusetts. These non-native species were brought to our area either for garden or landscape use, or as accidental hitchhikers in shipments. Lacking natural predators in our ecosystems, they thrive and displace our native flora. This starts an unfortunate chain reaction: as native plants decline, the insects that feed on them also suffer, as do bird species and other animals that eat these insects.

Although the law prohibits the sale of a number of the most problematic invasive plants in Massachusetts, many areas have already been invaded. Mass Audubon and other groups are working to reduce the impact of invasive plants through targeted management to protect native species and plant communities.

Here are a few quick facts about invasive plants in Massachusetts.

100+ years may pass before a cultivated plant has completed the process of establishing itself in the wild and becoming invasive.

1,000,000+ seeds can be produced every year by a large purple loosestrife plant. This invasive species lives in wetlands where it disrupts water flow and crowds out native vegetation.

6 feet is the greatest depth measured in a mat of invasive hardy kiwi covering several acres at Pleasant Valley Wildlife Sanctuary in Lenox (see background image). True to its name, this vine is related to the plant that makes kiwi fruits that can be found in stores, and it smothers native plants.

6 inches per day is the growth rate of the invasive vine known as mile-a-minute (see silhouette at right).

42% of all species on the Federal Endangered Species List are listed in part because of threats from invasive species.

\$100 million is spent annually in the United States to control aquatic weeds alone.

87 invasive plant management projects are currently in progress at Mass Audubon wildlife sanctuaries.

For more, visit massaudubon.org/invasives.

Lou Wagner is Greater Boston/North Shore Regional Scientist.



Land Trusts: For the Common Good

By Bob Wilber

Massachusetts residents should be proud of the fact that the land trust movement began here in the 1890s, when Mass Audubon, The Trustees of Reservations (TTOR), and other organizations were formed. The purposes of these private conservation organizations vary widely, and include preserving wildlife habitats or farmland, providing public access for recreation and education, and advocating for sound environmental policy. They also exist at different scales, from local to international and virtually everything in between.

Land trusts play a critical role in reducing the burdens on local, state, and federal governments to provide many essential services such as clean air and recreation spaces. These nongovernmental, nonprofit organizations are sometimes referred to as “conservation charities,” and they have historically received property-tax exemption for the land they own in Massachusetts.

Conserving Land Across America

The land trust “wave” that began in Massachusetts has proven to be one of the most effective aspects of the environmental movement in the United States and beyond. In the century plus that has passed since the first land trusts were formed, their number has grown to more than 1,700 nationwide, and nearly 150 in Massachusetts alone. Across the country, land trusts are credited with conserving as much as 47 million acres—an area nearly 10 times the size of Massachusetts!

Validation of Trusts

The many benefits that land trusts provide to the public were well chronicled in a unanimous decision of Massachusetts’ Supreme Judicial Court in May (the New England Forestry Foundation vs. Board of Assessors of Town of Hawley tax-exemption case).

In this landmark decision, the court concluded that, collectively, this diverse group of private conservation organizations generates a vast array of increasingly important benefits including clean air and water, access to healthful locally grown food, places for people to experience the wonders of nature firsthand, and resilience in the face of floods, storms, and other effects of climate change.

Mass Audubon is proud to be part of the vibrant land trust community in Massachusetts, and we’re pleased to see such powerful validation of the many important—and often life-sustaining—services that land trusts provide.

Bob Wilber is Director of Land Conservation.

Mass Audubon Land Updates

+ 53 acres at High Ledges Wildlife Sanctuary in Shelburne, an ecologically rich landscape that is home to native orchids and spotted salamanders.

+ 13 acres at Laughing Brook Wildlife Sanctuary in Hampden, including a 500-foot stretch of Big Brook, a pristine stream that flows through the sanctuary for more than half a mile.

+ 2.5 acres at Rough Meadows Wildlife Sanctuary in Rowley, valuable upland that will give the adjacent salt marsh space to migrate as the sea level rises in the coming years.

+ 101 acres at Daniel Webster Wildlife Sanctuary in Marshfield, encompassing a diverse salt marsh habitat that hosts a variety of wildlife and migratory birds and helps buffer increased storm surge due to climate change.

Mass Audubon is applying for **Land Trust Accreditation**, a program that encourages land trusts to incorporate national quality standards in their work. The program is seeking public input on our application. Learn more at massaudubon.org/accreditation.



The Updated Bottle Bill Needs Your Vote

By Christina McDermott

The Bottle Bill, the nickel deposit on beverage containers, is the state's most successful recycling and litter prevention program. Since the Bottle Bill's passage in 1983, more than 35 billion containers have been redeemed, contributing to a healthier environment, cleaner and safer communities, and a stronger economy. But to keep up with the times and consumers' tastes, the Bottle Bill must be updated.

An updated Bottle Bill would expand our container deposit system to include drinks such as noncarbonated beverages, water, iced tea, juice, and sports drinks. Almost 70 percent of deposit beverage containers are redeemed each year under the current Bottle Bill, adding to the 9 to 10 percent of containers recovered through curbside and transfer station recycling.

Overall, deposit containers are recycled at a rate of about 80 percent while nondeposit containers are recycled at only a 23 percent rate.

After the state legislature failed repeatedly to update the bill, the Coalition to Update the Bottle Bill successfully collected all the signatures needed to bring the measure to the ballot. We urge Mass Audubon members and Massachusetts voters to Vote YES on Question 2 this November to Update the Bottle Bill! To learn more, visit massaudubon.org/bottle-bill.

Christina McDermott is Assistant to the Director of Public Policy.



Laughing Brook and Arcadia's Anne Groth

By Patti Steinman



Anne Groth of Belchertown is an inspiration. For more than five decades, she has volunteered at Mass Audubon's Connecticut River Valley wildlife sanctuaries, helping thousands of children—

tomorrow's conservation stewards—discover the joys to be found in nature.

An Early Start

Groth developed a love of wild spaces early in her life. "As soon as I could walk, my mother let me go outdoors," she says, "So I spent my childhood grubbing around the fields and forest, catching frogs and turtles." As a parent, Anne shared her knowledge of nature with her own children. Once they were in school, she began volunteering with Mass Audubon, which was a natural extension of her skills and interests.

An Inspirational Teacher

In the 1970s, Anne helped to educate and inspire the many school groups that came to Laughing Brook Wildlife Sanctuary in Hampden. She led hikes, assisted with the fall festival, and brought resident animals such as a great horned owl and a black rat snake to local schools.

Anne later taught at Mount Holyoke and Elms colleges, but when she retired in the late 1990s, she returned to Mass Audubon. This time she was a volunteer at Arcadia Wildlife Sanctuary in Easthampton and Northampton, and she once again worked with school groups. She was also instrumental in creating Arcadia's Tree and Forest Quest, a rhyming outdoor treasure hunt, and in the development of the wildlife sanctuary's accessible Sensory Trail and an interpretive trail at Laughing Brook.

Continuing Dedication

When mobility issues made it difficult for Anne to get out on the trails, she worked in the office, performing tasks such as contacting schools and editing the program catalog. Now that it's difficult for her to drive to Arcadia, she continues her editing work at home. We're deeply grateful to Anne for her many years of hard work—and so are the children she has inspired throughout the years.

To find out more about volunteer opportunities at Mass Audubon, visit massaudubon.org/volunteer.

Patti Steinman is Education Coordinator at Arcadia Wildlife Sanctuary.



Make the SWITCH to Green Electricity

By Loring Schwarz and Michael P. O'Connor

Here's a stat that might surprise you: household energy use can account for more than 30 percent of an average American's carbon emissions, according to the Union of Concerned Scientists. There are many steps you can take to bring that number down, but one of the easiest and most effective ways is choosing green electricity.

How do we know? Since 2009 Mass Audubon has eliminated all carbon emissions from electricity use. Any green power that we don't generate ourselves from our photovoltaic arrays, we purchase through the Massachusetts Energy Consumers Alliance (Mass Energy), a local nonprofit dedicated to making energy more affordable and sustainable.

In an effort to take meaningful action against climate change, we have teamed up with Mass Energy to launch Make the Switch to Green Electricity, a new initiative that has the goal to inspire Mass Audubon member households to choose green electricity in the next year.



How It Works

When you buy electricity from a traditional utility such as NSTAR or National Grid, your power comes from a variety of sources including power plants that use coal, oil, natural gas, and nuclear fuel.

Mass Energy offers the option to switch from fossil fuels to 100 percent clean energy. By partnering with community-based energy projects in New England, Mass Energy can bring renewable power from wind, solar, biomass, and low-impact hydro to the average consumer—all without switching from your regular utility company.

Depending on your electricity provider, you can either pay for this option (which on average costs \$14 to \$23 more a month than "regular" brown electricity) directly through your utility bill or by way of a separate payment. Either way, the fee is tax deductible when itemized on federal returns.

Why It Matters

The current and projected future impacts of the changing climate on nature in Massachusetts are very significant, requiring a thoughtful and comprehensive approach and a sustained effort. Mass Audubon is undertaking a multipronged approach to address climate change.

- We actively protect and manage more than 35,000 acres of land in Massachusetts, including forests that store carbon.
- We assist with drafting legislation, advising state and federal panels on clean energy projects, supporting regulatory reform, and encouraging communities to take action at the local level.
- We lead by example, having reduced our annual carbon emissions from our buildings and vehicles by more than 50 percent over the course of a decade.
- And, with an engaged member base, we are creating and supporting a climate-literate community in Massachusetts.

It's this last point that drove Mass Audubon to join Make the Switch. We are not benefiting financially from this initiative. Our only goal is to help others take advantage of the same opportunities that have helped us lessen our own footprint.

Making a Difference

"Make the Switch is a terrific opportunity to help our members in taking direct action against climate change," said Mass Audubon Vice President for Operations and Chief Financial Officer Bancroft Poor. "Purchasing electricity from renewable sources is an easy, specific, and measurable way to address this overarching environmental challenge."

By joining us as a green energy buyer, together we can help the Commonwealth reach its emissions-reduction target of 80 percent by 2050 and boost green energy production and support renewable power providers in the state.

"Green power is an essential part of any strategy to reduce carbon dioxide emissions," noted Mass Energy Executive Director Larry Chretien. "Once you've made your home as energy efficient as possible, the next thing to do is to opt for local renewable energy sources."

Ready to Make the Switch? Get more information, including a list of participating utility companies, and enroll at massaudubon.org/maketheswitch.

Loring Schwarz is Climate Change Program Director and Michael P. O'Connor is Public Relations Manager.

Foliage & Fungi

Fall Foliage Canoes

Weekends, September 27 thru
October 19, various times
BROADMOOR, Natick
508-655-2296

Fungi Field Walk

October 19, 1–3:30 pm
DRUMLIN FARM, Lincoln
781-259-2200

Autumn at High Ledges

October 26, 10 am–1 pm
HIGH LEDGES, Shelburne
978-464-2712

Foliage and Cider

November 1, 10 am–noon
LAUGHING BROOK,
Hampden
413-584-3009

Make a Holiday Evergreen Wreath

November 16 & 22, 1–3 pm
WACHUSETT
MEADOW, Princeton
978-464-2712

Winged Wonders

Birding Cape Cod

Fridays, October thru
December, 9 am–noon
WELLFLEET BAY, Wellfleet
508-349-2615

Wednesday

Morning Birding
Every Wednesday, 9:30 am–
12:30 pm
JOPPA FLATS, Newburyport
978-462-9998

Fall Feathered Friends

October 25, 10:30 am–noon
BOSTON NATURE
CENTER, Mattapan
617-983-8500

Totally Turkeys PreK Story Hour

November 19, 10–11 am
BROAD MEADOW
BROOK, Worcester
508-753-6087

Wild Turkey Talk and Walk

November 22, 10–11:30 am
OAK KNOLL, Attleboro
508-223-3060

Evening Explorations

Sunset Salamander Search

October 9, 5:30–7:30 pm
PLEASANT VALLEY, Lenox
413-637-0320

Autumnal Astronomy

October 18, 6:30–8:30 pm
LONG PASTURE, Barnstable
508-362-7475

Stone Barn Spooky Night Hikes

October 24 & 25, 5–6:30 pm
ALLENS POND, South Dartmouth
508-636-2437

Night Hike

November 8, 6–7:30 pm
HABITAT, Belmont
617-489-5050

Space Invaders

December 13, 3 am–5:30 am
STONY BROOK, Norfolk
508-528-3140

Exciting Events

Fall Festival

October 11, 12, & 13, 10 am–4 pm
BLUE HILLS TRAILSIDE
MUSEUM, Milton
617-333-0690

Fern & Feather at 50 Fest Alumni Gathering

October 12, 11 am–3 pm
FELIX NECK, Martha's Vineyard
508-627-4850

Farm Day

October 18 (rain date
October 25), 10 am–4 pm
DANIEL WEBSTER, Marshfield
781-837-9400

Halloween Prowl

October 24, 6:15–7:45 pm,
October 25, 5:30–7:45 pm, &
October 26, 5:30–7:15 pm
MOOSE HILL, Sharon
781-784-5691

Big Woods Hike

November 16, two-hour
hikes every 15 minutes
from noon–1:30 pm
IPSWICH RIVER, Topsfield
978-887-9264

massaudubon.org/programs

*Preregistration may be required. Please contact the host wildlife sanctuary for details.

A Time-Honored Tradition

Now in its 118th edition, our
highly popular ring-standard
calendar is a little desk-top gem.



Order your 2015 calendar now!

massaudubon.org/shop

The Audubon Shop at
Drumlin Farm Wildlife Sanctuary
Lincoln, MA 01773 • 781-259-2214

Save the Date

Please join us for a special
keynote address by

Gina McCarthy

Administrator of the United States
Environmental Protection Agency

after the business section of our
annual meeting (see page 14 for
details).

Date: Friday, Nov 7, 2014, 6–7 pm

Location: Massachusetts Institute
of Technology
Ray and Maria Stata Center
Kirsch Auditorium, Room 32-123
32 Vassar Street
Cambridge, MA 02139

RSVP: [massaudubon.org/
annualmeeting](http://massaudubon.org/annualmeeting)



Join Mass Audubon Naturalists for
**Birding and Natural
History Tours**

Colombia with Elissa Landre
January 15–25, 2015

Uganda with Chris Leahy
February 8–24, 2015

Ecuador with Dave Larson
February 12–28, 2015

Panama's Darien Jungle with
Sue MacCallum
March 3–13, 2015

For more tours and itineraries, visit
massaudubon.org/travel.
Email travel@massaudubon.org,
or call 800-289-9504.



Weasels and their Relatives

by Rosemary Mosco



Short-tailed Weasel, or Ermine
(*Mustela ermina*)

Long-tailed weasels and short-tailed weasels are similar looking, and though the latter tend to be smaller, their sizes can overlap. Short-tailed weasels are always white in winter and brown in summer. Also, they're less likely to be found in dense coniferous forests and wetland areas than their larger relatives. These weasels are important predators of small mammals and help keep small rodent populations in check.



Mink
(*Mustela vison*)

Smaller than fishers but larger than long-tailed weasels, these dark-brown animals live in burrows alongside water bodies. They're true opportunists, preying upon birds, eggs, rodents, fish, insects, and much more. They'll even eat muskrats and take over their lodges.



Supremely agile, weasels and their kin patrol forests and ply waterways across most of Massachusetts. Our state hosts five species, and there's evidence of at least one species in every county.

Weasels, fishers, and river otters belong to the family Mustelidae. It's a diverse group that also contains ferrets and badgers. Though some members have robust bodies, most are shaped like dachshunds: they're long and thin, with relatively short legs. This body plan enables them to squeeze into tight spaces when they are looking for prey.

During the winter, this slender form doesn't retain heat as well as a rounder one might, so mustelids in the Northeast must eat frequently to stoke their metabolic furnaces. Depending on the species, their diets may include fish, frogs, birds, rodents, insects, and many other creatures.

Weasels and their relatives are active all winter and leave plenty of tracks as they tirelessly search for prey. The first snowfalls of the season afford ideal opportunities to look for signs of their presence. Some species—especially otters—will often slide across the snow, leaving broad flat trails.

That mustelids thrive in Massachusetts is a testament to their resilience. Trapping and habitat loss pushed two species from the state for good: the wolverine and the American marten. Another, the sea mink, once foraged along the coasts of New England and Canada but was driven to extinction by European trappers. Others such as the fisher and the river otter have made strong comebacks, and the state permits trapping of these and other mustelids. River otters have even been spotted swimming in the Charles River near Needham in recent years.

Learn more about Massachusetts wildlife at massaudubon.org/wildlife.

North American River Otter
(*Lontra canadensis*)

The largest mustelid in the state, this animal is an excellent swimmer. River otters mostly eat aquatic prey such as fish, turtles, and crayfish. The return of beavers to Massachusetts during the past century has provided otters with plenty of wetland habitat.



Long-tailed Weasel
(*Mustela frenata*)

These weasels have very short legs and brown fur with a yellow-white underbelly. They range from southern Canada to South America. In the more northern parts of their range, their fur turns white in the winter, which makes them hard to see against the snow. Though they weigh only upwards of 12 ounces, male long-tailed weasels can tackle cottontail rabbits.



Fisher
(*Martes pennanti*)

Although they're often called fisher cats, fishers aren't cats and they don't eat fish. They are, however, among the very few species that hunt porcupines. Because porcupines can damage trees by chewing their bark, fishers provide balance in the forest ecosystem. These powerful hunters are able to descend trees headfirst, thanks to special swivel joints in their hind ankles.

Rosemary Mosco is Marketing Coordinator.



Fall 2014

by Ann Prince

The Outdoor Almanac has been a longtime Sanctuary magazine favorite, and we're thrilled to bring it to the pages of Connections.

October



3 Monarch butterflies are migrating south toward the mountains of Mexico.

5 Watch for daddy longlegs still out and about.

6 Tamarack, the only northern deciduous conifer, turns golden yellow.

7 Look for the blue-green planet Uranus in the sky—it's at its closest approach to the earth now and fully illuminated by the sun.



8 Full moon. The Travel Moon (Algonquin).

11 Juncos are arriving from the north.

12 Blackbirds assemble in large congregations in trees and open fields.

15 Height of fall leaf color occurs at about this time.

17 Yellow-rumped warblers migrate. Watch for them in shrubs and trees and listen for their *check* call.

20 On warm days spiderlings disperse, floating with the wind on their featherweight film of webbing called gossamer.

25 Oaks change to russet and brown after other trees such as maples and birches have dropped their leaves.

28 Listen for the last calls of meadow crickets on warm days.

November



5 Peak migration of snow buntings to New England from their Arctic breeding grounds.

6 Full moon. The White Moon (Chinese).

7 Wood aster is still blooming in protected areas.



19 Watch for the bright-red ruby meadowhawk dragonflies over sun-warmed fields.

23 Airborne parachute-like milkweed seeds are drifting from still-bursting pods.

25 In those years when snowy owls come south for the winter from their breeding grounds in the Arctic tundra, they begin to arrive in the last weeks of November.

27 On Thanksgiving Day, look for bright yellow blossoms on witch hazel—one of the last plants to flower in the Northeastern forest.



30 Phoebes may still be lingering by this late date. Watch also for small flocks of migrating sparrows including white-throated and song sparrows.



December

6 Full moon. Twelfth Moon (Choctaw).



10 Overwintering thrushes such as robins and bluebirds feed on Virginia creeper berries.

13 Hibernating mammals are out of sight, though chipmunks, skunks, opossums, and raccoons may still be around.

14 The spectacular Geminids meteor shower peaks after midnight, with 120 meteors per hour.

17 Look for dry mullein stalks in old fields and on roadsides; check inside the fuzzy leaves for sheltering insects.

21 Winter solstice. First day of winter and longest night of the year.

25 Look for evergreen ferns and the bright red fruits of winterberry.



Ann Prince is Copyeditor.



The Shapes of Tree Leaves

How many of these leaf shapes can you find in your neighborhood?

Trees use their leaves to make food. When sunlight hits a leaf, it triggers a chain reaction called photosynthesis that produces sugars. Autumn is the perfect time to look at leaves, since so many of them are turning bright colors and falling to the ground where it's easy to take a closer look. The leaves of each tree species have their own special shape. If you examine a leaf, you can figure out what kind of tree it came from!

American Beech



Try to find a smooth, oval-shaped leaf with many little teeth along the sides and a pointy tip.

Silver Maple



Shaped a bit like your hand, this leaf has five "fingers" (or lobes). It's silvery underneath.

Red Oak



This leaf has lots of big spiky-tipped lobes sticking out all down its length.

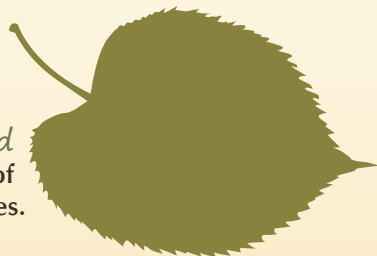
Sassafras

It can look like an oval, a mitten, or a turkey's three-toed footprint.



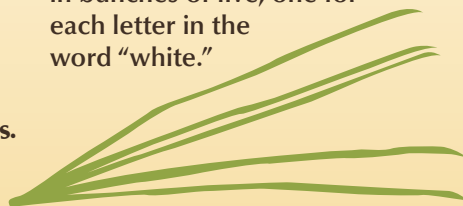
Basswood

Look for a big heart shape with lots of little spiky teeth all along the edges.



White Pine

These needle-like leaves come in bunches of five, one for each letter in the word "white."



Make Leaf Creatures

Gather leaves of different colors and shapes. Layer them on top of each other and see what animals you can make. You can add details with twigs and seeds.



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WHEN

Friday, November 7,
2014, at 4:30 pm

WHERE

Massachusetts Institute of Technology
Ray and Maria Stata Center, Room 32-123
32 Vassar Street, Cambridge, MA 02139

Notice is hereby given that the Annual Meeting of Members of Mass Audubon will be held on Friday, November 7, 2014, at 4:30 pm at the Massachusetts Institute of Technology, Ray and Maria Stata Center, Room 32-123, 32 Vassar Street, Cambridge, MA, 02139 to vote on the following items of business:

1. To elect Directors;
2. To elect the members of the Auditing Committee; and
3. To amend and restate the By-Laws of Mass Audubon (as last amended and restated on November 5, 1987).

Please see the description of the substance of the proposed changes to the By-Laws of Mass Audubon set forth below, which is incorporated herein by reference and made a part of this Notice of Annual Meeting of Members.

Gerylne Comeau

Secretary

September 1, 2014

Description of Substance of Proposed Changes to By-Laws of Mass Audubon

A description of the substance of the proposed changes to the By-Laws of Mass Audubon (as last amended and restated on November 5, 1987) made by the proposed Amended and Restated By-Laws of Mass Audubon (the "Proposed New By-Laws"), and the complete text of the Proposed New By-Laws, are contained on the website of Mass Audubon under massaudubon.org/bylaws. In addition, Mass Audubon will mail these documents to any Member without charge upon written request to the Secretary of Mass Audubon.

The Natural Inquirer will be back in the next issue of *Connections*!

Connections is published four times each year in January, April, July, and October.

Editorial Team:

Heather Cooper, Kristin Foresto, Jennifer E. Madar, Rosemary Mosco, Rose Murphy, Michael P. O'Connor, Ann Prince, and Hillary Truslow

The Final Word

We invite your comments, photographs, and suggestions. Please send correspondence to: Mass Audubon Connections, 208 South Great Road, Lincoln, MA 01773, tel: 781-259-9500, or e-mail: connections@massaudubon.org. For questions regarding your membership, contact: Mass Audubon Member Services, 208 South Great Road, Lincoln, MA 01773, tel: 781-259-9500 or 800-AUDUBON, or e-mail: membership@massaudubon.org.

Photography & Illustrations


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|---|--|
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Mass Audubon works to protect the nature of Massachusetts for people and wildlife. Together with more than 100,000 members, we care for 35,000 acres of conservation land, provide school, camp, and other educational programs for 225,000 children and adults annually, and advocate for sound environmental policies at local, state, and federal levels. Founded in 1896 by two inspirational women who were committed to the protection of birds, Mass Audubon is now one of the largest and most prominent conservation organizations in New England. Today we are respected for our sound science, successful advocacy, and innovative approaches to connecting people and nature. Each year, our statewide network of wildlife sanctuaries welcomes nearly half a million visitors of all ages, abilities, and backgrounds and serves as the base for our work. To support these important efforts, call 800-AUDUBON (800-283-8266) or visit massaudubon.org.

Welcome Fall

at a Mass Audubon Wildlife Sanctuary Near You!

Mass Audubon has 54 wildlife sanctuaries open to the public year-round. They provide important habitat for wildlife and opportunities for you to enjoy and appreciate nature.

 = Wildlife sanctuaries with nature centers

- 9 Lynes Woods, Westhampton
- 10 Arcadia, Easthampton and Northampton
- 11 Laughing Brook, Hampden

- 40 Attleboro Springs, Attleboro
- 41 Oak Knoll, Attleboro
- 42 North River, Marshfield
- 43 Daniel Webster, Marshfield
- 44 North Hill Marsh, Duxbury
- 45 Allens Pond, Dartmouth and Westport
- 46 Great Neck, Wareham

Cape Cod and the Islands

- 47 Ashumet Holly, Falmouth
- 48 Sampsons Island, Barnstable
- 49 Skunknet River, Barnstable
- 50 Barnstable Great Marsh, Barnstable
- 51 Long Pasture, Barnstable
- 52 Wellfleet Bay, Wellfleet
- 53 Felix Neck, Edgartown
- 54 Sesachacha Heathlands, Nantucket

Berkshires

- 1 Pleasant Valley, Lenox
- 2 Canoe Meadows, Pittsfield
- 3 Lime Kiln Farm, Sheffield

Connecticut River Valley

- 4 West Mountain, Plainfield
- 5 Road's End, Worthington
- 6 High Ledges, Shelburne
- 7 Conway Hills, Conway
- 8 Graves Farm, Williamsburg and Whately

Central Massachusetts

- 12 Pierpont Meadow, Dudley
- 13 Burncoat Pond, Spencer
- 14 Broad Meadow Brook, Worcester
- 15 Eagle Lake, Holden
- 16 Cook's Canyon, Barre
- 17 Rutland Brook, Petersham
- 18 Wachusett Meadow, Princeton
- 19 Lincoln Woods, Leominster
- 20 Lake Wampanoag, Gardner
- 21 Flat Rock, Fitchburg

North of Boston

- 22 Rocky Hill, Groton
- 23 Nashoba Brook, Westford
- 24 Joppa Flats, Newburyport
- 25 Rough Meadows, Rowley
- 26 Ipswich River, Topsfield
- 27 Endicott, Wenham
- 28 Eastern Point, Gloucester
- 29 Marblehead Neck, Marblehead
- 30 Nahant Thicket, Nahant

Greater Boston

- 31 Habitat, Belmont
- 32 Drumlin Farm, Lincoln
- 33 Waseeka, Hopkinton
- 34 Broadmoor, Natick
- 35 Boston Nature Center, Mattapan
- 36 Blue Hills Trailside Museum, Milton
- 37 Museum of American Bird Art at Mass Audubon, Canton

South of Boston

- 38 Moose Hill, Sharon
- 39 Stony Brook, Norfolk

Felix Neck Wildlife Sanctuary

is home to beetlebunges, the Martha's Vineyard name for the tupelo tree, and pinkletinks, also known as spring peeper frogs.

massaudubon.org/sanctuaries

