

Native Plant

SPRING/SUMMER 2017

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NEWS

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Native Plant News

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Eastern Prickly-pear



© New England Wild Flower Society

On the Cover:
Sweat bee
(Halictidae family)



From the Executive Director



AS THE PENDULUM SWINGS

We've been here before—an administration intent on gutting environmental regulations and slashing funding for programs that protect land, water, and the air we all breathe. Usually, the moves are more subtle: they don't start by letting coal companies dump toxic waste into streams, lifting the ban on the sport killing of hibernating bears, and proposing to eliminate entire areas of scientific research. But over time the effects are the same—federal funding and programs in conservation wither or die, and some states and the nonprofit sector try to fill the gaps to protect the places we love.

Longstanding partnerships that serve the public good are also at risk, as the administration proposes hollowing out agencies with natural-resource portfolios. Potentially gone are the Seeds of Success program; the regional Landscape Conservation Cooperatives; our work with the Fish and Wildlife, Forest, and National Park services; and the entire chain of scientists protecting endangered species, assessing impacts of climate change on biological systems, and supporting our work on rare plants and habitat restoration.

Typically, in an era of reduced government support for conservation, the philanthropic community steps up to fund, and even strengthen, the nonprofit organizations that already implement some of the nation's most important environmental programs. People realize that the work needs to continue and that what could be lost during the years of government indifference or assault can never be recovered.

The Society's work is both urgent—saving imperiled plants, understanding climate impacts on plant life, creating landscapes for declining pollinators—and fundamental, in that we create knowledge and resources and networks people can use to conserve and grow native plants.

Nonprofits are where a community invests in its values. We know you value native plants in the wild and in your gardens, and we hope you want to ensure that our important work can continue. We have just launched a new five-year strategic plan, and I urge you to head to our website (www.newenglandwild.org) to review what we have achieved during the last five years and find the part of our ambitious agenda that inspires you to invest in us.

Sincerely,

Debbi Edelstein

▷▷▷ RARE PLANT RESEARCH: *Isotria medeoloides*

How Much Light Does This Wild Orchid Need?

By Bill Brumback, Director of Conservation

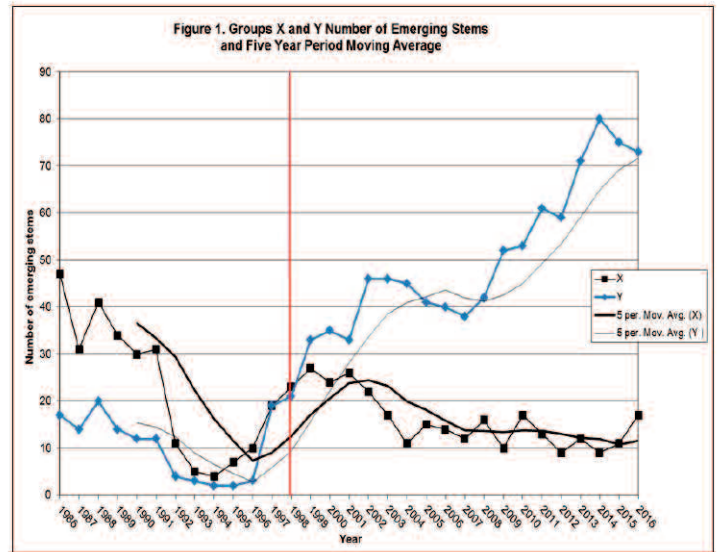


Isotria medeoloides

Tracking the number of emerging stems provides one benchmark of *Isotria's* success in varied light conditions in the wild.

In November 2016, a workshop hosted by the Smithsonian Environmental Research Center, in Edgewater, MD, featured the Society's study of a rare native orchid, the small whorled pogonia (*Isotria medeoloides*). The workshop assessed the current knowledge about the species, listed as threatened under the federal Endangered Species Act. Having monitored *Isotria* at an experimental site in New Hampshire since 1998, the Society holds significant data about the delicate yellow orchid.

The experiment consists of thinning the canopy in varying degrees to admit different levels of light to the forest floor, where *Isotria* grows. Because *Isotria* never has been successfully transplanted, the goal is to understand how to maintain it in its natural habitat. Over time, we have found that giving this species more light increases both the plant's numbers and its flowering (in this case, a proxy measurement of reproduction). This means that by thinning the canopy over *Isotria* on protected land, we may be able to preserve populations at risk of disappearing.



We have not thinned the canopy since the initial cut in 1998, and the plants continue to proliferate. Only in the last two years has the number of emerging *Isotria* stems declined slightly. Further monitoring will reveal whether this represents a true decline, possibly from the denser canopy, or a normal variation. 🌱

To support rare plant research, contact the Philanthropy Department: 508-877-7630 x 3802; gifts@newenglandwild.org.



Alan Smith



Ralph Brown

New Leadership on Board

By Jane Roy Brown, Writer-Editor

In January, the Society welcomed Alan E. Smith as the new chair and Ralph G. Brown as vice chair of the Board of Trustees. Smith served as chief scientific officer at Genzyme Corporation for more than two decades, and earlier as head of biochemistry at the National Institute for Medical Research, Mill Hill, London. He holds a BA in biochemistry and a PhD in molecular biology from the University of Cambridge. Smith

is also a Fellow of the Royal Society and of Christ's College, Cambridge, and chairman of Cambridge in America.

"As a scientist and gardener, I feel honored to take over the chair of the Society and energized by both the importance and the urgency of our work," says Smith.

Brown is vice president, strategic relationships at Beechwoods Software, where he is working on IoT and video

streaming devices. Previously, he was vice president of engineering at a division of United-Health Group and former chief technology officer at Integrated Development Enterprise. After founding Paxton Computers in England, he moved to Lotus Development and IBM in Boston. Brown has served on boards of several other nonprofit organizations and as board chair at Indian Hill Music in Littleton, MA. 🌱

Pollinate New England Zooms Forward

By Jessica Pederson,
Director of Public Programs

As scientists warn that populations of pollinating insects, including native bees, are plunging, the Society's public programs staff is working at a furious pace to roll out a multi-part program to raise awareness of the crisis and teach homeowners how native plants can create crucial habitat for pollinators. Last September—seven months after a United Nations report found that 40 percent of pollinating insects are facing extinction—a matching grant from the Institute of Museum and Library Services (IMLS) provided initial funding for our two-year program, Pollinate New England.

In summer 2018, the Society will build 12 model pollinator gardens, two in each New England state, and host public workshops at each garden. Meanwhile, we have pulled together an in-house task force to guide the project, hired consultants to design a curriculum and deliver the workshops, and started identifying locations to build the pollinator gardens. Collaborating with the curriculum designer, a consultant has begun writing the program's online course and presentations for the workshops. To maintain momentum, we are also racing to raise matching funds required by the IMLS grant. ☺

To support Pollinate New England, contact the Philanthropy Department: 508-877-7630 x 3802; gifts@newenglandwild.org.

HURRICANE SANDY INITIATIVE: PROGRESS REPORT: RESTORING COASTLINE

By Michael Piantedosi, Coordinator,
New England Plant Conservation Program

At Sachuest Point National Wildlife Refuge, in Middletown, RI, U.S. Fish and Wildlife Service staff members have started planting plugs of two salt-marsh species, smooth cordgrass (*Spartina alterniflora*) and saltgrass (*Distichlis spicata*), grown from seed provided through the Society's initiative to restore coastal habitat battered by Hurricane Sandy. To date, a total of 17,000 plugs of both grasses are growing on more than three acres of ravaged salt marsh

Sachuest Point, where a Society team collected seed in 2015, is one example of how the Hurricane Sandy initiative, in partnership with the federal Seeds of Success project, is helping to restore damaged coastline by providing landowners with the seed of locally adapted plants. In 2015 and 2016, the Society provided seed to five restoration sites including Sachuest, all of which have begun propagation or planting.

In summer 2016, the Society and its partners achieved new milestones: 305 seed collections that included 99 different taxa from 55 locations. We also added five new restoration project sites and provided seed to a total of 13, most managed by government agencies. The projects will use our seed to rehabilitate salt marshes, bolster flood resiliency on riverbanks, and establish native species on land exposed after dam removal or clearing invasive species.

In 2017, we will continue to collect seed for restoration projects on the coastline of five New England states, with four interns on board to help. And with several additional locations and more native taxa on our seed roster, we will cover even more ground. ☺

Seed-sowing Trials on Cadillac's Summit

By Bill Brumback, Director of Conservation

Atop Cadillac Mountain in Acadia National Park, hefty white sandbags hold coir netting in place over experimental plots, in which Society botanists are testing different seed-sowing methods, or treatments. Last summer, staff members from the Society's Conservation Department and Acadia, plus contractors, collected more than 20,000 seeds of 25 species. In October, they sowed portions of the seed in 2-square-meter plots treated in different ways. The variables include with and without seed, with and without coir netting, and with and without compost.

The team also staked out four plots and left them empty during the winter. These will contain seed collected in 2016 and sowed into mixed-species trays at Nasami Farm last fall. By spring these trays had sprouted mats of mixed seedlings. This spring and early summer, Society botanists will place these mats in the four empty plots on Cadillac, for comparison with plants in the seeded test plots. ☺



© Jill Weber

Sandbags anchor coir netting over experimental seeded plots.



Our Lawns Are Killing Us...

It's Time to Kick the Habit

By Mark Richardson, Director of the Botanic Garden



Pristine turf-grass lawns are as synonymous with America as baseball and apple pie. For those of us who grew up in the suburbs, waking up to the lulling drone of lawnmowers signaled the start of a summer Saturday, with all of its anticipated pleasures.

I've yet to meet a person who doesn't enjoy the smell of fresh-cut grass. And deep down, even those of us who are staunchly anti-herbicide harbor a secret hatred of dandelions, if only for the glares they evoke from our neighbors: Do they think I'm lazy? Or letting my property go downhill?

Yet despite what Scotts®, Bayer, TruGreen®, and other corporations in the so-called green industry would have us think, lawns are far from green, environmentally speaking. (They're not American, either. See sidebar, page 7.) We've known for decades about the harm lawns cause, but we are still mowing and blowing: Irrigated turf grass covers nearly two percent of the land in the United States, more than 40 million acres. Every square inch of it replaces diverse habitat for wildlife with a monoculture of nonnative plants, and we keep it going with fossil fuels and chemicals toxic to most living things.

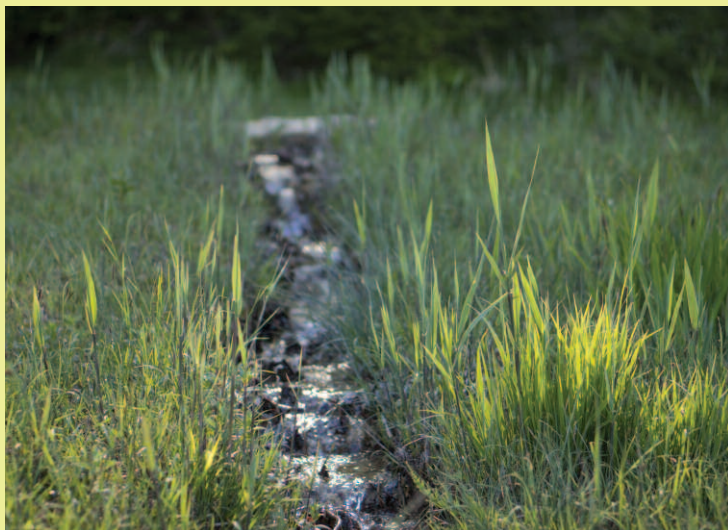
State Laws to Curb Fertilizer Runoff

Connecticut, Massachusetts, New Hampshire, and Vermont have issued regulations to curb water pollution caused by excessive use of fertilizers (a.k.a. plant nutrients) in residential, commercial, and agricultural landscapes. These common-sense restrictions will also save money for those who continue to use fertilizers on their lawns. In broad strokes, these rules:

- Limit the sale of phosphorous and, in some cases, nitrogen fertilizers; require that retailers shelve them separately; and provide some form of customer education about nutrient pollution
- Limit the quantity of nutrients that can be applied (phosphorus only when deemed necessary after a soil test; nitrogen sometimes to a specific quantity per square foot)
- Restrict the time of year nutrients can be applied, primarily during the active growing season
- Make it illegal to apply fertilizer to sidewalks or driveways, even accidentally, to limit runoff from pavement into rivers and streams
- Create a fertilizer-free buffer zone for applications near waterways.

For more information on nutrient pollution and alternatives to commercial fertilizers, visit www.epa.gov/nutrientpollution. ◉

—M. R.



Pixel

Perhaps our addiction to the lawn's visual appeal persuades us to overlook the hazards of maintaining it. But it's time we got serious about kicking this habit. Besides, when we consider the diversity of natural habitats and gorgeous native plants across the United States, it seems a shame that our signature cultural landscape relies on plants that are finicky—and, frankly, boring.

The trouble with lawns starts with the grass itself. Although some have American-sounding names like Kentucky bluegrass, most of the turf-grass species we plant in the United States are native to Europe. As a result, they are often poorly adapted to our climates and soils—especially the acid soils of New England—and must be kept on life support: only with supplemental irrigation, fertilizers, herbicides, and pesticides does the grass stay green and grow all summer. When it grows too high, which happens quickly because of the added water and fertilizer, we cut it. Most people do that with a gas-burning mower, trailing fumes that catalyze into ozone pollution in the summer heat. For those too busy to maintain their lawns themselves, multiple businesses compete to take it on. According to *Bloomberg News*, we spend, on average, more than \$40 billion per year on lawn care—\$3.5 billion more than the federal government's 2017 budget for foreign aid. ScottsMiracle-Gro, one of the largest beneficiaries of that spending, generates roughly \$3 billion in annual sales revenue from products like Turf Builder® Weed & Feed.

Consider the quantity of pesticides applied in the name of keeping grass green each year: 30,000 tons annually, according to the U.S. Environmental Protection Agency (EPA). The University of Massachusetts reports that the typical lawn-service company in that state applies five to seven pounds of pesticides per acre of lawn a year. Per EPA records, this is at least twice the amount applied to the most pest-plagued of agricultural crops, sweet corn. That is staggering—and terrifying—because lawns serve as the primary play space for our kids and pets. Fourteen of the 30 most commonly used lawn pesticides are neurotoxins, 16 are known or suspected carcinogens, and two-thirds of them may cause reproductive harm in humans. Not to mention the fact that many of the chemicals we dump on our lawns are herbicides meant to kill “weeds” that potentially offer benefits. Clover, for example, fixes nitrogen that can support turf-grass growth. Violets can host rare butterflies like the regal fritillary. Despite labels that tell us these products are safe for use around children and pets, ongoing scientific

studies find many of them anything but. Which means we need to act accordingly—and to the alarm of the landscape-services industry, we are starting to do it.

Over the last five years, for instance, many states have passed regulations to reign in a major source of surface-water pollution: lawn fertilizers, which feed the grass with varying combinations of nitrogen, phosphorus, and potassium. The EPA reports that nutrient pollution is “one of America’s most widespread, costly and challenging environmental problems, and is caused by excess nitrogen and phosphorus in the air and water.” Four of the six New England states now have regulations that limit the types and amounts of fertilizer that can be applied to lawns. The rules restrict fertilizer use for all non-agricultural turf grass, from residential neighborhoods to strip malls and public parks (see sidebar, page 6).

Regulating which chemicals can be sold and how to apply them is important. But to let go of the lawn, we need to replace it with a landscape that supports wildlife, looks beautiful, and is relatively easy to main-

tain. This is where homeowners sometimes balk. When I lead workshops about planting to replace lawns, I hear the same concerns time after time: “I don’t know what to plant.” “I don’t have time to pick out plants or learn which one goes where.” “I’m not a designer—what if my yard looks awful?”

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American Pastoral

America’s cultural elite imported the lawn from the country estates and palace gardens of 18th-century England and France. Until after the Civil War, only wealthy Americans planted domestic lawns, and they brought them to the civic institutions they founded—hospitals, universities, rural cemeteries. As members of this class, Frederick Law Olmsted and Calvert Vaux institutionalized the lawn in their 1858 design for Central Park (below), imprinting the American landscape with a Romantic, pastoral ideal: Nature at its

tamest and most civilized would represent our democratic society, then a fledgling experiment tilting toward civil war.

In the following century, railroad and trolley suburbs, then sprawling tract developments scaled to automobiles, brought the lawn to middle-class Americans. The front yard initially showcased flower gardens and shrubs as well as grass. With the rise of automobiles and their ogling occupants, residents retreated to the backyard and kept a generic lawn in front, where it joined a continuous ribbon of green. As part of this visually communal landscape, lawns reflect community spirit as well as individual character. At least that’s what the neighbors think. ☺ —J. R. B.



Instagram

My first response to questions like these is, “Be prepared for your neighbors to glare at you.” Ironically, the peer pressure of maintaining pristine turf grass limits our freedom to express ourselves in our most personal spaces. Who knows: maybe those disapproving looks will prompt constructive conversations about why you chose to limit your lawn? (Or, you could announce to your scowling neighbor, “Your lawn is killing us!”) Choosing what to plant can be as simple as picking a paint color. Start slowly—don’t

Regulating which chemicals can be sold and how to apply them is important. But to let go of the lawn, we need to replace it with a landscape that supports wildlife, looks beautiful, and is relatively easy to maintain.

tackle your whole lawn all at once. Sort areas of your yard into three categories: 1) where you could lose the lawn and not miss it; 2) where you desire a green groundcover, but not necessarily turf grass, for aesthetic reasons; and 3) where a lawn of some sort is useful, say, for kicking around a soccer ball or stretching out to read a book.

Now, work backward: In category 3 places, keep the lawn, but get off the weed-and-feed cycle. Mow high—between three and four inches—with a mulching mower and aerate your soil in the fall. Keep in mind that the longer your grass, the deeper its root system and the less irrigation it will need. Replace thirsty grasses with drought-tolerant species like tall fescue (*Festuca arundinacea*). In short, manage what lawn you have to limit the impact on the environment, kids, and pets.

In category 2 places, consider site conditions—sun exposure, moisture, and drainage. Now look for mat-forming perennial groundcovers, or true lawn alternatives, that thrive in your conditions. If you have a sunny spot, one of my favorites is wild strawberry (*Fragaria virginiana*), a semi-evergreen, mat-forming perennial that tolerates a wide range of conditions and does best in full sun. It’s a great plant for pollinators, supporting dozens of moth and butterfly species, and it bears tasty, fragrant little strawberries in mid-June. In shadier spots, consider Pennsylvania sedge (*Carex pensylvanica*). At Garden in the Woods, we have a sedge lawn that we mow once a year after the flush of spring growth. It looks much like standard turf grass the rest of the year. All of these groundcovers are lower maintenance than turf grass, requiring no fertilizer, very little if any supplemental watering, and a minimum of other care.

In category 1 places, again consider site conditions, then visit a garden center or a public garden to look for inspiration. Take photos as notes. Choose a color palette and find some plant combinations that complement each other and grow well in similar conditions. One of my favorite combinations of groundcover perennials for spring color in a shady spot is creeping phlox (*Phlox stolonifera*) and foamflower (*Tiarella cordifolia*). They flower at the same time and work as living mulches that stabilize soil and keep weeds at bay. Layer in some taller accent plants, such as a native flowering shrub or two that fit your color scheme and conditions, and you’ve got the start of a beautiful, low-maintenance garden that will provide a spot of native habitat for you and your family—and turn your lawn into an urban oasis for wildlife. 🍀

Wikimedia Commons



Regal fritillary (*Speyeria idalia*)

Stepping Away from Turf Grass

First, home in on your objectives: Want to populate a swampy swale with wetland plants? Design a drought-proof landscape? Expand your pollinator habitat? Next, browse the Society's two dozen-plus courses on these and related topics on our website (www.newenglandwild.org/learn/our-programs) or in the *Learn + Grow* catalog. Then, sign up for the classes you want.

Meanwhile, here is a sampling of tough, attractive native groundcovers for basic sun and shade:

Sun

- Autumn bentgrass (*Agrostis perennans*)
- Creeping juniper (*Juniperus horizontalis*)
- Moss phlox (*Phlox subulata*)
- Purple lovegrass (*Eragrostis spectabilis*)
- Wild strawberry (*Fragaria virginiana*)

Shade

- Barren strawberry (*Geum fragarioides*)
- Canada mayflower (*Maianthemum canadense*)
- Creeping phlox (*Phlox stolonifera*)
- Foamflower (*Tiarella cordifolia*)
- Pennsylvania sedge (*Carex pensylvanica*)



© New England Wild Flower Society

Wild strawberry (*Fragaria virginiana*)



Willemoon

Creeping juniper (*Juniperus horizontalis*)



© New England Wild Flower Society

Moss phlox (*Phlox subulata*)



© New England Wild Flower Society

Foamflower (*Tiarella cordifolia*)



© New England Wild Flower Society

Pennsylvania sedge (*Carex pensylvanica*)



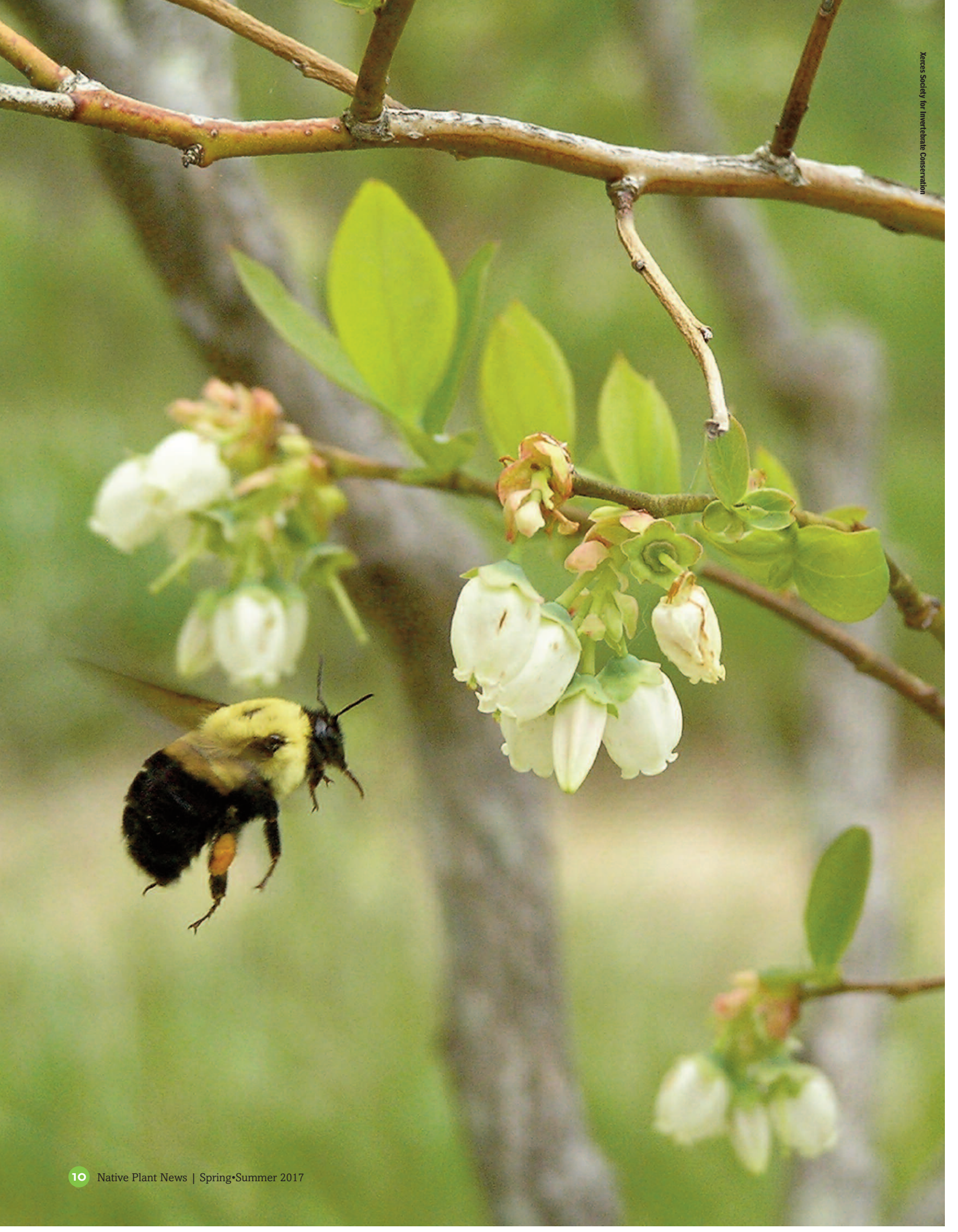
© New England Wild Flower Society

Canada mayflower (*Maianthemum canadense*)



© New England Wild Flower Society

Creeping phlox (*Phlox stolonifera*)





Searching for the Truth about Systemic Pesticides

By Jane Roy Brown

Ruth and Bill Shelley live on a wooded, four-acre property west of Boston. Most of their trees are mixed hardwoods—prime habitat for gypsy and winter moths—and the pests hit them hard in the last two seasons, especially during the 2016 drought.

“Last year we had a horrible infestation, even after we sprayed the trees ourselves,” says Ruth, who serves on the Society’s Board of Trustees. The Shelleys sprayed twice, because the two species hatch a few weeks apart, but were not able to reach the canopy, which suffered the worst damage. They used *Bacillus thuringiensis*, or Bt, a biological pesticide that kills only specific larval insects when they eat leaves that have been sprayed. Bt also breaks down in sunlight after a few hours.

Hoping to avoid more damage this year, the Shelleys consulted an arborist, who told them about a pesticide called Acelepryn® (active ingredient: chlorantraniliprole) that could kill both pests in one spraying. He assured them that it would dissipate in a

few weeks without significantly affecting other moths and butterflies in the same habitat. Wary of all pesticides, the Shelleys started looking into Acelepryn®, marketed by DuPont and Syngenta.

“Bill called DuPont, because the label doesn’t state the half-life of chlorantraniliprole,” Ruth says, referring to the time it takes for a chemical to lose half its initial potency. “A technical rep at the company said it was about a month, but he couldn’t cite a study.”

Ruth then contacted Mark Richardson, the Society’s botanic garden director, who told her that Acelepryn® “is a systemic pesticide, which in general he does not recommend,” she says. “He didn’t have specific data on this one, but I know that some systemics can remain active on the order of years, which would decimate the lepidopterans [butterflies and moths] in our woods.”

A systemic, as opposed to a contact pesticide, is absorbed through a plant’s vascular system and distributed, or translocated, throughout the plant. A host of

Photo (above): Female Cecropia moth

SYSTEMIC PESTICIDES

variables determine the long-term toxicity of systemic pesticides, which, depending on the chemical and how the user applies it—spraying leaves, injecting tree trunks, coating seeds, or drenching soil—can poison all parts of the plant and everything it produces: pollen, nectar, fruit, and sap. “Systemics can persist much longer in woody plants than in herbaceous species,” says Aimée Code, pesticide program director at the Xerces Society for Invertebrate Conservation. “In one study, rhododendrons still expressed systemic pesticide six years after one treatment.”

The Shelleys, both of whom are engineers familiar with scientific research, set out to find the half-life for chlorantraniliprole. Although they tracked down studies on the Internet and emailed a university entomologist, the research didn’t clarify how long the pesticide would remain toxic. One study reported 100 percent toxicity 59 days after application. Others quoted different figures or contained no long-term residual data.

Despite their efforts, the Shelleys ended their search with the same questions that baffle most consumers when investigating a pesticide: What does “safe” really mean? Which studies should I trust? Does the research apply only to honeybees or also to native bees, moths, butterflies?

A reportorial dive into the issues found plenty of reasons for this confusion. Here are five big ones:

1. Consumers may not recognize a chemical as a systemic pesticide. Most people have read about systemics in the same sentence as neonicotinoids, or “neonics,” usually in articles linking neonics to the decline of honeybees. (In 2013, the European Union banned three neonics for this reason.) But systemic is a categorical term that includes many specific classes of chemicals. Neonics entered the market in the 1990s, and new systemics have followed continually. Chlorantraniliprole, introduced in 2008, is in a class called anthranilic diamides.

2. Newer systemics have not been out long enough to test long-term effects. As pests develop resistance to older systemics like neonics, new chemicals attack invertebrate nervous systems in different ways. Their risks often do not come to light until they have been on the market for years. Also, Code points out, federal pesticide regulations require only avoiding “unreasonable harm.” In other words, she says, “even if users apply a pesticide as directed, regulators accept and expect some harm.”

3. On a pesticide label, “safe” applies only to land mammals. The chief argument for systemics is that they protect workers, who risk health problems from contact with insecticides applied to the plant’s surface. Safety research tends to prioritize human health, but several sources warn that science has not caught up with systemics’ long-term effects on vertebrates, including birds. Meanwhile, a 2015 study by U.S. Geological Survey and University of Iowa found neonicotinoid residues in rivers across the country and in Iowa tapwater.

4. The U.S. Environmental Protection Agency (EPA) sometimes lets us down. According to “Cultivating Plants that Poison Bees, Butterflies, and Birds,” an article by Nikita Maik, MPH, in the journal *Pesticides and You* (Winter 2015-16), “The new systemic pesticides that EPA has registered over the last decade, those that have been found to be highly toxic to bees, are nonetheless listed by the agency under the misleading category of ‘reduced risk pesticides’ because of their relatively low acute toxicity to mammalian species. . . . However, . . . their long-term impacts on terrestrial and aquatic ecosystems are not fully understood.”

Worse, EPA approves “reduced risk” chemicals for use in integrated pest management (IPM), a model that supports the least-toxic means of pest control. Manufacturers are quick to exploit the phrase: Acelepryn’s label claims that it is “recom-

Don Keirstead



Top: A buffer of pesticide-free pollinator habitat in an orchard.

Bottom: *Andrena* spp., or mining bee, one of many native bee species not addressed in research on honeybees.

Bugwood.org



mended for IPM programs on turf and landscape ornamentals.” Approving systemics for IPM also conflates them with “minimum risk” pesticides, which EPA asserts pose little to no risk to human health or the environment.

5. Landscape professionals and commercial growers of landscape plants get their safety information from chemical suppliers, directly or indirectly.

“A chemical that treats two voracious pests with one application and has no long-term impact on beneficial insects sounds too good to be true because it is. But that is what tree-care companies hear from their chemical reps,” says Richardson. “And if the tree-care folks are desperate to save your trees, they naturally want to believe it.”

This also holds at the level of horticulture industry associations, which educate member businesses. But individually and as a group, businesses like commercial nurseries risk big financial losses from insect pests, making them willing to believe the story they get from pesticide companies. This spring, for example, the horticulture industry’s national trade association, AmericanHort® (not to be confused with the American Horticulture Society), and its research foundation, the Horticultural Research Institute (HRI), launched a nationwide campaign called Grow Wise, Bee Smart™. The campaign targets growers but also will reach backyard gardeners as part of two national public-outreach projects, the Million Pollinator Garden Challenge and the Pollinator Partnership.

Although the best management practices brochure on the campaign website (www.growwise.org) promotes IPM and recommends “judicious use of pesticides,” it offers conflicting advice on systemics: “It is currently unclear how quickly systemic pesticides move from the treated area to pollen and/or nectar, how long their residues persist, and at what level residues may pose risk to bees,” reads a preliminary statement. A few paragraphs later, the text cautions: “Do not apply product to blooming, pollen-shedding, or nectar-producing parts of plants if bees may be foraging during this period.” But if the toxic period is “unclear,” might not application before flowering endanger pollinators?

Besides, says Code, “It isn’t unclear. It is that the answers differ in different landscapes.”

At best, the campaign spreads confusion and ignores systemics’ effects on pollinators other than honeybees. At worst, it rehashes the claims of chemical manufacturers while downplaying evidence such as the *Worldwide Integrated Assessment of the Impact of Systemic Pesticides on Biodiversity and Ecosystems* (2014; see sidebar).

Where does this leave the Shelleys? They decided that the best course is to practice IPM, even though they risk losing trees that now support beneficial lepidopterans. 🍯

Systemics Research Resources

Beyond Pesticides (formerly National Coalition Against the Misuse of Pesticides), nonprofit organization offering numerous resources including a scientific journal, *Pesticides and You*. See “Cultivating Plants that Poison Bees, Butterflies, and Birds,” Vol. 35, No. 4 (Winter 2015-16); www.beyondpesticides

“Earth-wise Guide to Products Toxicity Ratings,” City of Austin, TX; a useful fact sheet with glossary of label terms and symbols, additional resources; www.austintexas.gov/sites/default/files/files/Watershed/growgreen/products.pdf

Etoxnet (Extension Toxicology Network) of the Pesticide Information Project of the Cooperative Extension Offices of Cornell, Michigan State, and Oregon State universities, and University of California at Davis; identifies chemicals, uses, and trade names. <http://pmep.cce.cornell.edu/profiles/extoxnet/>

IPI Database, a project of the Xerces Society for Invertebrate Conservation, a multifaceted resource; peer-reviewed papers about pesticides’ effects on invertebrates; www.pesticideimpacts.org

National Pesticide Information Center (NPIC), Oregon State University and the Environmental Protection Agency, comprehensive databases from state to international; includes product search; <http://npic.orst.edu>; 800-858-7378 (8:00 a.m. - 12:00 p.m. PST); npic@ace.orst.edu

Pollinate New England, the Society’s regional public-outreach campaign, now in development (see page 3).

Worldwide Integrated Assessment of the Impact of Systemic Pesticides on Biodiversity and Ecosystems (WIA), a synthesis of 1,121 published peer-reviewed studies of two common systemics, neonics and fipronil, by 29 authors (2014); www.tfsp.info/worldwide-integrated-assessment



NATIVE PLANTS: THE BASIS OF EVERY ECOSYSTEM

By Alan E. Smith

DONOR PROFILE



DR. ALAN E. SMITH, CBE, FRS,
is chair of the Society's Board
of Trustees and a member of
our Conservation Circle

Upon first entering the rainforest in Brazil, in 1832, on an excursion from *HMS Beagle*, Charles Darwin wrote that his first reaction was one of reverence and of awe. He compared looking up into the canopy to the sense of being in a great European cathedral. He found it all the more astounding because the surroundings were not the work of human beings, but of Nature.

I too feel a sense of awe every time I venture out into the natural world, even into my own garden. The sheer beauty of Nature, its fecundity, and ever-changing color and texture lift the spirits. And yet all these wonderful organisms arose by natural selection, over eons. This thought led Darwin to conclude his *On the Origin of Species* with “there is a grandeur in this view of life, . . . that from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.”

Later, Darwin came to appreciate another great concept that his hero Alexander von Humboldt had proposed even earlier: the interconnectedness of all things in Nature. As he illustrated this concept: “It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so

different from each other, and *dependent upon each other* in so complex a manner, have all been produced by laws acting around us.” (The italics are mine.)

It is this interconnectedness that underscores the importance of native plants as the basis of every ecosystem. And it is no coincidence that a founder of New England Wild Flower Society was Jane Gray, the widow of Darwin’s great friend and champion in the United States, the Harvard University botanist Asa Gray. Like Darwin, both Grays understood that native plants are connected to each other, to the insects, birds, and animals that have grown up around them. They are interdependent on one another too; destroy any one and the balance of the whole is disturbed.

This interdependence, the sheer beauty of native plants, and my own attempts to encourage their growth in my garden first led to my passion for the work of the Society: to cultivate native plants; to educate us about their importance; and to work for their conservation. As a former undergraduate, now fellow, of Darwin’s Cambridge College, I am proud to be supporting such important and urgent work.

In the face of the seemingly relentless encroachment of human activity, as well as the evidence of climate change, our work today is even more important than it was in 1900 when the Society was founded. 🌱

Celebrating Your Support

In 1900, the founders of the Society for the Protection of Native Plants, which evolved into New England Wild Flower Society, had a compelling vision—to focus exclusively on protecting the region’s native flora. Their efforts foreshadowed our work today in conservation, horticulture, and education in all six New England states. As you read about our many accomplishments, please take a moment to be proud of your own support for this internationally renowned organization. Friends like you are at the heart of all our successes, and we are delighted to celebrate and publicly thank all of you!

CONSERVATION CIRCLE AND LEADERSHIP GIFTS

The total giving noted below for fiscal year 2016, ending December 31, reflects restricted and unrestricted gifts, membership dues, and pledges. The Conservation Circle especially honors individuals whose generous personal philanthropic support reached \$1,000.00 or more. Many leadership gifts and grants from companies and foundations also had an extraordinary impact on the Society.

† denotes deceased donors

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Bose Corporation is a generous funder of the Society’s annual intern program, which helps students obtain practical conservation and horticulture experience essential for their future careers. Courtesy: Bose Corporation.



Pam Resor, Jessie Panek (host), Deirdre Menoyo, and Loring Schwarz celebrate spring at the 2017 Social Gathering for our Board, Overseers, and Honorary Trustees.

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Claudia West, Janet Ganson, and Judy Preston enjoying the 2016 Leadership Summit following the SALT conference, at which the Society's first Regional Impact Award was presented to New Directions in the American Landscape.



Carrie Waterman learning the finer points of drawing at the 2016 Art & Nature event for our Conservation Circle.

Sandra Peters and Alan L. Frohman
Robert A. and Veronica S. Petersen
Elaine Reddick
Virginia Remeika and Jim Burke
Jacqueline Rigolio
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LIFE MEMBERS

These dedicated individuals have chosen to play a long-term role in the preservation of our region's native flora by becoming life members.

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Julia A. Barber
Patricia Callan and Chuck Crafts
Martha F. and
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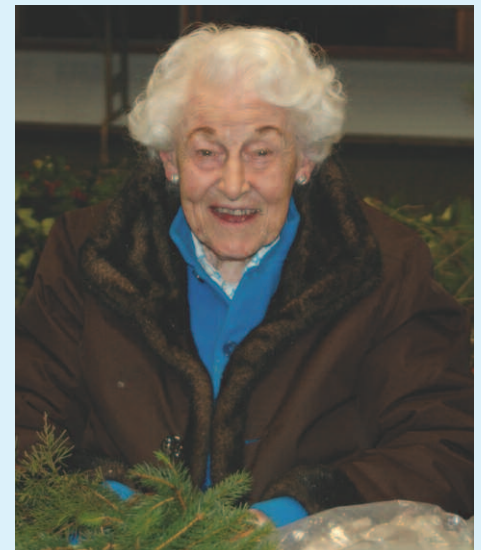
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Steve Atlas
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Margaret F. and
T. C. Price Zimmermann



Patterson wins 2016 Service to the Society Award: Bruce Patterson earned recognition for his extraordinary volunteer contributions over many years as a native plant sanctuary steward, a prolific collector of seed for propagation, and an assistant to conservation projects. From left: Debbi Edelstein, executive director; Patterson; Ted Elliman, botanist; Roberta Fox; and Cayte McDonough, nursery production manager.



Honorary Trustee Bev Ryburn making a native foliage display at the 2016 Life Members event. Sadly, Bev passed away in March 2017 and is deeply missed by her many friends and family.

Making Friends at Conservation Conversations

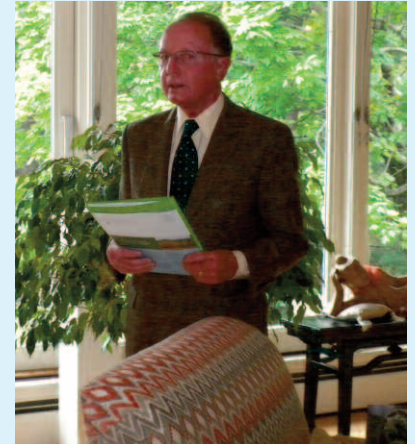
Our thanks to Peter Cope, Janet W. and John P. Ganson, Thelma K. and John H. Hewitt, Eleanor Kane and Theo Wiegand, Deirdre Menoyo, Jackie and Thomas E. Stone, Martha Wallace, Brian White, and Alan and Charlotte B. Wilson for hosting these special events across the New England region.



Sarah Schwaegler, Peggy Lahs, and Susan Damon celebrate summer at our Conservation Conversation in Hartland, VT. Photo: Roger Grzegorzewicz.



Lita Nelsen shares her passion for native plants at our Conservation Conversation in Tewksbury, MA.



Alan Wilson lends his voice to support seed banking at our Conservation Conversation in Manchester, MA.



Betty and Jim Wickis, Bruce Patterson and Roberta Fox, David and Pam Durant enjoying our Hartland, VT, gathering. Photo: Roger Grzegorzewicz.



Marty Wallace and friends explore farm trails during our Conservation Conversation in Barrington, NH.



Luke and Rhonda Fowler share stories from the Upper Valley with Charles and Marian Marrin at our Conservation Conversation in Hartland, VT. Photo: Roger Grzegorzewicz.



Judy Cope reconnects with her conservation roots in Sudbury, MA.



Lawrence Simon and Neela De Zoysa making new friends in Sudbury, MA.

TRILLIUM SOCIETY

The following generous friends have included the Society in their estate plans, to help ensure our future ability to conserve native plants and their habitats.

Elizabeth L. Aghajanian	Bettina L. Messana
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Joyce H. Bisson	Geri and Douglas D. Payne
Lalor Burdick	Karen D. and Matthew V. Pierce
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Peter V. Doyle and Ellen Clancy	Anita E. Springer
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Nancy Goodman	Jackie and Thomas E. Stone
George C. and Diantha C. Harrington	Mary Ann Streeter
Patti Laier	Leslie Turek
Ann R. Lemmon	Martha Wallace
Deirdre Menoyo	Cheryl K. Wilfong
Carole M. Merrifield	Elizabeth H. Wright
	Patty Wylde

MATCHING GIFT COMPANIES

We extend special thanks to the following businesses for their generous support in 2016.

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IBM Corporation Matching Gifts Program	Verizon Foundation Matching Gifts Program
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TRIBUTES

In 2016 we received honoraria or memorial donations in tribute to the following friends, colleagues, mentors and loved ones.

In Honor Of	In Memory Of
Juliette Brodeur and Chris Ward	Dorothy M. Andrews
Mimi Chandler	Bob August
Frances Clark and Bernard McHugh	Cindy Benway
Deborah Conant	Sally G. Cook
Dr. Elizabeth Farnsworth	Dr. Shirley Cross
David and Eugenia Harrison	Richard Darling
Deborah Hellmold	Valerie Hoadley
Dr. Barbara Keller	Robert Jost
Lisa Mattei	Mickey Leszczak
Virginia McIntyre	Henry Miller, Jr.
Lita Nelsen	Deborah Petri
Reece William Sarette	Lois Redden
Lynnea Schafer	Nancy Sanders
Virginia Steel	Barbara Selvitella
Carolyn Waterman	Elizabeth Springer
Gray and Paul Wexelblat	Janet Springfield
Laney Widener	Dorothy Toll
	Christie L. Wall

GIFTS-IN-KIND

Gifts-in-kind uniquely allowed us to expand our outreach in 2016 without impacting our outgoing expenses. We are pleased to thank the following gift-in-kind donors.

Bentley University	Deirdre Menoyo
Bertucci's	Eleanor Kane and Theo Wiegand
Boston College Athletic Department	Page Waterman Gallery Inc.
Boston Red Sox	Joan Pilson
Aviva and Douglas Brooks	Privateer International
Russell Cohen	Christine Quinby
Peter Cope	Rhode Island Nurseries
Domino's Pizza	Roche Brothers Supermarkets
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Dr. Elizabeth Farnsworth	Stop & Shop
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Elizabeth Haight	Carolyn Waterman
Ervina Hamilton	Brian E. White
Thelma Hewitt	Robin Wilkerson
Dr. Barbara Keller	Tracey Willmott
Christopher Leahy	Alan and Charlotte B. Wilson



Charitable Gifts Annuities

A lifetime gift with annual rewards

Are you making plans for the future? Charitable gift annuities are among the most popular planned gifts and have been around for more than 100 years. Such an income-producing gift to New England Wild Flower Society can provide the benefit of an annual tax-free sum.

For example: A \$10,000 gift* to a 72-year-old person would provide a payout of \$540 a year, \$391 of which would be tax-free. That person can be you or someone you designate. For a person aged 76, that annual payout would be \$600, \$448 of which would be tax-free. And, if the person is 80 at the time the gift is made, he/she would receive \$680 every year, \$524 of which would be tax-free.

This is a wonderful way to support the Society's mission while receiving tax benefits and income payments for yourself or a loved one. To see an example tailored to your circumstances, please contact Tracey Willmott, Director of Philanthropy, 508-877-7630 x3502 (gifts@newenglandwild.org).

*These figures assume the gift is made in cash.



PETER V. K. DOYLE is an Overseer at New England Wild Flower Society and a gift-planning specialist who worked for Harvard Business School and Wellesley College before retiring recently and becoming a consultant.

CUSTOM HORTICULTURE SERVICES

At our Nasami Farm Native Plant Nursery, we are constantly expanding the list of native species available for landscaping and restoration projects, as well as for individual retail sales through our Garden Shops. The following organizations either contracted with us for custom growing or purchased quantities of plugs for their projects (* indicates a partner nursery).

Lucy Birkett (ME)
Broadfork Permaculture (MA)
Scott Bruce (MA)
Cheshire County Conservation District (NH)
Russell Cohen (MA)
David Falk Gardening/Wild City Gardens (MA)
Ruah Donnelly (MA)
Franklin Regional Council of Governments (MA)
Friends of Mashpee National Wildlife Refuge, Inc. (MA)
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Carolyn Lattin (MA)
Manitoga Inc. (NY)
J. Patrick McIntyre (CT)
Merrimack River Watershed Council (MA)
Montshire Museum of Science (VT)
North Fork Boutique Gardens (NY)
Plant Euphoria (MA)
Safe Harbor (MA)
Smithfield Conservation Commission (RI)
Speaking of Landscapes, LLC (CT)
Sudbury Valley Trustees (MA)
Summer Hill Nursery (CT)*
Carolyn Summers (NY)
Sustainable Wellesley (MA)
The Xerces Society (MA)
Van Berkum Nursery (NH)*
Lisa C. Van Dusen (MA)

CONSERVATION SERVICES

In 2016, the following organizations contracted for our services or utilized our expertise in rare plant surveys, seed collection, invasive species management, botanical inventories, and restoration.

National Park Service

Appalachian National Scenic Trail (CT, MA, NH, ME)
Acadia National Park (ME)
Boston Harbor Islands National Recreation Area (MA)

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service

Great Bay National Wildlife Refuge (NH)
Great Meadows NWR Complex (MA)
John H. Chafee NWR (RI)
Maine Coastal Islands (ME)
Ninigret National Wildlife Refuge (RI)
North Attleboro National Fish Hatchery (MA)
Parker River NWR (MA)
Petit Manan NWR (ME)
Rhode Island NWR Complex (RI)
Sachuest Point NWR (RI)
Silvio O. Conte NWR (MA)
U.S. Fish and Wildlife Service (Northeast Region)
Wapack NWR (NH)
Wells National Estuarine Reserve (ME)

U.S. Forest Service

White Mountain National Forest (NH)
Green Mountain & Finger Lakes National Forest (VT)

State Natural Heritage Programs

CT Recreation and Natural Heritage Trust Program
MA Natural Heritage and Endangered Species Program
ME Natural Areas Program
NH Natural Heritage Bureau
RI Natural History Survey
VT Natural Heritage Inventory

State Offices

Baxter State Park (ME)
CT Department of Energy and Environmental Protection:
Barn Island WMA
Chatfield Hollow State Park
Cromwell Meadows Wildlife Management Area
Farm River & Bluff Point State Park
George Dudley Seymour State Park
Hammonasset Beach State Park
Housatonic State Forest
Hurd State Park
Indian Wells State Park
Kettletown State Park
Lamentation Mountain State Park
Mianus River State Park
Nehantic State Forest
Pachaug State Forest
Quinnipiac River State Park
Simsbury WMA
Sleeping Giant State Forest
West Rock Ridge State Park
Wildlife Division
Wooster Mountain State Park

CT Department of Transportation:

Division of Property Management

MA Department of Conservation & Recreation:

Bash Bish Falls State Park
Blue Hills State Reservation
Connecticut River Greenway State Park
Deer Hill State Reservation
Neponset River Reservation
Nickerson State Park
Manuel F. Correllus State Forest
Maudslay State Park
Mohawk Trail State Forest
Mt. Greylock State Reservation
Mt. Washington State Forest
Myles Standish State Forest
Otis State Forest
Ponkapoag Bog
Robinson State Park
Savoy Mountain SF
Skinner/Holyoke Range State Park
Sudbury Reservoir Trail
Tolland State Forest
Whitehall State Park

MA Department of Environmental Protection

MA Division of Fisheries & Wildlife

ME Bureau of Parks and Lands
ME Department of Inland Fisheries and Wildlife
ME Forest Service
NH Department of Environmental Services
NH Division of Forest and Lands

NH Division of Parks & Recreation:

Mt. Cardigan State Forest
Franconia Notch State Park
Livermore Falls State Forest
Pawtucketaway State Park
Weeks State Park

NH Fish and Game – Ellis Hatch WMA

RI Department of Environmental Management:
Arcadia Management Area
Beavertail State Park
Burlingame Management Area
Carolina Management Area
Colt State Park
Division of Fish & Wildlife
Great Swamp Management Area

Water Resources Board South Central CT Regional Water Authority

VT Department of Fish & Wildlife

VT Department of Forests, Parks & Recreation:

D. A. R. State Park
Jay State Park
Kingsland Bay State Park
Mt. Mansfield State Forest
Tinmouth Channel WMA

Invasive Species Cooperative Partnerships

Connecticut River Watershed Cooperative Invasive Species Management Area (CT, MA, NH, VT)
Sudbury-Assabet-Concord River Watershed Cooperative Invasive Species Management Area (MA)
Westfield River Invasive Species Partnership (MA)

OTHER PARTNERS

Includes towns, land trusts, utility companies, and other private and public landowners who allowed staff and volunteers access to their properties for conservation of our native flora.

A & J Construction (MA)	Dartmouth College Real Estate Office (NH)	Old Quarry Association (CT)	Town of East Longmeadow (MA)
A. D. Makepeace (MA)	Dragon Cement (ME)	Opacum Land Trust (MA)	Town of Fairhaven (MA)
American Forest Management (ME)	Elephant's Trunk Flea Market (CT)	Oxbow Associates (MA)	Town of Framingham (MA)
Amherst Country Club (NH)	Episcopal Dioceses of Vermont	Porter's Point School (VT)	Town of Franklin (MA)
Aquarion Water Company (CT)	Equinox Preservation Trust (VT)	Providence Water Supply Board (RI)	Town of Guilford (CT)
Avalonia Land Conservancy (CT)	Falmouth Conservation Commission (MA)	Roxbury Land Trust (CT)	Town of Hyannis (MA)
Biodiversity (MA)	Falmouth Land Trust (ME)	Salem Land Trust (CT)	Town of Jamestown (RI)
Black Bear Hydro (ME)	Francis Small Heritage Trust (ME)	Sandy Pond Campground (MA)	Town of Kingston (MA)
Branford Land Trust (CT)	Franklin Land Trust (MA)	Schumacher Companies Inc. (MA)	Town of Londonderry (NH)
Bridgewater Conservation Commission (MA)	Friends of Winter Pond (MA)	Society for the Protection of New Hampshire Forests (NH)	Town of Madison (CT)
Brown Ledge Camp (VT)	Great River Construction (MA)	Somerset Woods Trustees (ME)	Town of Mason (NH)
Burdick Family Farm LLC (CT)	Groton Utilities (CT)	South Central CT Regional Water Authority (CT)	Town of Meriden (CT)
Cambridge Water Department – Fresh Pond Reservation (MA)	Homestead Farms (NH)	South Windsor Land Conservation Trust (CT)	Town of New Milford (CT)
Camp Abnaki, Greater Burlington YMCA (VT)	Irving Woodlands LLC (ME)	Southbury Land Trust (CT)	Town of Newburyport (MA)
Camp Keewaydin (VT)	Kennebec Land Trust (ME)	Sudbury Historical Society (MA)	Town of Newtown (CT)
Camp Isabella Freedman (CT)	Lake Champlain Land Trust (VT)	Sudbury Valley Trustees (MA)	Town of Plymouth (MA)
Camp Sloane (CT)	Lakes Region Conservation Trust (NH)	The Nature Conservancy (CT, ME, NH, RI, VT)	Town of Salem (NH)
Camp Wigwam (ME)	Loon Echo Land Trust (ME)	The Trustees of Reservations (MA)	Town of Sanford (ME)
Carlisle Conservation Foundation (MA)	Manchester-Essex Conservation Trust (MA)	Town of Avon (CT)	Town of Seabrook (NH)
Chatham Conservation Foundation Inc. (MA)	Marian Fathers (MA)	Town of Barnstable (MA)	Town of Simsbury (CT)
Chester Land Trust (CT)	Mashantucket Pequot Indian Tribal Nation (CT)	Town of Bethel (CT)	Town of South Hadley (MA)
Chicago Botanic Garden (IL)	Massachusetts Audubon Society (MA)	Town of Bethel (VT)	Town of Stratford (CT)
City of Burlington (VT)	Middlebury College (VT)	Town of Bradley (ME)	Town of Suffield (CT)
City of Cambridge (MA)	Mystic Aquarium (CT)	Town of Brunswick Parks and Recreation (ME)	Town of Thomaston (ME)
City of Groton (MA)	Nantucket Conservation Foundation (MA)	Town of Carlisle (MA)	Town of Vernon (VT)
City of Holyoke (MA)	Nantucket Land Bank (MA)	Town of Chelsea (ME)	Town of West Springfield (MA)
City of Middletown (CT)	Narragansett Indian Tribe (RI)	Town of Cheshire (CT)	Town of Westford (MA)
City of New Haven (CT)	National Audubon Society	Town of Concord (MA)	Town of Westwood (MA)
City of Pawtucket (RI)	New England Forestry Foundation (MA)	Town of Conway (MA)	Town of Windham (NH)
City of Waltham (MA)	Northeast Utilities (CT)	Town of Cumberland (RI)	Town of Yarmouth (MA)
Coastal Resources Management Council (RI)	O and G Industries (CT)	Town of Durham (NH)	TransCanada (VT)
Cumberland Park and Recreation (RI)	Obwebetuck Hill LLC (CT)	Town of East Granby (CT)	University of Maine 4-H Camp
Dartmouth College Woodlands (NH)	Ocean Edge Golf Course (MA)	Town of East Haven (CT)	University of Rhode Island Walden Woods Project (MA)
			Willard J. Stearns & Sons Inc. Dairy Farm (CT)
			Wyantenuck Country Club (MA)
			Yale University

MESSAGE FROM THE TREASURER

In 2016 the Society moved several key initiatives forward, passed a new five-year strategic plan, and ended the year well-positioned for continued outstanding programmatic success. Work continued for a second year on a federally funded project to collect seeds for ecological restoration of coastal areas damaged by Hurricane Sandy, and the Society also began a project to restore the summit of Cadillac Mountain in Acadia National Park in Maine. In addition, the Society secured a two-year grant for a region-wide pollinator program, completed the renovation of the Curtis Woodland Garden at Garden in the Woods, revamped the programs for school-children, and published a four-color field guide to the wildflowers of New England. The Society also undertook funded capital projects and repairs, including upgrades to water infrastructure serving buildings at Garden in the Woods.

As the Society seeks to build on its achievements and move forward with an ambitious strategic plan, expanding philanthropic support and increasing the endowment are paramount.

The performance of the endowment, managed since 2002 by our Investment Committee, reflected general market trends and matched the 8.0 percent return of the committee's benchmark. The value of the investment portfolio was \$5,854,305 as of December 31, 2016.

Thanks to the hard work of our Board, dedicated staff, committed volunteers, and the generous gifts of our many members and supporters, the Society had a successful year in 2016.

Sincerely,



Janet Ganson

Fiscal Year 2016 Operating Results

Income

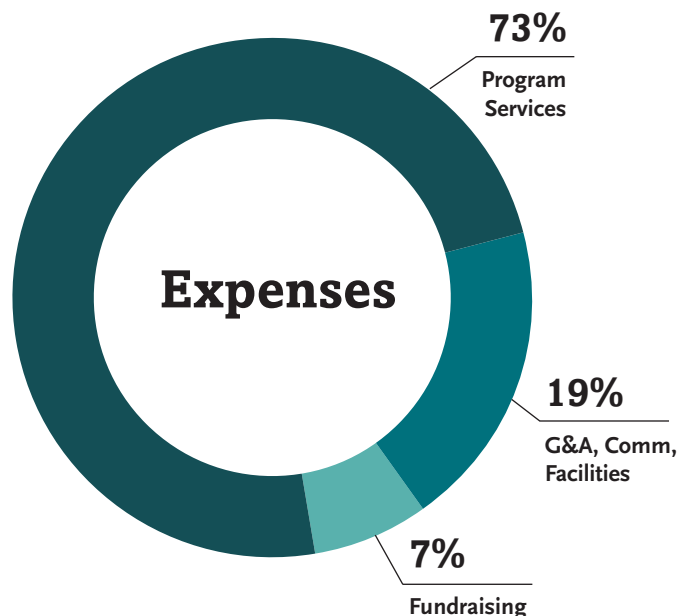
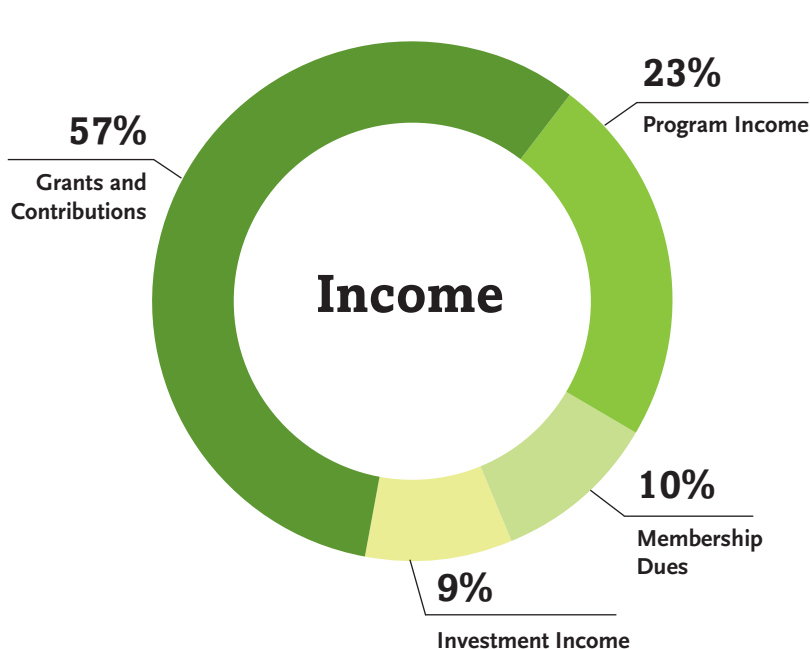
Grants and Contributions	\$	1,405,713
Program Income	\$	561,157
Investment Income	\$	230,223
Membership Dues	\$	252,921
Total Income	\$	2,450,014

Expenses

Program Services		
Conservation & Sanctuaries	\$	744,316
Horticulture	\$	565,896
Education	\$	302,666
Member Services	\$	173,312
Retail Shops	\$	230,200
Total Program Services	\$	2,016,390
Support Services		
G&A, Comm, Facilities	\$	535,623
Fundraising	\$	206,745
Total Support Services	\$	742,368
Total Expenses	\$	2,758,758
Operating Surplus (Deficit) - see note	\$	(308,744)

Notes

- Operating Surplus (Deficit) includes \$309,869 expense for noncash depreciation of fixed assets and the amortization of the development of the Go Botany website.
- The Society's net asset value is \$10,615,806 as of December 31, 2016.
- A complete copy of the audited financial statements is available upon request by emailing twillmott@newenglandwild.org.



CHANGE CAREERS, PICK UP NEW SKILLS, OR LEARN FOR LEARNING'S SAKE

In Our Self-Paced Certificate Programs in Native Plant Studies



EARN a basic or advanced certificate in one of New England Wild Flower Society's two nationally respected programs. **LEARN** from working experts in native plant botany, design, and horticulture. Classroom learning, on site or online, is complemented by field offerings. Tune into live webinars and learn in person at Garden in the Woods.

FIELD BOTANY

Study New England's amazing plant diversity. Learn to identify the species that compose our landscapes and delve into regional conservation issues. Learn how plants change as they grow, how they interact with other species, and how land and climate shape plant communities.



NATIVE PLANT HORTICULTURE AND DESIGN

Explore the limitless effects you can achieve in a garden setting with the region's diverse native flora. Learn about ecological horticulture and sustainable landscape design. Tease your palate with native edibles, learn what species make up a meadow, and grasp design principles in courses taught by independent landscape architects and designers as well as members of the Society's respected horticulture staff.



COOL NEWS FOR MASSACHUSETT SCHOOLS: OUR PROGRAMS MEET CURRICULUM STANDARDS

Our new pre-K–4 school programs at Garden in the Woods meet the Massachusetts Science and Technology/Engineering curriculum standards. Our teacher naturalists guide students in hands-on field investigations of plant life, diverse habitats, and the effects of weather and climate on plants. Our 45 acres of varied topography and habitat give kids a chance to observe an unusual variety of plants and wildlife.

To book a school visit or get more information:
www.newenglandwild.org/learn/school-programs.html

For questions: 508-877-3658 x3303; education@newenglandwild.org



© David Taylor

O. humifusa

RARE PLANT SPOTLIGHT



© David Taylor

O. cespitosa

Eastern Prickly-pear (*Opuntia* spp.): A Species Emerges

The study of plant diversity, called systematics, sometimes reveals that what we commonly believe to be one species actually comprises multiple species that have yet to be recognized and named. Systematics research is critical to plant conservation, because a species formerly thought to be common can turn out to be rare, and vice versa.

A recent example is the eastern prickly-pear cactus (*Opuntia humifusa*). Traditionally, New England botanists have identified this as the sole *Opuntia* in the region, found in Connecticut, Massachusetts, and New Hampshire. But recent research (Majure *et al.*) recognizes a new species—*Opuntia cespitosa*, or tufted prickly-pear—previously thought to be a variation of *O. humifusa*, and it also occurs here.

Studies like this advance our understanding of plants and inform choices about protecting them; but the latter is easier when we can tell the species apart without a microscope. Fortunately, the naked eye can easily spot the traits that distinguish the two New England cacti: *O. humifusa* has no long

spines, its flowers are entirely yellow, and its new cladodes, or pad segments, are green. The tufted prickly-pear has long spines on some cladodes, the innermost segments of the flower have pink to dark-red patches at the base, and the new cladodes are coated in a gray-green, waxy bloom. *Opuntia humifusa* also is more widely distributed, occurring in several counties in Connecticut; on mainland Massachusetts, including Cape Cod; on the coast of New Hampshire; and possibly, though unconfirmed, in Rhode Island. So far, tufted prickly-pear (*O. cespitosa*), is known to exist only in one county in Connecticut, and on the Cape and islands of Massachusetts. More field work will reveal whether one or both species warrant greater protection. 🌵
—Arthur Haines, *Research Botanist, Author, Flora Novae Angliae*

Read the full story of how botanists identify a new species like tufted prickly-pear at www.newenglandwild.org/blog. Your support helps keep our research botanist in the field.