NEWTON CONSERVATORS
WINTER ISSUE

NEWSLETTER

Newton's land trust working to preserve open space since 1961

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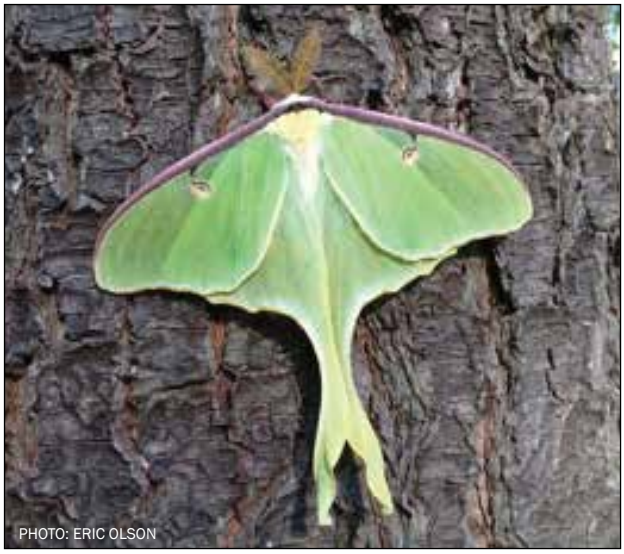
Where Have All the Giant Moths Gone?

By Eric Olson, Senior Lecturer in Ecology at Brandeis University

Even for the most insect-phobic among us, certain butterflies and some moths are so big and so beautiful, they seem to attain the status of honorary birds. These are bugs with a fan base. Monarch butterflies are the rulers of this rarified elite, and for years various wildlife groups have been nominating monarchs to Congress as the National Insect.



Wild Luna Moth at rest. Memorial Day Weekend 2012, Lake Winnipesaukee, NH.

As a boy, I was most enamored of the giant silkmoths, with their big caterpillars, showy adults, and common names drawn from the Greek myths, like Polyphemus, Prometheus, Io, Luna. With my maternal grandfather's help, I collected my first Luna Moth from a plate-glass window, and he helped me frame it between glass and a bed of cotton. I still have it today, 50 years later. Biking my newspaper route in a suburb of Detroit, I would watch for the surprisingly big frass pellets (deer droppings in size!) of giant Cecropia Moth caterpillars, and I'd sometimes return with my dad to hunt for them in the branches above. These experiences shaped my future in ways I could not have imagined, for they led eventually to a PhD in ecology and a dissertation on tropical insect dietary ecology. The caterpillar of choice for my field experiments was the Rothschildia Moth, a giant silkmoth found from Mexico to Brazil.

Unfortunately, New England's silkmoths are no longer as common as they once were, and that means fewer youngsters will share in the delights of raising their caterpillars or discovering the adults below their porch lights on an early summer morning. A number of factors account for the rarity of these insects today, but one in particular – a biological control agent called *Compsilura*, deliberately introduced against Gypsy Moths, may well be the dominant cause. Its story serves as a cautionary tale as entomologists seek to control more recent insect invaders.

The Challenge of Invasive Insects

The story of *Compsilura* needs a bit of context to explain the "why" and "how" of biological control efforts aimed at invasive species like the Gypsy Moths. Many of us are all too familiar with invasive species. Dozens of Conservators and friends have joined in weed-pulls in recent years, aimed at garlic mustard, Japanese knotweed, and other non-native plants encroaching on Newton's open spaces. Go up a step in nature's food chain, though, to invasive insects like Winter Moth and Hemlock Wooly Adelgid, and we

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amateurs are at a loss. Homeowners and local governments may succeed at control on a small scale, tree-by-tree, and volunteers can help to monitor the spread of Emerald Ash Borer and the Asian Long-Horned Beetle. But when it comes to intervening in a major way against insect threats, we have to look to professional entomologists and hope they come up with some means to stop or at least slow their spread.

Because of the highly mobile nature of insect invaders, most entomologists believe that biological control is the most cost-effective approach over the long term and is certainly better than spraying forests with broad-spectrum insecticides. A biocontrol program begins with researchers traveling to the place where an insect invader is native. There, in collaboration with local specialists, they work to identify all the enemies — especially the parasitoid wasps and flies — that have the potential to control a target insect. Once identified, some of these wasps and flies are brought back home, reared up in large numbers, and released into the wild with the hope that they will establish successfully. The initial cost of such programs can run into millions of dollars, but once a new natural enemy becomes established, costs drop to zero, as the insects reproduce themselves year after year.

A wild Cecropia Moth male mating with a reared female, through the chicken wire mesh of a cage placed out in the woods along the Charles River, 5 June, 2016.

This cheerful scenario is likely to cause some readers to cringe, and I can hear the questions now: "So you intend to control one non-native insect by introducing more? That sounds like a recipe for biological chaos." The answer comes in two parts. First, some invasive insects are already wreaking chaos. It's a bit late to say, "Just leave nature alone, and it'll right itself." We might lose all the hemlocks of North America, for example, as the adelgid continues its spread northwards, aided by warmer winters (another aspect of human-caused chaos). Second, entomologists have learned some harsh lessons from the mistakes of the past and are much more careful now about the kinds of biocontrol agents they propose for introduction.

I know of no better example of a past error that most entomologists wish they could undo than that of the tachinid parasitoid fly *Compsilura*, introduced years ago to control Gypsy Moths. The Gypsy Moth was brought from Europe to the US in 1868 by a resident of Medford, who had the notion that the US could have its own silk industry. Some of his caterpillars escaped, and we've been suffering outbreaks of Gypsy Moths ever since. In the years to follow, in their desperation to halt defoliation events that left entire forests leafless, entomologists introduced a dozen species of Eurasian wasps, flies, and other natural enemies. *Compsilura* was one.

Like other parasitoid flies, *Compsilura* females lay their eggs on or near a caterpillar, and the maggots burrow in and devour the caterpillar from the inside out. It's a grim sight, but in a healthy ecosystem parasitoids do help prevent caterpillars from becoming too common.

The trouble with *Compsilura* is, first, there's no good evidence it has any effect on Gypsy Moth outbreaks, and, worse still, it is not a specialist, so it readily attacks our native butterfly and moth caterpillars. We now know that it attacks scores and probably hundreds of species of our native caterpillars. And sad to report, research in Prof. Joe Elkinton's lab at UMASS Amherst has shown that populations of our native silkmoths are impacted by this killer fly. In a good faith effort to save New England's forests, spectacular moths have been caught up in the entomologists' version of friendly fire.

The good news is that Luna, Cecropia, Polyphemus, and others are not going extinct and appear to be in no danger of complete extinction. However, they certainly are rarer than they once were. Some still exist in Newton, though, and here's how I know: each summer I raise Cecropia moth caterpillars in cages in my yard, keep the cocoons in my shed over winter, and the following spring, I set out newly emerged female moths in mating cages (see photo). During the night, a female moth emits her powerful pheromone to attract a male — and, of course, it works only if there are wild males around. I have tried this for two different years now, setting out reared females near the Blue Heron Bridge in West Newton. Both times, my Cecropia females have successfully called males — not on the first night, and not necessarily on the second night, but by the third night, a male has arrived.

Compsilura is not the only threat to these night insects — they also can become "stuck" at a streetlight and bang

into the light aimlessly instead of searching for a mate (males) or laying eggs (females). We're fortunate that these glorious insects are still hanging on in spite of all the various obstacles we've set in their way.

Would you like to help our native moths and butterflies? The best way to do so is to plant native trees and shrubs in your yard and to help control invasive plants in Newton's parks. The caterpillars of most butterflies and moths cannot feed either on invasives or on many of the common plantings used by the nursery trade to landscape suburban properties. For more on making Newton more welcoming to native insects, read Prof Doug Tallamy's book, *Bringing Nature Home*, or visit www.bringingnaturehome.net. ■

President's Message

With high daily temperatures in the 40s and 50s as I write this note, it's hard to believe that Thanksgiving is almost here. New England asters and White Turtlehead *(Chelone)* flowers still are blooming in my garden. The first juncos of the season have arrived, but some grackles still have not started their journey south. It's great to be outside wearing just a sweater, but the thoughts of climate change rarely are far from my mind when the temperatures are so high in November.

On October 26, several Conservators' board members and advisors joined Boston University faculty and students to hear NC advisor Professor Richard Primack deliver the 2016 University Lecture titled "Walden Warming: Climate Change Comes to Thoreau's Woods" (also the name of Dr. Primack's book on the same topic).

By using bloom dates recorded at Walden Pond by Henry David Thoreau in the 1850s, Professor Primack was able to document the definite effects of climate change in our region. According to Susan Seligson of *BU Today*, "Even in light of other factors, such as development and loss of habitat, the changes at and around Walden reveal potentially destructive changes ranging from bird migration times to the ripening of the fruits those birds feed on."

In this newsletter, Eric Olson's article on moths and Brooks Mathewson's article on red-backed salamanders provide further distressing—but fascinating--evidence of the negative effects of climate change. Let's be inspired to conserve energy and to encourage our political leaders to do so on a larger scale--and to plan for how the state will deal with the higher ocean levels and other impending consequences of climate change.

Help Wanted

The members of the Newton Conservators' board are very grateful for all of our members.

It's time for annual membership renewal, and we hope to welcome everyone back to support our many projects for another year. As we plan for next year, we also need some help with specific tasks. There are two ongoing positions we'd like to fill.

- **Newsletter Editor:** An exciting challenge four times a year. Would you like to shape the conservation news that goes to Conservators' members? On-the-job training would be provided.
- **Walks Coordinator:** Assemble the popular walks that take place every fall and spring.

It's time to update the Conservators' Trail Guide. There are three limited-time projects connect to that task:

- Trail guide editor
- Trail guide designer
- Trail guide production person

As an associated project, we'd need a Web Designer to help to combine pages for Newton's open spaces on the website for the city's Conservation Commission with those on the Conservators' website (to which visitors to conservation areas can connect by means of QR codes on local signs). This would be a great project for a student!

If you can help us with any of those tasks, please reply to president@NewtonConservators.org.

Monitoring the Wolves of the Forest Floor in Edmands Park with the Newton North High School

By Brooks Mathewson, M.F.S. - Ecologist/Educator/Photographer

Note: *Tables referred to in this article and references can be found on NewtonConservators.org/newsletter.*

In the spring of 2016, I established a study of a population of eastern red-backed salamanders *(Plethodon cinereus)* in Edmands Park, also known as Cabot Woods, along with Tom Gwin, the head of the science department at Newton North High School, teachers Anndy Dannenberg and Shu-yee Chen, and four AP Biology classes.

The study was designed to acquire baseline data on the population size, age structure, distribution, and color-morph ratios of an ecologically important indicator species. It was also intended to provide the students with an opportunity to participate in research and to explore ecological concepts such as food webs, the carbon cycle, and climate change. Most importantly, it was our hope that the students would be encouraged to look more closely at the forests of Newton, and to have a greater appreciation for the numerous benefits that they provide.

The eastern-red backed salamander (Plethodon cinereus) is the most abundant vertebrate in healthy forests in the northeast with a biomass twice that of breeding birds.

Spending time in forests boosts the immune system, lowers blood pressure, reduces stress, improves mood, increases focus and energy levels, improves sleep, and can even accelerate recovery from surgery or illness (New York State - Department of Environmental Conservation).

Forests also provide ecological services including habitat for wildlife, clean air, clean water, and carbon sequestration. Ten to twenty percent of all carbon emissions in the United States are absorbed by our forests (Hite and Daley 2015). Along with a rapid conversion to clean energy and an overall reduction in energy consumption, the conservation of healthy forests is essential to reducing climate change.

Red-backed Salamanders as Bioindicators

Two thirds to three fourths of the carbon stored in forests is stored on the forest floor and in soils (Birdsey, R.A. 1992). Therefore, when we assess the health of our forests, it is imperative that we take a very close look beneath our feet. Red-backed salamanders are important indicators of the health of the forest floor and soils due to their widespread distribution, high densities, position in the middle of the food web, site fidelity, and sensitivity to environmental change (Welsh and Droege 2001). Unlike most species of amphibians who lay their eggs in water, red-backs spend their entire lives on land, laying their eggs in moist locations under rocks or logs. Free of the requirement to be within close proximity to aquatic habitat, red-backs have dispersed throughout forests and are often the most abundant vertebrate in them. Indeed, the biomass of red-backs has been found to be equivalent to small mammals and twice that of breeding birds (Burton and Likens 1975a, Mathewson 2009).

As top-level predators of the forest floor, red-backs prey on a great diversity of soil fauna, including larval and adult two-winged flies, larval and adult beetles, spiders, mites, ticks, collembolans, ants, nematodes, and other invertebrates (Burton 1976). Many of these prey play a critical role in soil decomposition by shredding leaves, greatly increasing the amount of surface area available for primary decomposers - bacteria and fungi. Red-backs keep populations of leaf shredders in check, thereby slowing down soil decomposition and keeping more carbon in the soil, some of which is immobilized and permanently added to the organic layer (Hairston 1987; Wyman 1998; Best and Welsh 2014). This has large implications for the global carbon budget as of course more carbon in the soil means less in the atmosphere (Wyman 1998).

As ectotherms, salamanders have low metabolic rates and are extremely efficient at converting the prey they consume into new biomass, fixing 60% of digested material into new tissue. To put this in perspective, birds, which are endothermic, only convert 2% of the food they ingest into new biomass (Burton and Likens 1975b).

Salamanders are also important prey for ground-foraging birds like the hermit thrush *(Catharus guttatus)* and American robin *(Turdus migratorius)*, snakes like the garter *(Thamnophis sirtalis)* and ringneck *(Diadophis punctatus)*, and small mammals (Coker 1931; Fenster and Fenster 1996; Arnold 1982; Uhler et al. 1939).

Since red-backs are non-migratory, changes in their populations can be directly linked to changes in the conditions of the forests in which they live (Welsh and Droege 2001). Some of the environmental conditions for which red-backs have been found to be good indicators include soil moisture (Heatwole 1962; Feder 1983), soil temperature (Bobka et al 1981), and soil pH (Frisbie and Wyman 1991; Wyman and Jancola 1992).

Methods of Monitoring Populations of Eastern Red-backed Salamanders

One way to assess changes in the size of populations of red-backs is by using mark-recapture studies in which individuals are captured, marked, released, and then recaptured. By determining the percentage of captured individuals that had been previously marked during each sampling round, it is possible to estimate population densities. Marking individuals with visual implant elastomers (harmless colored tags injected under the skin) is less invasive than the old method of toe clipping, but it is still labor intensive and requires a modest financial commitment.

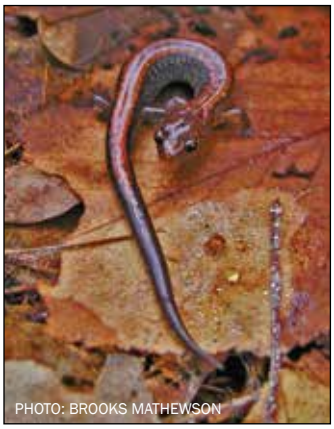
PHOTO: BROOKS MATHEWSON

As predators of invertebrate fauna on the forest floor, red-backed salamanders often slow down soil decomposition and help to keep more carbon in the soil.

An alternative approach is to derive an index of relative abundance based on individuals counted on the surface of the soil. Surface counts can be conducted either under natural cover objects (NCOs) such as rocks, logs, and leaf litter or artificial cover objects (ACOs) such as cover boards. One major drawback to raw counts is that it is unknown what percentage of the population is being counted during each sampling session. Differences in counts from one sampling date to the next may be a reflection of a change in the probability of detecting an individual due to differences in environmental conditions rather than an actual change in the population. In addition, observers' sampling efforts or ability can vary significantly. That is why it is imperative to take sampling conditions as well as sampling effort into account when comparing raw count data. A major advantage of ACOs is that they limit between-observer variability, while also limiting disturbance to NCOs.


PHOTO: BROOKS MATHEWSON

Two color morphs, a striped and an unstriped or lead-backed morph (shown here), occur in most populations of red-backs including the one at Edmands Park.

Another way to monitor populations of red-backed salamanders is by tracking changes in the color-morph ratios of populations. Red-backed salamanders occur in two color morphs, an unstriped morph and a striped morph. Interestingly, the frequencies of color morphs in a population has been linked to differences in climate; higher percentages of the unstriped morph are found in drier, warmer sites (Lotter and Scott 1977). Further, as the climate has warmed the unstriped color morph has become more common throughout the species' range (Gibbs and Karraker 2006). Therefore, monitoring color morph ratios in a local population is a way to contribute to our understanding of how organisms are changing in the face of climate change.

Climate change is also believed to be playing a role in reducing the average adult body size of salamanders, including red-backs (Caruso et al. 2014). This change in body size is believed to be caused by a reduced metabolic efficiency due to changes in moisture and air temperature. By measuring red-backs, we can estimate how average body size might continue to change in the future. This body size information can also help us assess the age structure of a population.

Results from Edmands Park

The students, teachers and I searched for red-backs under NCOs on eight separate dates totaling six hundred and ninety minutes of search time in May and early June of 2016. Care was taken to not damage NCOs and to return them to their original location. The search effort was focused on the southern section of Edmands Park, as this area seems to receive the least traffic and overall seems to be the least disturbed. When red-backs were encountered, we recorded color morph and estimated size class based on the following categories - small: snout-to-vent length (SVL)

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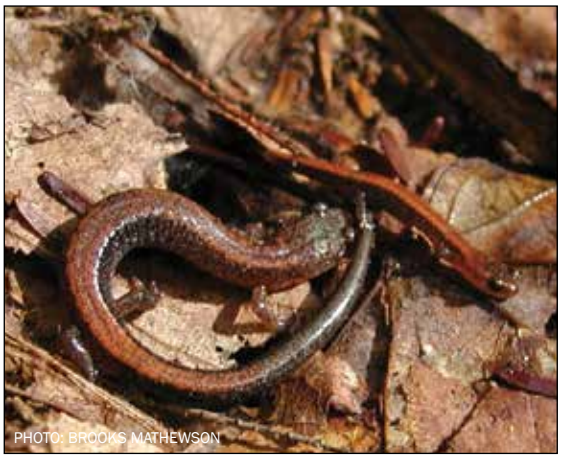
under 30mm - believed to be first-of-the-year individuals hatched in the fall of 2015; intermediate: 30mm < SVL <= 35mm - believed to be juveniles, hatched in the fall of 2014 or possibly adults in their third year; and large: SVL > 35 mm - believed to be adults three years or older.

In addition, I installed an array of 50 ACOs made of one-inch thick, rough-cut hemlock boards in a grid in the southern section of Edmands Park on May 7th, 2016. The grid consisted of five rows of ten ACOs; each row was 1m apart and ACOs were placed 1m apart in each row. We used ACOs of two lengths, 12 and 18 inches; the width of the boards ranged from 8 to 11 inches. ACOs were checked three times in the spring and three times in the fall. When red-backs were encountered under ACOs, color morph and exact SVL and total length (TL) were measured. Temperature, relative humidity, and precipitation prior to sampling were also recorded for each sampling date.



Red-backs undergo direct development and do not have an aquatic larval stage. When young hatch after about six weeks of incubation, they resemble miniature adults.

A total of fifty-four red-backs were observed during NCO searches. The highest rate of observation was 16 red-backs/hour on May 6th. This sampling session was conducted in a light rain after six straight days of rain. The maximum number of red-backs found during one sampling session was 20 on May 18th (observation rate - 8.0 red-backs/hour) (Table 1). Given that only about a quarter of the park (albeit the quarter that seemed to be the best habitat for salamanders) was searched and that only 2% to 32% of a population is found on the surface of the soil at any one time depending on environmental conditions (Taub 1961), a reasonable estimate of the population size of red-backs at Edmands Park is likely between 150 and 250 individuals.

ACOs seldom yield observations of red-backs until they have weathered in the field for a few months, and not surprisingly three rounds of ACO monitoring in the spring yielded only one observation. Another round in the late summer yielded only one more. However, two rounds of ACO monitoring in October yielded fourteen observations of red-backs (Table 2). All but three observations were made under longer ACOs. The observation rate under ACOs in October (average rate: 0.14 salamanders/ACO; maximum rate: 0.20 salamanders/ACO) was similar to that of second-growth rural forests in north central Massachusetts in October (both average and maximum rate: 0.20 salamanders/ACO) (Mathewson unpublished thesis).

The estimated size class distribution of red-backs observed under NCOs was as follows: small: 16%, intermediate: 76%, and large: 8%. Under ACOs, the lone salamander observed in the spring was in the intermediate size class, while all fifteen individuals observed in the late summer and fall were in the largest size class. Part of the reason for the differences between the size class distributions is undoubtedly that the NCO searches were conducted in the spring and the ACO searches were conducted in the fall after the salamanders had had a chance to feed and grow all summer. However, the lack of intermediate size class observations under ACOs in the fall suggests that larger individuals are likely choosing these microhabitats preferentially, perhaps establishing territories around them and excluding smaller salamanders.

The unstriped color morph accounted for 56% of individuals observed under NCOs and 50% of observations under ACOs. These are larger percentages of unstriped morphs than in any previous published work from New England. In the closest study both in time and location to this one, conducted at the Arnold Arboretum in 2005, 40% of the population consisted of unstriped morphs (Mathewson 2007). The average percentage of unstriped morphs from eight populations in Massachusetts in 1977 was 18% with the highest being 33% in Boxford, MA (Lotter and Scott 1977). Our results, therefore, appear to be consistent with the overall trend of an increase in unstriped morphs (Gibbs and Karraker 2006).

Conclusions and Thoughts for the Future

Overall, I believe this study was valuable both educationally and in terms of the data we collected. The lectures I gave to students prior to data collection as well as in the field were well received. Numerous students inquired about how they might pursue a career in ecology, and everyone seemed very engaged and excited to be participating in research so close to their school.

In addition to continuing to work with the Newton North High School, there is also a tremendous opportunity to include elementary and middle schools in this study. Analysis of other aspects of the forest in Edmands Park would be extremely beneficial as well. Further, red-backs are found in a number of additional green spaces in Newton including Cold Spring Park, Hammond Pond Reservation, Webster Conservation Area, and Kennard Park. A network of long-

term monitoring sites throughout Newton would be of great ecological and educational value. I will be presenting the results from this work at the Newton Free Library on January 18th, 2017, at 7:00 pm and would be excited to discuss these ideas further.

Acknowledgements

I am grateful for the support for this project that was provided by the Newton Conservators and the Newton Parent Teacher Student Organization. I am also very appreciative of the support and assistance provided by Newton North High School AP Biology teachers Anndy Dannenberg and Shu-yee Chen and for the leadership of Thomas Gwin. I would also like to thank Jennifer Steel from the Newton Conservation Commission and Newton Open Space Coordinator Carol Schein for their approval to conduct this study at Edmands Park. Harry Sanders from the Friends of Edmands Park provided much appreciated insight into the layout and history of Edmands Park. ■

In Tribute

The Newton Conservators was saddened to learn of the death of member Andrée Désirée Wilson of Newton Centre.

In addition to being an activist and conservationist, Andrée was a talented gardener who used her artist's eye to create beautiful gardens on the grounds of the home she shared with her husband, Richard. She had a special love for trees and historic irises and featured them in her gardens, which received a City of Newton Beautification Award in 2004.

The Wilsons worked with the Conservators to put a conservation restriction on their land to protect all but an envelope of land around the house from any development. There also is a path open to the public in perpetuity. Andrée welcomed neighborhood children to walk to school through her gardens, where a sign warns, "Beware of the Gardener. She talks."

Andrée and Richard were founding members of the Conservators. They donated a piece of their Newton Centre land to the city, and it's now the Wilson Conservation Area. Andrée also worked with the Conservators to preserve Webster Vale, which became the Charles Cohen Conservation Area (part of Webster Woods) when it was purchased by the city in 1972.

We will miss her strong spirit and her dedication to beauty and conservation.

Newton's Volunteer Land Stewards

By Jennifer Steel, Senior Environmental Planner for the City of Newton

In the 1990s, Helen Heyn, Newton's terrific Conservation Administrator, coordinated "Path Pruners" to help care for Newton's trails. But by the time I took on the role of Conservation Administrator in the fall of 2013, many Conservation parcels were in a state of decline. Many of the signs, trailheads, trails, and boardwalks on the 20 parcels the Conservation Commission oversees were in need of sprucing up. In 2013 and 2014, Eagle Scouts and the Newton Environmental Science Program assisted with a few improvement projects. In 2014, John Menard and Sons, Inc. was re-employed to care for all the parcels.

However, it was clear that more help was needed, so in 2015, I gave a presentation at the public library to re-introduce Newton's conservation land and revitalize Newton's conservation tradition. At that meeting, some people expressed interest in a land-steward program, and there are now 14 wonderful volunteer land stewards, who help look after the 10 largest, trailed parcels of Conservation land in Newton.

The land stewards walk "their" parcels several times each year, and report their findings or suggestions (such as trees blocking trails, erosion of the footbed, recent dumping of brush or trash, or stairs in need of fixing). Jennifer can then make sure that John Menard or an Eagle Scout will address the problem. Many stewards also undertake maintenance activities on their own, clipping overhanging branches, moving fallen branches or trees from the trail, collecting trash, and reminding dog owners that dogs must be on-leash. Stewards also come together for workdays, educational walks, and social gatherings. It has been a very successful program to-date. More volunteers and involvement are always welcome!

To show what land stewards can accomplish, here is a report from Jay Werb and Ellen Katz, the stewards for the Charles River Pathway. ■

Charles River Pathway

By Ellen Katz and Jay Werb, Land Stewards

Charles River Pathway
(aka Williams-Saco Streets Riverwalk)
Conservation Area Site Visit Summary
9 September 2016
Jay Werb and Ellen Katz, Volunteer Stewards

Yellow is the color of ripeness, and also the autumn color of the pathway, if one takes the time to appreciate it. Yarrow, with its feathery foliage, begins blooming in late July and as its yellow button blossoms turn to warm brown, the goldenrod flowers open on graceful, drooping stalks.

Left: Goldenrod. Right: Yarrow. Both are native to North America.

Autumn is also the time when the dreaded Japanese Knotweed blooms and it's easy to see how why the Victorians, who imported it as an ornamental, named this plant foamflower.

Jay, working many weekends, made significant progress towards containment of the invasive at the headwall. Next season, we can continue the long-term process of organizing community activity on the pathway.

Knotweed at the headwall, May 2016.

Most of the knotweed pulled, September 2016.

Dead trees across from bench.

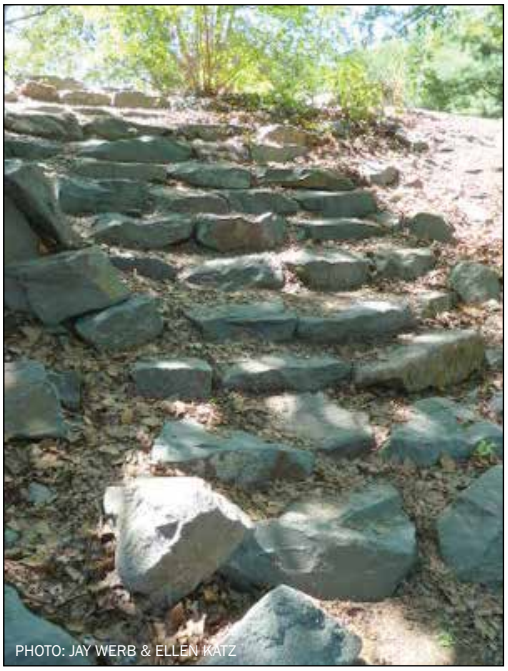
Regarding other vegetative issues, there are two dead trees across from the bench which need to be removed professionally the next time Mr. Menard has scheduled maintenance. Thank you for removing the trash barrel by the condominiums.

The path continues to be heavily used.

During our river walks in Watertown we noticed several access points where stone steps lead down to the river. Perhaps some day on the pathway…? ■

Looking at the low water in the river.

All ages enjoy the woods.



Stone steps down to the river, Watertown.

✯ A New Contest from the Newton Conservators! ✯

Can You Identify This Location?

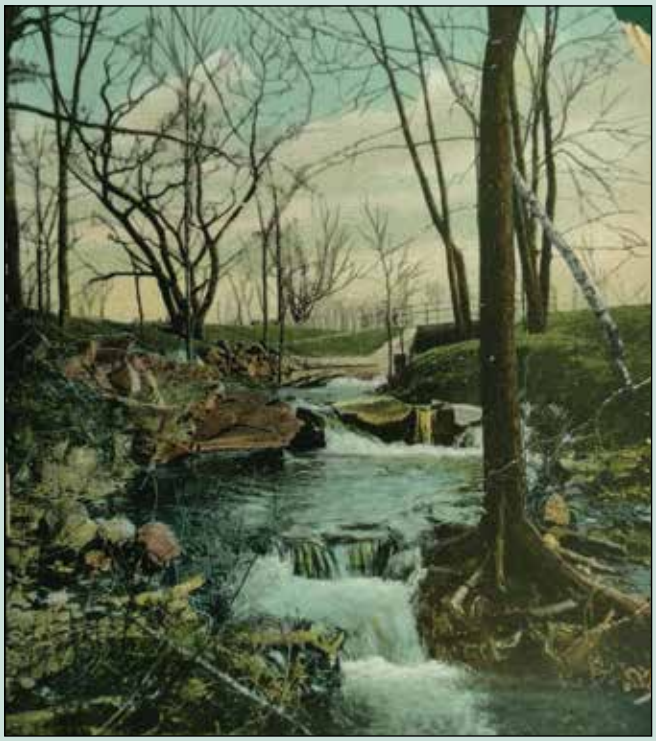
Win a Free One-Year Membership —
For Yourself or For Anyone of Your Choice

Where was this photograph taken?

Send your best guess to
Newsletter@NewtonConservators.org

The winner will receive a one-year membership. If we receive more than one correct entry by January 15, we will draw two names from a hat.

This is a hard place to identify!
Hint: It's in Newtonville.



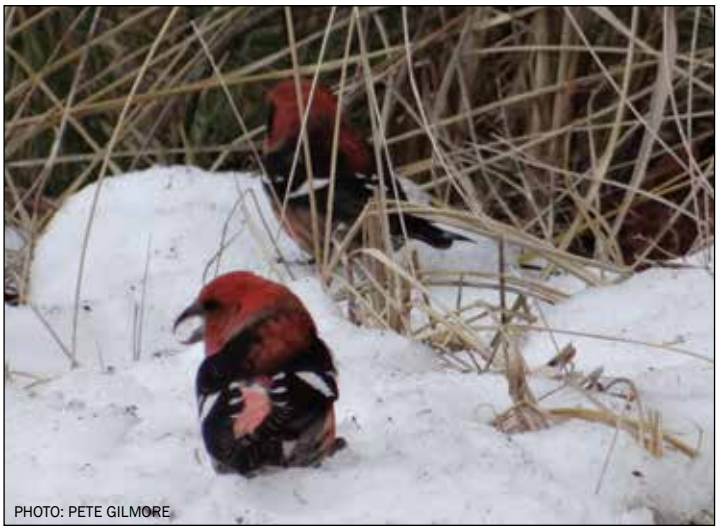
This Winter, Crossbills?

An irruption of winter finches refers to an invasion of northern, or boreal, birds down to our region. This is a fairly regular occurrence in Massachusetts. We get Red- and White-winged Crossbills, Evening and Pine Grosbeaks, Pine Siskins and Common and Hoary Redpolls every few years. The species vary from year to year: one year having a lot of redpolls; another year having a lot of crossbills.

The most recent irruption of crossbills to our area was in the winter of 2008-2009. There were many more White-winged Crossbills than Red Crossbills in Newton that winter. I saw them first at the end of September over Richardson Field, between Beethoven and Allen Avenues. They were around my yard later that winter and continually in the Newton area a lot of the winter.

As of late October, 2016, folks have been seeing White-winged Crossbills elsewhere in Massachusetts. This might mean that we are in for an irruption this year, or it might be wishful thinking on the part of birders.

Red Crossbill



White-winged Crossbills

The two species of crossbills are very different in their breeding habits and looks. Both have the unusual crossed bills, which make them look deformed. (When you occasionally see another bird, such as our Northern Cardinal, with a deformed beak, you wonder how long it will live.) It seems that an ancestral bird of the crossbills had such a deformity, and the new beak allowed it to extract the seeds from conifer cones. Its offspring then survived in the harsh northern winters differently than other birds. It had discovered a new niche in which to feed.

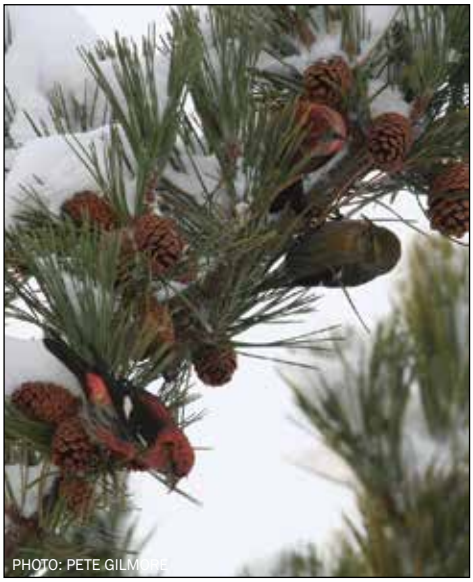
Extracting pine nuts from cones has made crossbills evolve stronger feet than other finches. This allows them to wrestle with cones while perched on a tree limb or on the ground. Their jaw muscles are asymmetrical, allowing their beaks to move sideways, which helps them to get at the seeds hidden in the cones. Watching them eat reminds me of a small parrot as they tumble a cone around while holding it.

The White-winged Crossbill is very nomadic, and we have only one type in North America. The Europeans also have only one type, but it is a little different from ours. The two continental types are called "subspecies." (That may change as DNA research goes on, and they may be "split" into two different species.) There is a different species of White-winged crossbill in Haiti and the Dominican Republic, called the "Hispaniolan Crossbill." It probably was a population of our White-winged Crossbills that got isolated on Hispaniola when the glaciers receded.

Our White-winged Crossbills find suitable food and breed almost all of the year. The decision to reproduce depends on finding a big cone crop in tamarack or spruce forests. Once the nomadic flock discovers such a source, they settle down and nest. At a given nesting area they are monogamous. It is not known whether that habit extends beyond the move to a new area.

White-winged Crossbills travel in flocks, rarely as individuals. In Canada, they must travel long distances to find food sources because the cones that they consume are spread widely across the northern part of North America. Thus, they never settle down in one place for very long.. These birds eat cones from various fir trees but do not specialize a lot in their diet. Thus, they are constantly mixing their gene pool, and no separate subspecies emerge.

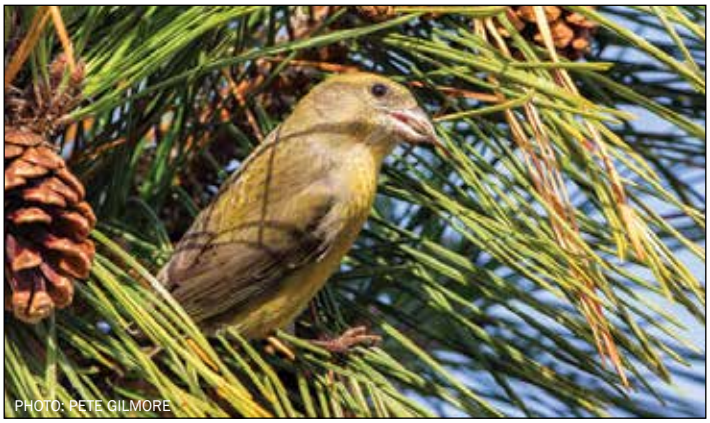
The very similar Red Crossbill is a different animal, genetically speaking. There are twelve known subspecies of Red Crossbills in North America. The different subspecies eat different sorts of fir tree cones, usually. They do better with slightly different beaks for the different types of cones. They do not interbreed normally. They are also nomadic but keep somewhat isolated from each other due to their food preferences. (Have you noticed a difference in your friends who are meat eaters and those who are vegetarians?)



White-winged Crossbills Feeding

The different food preferences and the resulting isolation have created different groups of birds. At present these are considered subspecies.

The way to distinguish red Crossbill subspecies is by the vocalizations that the different types make. This difference was first discovered by a student, Jeffrey Groth, at Virginia Polytechnic Institute in 1983. A great article, with all of the different vocalizations, written by Matt Young at the Cornell Lab of Ornithology is at the link: ebird.org/content/ebird/news/recrtype/



Female Red Crossbill

One interesting wrinkle in the Red Crossbill's makeup was pointed out by Charles Darwin, who was fascinated by the crossbills. He wrote in Natural Selection about how variable these beaks are. He believed that the most variable part of a creature's anatomy was what would be most likely to create new species when some difficulty in surviving forced natural selection to operate. So, in the face of global warming, the Red Crossbill is poised to take advantage of shifts in food sources and evolve into a species, or several new species, that survive the coming changes.

Darwin believed that we would never see evolution because it operates over such enormous time spans. But biologists have watched various mammals, small fish and plants evolve in the space of a decade or two. Each of us should be aware that using a lot of antibiotics puts survival pressures on the bacteria we are killing. They then evolve into resistant strains that do not die when that antibiotic is used. Evolution is a little too close for comfort.

Birders also have been seeing Pine Siskins and Evening Grosbeaks in Massachusetts.

Pine Siskin

The Pine Siskin is a little boreal species that turns up at our feeders in Newton. They resemble female goldfinches but are very streaked underneath, and have a yellow bar of color in their brown and black wings. They also have very pointed and sharp little beaks. It pays to keep an eye on your feeders for these little guys. They have a taste for thistle seeds as do goldfinches. They often will find food by following the local goldfinches, so watch those goldfinches for a different looking sidekick.

The chance that more boreal birds may follow those grosbeaks, siskins and White-winged Crossbills to Massachusetts will get me out of doors this winter. I hope to see some of you out in the cold, bundled up and curious about the winter landscape and creatures. It is a nice change from the warm comfort of your home and helps you appreciate your home when you get back. The peace you get outside will give you a different peace when you return. Get out this winter, and check out the chickadees!

One organized venture of this sort is the **Newton Christmas Bird Count**. A group of us meet at 5 AM to look for owls, which we always find, more some years than others. More relaxed folks meet at 7 AM and look for birds in groups, covering most of Newton, until about 12 noon. Some folks participate for only part of the morning as they choose. We meet on Rayburn Terrace in Newton Highlands for bagels and coffee before organizing ourselves into groups and going out. The exact date has not yet been set. If you are interested, contact Pete Gilmore, 617-969-1513 or maurice.gilmore@comcast.net. ■

Pete Gilmore

Environmental Science Program Groups - 1970s and 1980s

The "Envi Sci" Program Turns 50 Next Year!

In 2017, the Environmental Science Program of Newton will celebrate its 50th anniversary.

That news has surprised some parents of students who recently enjoyed the program, and it has delighted former leaders and students, some going back to the 1970's.

The "Envi Sci" Program has evolved with the times, but it still does many of the things that have made it successful year after year. The Program is planning several events for the summer of 2017 that will let "alums" of the Program get together and enjoy remembering what they liked most about their time in the Program.

If there is a way to explain what makes the Program so well-liked, it would be the things that make it unique compared to other programs for students.

First, the Program is not like many sports-and-swimming summer camps. It is different every day, and students can expect to go on a hike one day, to take a bicycle trip another, or to take a trip on the T to a special environmental destination. There is a "mountain sequence" that helps students develop the skills and endurance necessary for ambitious back-packing.

Second, a long-standing tradition is that the leaders run the Program. That is because the leaders meet regularly during the January through June months to plan and to develop the science workshops that they will teach in the field when the Program is running. The meetings give the group of leaders a chance to bond and to work on their leadership skills. During the operation of the Program in the summer, the leaders divide the students into small groups and take them out on the day trips, with a lot of individual attention.

Third, the Program takes the students and the leaders to climb Mt. Washington every year, which is an accomplishment that gives anyone a lot of pride. The Appalachian Mountain Club knows the Program from its 40+ years of staying at the Lakes of the Clouds hut on Mt. Washington, and the staff at the AMC hut welcomes our group every year.

The Program has been able to sustain this experience for students and leaders with the help from the Newton Conservators, which for many years has generously donated scholarship funds to support students from families who cannot afford the Program's tuition. In recent years, the Program has also received support from Green Newton (formerly Green Decade), and each year there are parents and other individuals who donate to help the Program succeed.

It is important to note that the Program is part of the Newton Conservation Commission and receives essential support from staff at the City of Newton to "keep the wheels turning" year after year.

The process of planning the 50th anniversary celebration has made it possible to connect with many people from the past decades, some of whom have enthusiastically told me stories of their time as students and leaders and have been happy to hear that the Program is still going strong. Some have generously sent donations to support the Program's operations or to fund education of the leaders.

A number of alums have repeatedly talked about how people in the Program made friends they have kept for life and how they learned a lot of interesting science, in one case, "more than I learned in school."

There are some things that the Program no longer does — we dispensed with the "phone tree" of sequenced family telephone numbers once used for relaying news to families about our expected arrival time from mountain hikes now that almost everyone has a cell phone. We have had to come to terms with guidelines for social media use, and we use online outreach to connect with families more than we use conventional media.

But the Program still continues to do what it does best: allowing students and leaders to enjoy the wilderness and to learn about the science of the environment. Along the way, it helps build relationships that last a long time.

There have been dozens of leaders who have worked in the Program over the years, and hundreds of students, many of whom have who have gone on to careers in science. The Program hopes to have many of them be part of the celebration planned for next year.

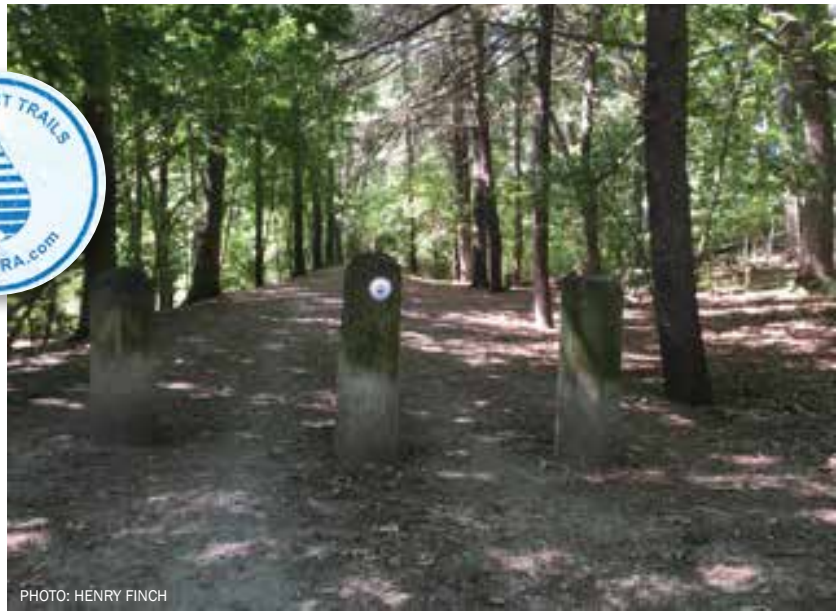
The current plans for the anniversary celebration include a gathering in Newton, most likely during the first week in August of 2017, for a barbecue or dinner that will feature photos, videos, and story-telling. There are also plans for a trip for "A Night At the Hut!" for those who would like to return to the Lakes of the Clouds AMC hut for a night, scheduled for August 5th-6th. These plans are subject to change, but the Program hopes to have more detail available soon.

The Program has information about the plans for the 50th anniversary online at: www.newtonenvisci.org/50years/index.html which includes a link to the Facebook page for the Envi Sci 50th. We plan to post updates in the coming months.

If you or someone you know has been part of the Envi Sci Program and would like to participate in the 50th anniversary events, please contact the Program's Executive Director, David Backer, at contact@newtonenvisci.org for more information. ■

David Backer

New, Official MWRA Signs Posted Along Sudbury Aqueduct in Newton!



Conservators' members Andreae Downs and Henry Finch posted these signs provided by the MWRA along the Sudbury Aqueduct in Newton. The Conservators hopes that Newton city officials will apply for the permission being offered by the MWRA for public access to the aqueduct trails. For more about that process, see the article by Andreae in the newsletter from the summer of 2015: http://bit.ly/2bHmilE.

If you haven't renewed your membership already, now is the time. And consider a gift for a conservation-minded friend.

NEWTON CONSERVATORS

Newton Conservators
PO Box 590011
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MA 02459

2016 MEMBERSHIP RENEWAL

YES! Please renew my tax-deductible membership at the level checked below:

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Please make checks payable to Newton Conservators, Inc.
Visit our website at www.newtonconservators.org if you wish to renew your membership online.

Yellow Warbler
Photo by Suzette Barbier

Do You Use Amazon for Purchases for your Home or Business?

As explained in past newsletters, Amazon Smile is a program through which Amazon donates .5% of most purchases (yes, $5 of every $1,000) to a nonprofit (501c3) organization of your choice (the Newton Conservators, we hope!).

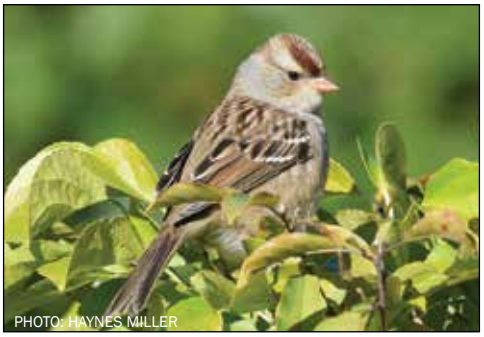
How does one use Amazon Smile? Instead of going to Amazon.com, you go to Smile.amazon.com. On your first visit, you will be asked to choose a nonprofit organization to receive the bonus donation. Enter "Newton Conservators," and you are ready to go. The rest of your shopping proceeds exactly the same as if you had logged in to Amazon.com initially.

Even with relatively few members using the program so far, the rewards have grown. For the first quarter we participated in 2014, we received $22.32. For the most recent quarter in 2016, we received $38.31.

We do encourage you to support our local bookstores, but as most people know, you can buy almost anything on Amazon, and we hope that you will let your purchases work on behalf of open space in Newton.

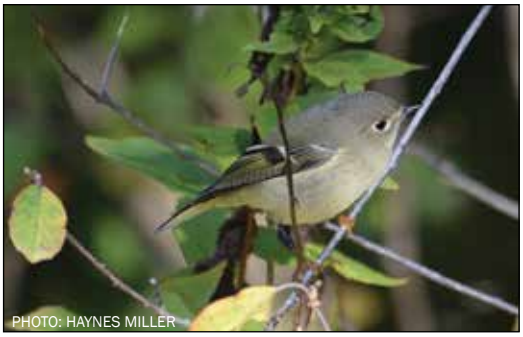
If you have any further questions about the program, check the FAQ page: http://smile.amazon.com/about.

This Fall at Nahanton Park..



Immature White-crowned Sparrow

Brown Thrasher



Ruby-crowned Kinglet

MISSION
Newton Conservators, Inc.

The Newton Conservators promotes the protection and preservation of natural areas, including parks, playgrounds, forests and streams, which are open or may be converted to open space for the enjoyment and benefit of the people of Newton. It further aims to disseminate information about these and other environmental matters.

A primary goal is to foster the acquisition of land, buildings and other facilities to be used for the encouragement of scientific, educational, recreational, literary and other public pursuits that will promote good citizenship and the general welfare of the people of our community.

The Newton Conservators was formed as a not-for-profit organization 55 years ago in June 1961.

The Newton Conservators Newsletter© is published four times each year by the Newton Conservators, Inc., in June, September, December, and March. Deadlines for these issues are the first Friday of each month in which an issue is scheduled to be published.

We welcome material related to our mission from any source. Send proposed articles or letters by email in MS Word or rich text format to bethwilkinson@mac.com. Digitized photographs, maps and diagrams are also welcome.

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WINTER ISSUE

NEWSLETTER

Newton's land trust working to preserve open space since 1961

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IN THE WINTER ISSUE:

Black-throated Green Warbler
photo by Haynes Miller

Go Green! ...and all the other colors of the rainbow. You can view this newsletter at www.newtonconservators.org/newsletter.htm. To elect not to receive a paper copy of the newsletter, update your membership profile at www.newtonconservators.org