Citizens for Lexington Conservation
PO BOX 292, LEXINGTON, MA 02420-0003
http://www.clclex.org

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September, 2011
Kate Fricker, Editor **Eileen Entin & Keith Ohmart, Co-Presidents**

IN THIS ISSUE:

Honeybee with full pollen baskets on Goldenrod flowers

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Citizens for Lexington Conservation is a non-profit organization that relies on dues paid by members to cover its expenses. Look at your mailing label to check your membership status. If it says "Dues paid 2011," you are up to date. If it says "Dues paid 2010" (or earlier), then it is time to renew your membership for 2011. If it says "Complimentary Copy," you are receiving a complimentary copy of our newsletter because you are a Town Meeting member or other public official in Lexington. We hope that those who receive complimentary copies will find our organization of value and will become dues-paying members. To join CLC or renew your membership send $15.00 to CLC, P.O. Box 292, Lexington, MA 02420-0003.

There is an electronic version of the CLC newsletter, sent by email with a link to the newsletter. This version of the newsletter has illustrations in color and live links, it arrives much sooner than the snail mail version, it saves paper, and it costs CLC about $1 less per copy. If you are currently receiving your newsletter by snail mail, but would like to get it by e-mail, contact Kate Fricker at kfricker@alum.swarthmore.edu.

CLC Publications

Over the years CLC has encouraged members to write guides to the open spaces in Lexington. These guides have been scanned and are available at no charge on our web site, http://www.clclex.org.

You may also use the web site to contact us about conservation-related happenings or sightings of unusual birds and wildlife that we can use on our web site and in our newsletter.

Thank you Walk Leaders

CLC is grateful for the people who volunteer to lead our spring and fall walks. Leaders of the 2011 Spring Walks were Nell Walker, Kate Fricker, Harry West, Emily Schadler, Alex Dohan, Fran Ludwig, and Chris Floyd.

Photo Credits

p. 1, 2, 6, 12, 13, Kate Fricker
p. 5, David Kaufman
p. 7, Emily Schadler
p. 7, 8, 9, 10, 11, Ned Eisner

A Hoverfly on Goldenrod

Did you realize:

The amount of oil consumed in the manufacture of a bottle of water is equivalent to having each bottle one-quarter full of oil?

The amount of water consumed in manufacturing each bottle is three times as much as the bottle contains?

(Source: The View from Lazy Point by Carl Safina.)

Citizens for Lexington Conservation Fall Walks 2011

All walks are in Lexington and are free and open to the public

Sunday, September 18, 2 – 3 PM **Dunback Meadow Butterfly Walk**

Meet at the Allen St. entrance to Dunback Meadow (park on Allen St; additional parking at the Clarke entrance, if needed). We will walk in the community garden and on the main paths in the wet meadow. Expected species include, Monarch, Pearl Crescent, Eastern Comma, Red Admiral, skipper species, with a possibility of unusual fall migrants. Opening remarks will describe places to go locally for rare species and coastal locations for observing the fall Monarch migration. Rain date Sunday, September 25, at the same time. Leader: Tom Whelan (781—863-1880; tom@whelanphoto.com).

Thursday, September 22, 2:30 – 3:30 PM **Pond Exploration at Parker Meadow**

Geared for children in grades K – 5 accompanied by an adult. Meet at the Revere St. entrance to Parker Meadow. Limited parking is there; additional parking is available on neighborhood streets across Revere St. Join Emily Schadler for a prowl around Parker Meadow to look for signs of beavers, bugs, frogs, and toads. We'll dip a net into the water to see what kinds of critters are wriggling around below the surface. Bring rain boots if you have them, and be prepared to get dirty. If you have a small bug box or magnifier, bring it along. Rain will cancel the event. Leader: Emily Schadler, Conservation Assistant. (781-862-0500 x 240; eschadler@lexingtonma.gov).

Sunday, September 25, 1:30 – 3 PM **Six-Legged Safari at Willard's Woods**

Family friendly walks for kids in grades K - 5 accompanied by an adult. Meet at Brent St. entrance to Willard's Woods. Look and listen for insects and other creepy crawlers in field and forest. We will do some sketching of what we find. Equipment will be provided. This is an easy walk. If there is steady rain or lightning, the walk will be cancelled. Leader: Fran Ludwig (781-861-7231; fludwig12@yahoo.com).

Saturday, October 1, 8 – 10 AM **Bird Walk in Dunback Meadow**

Meet at the Allen St. entrance to Dunback Meadow. In early October the last of the migrating birds will still be coming through Dunback Meadow. Although the ground is slightly rough, the pace is slow so the walk is accessible to most. Children and beginners are welcome. We will enjoy a varied habitat, including mixed woods, open fields, and a stream. Bring binoculars if you have them. Heavy rain or lightning will cancel the walk. Leader: Bobbie Hodson (781-861-9421; robertahodson@comcast.net).

Thursday, October 13, 2:30 – 4 PM **Lexington's Autumn Leaves**

Geared for children in grades 2 – 5 accompanied by an adult. Meet at the Visitors Center on the Buckman Tavern grounds. Street and municipal lot parking are available. Join Karen Longeteig for a walk around the Buckman Tavern 'arboretum' to gather and identify autumn leaves. Bring an old catalog or thick magazine to press your best leaves and a pen or pencil to write their names. Wear boots or be prepared to have muddy shoes. Rain date is October 20. Leader: Karen Longeteig, Lexington Tree Committee member (781-862-4094; karen.longeteig@gmail.com).

Saturday, October 22, 10:30 AM – 12:30 PM **Western Greenway Walk**

Meet and park at Falzone Field, 901 Trapelo Rd., Waltham, (across from Our Lady's Church/Academy). We will walk on new and established Western Greenway trail segments on the properties south of Trapelo Rd. We'll go on new trails in Lot 1 and 3, through Shady's Pond Conservation Area over boardwalks and bridges built by volunteers, and then back to Falzone

Field. The walk is not overly strenuous. Wear sturdy shoes. We will walk in steady rain—only lightning will cancel the walk. Leaders: David Kehs (drkehs@erols.com); George Darcy (gadiii@yahoo.com)

Sunday October 23, 8 – 10 AM, Ducks and Sparrow at Arlington Reservoir and Busa Farm

Meet at Rindge Avenue Playground and park along Rindge Ave. We will look for migrant ducks in the reservoir and migrant sparrows at the back edge of Busa Farm. Many unusual birds were seen in mid-October at the farm last year, including Orange-Crowned Warbler, Tennessee Warbler and Blue Grosbeak. Depending on the weather, some muddy conditions might be encountered. We'll likely walk around Arlington Reservoir. Total walking about 1 mile. Walk will be cancelled if more than light rain.
Leader: Chris Floyd (781-862-2841; chrisf@mitre.org)

Sunday October 30, 2 – 4 PM **Stone Walls of Whipple Hill**
Meet at the Winchester Drive parking lot. Whipple Hill contains some of the most extensive and beautifully preserved stone walls in all of Lexington. Late fall after most of the leaves have fallen is a wonderful time to appreciate these treasures and the overall lay of the landscape. Sturdy shoes are recommended for this strenuous walk. Heavy rain will cancel the walk. Leader: Keith Ohmart (781-862-6216; kohmart@verizon.net)

Saturday Nov. 5, 11AM–12:30 PM **Cotton Farm – Upper Vine Brook, Dunback Meadow**
Meet in the parking area in the Cotton Farm Conservation Land (entrance on Marrett Rd.). Additional parking is available on Marrett Rd. We will walk in the newly acquired Cotton Farm Conservation Land with its apple orchard, open fields and lovely pond. We will then walk the Upper Vine Brook trail, which connects to Highland Ave. If time permits, we can then explore Dunback Meadow conservation area on the other side of Marrett Rd. Rain date: Sunday, Nov. 6, at the same time. Leaders: Gerry Paul (781-861-6279; gerryp@bu.edu); Bonnie Newman (781-861-8191; bjnewman@rcn.com)

Maps of conservation lands can be found at
http://www.lexingtonma.gov/conservation/conland.cfm

Watershed Stewardship Storm Drain Marking Program

By Stew Kennedy

Lexington's Watershed Stewardship program was established three years ago as a partnership between the Conservation Stewards and the Town's Conservation Division and Engineering Division with the goal of monitoring and tending to the health of Lexington's twenty streams. Happily, the program is well off the ground, doing very important and satisfying work in the community. Some of the program's accomplishments to date include: educational presentations made to civic groups about Lexington's watersheds and the importance of watershed health; three stream survey days conducted, with reports on findings produced and with follow-up cleanups; and tance to Engineering in the development of a professional stream management plan for Lex-

ington's Charles River Watershed and a second one in process for our Shawsheen River Watershed. While these important projects have involved teams of volunteers often working unseen and in sometimes challenging conditions far out in the field, one of our projects, on the other hand, is very visible publicly – which is precisely its point. This is the result of our initial foray into town to mark the storm drains with plaques intended to help raise public awareness about the connection between storm drains and the health of our local streams.

It turns out that a surprising proportion of the population does not realize that all storm drains lead directly into the nearest stream, with the contents completely untreated. The goal of this marker project is to remedy that. To help folks understand this link, and also to raise their consciousness about stream health in general, we have undertaken to mark sidewalk-edge curbs adjacent to the drains throughout town (as far as finances and volunteer energy allow) with attractive stainless steel disks, as reminders. We hope they will effectively inform passersby not to toss things into the drain and to be careful about everything that finds its way into the roads. After describing the plan to interested town committees, culminating in obtaining approval for the program from the Board of Selectmen, we targeted Lexington Center as the first area to receive markers.

Carolyn Levy and Eileen Entin installing drain markers

The area covered was from the Minuteman Statue to Woburn St. roughly east-west and from just beyond the Bikeway to Forest St. north-south. It was chosen because of the high foot traffic there, to maximize visibility. All the water (and other "stuff" that gets picked up by it) that lands on or drains into the roadways there goes directly into the Vine Brook. (Vine Brook enters a 4-foot diameter culvert when it reaches Vine Brook Rd. just south of the Center and continues thus underground, passing underneath Mass. Avenue between the post office and the town office building, and finally returns to daylight after it passes under Hayes Lane. The storm drains throughout the center area are connected by pipes directly to this large culvert.) Vine Brook, after it leaves Lexington, eventually joins the Shawsheen River, whose water is used by some downstream communities.

With flyers posted around the Center calling attention to the coming installation, volunteers were invited to participate in the installation on a quiet Sunday morning in May. Turnout was just right, so we could divide the area into four teams of two or three each. Armed with markers, a map of drains to be done, gloves and glue guns, the teams did a great job applying 68 markers. Although the markers are guaranteed to last for 30 years, that doesn't ensure they will stay firmly affixed for any period of time. It's a pleasure to report, though, that all remain soundly in place four months later. Based on the success of this pilot effort, we will expand the program to other appropriate neighborhoods throughout town. Such neighborhood projects should lend themselves well to scout, church youth, school and other interested groups.

Thanks for this successful new educational/outreach program go to the Watershed Stewards, to Engineering for their support and for budgeting money for materials, and to Conservation for

help coordinating the program helping with outreach. And a special thanks is due to the volunteers who applied the glue. It should be noted that CLC was very well represented in that group.

Western Greenway Trail Update

By Keith Ohmart

A volunteer work crew from the communities of Lexington, Waltham and Belmont completed one of the last remaining links in the Western Greenway Trail connecting Mass Audubon's Habitat Sanctuary in Belmont with the Paine Estate in Waltham this past May. Approximately one half mile of trail was constructed across a previously untrailed section of the Department of Conservation and Recreation's Lot 1 property connecting Walnut Street with the existing trail network on Lot 1 behind Brookhaven.

This new trail begins just north of Cart Path Lane off Walnut Street, and continues the trail created two years ago across DCR's Beaver Brook North property west of the Avalon at Lexington Hills complex. The trail heads north from Cart Path Lane parallel to Walnut Street, then turns left and crosses a meadow before entering a wooded area of mature sumac. Leaving the sumac behind, the trail then crosses through a fine stand of mature pine/oak woodland with impressive stone walls before joining the existing Lot 1 trail system descending from the MWRA water tower on the north side of Lot 1. Turning left/south on this trail will lead you around a seasonal vernal pool and across another meadow area before reaching an intersection with a colonial era cart path, which now also serves as the border between Lexington and Waltham on the far side of the meadow.

Work is scheduled for later this fall to connect this cart path down to Trapelo Road where it will connect with the Western Greenway trail constructed last year south of Trapelo Road through Waltham's Shady's Pond conservation area. With the completion of this last trail segment along with a short section of trail further south in Waltham across property owned by the YMCA of Greater Boston, it will be possible to hike or bike the entire 6.5 miles of trail from Habitat to the Paine Estate, with only minimal road crossings.

With the completion of the Lot 1 trail segment in Lexington, the need has now arisen for recruiting volunteer stewards, for both the Beaver Brook North and Lot 1 sections of the trail, who would be willing to periodically weed wack sections of these new trails which become seasonally overgrown. The trails on these DCR properties fall outside the jurisdiction of the Lexington Conservation Department and its Steward organization. Interested parties can contact Keith Ohmart (kohmart@verizon.net, 781-862-6216) for further details.

Exploring Lexington's Streams

By Emily Schadler

Over the past three years, a crew of citizen scientists strikes out through dense vegetation, soggy footing, and mosquito hordes every spring to explore Lexington's streams. They are Lexington's Watershed Stewards, and they are a heardy breed. In their explorations, they have discovered stream reaches and wetlands that most Lexingtonians never see, tracked down pipes buried by thick sediment, and returned to pick enough ticks off of their bodies to fill a coffee cup.

Kiln Brook, in Meagherville

Lexington's Watershed Stewardship Program started in 2008 as a partnership between a dedicated citizen volunteer corps and the Town of Lexington's Conservation and Engineering Divisions, focused on improving the health of Lexington's 21 streams. (To learn more about Stewards' outreach efforts, see Stew Kennedy's article in this newsletter about storm drain marking). One of their primary goals has been to walk along each of Lexington's 21 streams to collect data on stream characteristics, problem areas, and assets, and then to share that data with other citizens and Town staff.

Over the past three years, the Stewards have explored Vine Brook, Willard's Brook, North Lexington Brook, Farley Brook, Simond Brook, and Kiln Brook. Their data shows that Lexington's streams are generally small, shallow, and slow-flowing, and that many have been altered over time, often for past agricultural or drainage purposes. Watershed Stewards have identified a number of specific problem areas, such as malfunctioning pipes and culverts, dumping areas, fertilized lawns on stream banks, and areas with "off" smells, which might indicate the presence of sewage or other pollutants. In some areas, impacts from urban stormwater run-off are evident, such as locations where sharply eroded stream banks suggest an increase in water volume and flow rate over time.

Fish have been sighted in only a few locations, including at Juniper Hill Brook and in Vine Brook after the heavy rains in the spring of 2010 (probably overflow fish from flooding in Butterfield Pond). Fortunately, no aquatic invasive species have been identified from the surveys yet, although water chestnut is known to exist in Arlington Reservoir, which connects to Munroe Brook. In the future, the Watershed Stewards plan to take their stream explorations a step further by undertaking water quality sampling and monitoring.

One of the important lessons that has been learned through the Watershed Stewardship Program is that many people are unaware of Lexington's streams, because they are relatively small and hidden on our landscape. The brave Watershed Stewards who strike out to walk their lengths have discovered pleasant surprises along with the problem areas—beautiful skunk cabbage and red maple swamps, short bubbling cascades, and herons fishing along stream edges. These discoveries are a reminder of why it is important to care for all of our water resources, and to help others in Lexington to learn about our waterways, however hidden they may be.

Be Nice to Spiders

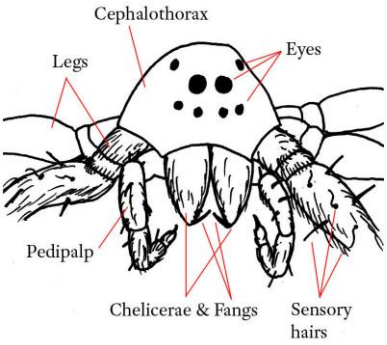
By Ned Eisner

Long-bodied Cellar Spider, Pholcus phalangiodes, in my basement

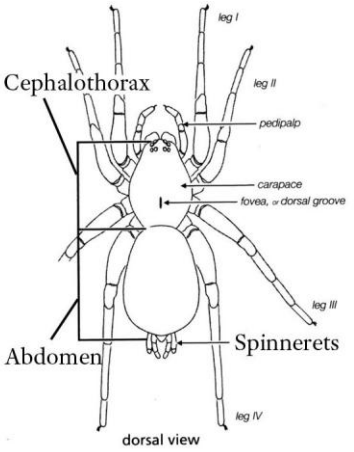
Something scuttles quickly along the floor and disappears under the refrigerator. A strange whitish patch covers where the wall joins the ceiling. A pile of dead sow bugs lurks in a forgotten corner of the basement. What do all of these have in common? They are all signs of spiders in our houses. Although we find spiders in our homes with some frequency, most are only passing through. Only a few species are comfortable living with us, and most of these confine themselves to the basement. side, spiders fill many ecological niches, but all have one thing in common: they are carnivores that eat, collectively, vast quan-

tities of other arthropods including many that are nuisances to us, such as mosquitoes and plant pests.

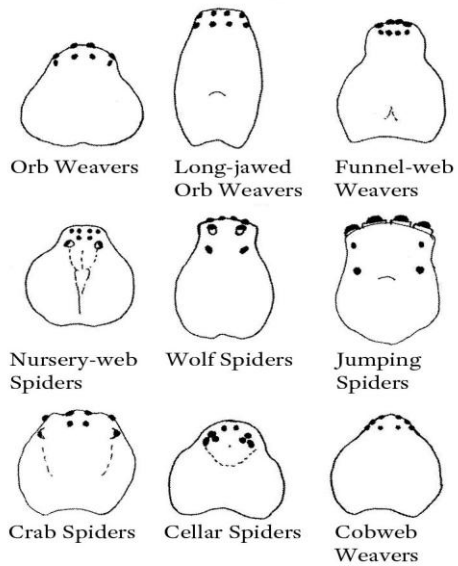
Spiders evolved from early arthropods, possibly the sea spiders. Some daring individuals crawled from the sea onto land about 443-414 million years ago, roughly 50 million years after plants first colonized the land and tens of millions of years before the ancestors of the insects did the same. The defining characteristic of these early arthropods is the presence of appendages of the first body segment that have been modified to perform a variety of roles, mostly involved with feeding, called chelicerae (pronounced kel-iss-er-ee). They also have 4 pairs of walking legs, as well as a pair of pedipalps, another leg-like structure. These first terrestrial sea spider relatives became arachnids, while the remaining aquatic sea spiders became the modern sea spiders, horseshoe crabs, and the now-extinct sea scorpions.



Arachnids are a diverse group, but only three classes are commonly seen in the Northeast: spiders, ticks and mites, and the harvestmen or daddy-longlegs. Spiders are distinguished from their arachnid cousins by four main traits: venom glands in the chelicerae, male pedipalps modified for sperm transfer, abdominal spinnerets and silk glands, and the lack of a particular leg muscle. In the wild, silk production and spinnerets are the easiest to see, especially if the spider is sitting in the middle of a beautiful web or ballooning on a silk thread.



Spiders, like all arthropods, have jointed legs and segmented bodies. Spiders have two body segments, the cephalothorax in front and the abdomen in back.



Eye location is used to help identify spiders.

A Daring Jumping Spider, *Phidippus audax*, crawling on the deck of my mother-in law's house

The cephalothorax contains the eyes, mouth, and brain, part of the digestive system, as well as all of the appendages. These are the pedipalps, the chelicerae, and the four pairs of walking legs. The abdomen contains the remainder of the internal organs including the breathing organs, heart, the bulk of the digestive organs, the reproductive organs, and the silk glands and spinnerets.

Spiders have sense organs distributed over their bodies, and the range of stimuli detectable roughly mirrors our own 5 senses. Multiple types of sensory hairs cover most of the spider, and these hairs are used for the touch sense. Some are also very sensitive to air motion, and can be used to detect flying insects through air currents generated by their wings. Open-ended hairs at the ends of the legs and pedipalps act as the equivalent of our taste buds, giving the spider the ability to detect chemicals on what they touch. Spider noses, such as they are, may be located on the pedipalps and legs. Little is known of a spider's sense of smell. The legs also carry slit sense organs that are somewhat analogous to our ears. These structures are extremely sensitive to vibration and are used to determine what is moving on a web, as well as helping with navigation, acting like an inertial guidance system.

Common House Spider, *Archaearanea tepidariorum*

Vision is usually not the most important sense in spiders, although many can have a very wide field of view since they can have many eyes facing in different directions. Jumping spiders are an exception, and may even have color vision. If you approach them they will turn and face you and they can be clearly seen tracking your movements. Unlike most insect orders, the placement, size, and even number of eyes are quite variable across spider families. In fact, the arrangement of a spider's eyes is a key feature for distinguishing different families of spiders. Most spiders have eight eyes, although some have six, and a few have only two or no eyes at all. Spider eyes are simple eyes, like ours, unlike the compound eyes of insects.

Hunting behavior can be divided into two main categories: active, mobile hunters and more passive sit-and-wait hunters. The active, mobile hunters wander throughout their chosen habitats looking for prey. These habitats can be quite varied, from treetops to under water, from the forest floor to our kitchen floors. Depending on the habitat, the spider may have specific adaptations to make them more successful. For example, jumping spiders have excellent vision that allows them to more easily find prey, gauge the

A Venusta Orchard Spider, *Leucage venusta*. It is not as elongated as manyother long jawed orb weavers.

Banded Garden Spider, *Argiope trifasciata*, in its web in the medow on Doran Farm Lane

distance to that prey, and then jump to the attack (or retreat).

The sit-and-wait hunters typically employ the trademark of spiders, the web. Like the arrangement of a spider's eyes, the type of web it weaves is a good method of identifying the family the spider is classified in. The orb weavers spin the "classic" spider web: symmetric radial spokes with bull's-eye rings of silk. The spider waits either in the middle of the web, or hidden just off the web with its legs contacting some of the web supports to feel if something is stuck in the web. The grass spiders, or funnel-web weavers, make cornucopia-shaped tubes of silk with wide, roofless openings. They wait within the narrow part of the tube for prey to arrive on the wide, "patio" portion of the web and then dart out and kill it. However, not all passively hunting spiders use webs. Many are well camouflaged and simply hide in flowers, leaves, crevices, etc. and then pounce when prey comes near.

A Dimorphic Jumping Spider, *Maevia inclemens,* hunting in the meadow. Note the large forward-facing eyes.

Lexington is home to hundreds of spider species, in at least 20 families. For those willing to look, finding many types of spiders is easy. A common house dweller is the Common House Spider. It is the spider most commonly responsible for the disordered webs we call cobwebs, although a recent survey of my basement found a dozen or so Long-Bodied Cellar Spiders and no Common House Spiders. Spiders like the Cellar Spider may be mistaken for daddy-longlegs, but a closer examination will reveal that the spider has two distinct body segments while the daddy-longlegs has only one.

A huge *Pisaurina mira*, about 4 in. long, on the wall of our old patio in Burlington

We have many orb weavers, including three large spiders, the Black and Yellow Argiope, the Banded Garden Spider, and the Shamrock Spider. All three are full-grown by September and can be found in their webs. The two Argiope have an interesting habit of bouncing their webs like trampolines when frightened.

Six-dotted Dolomedes, *Dolomedes triton,* on the surface of the pond in Lower Vine brook conservation area

The long-jawed orb weavers are the basketball players of the spider world. They have very long, thin bodies, with long, thin legs, and tend to rest with their front legs held out directly in front, maximizing their apparent size. Many make attractive webs similar in shape to the other orb weavers. The Venusta Orchard Spider is very common,

and has a multi-colored, metallic-sheened body.

The jumping spiders are a beautiful family of stalking spiders. They have two very large eyes facing forward that provide excellent vision. Six other eyes provide views to the side and top that are mainly used to detect predators. With their excellent vision, jumping spiders search for prey, jumping from plant to plant. Before they jump, they anchor a silk line to whatever they are on, and then let the line out as they jump. If they miss their target, they simply climb back up the line and try again. Most use their silk to make temporary houses in folded or rolled leaves. Commonly seen jumping spiders are the Daring Jumping Spider and the Dimorphic Jumping Spider.

A wolf spider carrying her young in Willard's Woods

The largest spider I have seen in our area was a member of the nursery web spiders, *Pisaurina mira*. These spiders are also stalkers, but they spin a web for their hatchlings. A pair of them was hunting after midnight on our patio. The larger of the two had a leg span of about 10cm, or almost 4". One of the most interesting of these spiders, the Six-dotted Dolomedes, is a fishing spider. It walks along the surface of ponds looking for prey either on the surface, or below. It can dive underwater to catch prey, using a bubble of air trapped by special hairs on its body and legs.

Wolf spiders look very similar to nursery web spiders, but instead of spinning a nursery web, these spiders provide more direct maternal care. Like human mothers, these spiders carry their newborns with them to keep them safe and fed, but instead of having just one or two, they have to carry up to 100!

A Goldenrod Spider, *Misumena valie,* on Queen Anne's Lace in Willard's Wood

Crab spiders are also commonly seen. They are called crab spiders because the shape and arrangement of their legs make them look a bit like small crabs. The Goldenrod Spider is very common and hides in the flowers of various white or yellow wildflowers, especially Queen Anne's lace and goldenrod. Their prey are typically pollinators, including bees, flies, and moths. The Goldenrod Spider can change color over the course of many days, from bright yellow to white or vise-versa, depending on what color flower it is on.

One of my son's and my favorite books when he was a younger child was Be Nice to Spiders by Margaret Bloy Graham. In it, a little boy donates his pet spider to the zoo because he cannot take it to his new apartment. At the zoo, the spider eats all of the flies that are bothering the animals in each cage, slowly moving from cage to cage. Eventually the zoo keeper realizes that the spider is responsible for the animals' happiness and makes a rule for all his workers: Be nice to

spiders. The spider is able to reproduce, and spiderlings move into all the cages at once, presumably keeping all the animals happy forever after. While spiders are not generally able to remove pests on the scale described in the book, leaving places devoid of insects, they are still critical to our ecosystems. They are also fascinating to watch, and in their own way, quite beautiful. They deserve our following the zoo keeper's rule.

Note: You can view this article in color at http://clclex.org. Click on "Current Newsletter".

Watch out for the Tree of Heaven

By Jane Warren

The Plant Materials Guide for Lexington (www.lexingtonma.org/HomePage.htm) lists exotic invasive plants as well as plants native to Lexington. Knowledge about invasive species like the tree-of-heaven (Ailanthus altissima) is important in protecting the native environment. The tree-of-heaven was introduced from China to North America as an ornamental tree in 1748 by a Pennsylvania gardener. These trees became available from nurseries in 1840 and were widely planted in cities. According to the US Department of Agriculture, they currently grow in 42 states in the US. Tree-of-heaven is included in a list of plants that Massachusetts has prohibited for sale, trade, purchase, or distribution. Though trees-of-heaven are attractive, they are highly invasive. They crowd out native plants that are good for the environment and produce toxins that prevent establishment of other species nearby.

Tree of Heaven Foliage and Seeds

Trees-of-heaven can be found in people's yards, in conservation lands and other open spaces, and along many roads in this area. Particularly noteworthy are the large numbers of tall trees-of-heaven along Rte. 2 in Arlington, with many smaller ones coming up in front of them. West Farm, a small Lexington conservation meadow, has many small trees-of-heaven just in front of the large ones, too. This scenario is found all over. On a family trip to the Great Smoky Mountains National Park in 2010, we drove on federal highways lined thickly with trees-of-heaven, sometimes with long stretches of them at a time, in all the states from Massachusetts to Tennessee.

Clump of mature trees with young ones in foreground invading the meadow at West Farm

Trees–of-heaven grow fast and can reach about 80 feet in height. The trees are dioecious—male and female flowers occur on separate plants. The flowers are small and pale yellow to green. Flat-winged

reddish fruits, each containing one seed, are produced on female trees in late summer or early fall. The fruits are on terminal clusters of the female trees' branches in summer and persist on the trees over the winter. Trees-of-heaven have compound pinnate leaves—they are structured like a feather with leaflets on both sides of the stem, sometime with a terminal leaflet at the end. The leaves are 1- 4 feet in length with 10 to 41 leaflets. Young sumac shrubs, which are good for the environment, look somewhat similar to young trees-of-heaven.

The seeds of trees-of-heaven are dispersed by wind and water. They produce a prolific amount of seeds. One study found that one tree-of heaven could produce more than 300,000 seeds a year. In addition to reproducing by seed, the trees frequently reproduce through vegetative sprouting from roots. The seedlings can grow to 3 – 6 feet in the first year and root sprouts 10 – 14 feet in that time. Trees-of-heaven form dense thickets. The main vulnerability of the tree-of-heaven seems to be its lack of shade tolerance. Thus, it thrives at forest edges, in disturbed or harvested forests, in abandoned city lots, along roads, and in meadows.

Mature Tree of Heaven with Seedpods

Chopping down a tree-of-heaven does not get rid of it because it produces large numbers of sprouts from the roots. The root system is extensive and hard to eradicate. However, repeated cutting of sprouts over time can eventually exhaust the plant's reserves. Chemical methods of control are most effective. Two fungal pathogens that have been found on dead trees-of-heaven are being investigated as possible biological controls.

If a seed of a tree-of-heaven floats into your yard and starts growing, which is quite likely given the number of trees-of-heaven around, dig it out right away and make sure every piece of root is gone. These trees are extremely invasive and destructive to the environment, as are many alien plants. For those who find trees-of-heaven attractive, 5 species of trees listed in the Native Plant Guide for Lexington have deciduous, compound pinnate leaves similar to those of the tree-of-heaven, but they also provide food and cover for wildlife and have other good attributes.

Green ash (Fraxinus pennsylvanica): This dioecious tree grows 30 – 75 feet tall with a trunk diameter up to 20 inches. Its leaves are up to 6 to 9 inches long divided into 5 to 9 leaflets, each about 3 - 4 inches long. The deep-green leaves turn yellow in fall. Both male and female flowers are not conspicuous. The fruiting period is in September and October; the fruits persist through winter. About 10 species of birds eat the seeds from the winged fruits (samaras). This tree is also a larval host to caterpillars of 6 species of butterflies. It grows well in sun, partial shade, and shade and in dry, moist, and wet neutral soil.

White ash (Fraxinus americana): This ash has a straight trunk with a conical or round crown of foliage. White ash grows to 60 to 100 feet tall with a trunk diameter of 4 feet, considerably larger than green ash trees. The leaves grow up to 12 inches long, usually with 7 leaflets that are 3- 5 inches long. In the fall, the leaves turn yellow and then purple. This ash is also dioecious, and the male and female flowers are inconspicuous. The fruiting period is in September

to November with fruits persisting to early winter. About 8 species of birds, mostly song birds, eat the seeds of the winged fruits. Many are the same as those that eat green ash seeds. This ash also is a larval host for caterpillars of 6 butterflies, some the same as green ash and some different. Both green and white ash trees provide cover and good nesting sites for birds. White ash grows well in sun, partial shade, or shade and in dry or moist acid soil.

Butternut (Juglans cinerea): The butternut tree, also called white walnut, reaches 40 – 80 feet tall with a trunk diameter of 1 – 2 feet. The leaves have 11 to 17 leaflets, each 3 - 4 inches long. The leaf size ranges from 15 to 30 inches. The yellow-green leaves turn yellow in fall. This tree is monoecious—the male and female flowers form on the same tree. Neither type of flower is conspicuous. The fruiting period is September to November. The fruits are oblong nuts, 1 to 1½ inches in diameter, that are covered with a sticky husk. About a dozen bird species eat the fruits. Most of them eat the meats of butternuts after they have been opened by squirrels or chipmunks or have split naturally. Butternut trees prefer sun and moist, neutral soil.

Mockernut hickory (Carya alba): The mockernut hickory grows 50 - 60 feet or more in height The bark is rough with shallow ridges, but does not shed like the bark of shagbark hickory. The leaves are 9 – 14 inches long with 7 – 9 (and some times 5) leaflets about 6 inches long. The leaves turn bright golden yellow in fall. This tree is monoecious, and both the male flowers (catkins) and female flowers (spikes) are inconspicuous. The fruiting period is September to October, with fruit persisting to December. The round fruits, 1½ inches in diameter, have thick husks that encase the small nuts. Mockernut hickory prefers partial shade and acidic moist soil.

Shagbark hickory (Carya ovata): This tree grows 70 - 90 feet or more in height. It has shaggy bark that sheds. The leaves are 10 - 14 inches long, usually with 5 leaflets, but sometimes 7. In the autumn the leaves turn to yellow or gold. The male and female flowers are similar to those on the mockernut hickory. The fruiting period is September to October, with fruit persisting to December. The fruit, 1½ to 3 inches long, is nearly round and has a thick green husk covering the nut. This tree also provides cover and nesting sites for birds. It grows in sun, partial shade, and shade, and in dry or moist acidic soil.

About 20 bird species eat the nut meats from mockernut and shagbark hickory trees, often after squirrels or other mammals have opened them or they have split naturally. Also, both mockernut and shagbark hickories are larval hosts for caterpillars of several butterflies and moths. Unfortunately, hickory trees have very long tap roots even when they are small so you may not be able to buy them at nurseries. If you know someone with hickory trees, you should be able to transplant them in the first year.

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